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Miller et al.

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(54) **CRYPTOGRAPHIC SECURITY FUNCTIONS BASED ON ANTICIPATED CHANGES IN DYNAMIC MINUTIAE**

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(51) **Int. Cl.**
H04L 29/06 (2006.01)
H04L 9/32 (2006.01)
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(52) **U.S. Cl.**
CPC ***H04L 9/3271*** (2013.01); ***H04L 9/0861*** (2013.01); ***H04L 9/0866*** (2013.01); ***H04L 9/0872*** (2013.01);
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(58) **Field of Classification Search**
CPC ... H04L 36/0876; H04L 9/0861; H04L 9/0866
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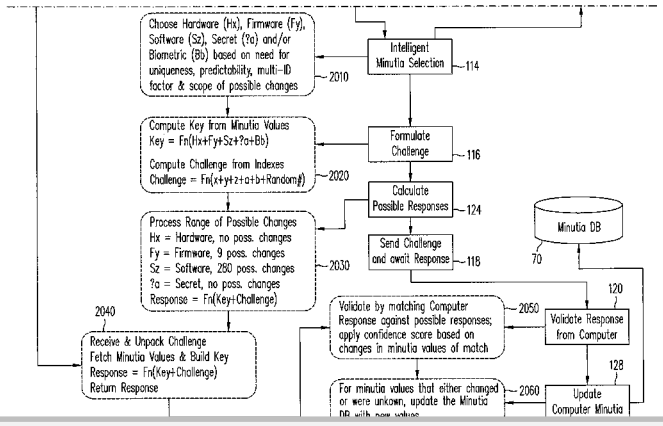
(57) **ABSTRACT**

Dynamic key cryptography validates mobile device users to cloud services by uniquely identifying the user's electronic device using a very wide range of hardware, firmware, and software minutiae, user secrets, and user biometric values found in or collected by the device. Processes for uniquely identifying and validating the device include: selecting a subset of minutia from a plurality of minutia types; computing a challenge from which the user device can form a response based on the selected combination of minutia; computing a set of pre-processed responses that covers a range of all actual responses possible to be received from the device if the combination of the particular device with the device's collected actual values of minutia is valid; receiving an actual response to the challenge from the device; determining whether the actual response matches any of the pre-processed responses; and providing validation, enabling authentication, data protection, and digital signatures.

25 Claims, 11 Drawing Sheets



Related U.S. Application Data

continuation of application No. 13/366,197, filed on Feb. 3, 2012, now Pat. No. 8,817,984.

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(51) **Int. Cl.**
H04L 9/16 (2006.01)
H04L 9/08 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 9/16*** (2013.01); ***H04L 9/3231*** (2013.01); ***H04L 9/3247*** (2013.01); ***H04L 63/0428*** (2013.01); ***H04L 63/0861*** (2013.01); ***H04L 63/0876*** (2013.01)

(58) **Field of Classification Search**
USPC 380/255
See application file for complete search history.

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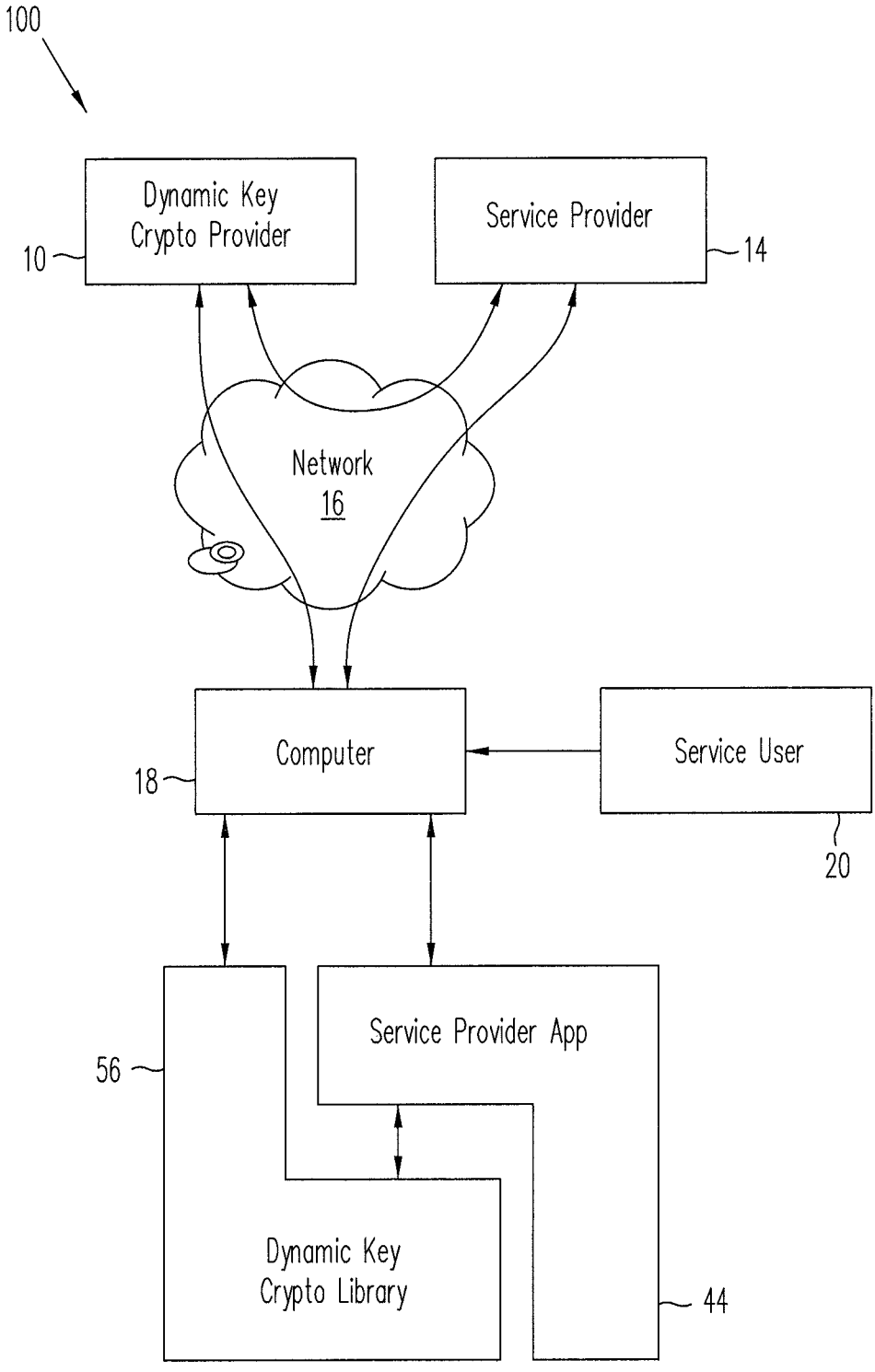

