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Canadian Intellectual Property Office

CA 3034612 A1 2018/03/01

(21) 3 034 612

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2017/08/11
(87) Date publication PCT/PCT Publication Date: 2018/03/01
(85) Entrée phase nationale/National Entry: 2019/02/20
(86) N° demande PCT/PCT Application No.: CN 2017/096987
(87) N° publication PCT/PCT Publication No.: 2018/036389
(30) Priorité/Priority: 2016/08/24 (CN201610717080.1)

(51) Cl.Int./Int.Cl. *H04L 29/06* (2006.01)

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(54) Titre : PROCEDE, APPAREIL ET SYSTEME DE VERIFICATION D'IDENTITE D'UTILISATEUR
(54) Title: USER IDENTITY VERIFICATION METHOD, APPARATUS AND SYSTEM

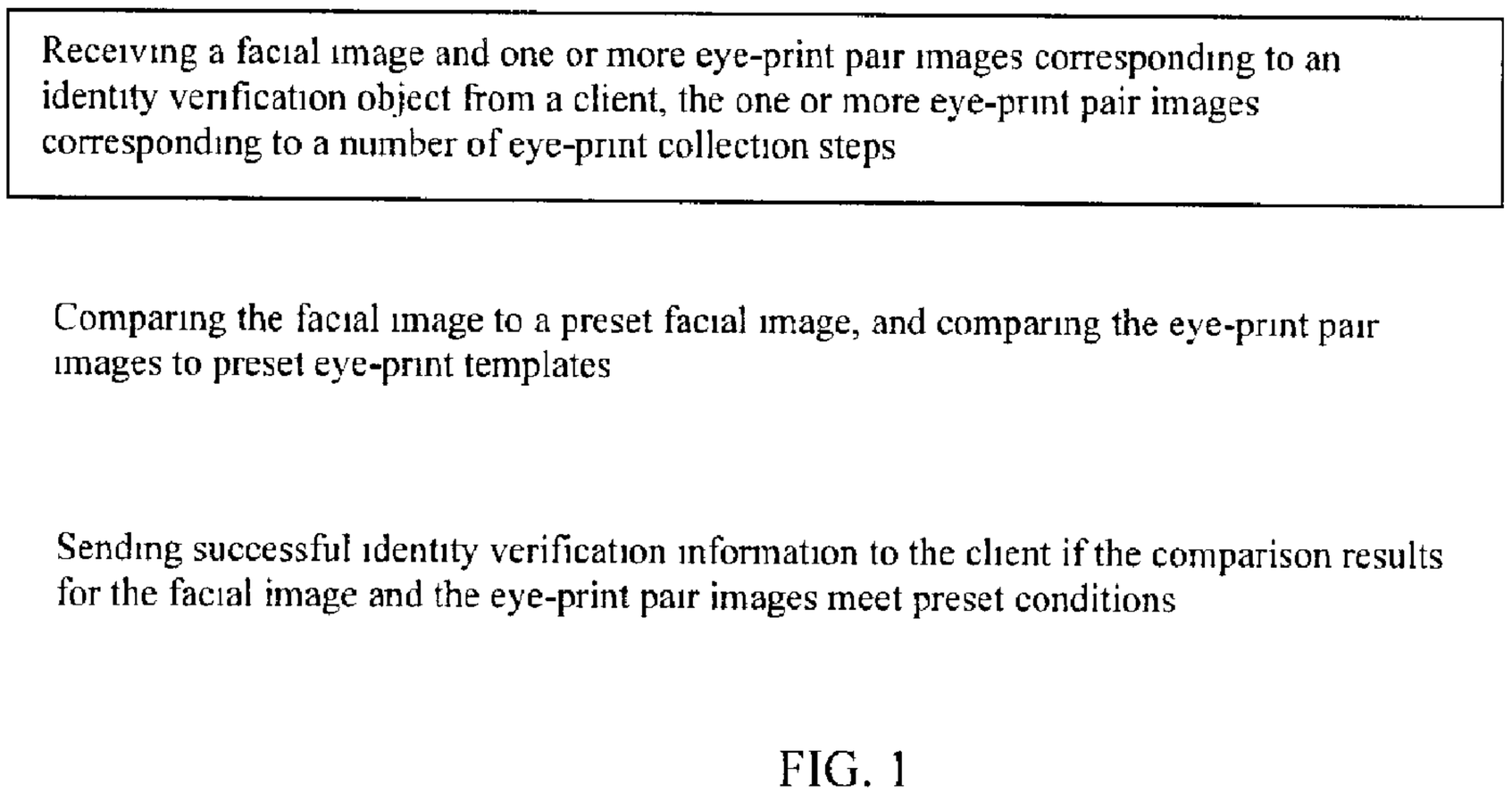

FIG. 1

(57) Abrégé/Abstract:
Disclosed are a user identity verification method, apparatus and system, relating to the technical field of information. The present invention is primarily used for solving the problems of relatively low accuracy and reliability in an existing user identity verification method. The method comprises: firstly receiving a human face image corresponding to an identity verification object and an eyeprint pair image corresponding to the number of eyeprint acquisition steps, which are sent by a client; then comparing the human face image with a pre-set human face image, and comparing the eyeprint pair image with a pre-set eyeprint template; and if comparison results of the human face image and the eyeprint pair image both satisfy a pre-set condition, sending identity verification success information to the client.

Abstract

This invention discloses a user identity verification method, apparatus, and system, relating to the field of information technology. This invention primarily is used to solve the problems of low precision and reliability in current user identity verification methods. The method comprises: first receiving a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps, then comparing the facial image to a preset facial image, comparing the eye-print pair images to preset eye-print templates, and sending successful identity verification information to the client if the comparison results for the facial image and the eye-print pair images meet preset conditions.

Claims

1. A user identity verification method, comprising:

receiving a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps;

comparing the facial image to a preset facial image, and comparing the one or more eye-print pair images to preset eye-print templates;

sending successful identity verification information to the client if comparison results for the facial image and the one or more eye-print pair images meet preset conditions.

2. The method according to claim **1**, wherein before receiving a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps sent by a client, the method further comprises:

