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Filed on behalf of Apple Inc.

By: Monica Grewal, Reg. No. 40,056 (Lead Counsel)  
Ben Fernandez Reg. No. 55,172 (Backup Counsel)  
Wilmer Cutler Pickering Hale and Dorr LLP  
60 State Street  
Boston, MA 02109  
Email: [monica.grewal@wilmerhale.com](mailto:monica.grewal@wilmerhale.com)  
[ben.fernandez@wilmerhale.com](mailto:ben.fernandez@wilmerhale.com)

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.

UNIVERSAL SECURE REGISTRY, LLC,

Patent Owner.

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Case IPR2018-00808

U.S. Patent No. 9,530,137

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**DECLARATION OF DR. VICTOR SHOUP IN SUPPORT OF PETITION  
FOR *INTER PARTES* REVIEW**

Apple 1002

Declaration of Dr. Victor Shoup in support of Petition for  
*Inter Partes* Review of U.S. Patent No. 9,530,137

**TABLE OF CONTENTS**

I.	BACKGROUND.....	1
II.	LEGAL PRINCIPLES .....	3
	A. Claim Construction.....	3
	B. Obviousness .....	4
III.	DESCRIPTION OF THE RELEVANT FIELD AND THE RELEVANT TIMEFRAME .....	6
IV.	THE '137 PATENT .....	7
	A. Specification and Claims .....	7
	B. Prosecution History .....	8
V.	LEVEL OF ORDINARY SKILL .....	11
VI.	CLAIM CONSTRUCTIONS.....	12
	A. Biometric Information (All Challenged Claims).....	12
	B. Secret Information .....	14
	C. Authentication Information .....	15
VII.	CLAIMS 1, 2, 5-12 OF THE '137 PATENT ARE UNPATENTABLE UNDER 35 U.S.C. § 103 .....	17
	A. Prior Art Patents and Publications.....	17
	1. Ex-1013 – Maritzen.....	17
	2. Ex-1014 – Gullman .....	18
	3. Ex-1015 – Schutzer .....	19
	4. Ex-1017 – Niwa .....	19
	B. Ground 1: Claims 1, 2, 5-7, 9, 10, and 12 are Obvious Over Maritzen in View of Gullman and Niwa .....	20

Declaration of Dr. Victor Shoup in support of Petition for  
*Inter Partes* Review of U.S. Patent No. 9,530,137

1.	Independent Claim 1 .....	20
2.	Dependent Claim 2 .....	47
3.	Dependent Claim 5 .....	51
4.	Dependent Claim 6 .....	53
5.	Dependent Claim 7 .....	54
6.	Dependent Claim 9 .....	56
7.	Dependent Claim 10 .....	57
8.	Independent Claim 12 .....	60
C.	Ground 2: Claim 8 and 11 Are Obvious Over Maritzen in View of Gullman, Niwa, and Schutzer .....	63
1.	Dependent Claim 8 .....	63
2.	Dependent Claim 11 .....	68
VIII.	CONCLUSION .....	73
IX.	AVAILABILITY FOR CROSS-EXAMINATION .....	73
X.	RIGHT TO SUPPLEMENT .....	74
XI.	JURAT .....	75

Declaration of Dr. Victor Shoup in support of Petition for  
*Inter Partes* Review of U.S. Patent No. 9,530,137

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 9,530,137 (“137 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 from 1995 to 1997 and at IBM Research Zurich from 1997 to 2002. My work 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

Declaration of Dr. Victor Shoup in support of Petition for  
*Inter Partes* Review of U.S. Patent No. 9,530,137

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 transactions.

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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