US 20190296905A1

(19) United States
(12) Patent Application Publication
Saurav et al.
(10) Pub. No.: US 2019/0296905 A1
(43) Pub. Date: Sep. 26, 2019

(54) **CRYPTOGRAPHIC ENTROPY TREE**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Kumar Saurav**, Santa Clara, CA (US); **Jerrold V. Hauck**, Windermere, CA (US); **Yannick L. Sierra**, San Francisco, CA (US); **Charles E. Gray**, San Francisco, CA (US); **Roberto G. Yepez**, San Fracisco, CA (US); **Samuel Gosselin**, San Francisco, CA (US); **Petr Kostka**, Praha 9 (CZ); **Wade Benson**, San Jose, CA (US)

(21) Appl. No.: **16/436,328**

(22) Filed: **Jun. 10, 2019**

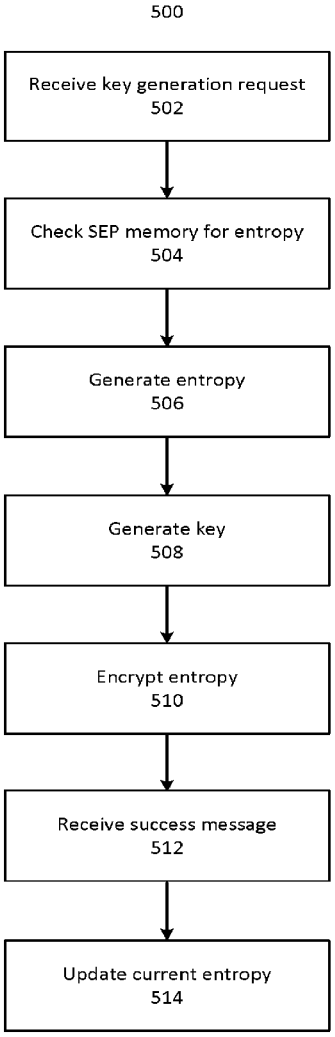
Related U.S. Application Data

(63) Continuation of application No. 15/274,816, filed on Sep. 23, 2016, now Pat. No. 10,320,563.

Publication Classification

(51) **Int. Cl.**
H04L 9/08 (2006.01)
G06F 21/60 (2006.01)
G06F 21/74 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 9/0861*** (2013.01); ***H04L 9/0897*** (2013.01); ***H04L 9/0891*** (2013.01); ***G06F 21/74*** (2013.01); ***G06F 21/602*** (2013.01)

(57) **ABSTRACT**

A device may include a secure processor and a secure memory coupled to the secure processor. The secure memory may be inaccessible to other device systems. The secure processor may store some keys and/or entropy values in the secure memory and other keys and/or entropy values outside the secure memory. The keys and/or entropy values stored outside the secure memory may be encrypted using information stored inside the secure memory.