obtaining a number of eye-print templates corresponding to the identity verification object from a preset storage location when a user identity verification request is received, wherein the preset storage location stores eye-print templates corresponding to different identity verification objects;

determining that a current mode is an identity verification mode if the number of eye-print templates is greater than or equal to a preset threshold; and

sending a facial quality score threshold and the number of eye-print collection steps corresponding to the identity verification mode to the client, causing the client to obtain the facial image based on the facial quality score threshold and obtain the one or more eye-print pair images corresponding to the number of eye-print collection steps.

3. The method according to claim **2**, wherein after obtaining a number of eye-print templates corresponding to the identity verification object from the preset storage location, the method further comprises:

determining that the current mode is an eye-print enrollment mode if the number of eye-print templates is less than the preset threshold;

sending a facial quality score and the number of eye-print collection steps corresponding

to the eye-print enrollment mode to the client, causing the client to obtain the facial image based on the facial quality score threshold and obtain the one or more eye-print pair images corresponding to the number of eye-print collection steps; and

storing the one or more eye-print pair images in the preset storage location as the eye-print templates corresponding to the identity verification object.

4. The method according to claim **2**, wherein:

comparing the facial image to a preset facial image comprises:

using the facial image and the preset facial image as input to a preset facial algorithm, and obtaining a facial comparison score corresponding to the identity verification object; and

comparing the one or more eye-print pair images to preset eye-print templates comprises:

using the one or more eye-print pair images and the eye-print templates corresponding to the identity verification object as input to a preset eye-print algorithm, and obtaining multiple eye-print liveness scores and an eye-print match score, wherein the number of the multiple eye-print liveness scores corresponds to the number of eye-print collection steps.

5. The method according to claim **4**, wherein sending successful identity verification information to the client if the comparison results for the facial image and the one or more eye-print pair images meet preset conditions comprises:

sending successful identity verification information to the client if the facial comparison score, the multiple eye-print liveness scores, and the eye-print match score are greater than respective preset thresholds.

6. The method according to claim **4**, further comprising:

when the user identity verification is determined as successful, based on the one or more eye-print pair images collected by the client, updating the eye-print templates corresponding to the identity verification object stored in the preset storage location.

