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(54) **SELF-AUTHENTICATION APPARATUS AND METHOD**

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(52) **U.S. Cl.** **382/115**; 382/125; 382/100; 713/186

(58) **Field of Search** 178/89; 283/17, 283/73; 382/115, 124, 125, 100, 232; 380/54, 282, 55; 713/186; 340/825.33; 705/50, 71

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(57) **ABSTRACT**

An apparatus, method, and computer program for providing authenticating indicia and verifying the image thereby. One particular embodiment is a biometric application such as a fingerprint-based authentication system. The apparatus includes an image receiver for receiving the original image with true image point, a false image point generator providing false image points, and a transient template generator that selectively combines the true image points and the false image points. The apparatus can also constrain false image points to be non-coinciding plausible impostors of the true image points. The apparatus can include a claimant image receiver, a transient template receiver and a comparator for comparing the claimant image points with the template image points and producing an authentication signal. The method can employ a hashing technique to produce an encoding key from the non-coincident plausible impostor false image points, and preselected encryption techniques to produce ciphertext from plaintext with the encoding key. The method can include extracting claimant image points from template image points and iteratively constructing candidate decoding keys from the post-extraction residual points. Authentication is indicated if the decoding key successfully produces a matching plaintext from the ciphertext.

18 Claims, 12 Drawing Sheets
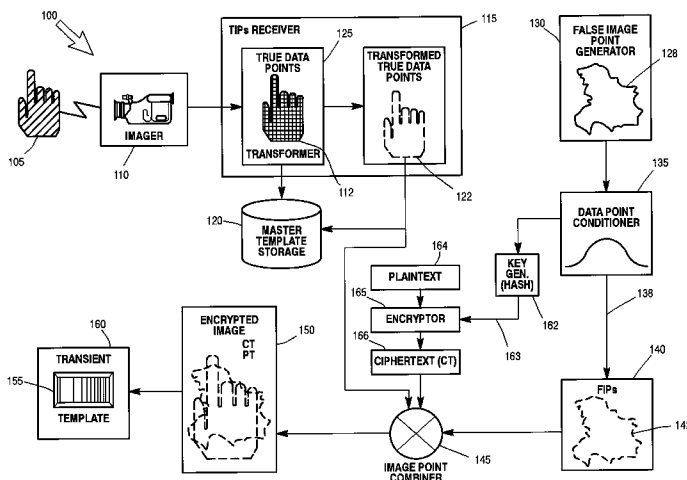
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Figure 1

