UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

XILINX, INC, Petitioner

v.

Patent of INTELLECTUAL VENTURES MANAGEMENT, LLC,
Patent Owner.

Inter Partes Review No. IPR2013-00112
Patent No. 5,779,334

SUPPLEMENTAL DECLARATION of A. BRUCE BUCKMAN, PH.D

I, Dr. A. Bruce Buckman, do hereby declare:

1. I am making this declaration at the request of Xilinx in IPR2013-00112 of US Patent No 5,779,334 ("the '334 Patent") to Kikinis.

2. I previously submitted a declaration explaining why the '334 patent is invalid. That declaration is marked as XLNX-1005, and sets forth my experience, qualifications, publications, materials considered and compensation.

3. As described in my prior declaration, I have over forty years of experience in the field of optics, including thirty-five years of experience as a professor in the electrical engineering department of the University of Texas at Austin. During this time, my teaching and research have focused on a wide range of topics in field of optics.

4. I understand that Patent Owner Intellectual Ventures has objected to my testimony on the grounds that I "lack[] expertise in the relevant field" and do not possess "special skill, knowledge, or experience concerning the particular issue before the Board." I disagree—I believe my experience and qualifications in the field of optics speak for themselves. Nevertheless, to eliminate any doubt, I have been asked to provide the following elaboration on my experience and expertise as it pertains to the subject matter of the '334 patent.

5. As noted in my previous declaration, my 44 years of experience in

optical engineering includes over 15 years of teaching a graduate course in fiber and guided-wave optics at the University of Texas at Austin. Course topics included many of the components that appear in the ’545 Patent, such as filters, prisms and lenses for redirecting light rays, and dichroic elements for combining or splitting light of different wavelengths or colors. For example, that course dealt with many image processing topics, including using a dynamic mask to create a desired output pattern or image. LCDs and spatial light modulators are just two of many types of dynamic masks that can be used to selectively block or transmit light to create dynamically changing images or patterns, of which video is but one example.

6. I authored a textbook, *Guided-Wave Photonics* as an aid in teaching the course. I concurrently conducted research in optical systems that resulted in dozens of peer-reviewed publications, including one on a 6-Degree of freedom non-contact optical position sensor that won the Best Paper Award at an international conference in 1994. I am a co-inventor on a US Patent for that device, and an inventor on three other patents covering various optical systems. This combined teaching and research experience with varying realizations of each of the above optical components has given me familiarity with the results of substituting one realization of a particular component for another.

7. I also taught courses on fiber and guided wave optics that included

significant discussions of the components that make up the systems discussed in the ’334 patent and the prior art references at issue, including components such as dichroic prisms, filters, polarizers, spatial light modulators, and other similar components.

8. During my career, I also designed and built systems using these components. These systems included prisms and mirror systems for separating light, lens systems for focusing light, lens / mirror systems for recombining light, polarizers for controlling light polarity, color filters, and interferometers that split and then subsequently recombine light.

9. This experience is directly relevant to the ’334 patent. Claim 1 of the ’334 patent reads:

> 1. A video projector system comprising:
> a source projecting parallel beams of light of different colors;
> a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;
> a video controller adapted for controlling the light-shutter matrix system; and
> an optical combination system adapted for combining the separate beams after the light-shutter matrix system into a single composite beam for projection on a surface to provide a video display.

10. I have experience with all of the components of this system. For example, a source projecting parallel beams of light of different colors can be built in a variety of ways, including by using dichroic prisms to divide the light, and

light collimators to ensure that the beams of light are roughly parallel. I have consulted about dichroic mirrors and coatings for a company that uses them in the illumination systems they manufactured. Earlier in my career, I routinely created parallel beams of light in connection with my work on six-degree-of-freedom optical sensors, some of which received a "best paper" award at an international conference.

11. I also have experience with light-shutter matrix systems. In particular, I have experience with spatial light modulators (SLMs), which are pixelated devices used to create light masks. A liquid crystal display is but one type of SLM.. Additionally, the graduate course I taught for many years from my textbook entitled *Guided-Wave Photonics*, XLNX-1009, and earlier from note-sets that became the book, involved extensive discussions of SLMs and their application to the field of optics. The guided-wave versions of SLM's that I taught are pixilated and operate on essentially the same principles as conventional SLM's. XLNX-1009 at 253.

12. My textbook also describes the electrical devices that control a guided-wave SLM. A video controller is a form of SLM controller that uses electrical signals to control SLM pixels, typically modulating the SLM pixels around 30 times per second. With the electronic SLM controllers I researched for my textbook, the spectrum analyzer application incorporates modulation of the

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