7. A user identity verification method, comprising:

collecting a facial image and one or more eye-print pair images corresponding to an identity verification object, the one or more eye-print pair images corresponding to a number of eye-print collection steps;

sending the facial image and the one or more eye-print pair images to a server, causing

the server to perform identity verification of the identity verification object.

8. The user identity verification method according to claim **7**, wherein before collecting a facial image and one or more eye-print pair images corresponding to an identity verification object, the one or more eye-print pair images corresponding to a number of eye-print collection steps, the method further comprises:

sending a user identity verification request to a server; and

receiving a facial quality score threshold and the number of eye-print collection steps corresponding to a current mode sent by the server,

wherein collecting a facial image and one or more eye-print pair images corresponding to an identity verification object, the one or more eye-print pair images corresponding to a number of eye-print collection steps comprises:

obtaining the facial image corresponding to the identity verification object based on the facial quality score threshold; and

obtaining the one or more eye-print pair images corresponding to the number of eye-print collection steps.

9. The user identity verification method according to claim **8**, wherein before sending the facial image to the server, the method further comprises:

determining whether an image quality of the current obtained facial image is greater than or equal to the facial quality score threshold,

wherein sending the facial image to the server comprises: sending the facial image to the server if the image quality of the current obtained facial image is greater than or equal to the facial quality score threshold.

10. The user identity verification method according to claim **7**, wherein before sending the one or more eye-print pair images to the server, the method further comprises:

determining whether the one or more eye-print pair images meet preset eye-print liveness conditions,

wherein sending the one or more eye-print pair images to the server comprises: if the conditions are met, sending the one or more eye-print pair images to the server.

11. A server, comprising:

a receiving unit, configured to receive a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps;

a comparison unit, configured to compare the facial image to a preset facial image, and compare the one or more eye-print pair images to preset eye-print templates;

a sending unit, configured to send successful identity verification information to the client if comparison results for the facial image and the one or more eye-print pair images meet preset conditions.

12. The server according to claim **11**, wherein the server further comprises: an acquisition unit and a determination unit;

the acquisition unit is configured to obtain a number of eye-print templates corresponding to the identity verification object from a preset storage location when a user identity verification request is received, wherein the preset storage location is configured to store the eye-print templates corresponding to different identity verification objects;

the determination unit is configured to determine that a current mode is an identity verification mode if the number of eye-print templates is greater than or equal to a preset threshold; and

the sending unit is further configured to send a facial quality score threshold and the number of eye-print collection steps corresponding to the identity verification mode to the client, causing the client to obtain the facial image based on the facial quality score threshold and obtain one or more eye-print pair images corresponding to the number of eye-print collection steps.

13. The server according to claim **12**, wherein the server further comprises a storing unit; the determination unit is further configured to determine that the current mode is an eye-print enrollment mode if the number of eye-print templates is less than the preset threshold;

the sending unit is further configured to send a facial quality score and the number of eye-print collection steps corresponding to the eye-print enrollment mode to the client, causing the client to obtain a facial image based on the facial quality score threshold and obtain the one or more eye-print pair images corresponding to the number of eye-print collection steps; and

the storing unit is configured to store the one or more eye-print pair images in the preset

storage location as the eye-print templates corresponding to the identity verification object.

14. The server according to claim **12**, wherein,

the comparison unit is configured to use the facial image and the preset facial image as input to a preset facial algorithm, and obtain a facial comparison score corresponding to the identity verification object;

the one or more eye-print pair images and the eye-print templates corresponding to the identity verification object are used as input to a preset eye-print algorithm, to obtain multiple eye-print liveness scores corresponding to the number of eye-print collection steps and an eye-print match score.

15. The server according to claim **14**, wherein,

the sending unit is configured to send successful identity verification information to the client if the facial comparison score, the multiple eye-print liveness scores, and the eye-print match score are greater than respective preset thresholds.

16. The server according to claim **14**, further comprising:

an updating unit configured to update the eye-print templates corresponding to the identity verification object based on the one or more eye-print pair images collected by the client, when user identity verification is determined as successful, wherein the eye-print templates are stored in the preset storage location.

