

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE, INC.  
Petitioner

v.

UUSI, LLC d/b/a NARTRON,  
Patent Owner.

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Case IPR2019-00359  
Patent No. 5,796,183

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**DECLARATION OF DR. DARRAN CAIRNS  
IN SUPPORT OF PATENT OWNER'S RESPONSE**

I, Darran Cairns, declare as follows:

1. My name is Dr. Darran Cairns. I am a Director of Program Operations and Faculty Member in the School of Computing and Engineering at the University of Missouri Kansas City. I am also an Adjunct Professor of Mechanical and Aerospace Engineering at West Virginia University, where I have served on the faculty since 2006.

2. I have been retained by UUSI, LLC d/b/a Nartron (“Patent Owner” or “Nartron”) as an independent expert in the above-captioned proceeding, IPR2019-00359, before the Patent Trial and Appeal Board (“PTAB” or “Board”).

3. I have been asked to review and opine on Apple’s Petition for Inter Partes Review, Case No. IPR2019-00359 (“Petition”), of U.S. Patent No. 5,796,183 (“the ’183 Patent”), the Declaration of Dr. Phillip Wright submitted in support of that Petition, and the Board’s decision to institute review in this case. I have also been asked to explain the technology described, and the invention claimed, in U.S. Patent No. 5,796,183 and the two Reexamination Certificates issued for that patent. Finally, I have been asked to consider and describe the prior art cited in the IPR.

4. I am being compensated at a rate of \$490/hour for my work. I have no other interest in this proceeding. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this proceeding.

## I. BACKGROUND AND QUALIFICATIONS

5. As stated above, I am a Director of Program Operations and a Faculty Member in the School of Computing and Engineering at the University of Missouri Kansas City. I am also an Adjunct Professor of Mechanical and Aerospace Engineering at West Virginia University. I was an Associate Professor with Tenure at West Virginia University until August 2014.

6. I hold an undergraduate degree in Physics (1995) and a Ph.D. in Materials Science and Engineering (1999) from the University of Birmingham in the United Kingdom. From 1998 to 2001, I was a postdoctoral research associate in the Display Laboratory at Brown University. While at the University of Birmingham, I performed research related to optical fibers and optical sensors, and worked closely with engineers at Pirelli Cables. During my time at Brown University, I performed research on optoelectronic and display devices, including flexible electronics, conformable displays, encapsulated liquid crystal devices, and touch sensors.

7. At West Virginia University, my research focused on the fabrication of flexible electronic devices. My work was funded by federal agencies, including the National Science Foundation, NASA, the Air Force Office of Sponsored Research, and the Department of Energy, and by private companies, including EuropTec USA, Grote Industries, Kopp Glass, Eastman Chemical, and Articulated Technologies. I have worked closely with engineers at each of these companies, and assisted them

in developing and commercializing electronic devices, including electronic lighting for automotive use and flexible backlights for displays.

8. In my own research, I am developing patented technologies on functional coatings for electronic and energy applications. I am a named inventor on 11 U.S. patents in the field of touch sensors, displays, and liquid crystal materials.

9. Prior to joining the faculty at West Virginia University, I worked for five years as a Research Specialist at 3M Touch Systems. My research there focused on capacitive touchscreen applications. My work at 3M included the development of patented and proprietary technologies on capacitive touch sensors.

10. I am a member of the Society of Information Display (SID), the Institute of Physics (IOP) and the American Society of Mechanical Engineers.

11. My students have been awarded prestigious fellowships for work performed in my laboratory, including NSF Graduate Fellowships (3 students), NDSEG Fellowship (1 student) and the RUBY graduate Fellowship (1 student).

12. My curriculum vitae, attached as Appendix 1, lists more than 79 scientific publications in journals, books, and peer-reviewed conferences, as well as invited presentations on my work in polymer materials for electronic devices.

## **II. MATERIALS REVIEWED**

13. In preparing this Declaration, I have reviewed at least the following materials:

- a. All materials specifically identified in this Declaration;
- b. All materials identified as having been reviewed in my prior Declaration in this case, dated 5/6/2019 (IPR2019-00359, Ex. 2002);
- c. The Federal Circuit's decision in *Samsung Elecs. Co. v. UUSI, LLC*, 775 F. App'x 692 (Fed. Cir. 2019);
- d. The '183 Patent (IPR2019-00359, Ex. 1001);
- e. Apple's Petition for *Inter Partes* Review of the '183 Patent (IPR2019-00359, Paper 2);
- f. Excerpts from the Prosecution History of the '183 Patent (IPR2019-00359, Ex. 1002);
- g. The Declaration of Phillip Wright, submitted in support of Apple's Petition for *Inter Partes* Review (IPR2019-00359, Ex. 1003);
- h. The prosecution history of Reexamination Control No. 90/012,439 (IPR2019-00359, Ex. 1006);
- i. The prosecution history of Reexamination Control No. 90/013,106 (IPR2019-00359, Ex. 1007);
- j. U.S. Patent No. 4,561,002 to Chiu ("Chiu") (IPR2019-00359, Ex. 1005);
- k. U.S. Patent No. 4,922,061 to Meadows ("Meadows") (IPR2019-00359, Ex. 1013);

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