FIG. 1

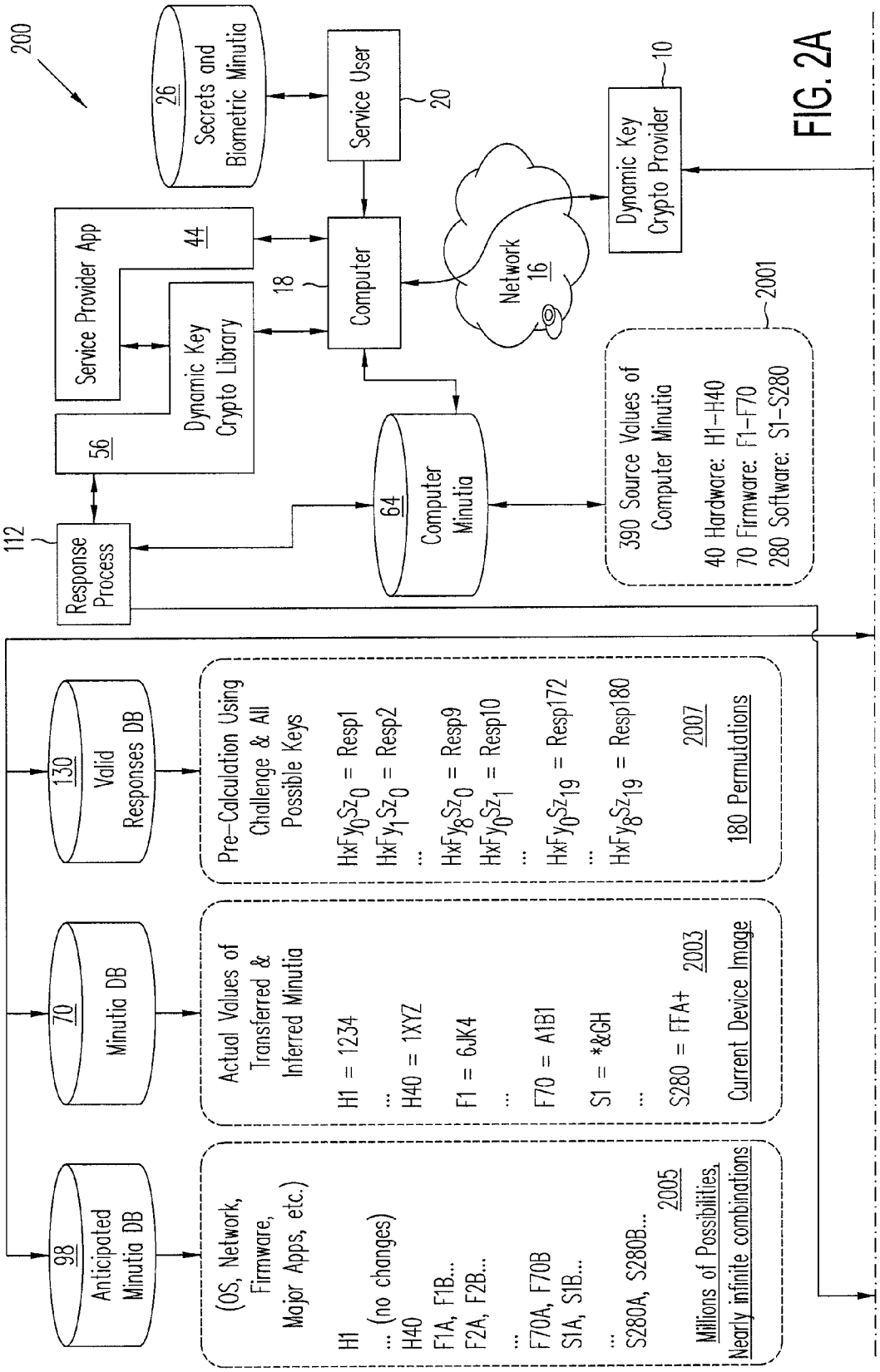

FIG. 2A

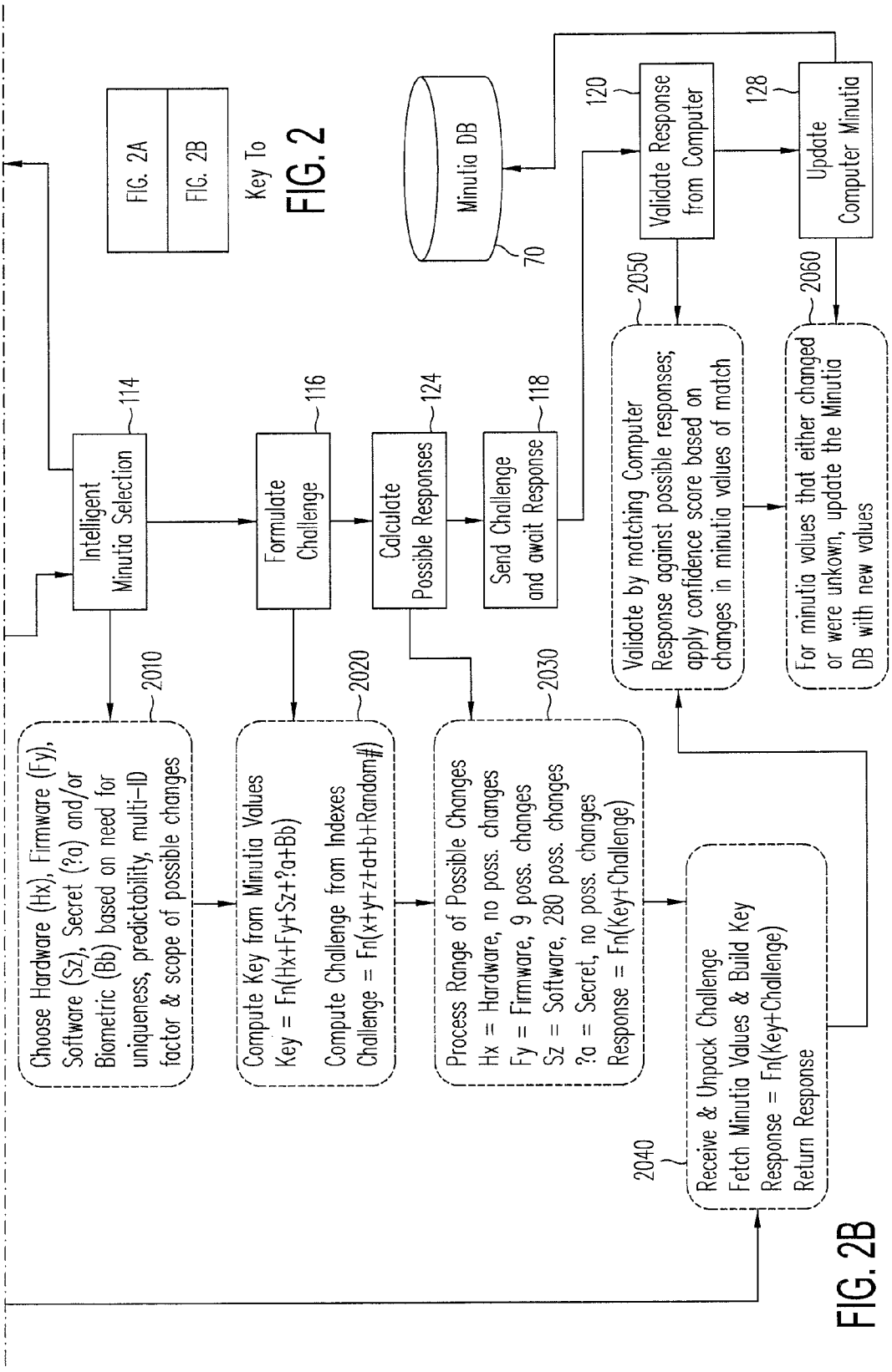

FIG. 2B

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