17. A client, comprising:

a collection unit, configured to collect a facial image and one or more eye-print pair images and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps;

a sending unit, configured to send the facial image and the one or more eye-print pair images to a server, causing the server to perform identity verification of the identity verification object.

18. The client according to claim **17**, further comprising: a receiving unit;

the sending unit is further configured to send a user identity verification request to the server;

the receiving unit is configured to receive a facial quality score threshold and the number of eye-print collection steps corresponding to a current mode sent by the server; and

the collection unit is configured to obtain the facial image corresponding to the identity verification object based on the facial quality score threshold and obtain the one or more eye-print pair images corresponding to the number of eye-print collection steps.

19. The client according to claim **18**, further comprising: a determination unit configured to determine whether the image quality of the currently obtained facial image is greater than or equal to the facial quality score threshold; and

if the image quality of the currently obtained facial image is greater than or equal to the facial quality score threshold, the sending unit sends the facial image to the server.

20. The client according to claim **19**, wherein,

the determination unit is further configured to determine whether the one or more eye-print pair images meet preset eye-print liveness conditions; and

the sending unit is further configured to send the one or more eye-print pair images to the server if conditions are met.

21. A user identity verification system, comprising: the server of any one of claims **11-16** and the client of any one of claims **17-20**.

Receiving a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps

Comparing the facial image to a preset facial image, and comparing the eye-print pair images to preset eye-print templates

Sending successful identity verification information to the client if the comparison results for the facial image and the eye-print pair images meet preset conditions

