

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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NICHIA CORPORATION,

Petitioner,

v.

DOCUMENT SECURITY SYSTEMS, INC.,

Patent Owner.

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Case IPR2018-00966  
Patent 7,652,297

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**DECLARATION OF THOMAS L. CREDELLE**

I, Thomas L. Credelle, do hereby declare as follows:

**A. QUALIFICATIONS**

1. I have more than 40 years of deep and extensive experience in the research and development, product development and marketing of Liquid Crystal Display (LCD) technology, other flat panel display technologies, Light Emitting Diode (LED) technology, and optical systems.

2. I received my M.S. degree in Electrical Engineering from the Massachusetts Institute of Technology in 1970, with an emphasis on Electro-optics and Solid-State Materials. I received my B.S. degree in Electrical Engineering in 1969 from Drexel University.

3. I was employed by RCA at Sarnoff Labs in Princeton, NJ from 1970 through 1986 at first as a Member of the technical Staff and later as a Group Manager in charge of all Active Matrix LCD research. During my time at RCA, I participated in research and development projects relating to optical materials and flat panel displays, including LCD devices. I researched optical materials for photodetectors and holography before joining a team developing flat panel displays. In 1983, I established the Thin-Film Transistor (TFT) LCD Program at Sarnoff Labs. As a Group Manager, I led a project that resulted in the development of the first poly-Silicon TFT LCD at Sarnoff Labs. I received the

Sarnoff Outstanding Achievement Award for Large-Area Flat Panel TV

Developments.

4. From 1986 to 1991, I was employed by GE as the Manager of TFT LCD Research and Development at the GE Research and Development Center in Schenectady, NY. My duties included managing research and development efforts relating to TFT and LCD technology for avionics applications. While employed by GE, I led the team that built the world's first 1-million-pixel color LCD. I also led development of numerous other display devices utilizing LCD technology. As with the earlier work at RCA, a key part of this effort was the development of drive electronics for both the LCD and the backlighting system, including ruggedization for military use.

5. From 1991 to 1994, I was employed by Apple Computer as the Manager of Display Engineering. In my role at Apple, I supervised all LCD design, engineering, and qualification for the first PowerBook notebook computers introduced to market in the United States.

6. From 1994 to 1996, I was employed as the Director of Advanced Product Marketing by Allied Signal, where I was involved with the design and engineering of optical films and custom focusing backlight designs for improving the viewing angle performance of LCD devices.

7. From 1996 to 1999, I was employed as the Director of Product Marketing for Motorola's Flat Panel Display Division, where I worked in the development of new flat panel technology, and I also worked closely with Motorola groups responsible for integrating LCD technology into mobile phone products, which were some of the first products to incorporate LED devices into the backlight system.

8. From 1999 to 2001, I served as the Vice President of Operations of Alien Technology Corporation. During my time at Alien Technology, I was involved with the design and architecture of drive-electronics and LED packaging technology suitable for flexible display devices.

9. From 2001 to 2007, I served as the Vice President of Engineering for Clairvoyante, Inc. My responsibilities as the VP of Engineering included managing research, development, engineering, and marketing of technologies for improving the resolution and power consumption of color flat panel displays. During my time at Clairvoyante, I was heavily involved with the design of LCD driving circuitry and image processing circuitry, including image processing algorithms. My work resulted in the issuance of multiple patents relating to display technology.

10. From 2007 to 2008, I served as the Senior VP of Engineering for Puredepth, Inc. My responsibilities included the design of hardware and software to create 3D images on LCDs.

11. In 2008, I founded TLC Display Consulting, a company that provides technical consulting in the areas of flat panel displays, liquid crystal displays, LEDs, and related electronics as well as expert reports for patent litigation. One of my key technical consulting projects (Display Engineering, Inc.) was the design and development of high-brightness LED-backlit LCDs for digital signage and other outdoor applications. A key issue with LEDs in this application was heat management; our team made significant advancements in heat flow and weatherproofing for these products. We also developed controllable-brightness circuits for LEDs using commercial LED driver circuits and upgraded power supplies.

12. From 2012 through 2015, I served as the VP of Application Engineering and Device Performance for Innova Dynamics, Inc., a nanotechnology company developing materials to be used in LCDs and touch sensors.

13. I have been a member of the Society for Information Display for over 40 years. I was a member of the Society for Information Display's Program Committee for 15 years, and the Director of the Society for Information Display's Symposium Committee for 10 years. In 1984, I was awarded the title of Society

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