IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Racz et al
U.S. Patent No.: 8,061,598
Issue Date: November 22, 2011 USPTO Control No.: TO BE DETERMINED
Appl. Serial No.: 13/012,541
Filing Date: January 24, 2011
Title: DATA STORAGE AND ACCESS SYSTEMS

DECLARATION OF DR. JEFFREY A. BLOOM

1. My name is Dr. Jeffrey A. Bloom. I understand that I am submitting a declaration in connection with the above-referenced Covered Business Method ("CBM") review proceeding pending in the United States Patent and Trademark Office for U.S. Patent No. 8,061,598 ("the '598 Patent").

2. I have been retained on behalf of Samsung Electronics America, Inc. to offer technical opinions with respect to the '598 patent and the prior art references cited in this CBM review. My compensation is not based on the outcome of my opinions.

3. I am not a lawyer. However, counsel has advised me of legal concepts that are relevant to CBM review proceedings and to the opinions that I offer in this declaration. I understand that, during CBM review, claims of the subject patent are given a broadest reasonable interpretation. Counsel has advised me that the broadest reasonable interpretation must be consistent with the specification, and that claim language should be read in light of the specification and teachings in the underlying patent.

4. I have reviewed the '598 patent, including the claims of the patent in view of the specification, and I have reviewed the '598 patent's prosecution history. In addition, I have reviewed the following documents: PCT Publication No. WO 00/08909 ("Gruse"), U.S. Patent No. 5,530,235 ("Stefik '235"), U.S. Patent No. 5,629,980 ("Stefik '980"), U.S. Patent Application No. 10/111,716 ("the '716 application"), PCT Application No. PCT/GB00/04110 ("the '110 application"), United Kingdom Patent Application GB9925227.2 ("the '227.2 application").

5. I am currently Director of System Engineering and Software Development for Conditional Access and Identity Management Systems for SiriusXM radio. In my current position at

SiriusXM, I manage systems that employ many of the industry standard techniques for calculating one-way hash functions, encrypting content with both symmetric and asymmetric encryption, key management, key generation, zero-knowledge proof, authentication via digital signature, and other industry standard security techniques. I lead a team of systems engineers, requirement analysts, and software developers responsible for all conditional access (CA) security systems. This includes CA systems to control delivery of satellite radio services to automobiles and other satellite signal receivers, CA systems to control the delivery of streaming audio services over the Internet, and CA systems to control delivery of telematics services to automobiles. The systems that I manage rely on cryptographic methods and systems for protecting content and managing keys, and include identity management infrastructure such as SAML and Auth solutions for sign-on. As the Director of System Engineering and Software Development for Conditional Access and Identity Management Systems for SiriusXM radio, I am familiar with various licensing and reporting requirements, and royalty payment regimes used to compensate copyright owners for the broadcast transmission of copyrighted content. A media company like SiriusXM had direct arrangements with many rights holders.

6. From 1997 to 2000, I worked for Signafy (acquired by NEC) where I developed digital watermarking technology for use in rights management systems, and participated in the Data Hiding Subgroup of the Copy Protection Technical Working Group. In this role, I became very familiar with the field of Digital Rights Management and underlying cryptographic component technologies including digital signatures, digital certificates, and public key encryption.

7. From 2000 to 2005, I worked with the National Institute of Standards and Technology to develop robust tracking technology allowing content owners to identify sources of digital piracy of motion picture content.

8. In 2012, I worked as a Video and Streaming Consultant for VideoTechResearch LLC of Princeton Jct, NJ. VideoTechResearch provides consulting services that include on-site systems engineering for multimedia security and streaming, pre-sales business development, project management, and strategy and roadmap development. While at VideoTechResearch, I supported SiriusXM Satellite Radio, where I worked with the Streaming Services and Products group on the architecture of an IP streaming solution based on HLS with associated metadata. I also wrote

the primary API documentation for the back-end systems and provided support to partner client developers implementing clients based on that API. I also supported DAX Technologies, where I worked with DAX executives to create a video quality monitoring solution proposal for external customers.

9. Since 2012, I also have been an Adjunct Professor of Electrical and Computer Engineering at the New Jersey Institute of Technology Newark, NJ. In this role, I have taught graduate-level courses in Digital Image Processing

10. From 2009 – 2012, I also worked at Dialogic, Inc. in Eatontown, NJ as the Director Video Technologies. At Dialogic, I developed the technology and software components for a new QoE video quality monitoring and tracking business, enabling monitoring and tracking of video quality across VOD and live streaming.