FIG. 1

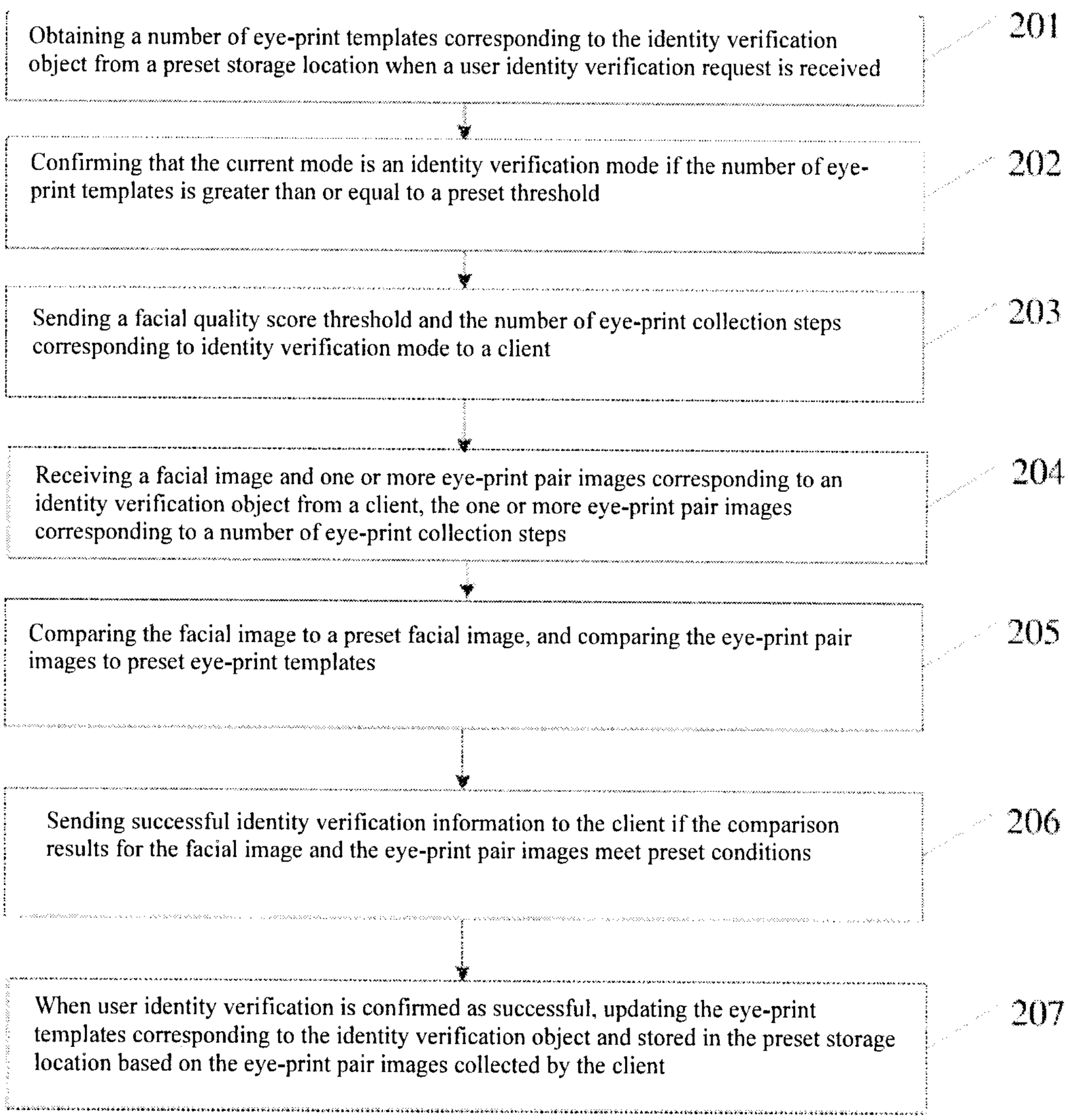

FIG. 2

Collecting a facial image and one or more eye-print pair images from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps

Sending the facial image and the eye-print pair images to the server

FIG. 3

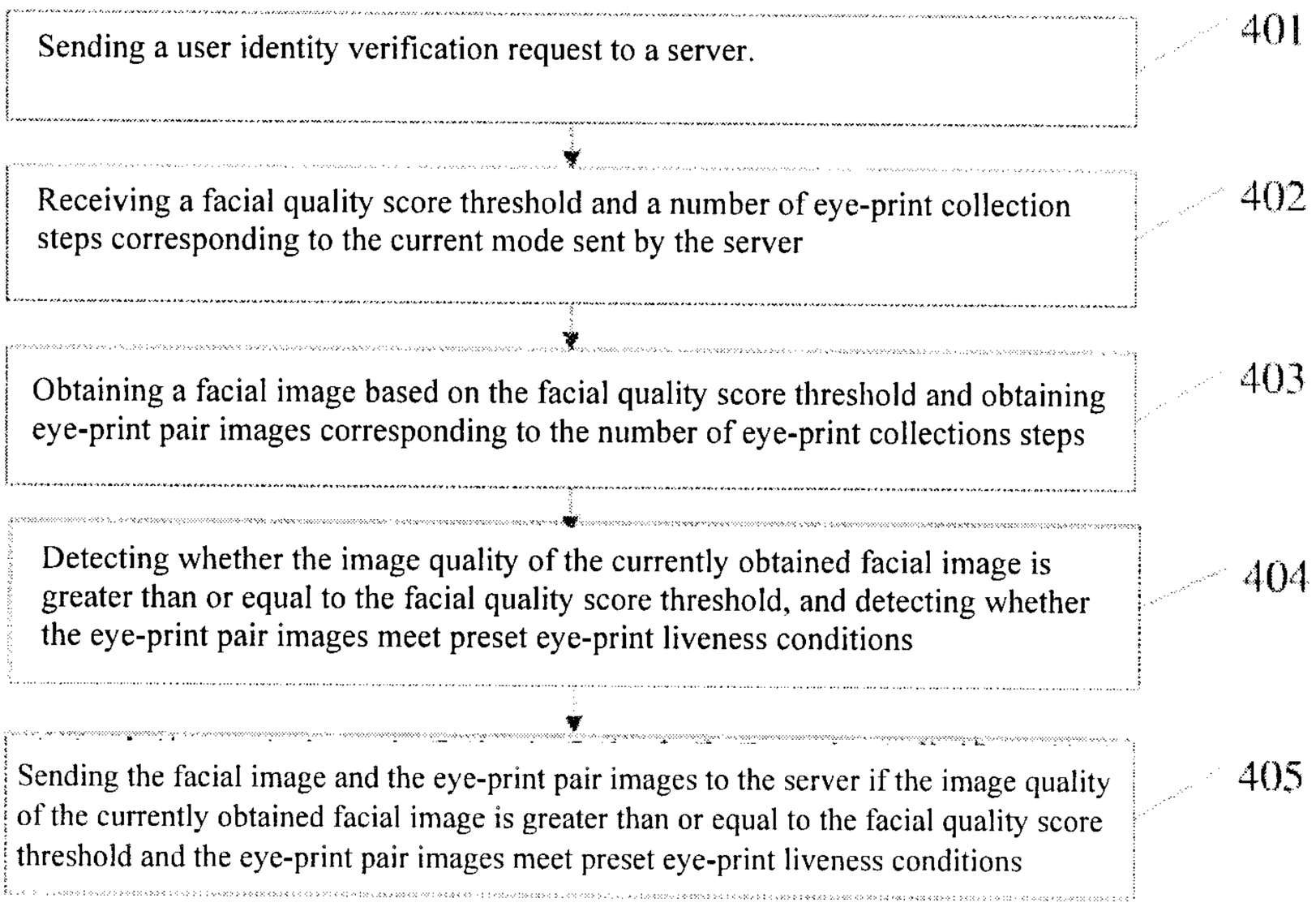

FIG. 4

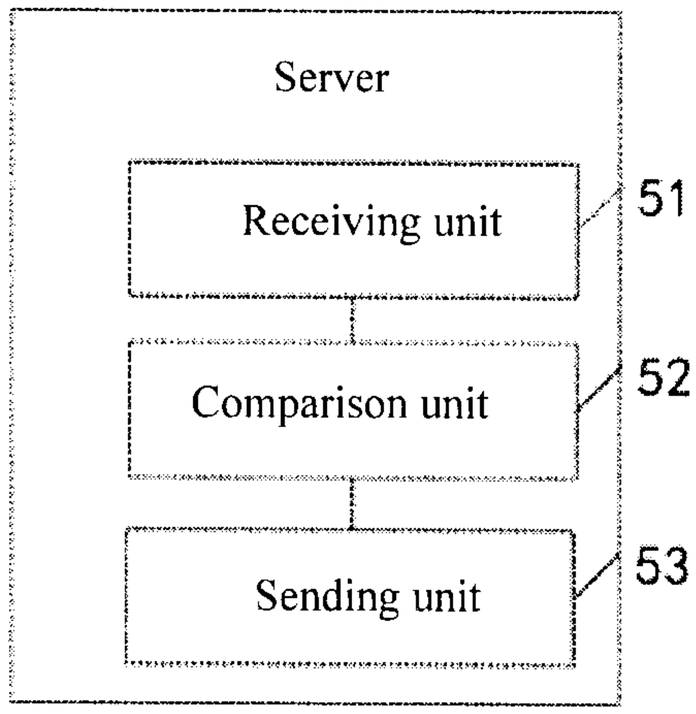

FIG. 5

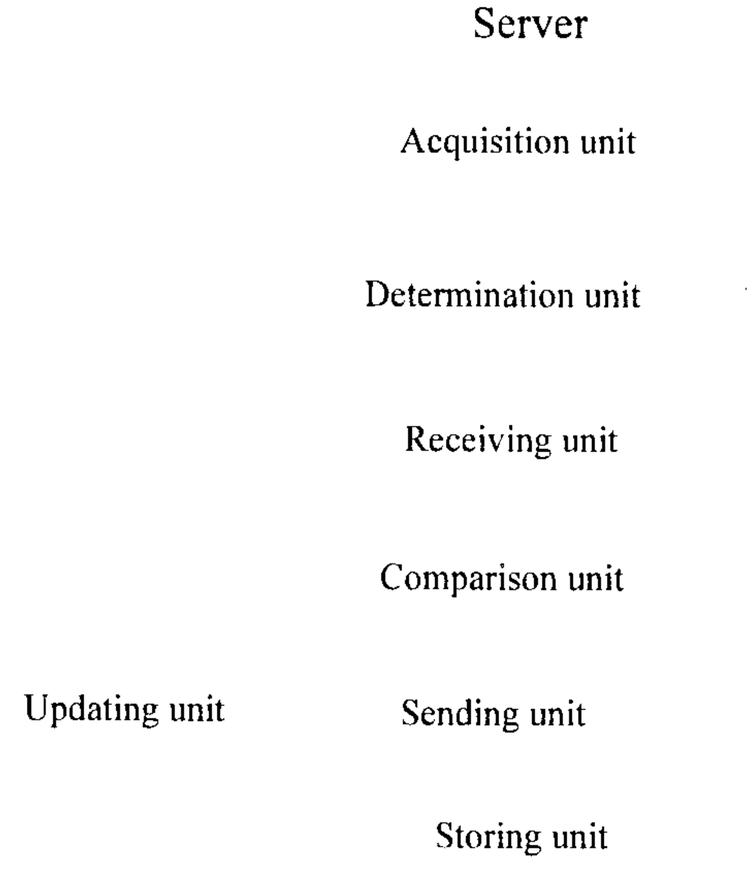
Server
Acquisition unit
Determination unit
Receiving unit
Comparison unit
Updating unit
Sending unit
Storing unit