5

10
SENSE ORIGINAL IMAGE

30
GENERATE FALSE IMAGE POINTS

15
CONVERT IMAGE TO TRUE IMAGE POINTS (TIPs)

35
SELECT FALSE IMAGE POINTS (FIPs)

25
SAVE IMAGE AS MASTER TEMPLATE

20
SELECT TRUE IMAGE POINTS

40
CREATE KEY

45
COMBINE FALSE IMAGE POINTS WITH TRUE IMAGE POINTS
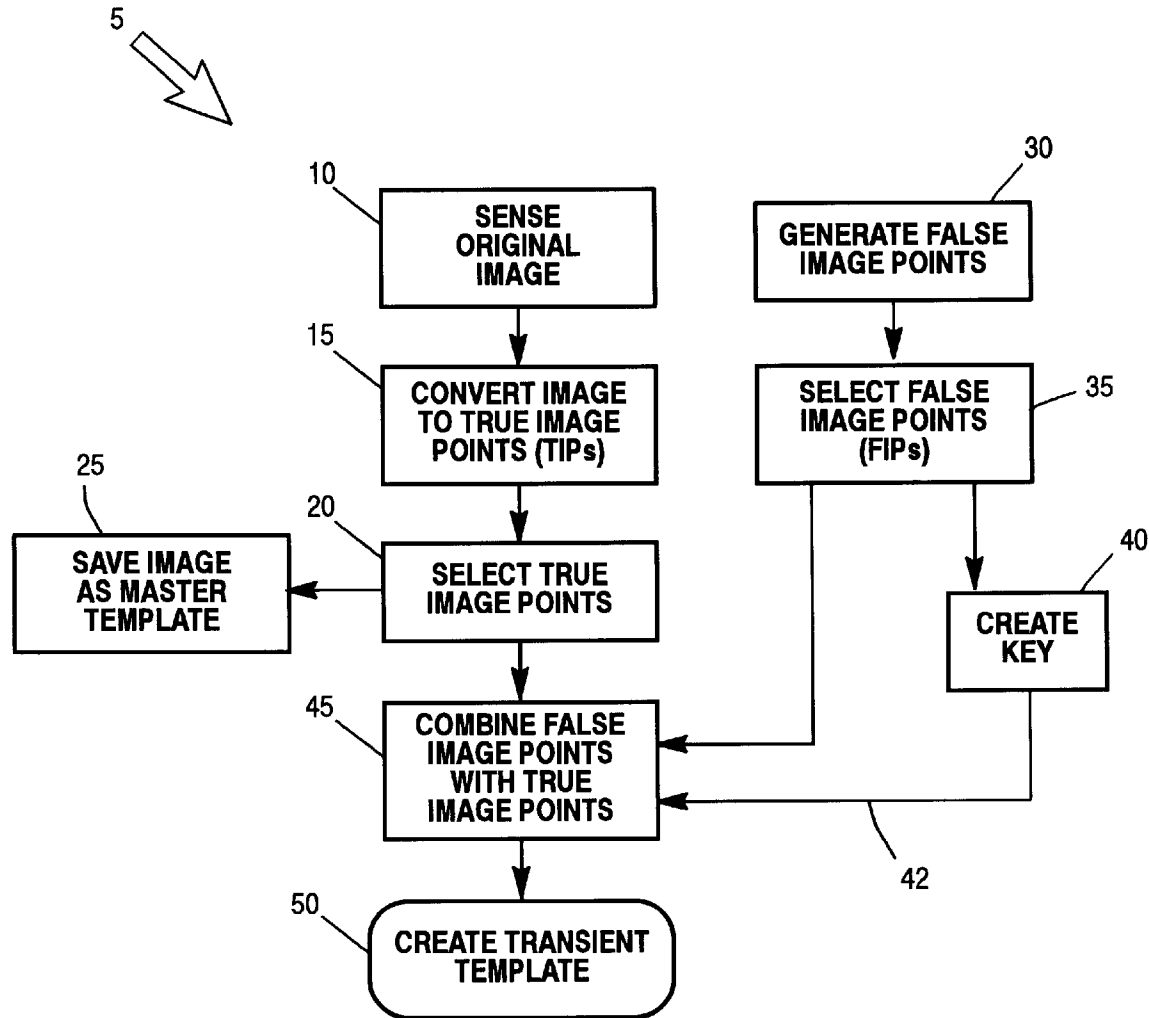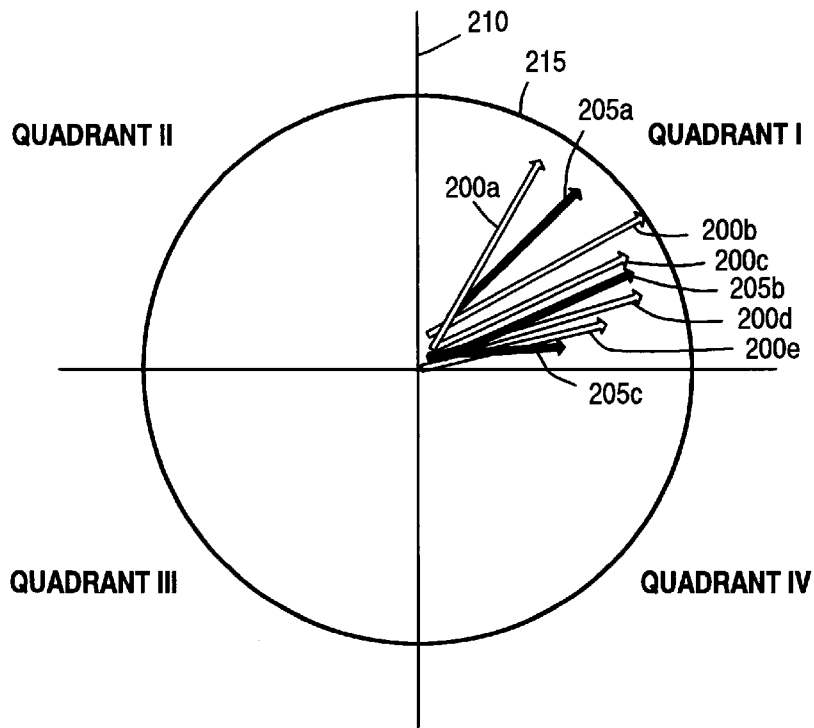
42

50
CREATE TRANSIENT TEMPLATE

Figure 2

Figure 3A
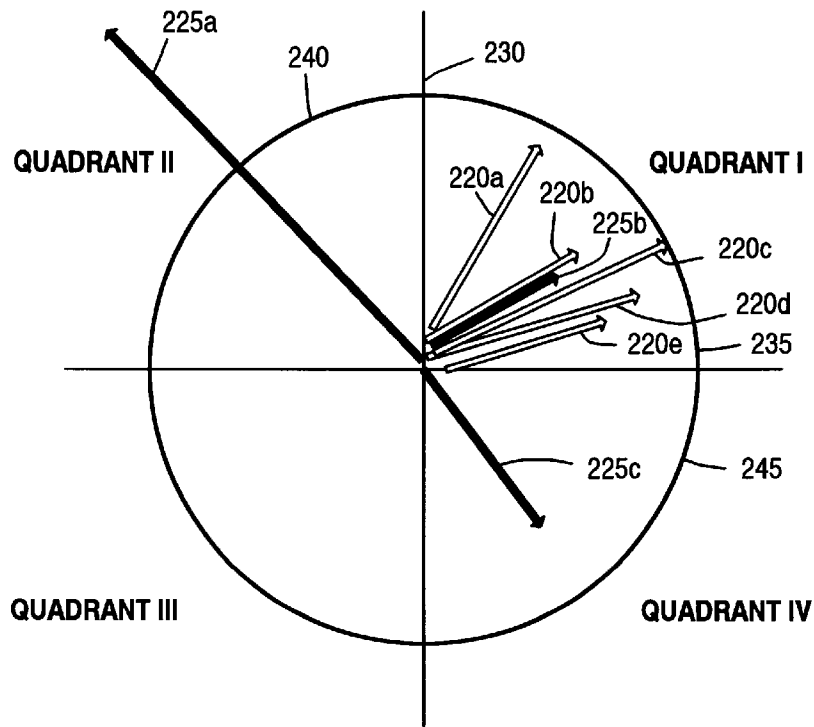
Figure 3B

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