11. From 2008 – 2009, I was a research center director at Thomson, Inc. (Technicolor) in Burbank, CA, where I managed a research center of 2 administrators and 15 researchers working in the areas of content security, signal processing, and content production and management.

12. From 2005–2009, I was a content security lab manager at Thomson, Inc. (Technicolor) in Princeton, NJ, where I managed an international group of 10 researchers in the US, France, and Germany. I led content security R&D efforts including conditional access systems, digital rights management systems, and watermarking systems. I also provided content security expertise and technical support for all Thomson business units.

13. From 2000–2005, I was a technology leader at Sarnoff Corporation in Princeton, NJ. At Sarnoff, I lead Sarnoff's digital watermarking research efforts in tracking watermarks for motion picture content, digital cinema watermarking, video database watermarking, and removable visible attribution watermarks; authentication watermarks. I also Developed Sarnoff's audio fingerprinting technology for audience monitoring and automatic audit log creation.

14. From 1998–2000, I was a research scientist at the NEC Research Institute / Signafy, Inc. in Princeton, NJ. There, I developed a number of still image watermarking products, and I developed two video watermarking technologies designed for broadcast monitoring and copy

protection, respectively. I also designed, implemented, and executed testing and evaluation procedures for video watermarking technologies.

15. From 1995-1999, I earned my Ph.D. Electrical and Computer Engineering from University of California Davis, CA. My thesis was titled, "The Derivative of Gaussian Transform," and my advisor was Todd Reed. I was a U.S. Department of Education GAANN Fellow under a TRW Fellowship. My research represented a study of models of the human visual system and the use of one such model to design and build 2D and 3D spatial and spatio-temporal transforms for images and image sequences. This transform was then used to build image and image sequence compression algorithms that are competitive with JPEG and H.261, respectively.

16. In 1990, I earned my M.S. Electrical and Computer Engineering from the Worcester Polytechnic Institute Worcester, MA. My thesis was entitled, "Feature Extraction and Surface Recognition of Arbitrary Surfaces from Range Data." This research focused on the modeling of surface data clouds, as might be obtained from contemporary lidar systems. An adaptive optimization method is applied to a standard triangular mesh to align mesh nodes with 3D feature points.

17. In 1987, I earned my in B.S. Electrical Engineering from the Worcester Polytechnic Institute in Worcester, MA.

18. I was an Associate Editor, EURASIP Journal on Information Security, 2006 – 2014, and an Associate Editor, Springer LNCS Transactions on Data Hiding and Multimedia Security, 2006 – 2014. I was involved with the Technical Program Committee, IEEE International Conference on Images Processing 2014; the Technical Program Committee, International Workshop on Quality of Multimedia Experience (QoMEX), 2010 – 2013; the Technical Program Committee, SPIE Security and Watermarking of Multimedia Contents, 2003 – 2014; the IEEE Multimedia Signal Processing Technical Committee, 2008-2012.

19. I worked as an editor for Transactions on Evolutionary Computation, 2011; European Signal Processing Conference (EUSIPCO), 2008-2011; Journal of Digital Forensics, Security and Law, 2009; and International Journal of Computer Mathematics, 2008.

20. I am an author of two books, including a leading textbook in digital watermarking – an image processing technology used for DRM, "Digital Watermarking" by Ingemar J. Cox, Matthew L. Miller, and Jeffrey A. Bloom, Morgan Kaufmann Publishers, Inc., San Francisco, 2002, and also "Digital Watermarking and Steganography, 2nd Edition" by Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom, Jessica Fridrich, and Ton Kalker, Morgan Kaufmann Publishers, Inc., San Francisco, 2008.

21. I have also published chapters in two books: Digital Rights Management–Concepts and Applications by Kambhammettu (2005) and Multimedia Security by Zeng, Yu and Lin (2006)

22. My findings explained below are based on my study, experience, and background in the digital rights management industry, and are further informed by my education in electrical and computer engineering. This declaration is organized as follows:

I. Overview
II. Terminology
III. Discussion of References
    A. Discussion of the Gruse Reference
    B. Discussion of the Stefik ‘235 and Stefik ‘980 References
    C. Discussion of the Combination of References
IV. Discussion of the Priority Application
V. Ineligibility of the Subject Matter of the Challenged Claims
VI. Legal Principles

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