FIG. 6

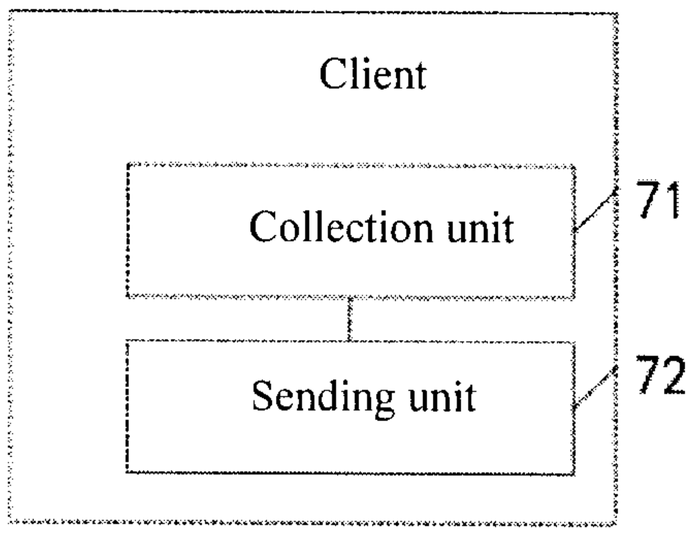
Client
Collection unit
71
Sending unit
72

