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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

UNIVERSAL SECURE REGISTRY, LLC,

Patent Owner.

Case CBM2018-00023

U.S. Patent No. 8,856,539

**DECLARATION OF DR. VICTOR SHOUP IN SUPPORT OF
PETITION FOR COVERED BUSINESS METHOD REVIEW**

Apple 1002

Declaration of Dr. Victor Shoup in support of Petition for
Covered Business Method Review of U.S. Patent No. 8,856,539

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Declaration of Dr. Victor Shoup in support of Petition for
Covered Business Method Review of U.S. Patent No. 8,856,539

I, Victor Shoup, Ph.D., declare as follows:

1. My name is Victor Shoup.
2. I have been retained by Apple to provide opinions in this proceeding relating to U.S. Patent No. 8,856,539 (“’539 patent”).

I. BACKGROUND

3. I received a Bachelor of Science in Computer Science and Mathematics from the University of Wisconsin at Eau Claire in 1983. I received my Doctorate in Computer Science from the University of Wisconsin at Madison in 1989. I worked as a research scientist at Bellcore and at IBM Research Zurich. My work there included design of cryptographic protocols such as a new public key cryptosystem (now called the Cramer-Shoup cryptosystem) that achieved higher levels of security than were previously thought possible in a practical scheme.

4. I have been Professor of Computer Science at the Courant Institute of Mathematical Sciences at New York University since 2002 (initially as an Associate Professor, and as a Professor since 2007). I teach a variety of graduate and undergraduate courses on cryptography. Since 2012, I have also been a part-time visiting researcher at the IBM T. J. Watson Research Center in Yorktown, New York, where I collaborate with the Cryptography Research Group, which does work on a range of projects from the theoretical foundations of cryptography

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to the design and implementation of cryptographic protocols, such as
homomorphic encryption.

5. My areas of research include cryptography and number-theoretic algorithms, and I have published over 60 papers in these areas. In the area of cryptography, I have made substantial contributions in the sub-areas of digital signatures, public key encryption, hash functions, distributed computation, session key exchange, and secure anonymous credentials.

6. I was also an editor of the ISO18033-2 standard for public-key encryption, which was published in 2006.

7. I have been on the program committee of numerous international conferences on cryptography, and was the Program Chair at Crypto 2005 (Crypto is the premier international conference on cryptography). I have also acted as a consultant on cryptographic protocols for several companies.

8. In recognition of my contributions to the field of cryptography, I was named a Fellow of the International Association for Cryptographic Research (IACR) in 2016, for fundamental contributions to public-key cryptography and cryptographic security proofs, and for educational leadership.

9. I have given a number of invited lectures on my research in cryptographic protocol design. In 2005, I published a textbook on the mathematical underpinnings of cryptography titled *A Computational Introduction*

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