FIG. 7

Client

Sending unit

Receiving unit

Collection unit

Determination unit

FIG. 8

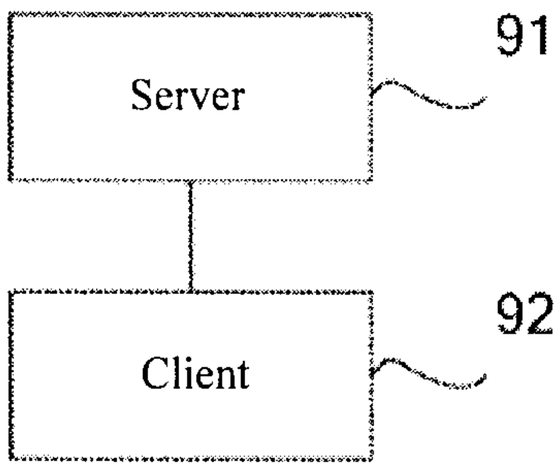

FIG. 9

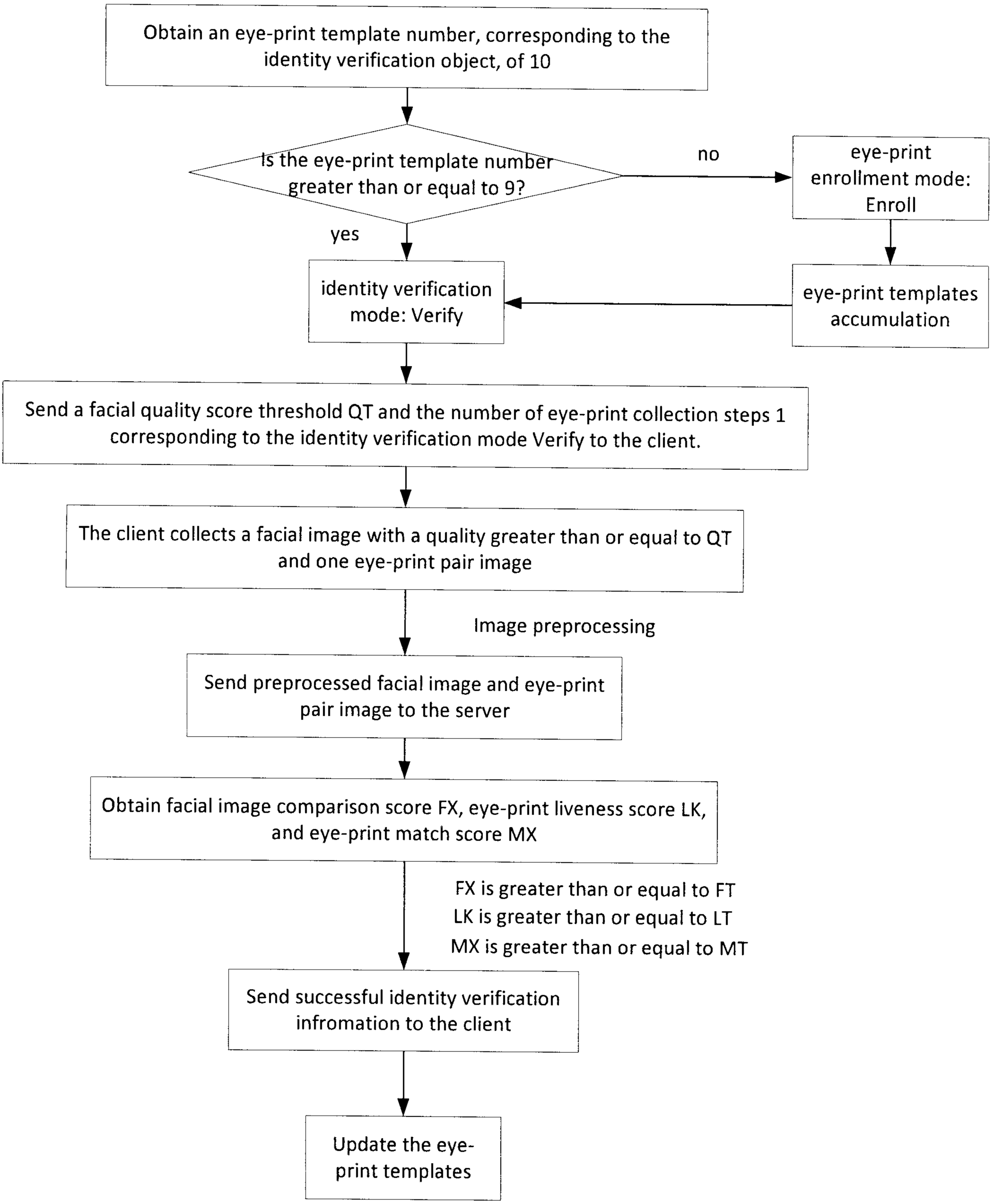
Obtain an eye-print template number, corresponding to the identity verification object, of 10
Is the eye-print template number greater than or equal to 9?
no
yes
eye-print enrollment mode: Enroll
eye-print templates accumulation
identity verification mode: Verify
Send a facial quality score threshold QT and the number of eye-print collection steps 1 corresponding to the identity verification mode Verify to the client.
The client collects a facial image with a quality greater than or equal to QT and one eye-print pair image
Image preprocessing
Send preprocessed facial image and eye-print pair image to the server
Obtain facial image comparison score FX, eye-print liveness score LK, and eye-print match score MX
FX is greater than or equal to FT
LK is greater than or equal to LT
MX is greater than or equal to MT
Send successful identity verification infromation to the client
Update the eye-print templates

FIG. 10

Receiving a facial image and one or more eye-print pair images corresponding to an identity verification object from a client, the one or more eye-print pair images corresponding to a number of eye-print collection steps

Comparing the facial image to a preset facial image, and comparing the eye-print pair images to preset eye-print templates

Sending successful identity verification information to the client if the comparison results for the facial image and the eye-print pair images meet preset conditions

FIG. 1