

CLAIMS

[Claim 1]

An authenticating apparatus comprising:

receiving means that receives an image region as an authentication target read from a surface of a target object possessed by a user together with an authentication request from the user;

identifying means that identifies a position in one reference image region corresponding to the image region as the authentication target and one reference image region corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects; and

authenticating means that determines authentication failure in response to the authentication request if the identified position in the reference image region is included in a used image region including a position identified in past for the reference image region by the identifying means.

[Claim 2]

The authenticating apparatus described in Claim 1, wherein, if the authentication request received from the same user by the receiving means is determined to be valid by a predetermined number of times, the authenticating means determines authentication success in response to the authentication request received from the user.

[Claim 3]

The authenticating apparatus described in Claim 1 or 2, further comprising registering means that registers identification information to be linked to each of at least parts of the plurality of reference image regions,

wherein the receiving means receives identification information together with the authentication request, and

wherein the authentication means executes authentication in response to the received authentication request based on whether or not the registered identification information matches the received identification information.

[Claim 4]

The authenticating apparatus described in one of Claims 1 to 3, further comprising reading position determining means that determines a reading position of an image region to be read from the target object possessed by the user,

wherein the receiving means receives the image region as the authentication target read based on the reading position determined by the reading position determining means.

[Claim 5]

The authenticating apparatus described in Claim 4, wherein the reading position determining means determines a reading position of an image region to be read next time from the target object possessed by the user in the one reference image region corresponding to the image region as the authentication target excluding the used image region.

[Claim 6]

The authenticating apparatus described in Claim 5,

wherein, if the authentication request has been determined to be valid, the reading position determining means determines the reading position of the image region to be read next time from the target object possessed by the user.

[Claim 7]

The authenticating apparatus described in Claim 6, wherein, if the identified position is included in the used image region, the reading position determining means determines the reading position of the image region to be read next time from the target object possessed by the user.

[Claim 8]

The authenticating apparatus described in one of Claims 1 to 7, wherein, if a maximum value of correlation values between local regions set for each of the plurality of reference image regions and the image region as the authentication target is equal to or greater than a first threshold serving as a criterion for similarity and less than a second threshold serving as a criterion for match, the identifying means identifies a position in a local region corresponding to the maximum value as a position in the one reference image region corresponding to the image region as the authentication target.

[Claim 9]

The authenticating apparatus described in Claim 8, wherein, if the maximum value of the correlation values between the local regions set for each of the plurality of reference image regions and the image region as the authentication target is less than the first threshold or equal to or greater than

the second threshold, the identifying means does not identify the position in the one reference image region, and

wherein, if the position in the reference image region has failed to be identified by the identifying means, the authenticating means determines authentication failure in response to the received authentication request.

[Claim 10]

The authenticating apparatus described in one of Claims 1 to 9, wherein an image size of the reference image region is greater than an image size of the image region as the authentication target.

[Claim 11]

An authenticating system comprising a terminal apparatus and an authenticating apparatus, wherein the terminal apparatus includes

reading means that reads a surface of a target object possessed by a user, and

means that transmits an image region as an authentication target read by the reading means together with an authentication request from the user, and

wherein the authenticating apparatus includes

receiving means that receives the image region as the authentication target and the authentication request transmitted,

identifying means that identifies a position in one reference image region corresponding to the image region as the authentication target and one reference image region

corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects; and

authenticating means that determines authentication failure in response to the authentication request if the identified position in the reference image region is included in a used image region including a position identified in past for the reference image region by the identifying means.

[Claim 12]

A program for causing a computer to function as:

receiving means that receives an image region as an authentication target read from a surface of a target object possessed by a user together with an authentication request from the user;

identifying means that identifies a position in one reference image region corresponding to the image region as the authentication target and one reference image region corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects;

authenticating means that determines authentication failure in response to the authentication request if the identified position in the reference image region is included in a used image region including a position identified in past for the reference image region by the identifying means.

[Claim 13]

An authenticating apparatus comprising:

receiving means that receives an image region as an authentication target read from a surface of a target object possessed by a user together with an authentication request from the user;

identifying means that identifies a position corresponding to the image region as the authentication target and one reference image region corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects; and

authenticating means that executes authentication in response to the authentication request based on the identified position,

wherein if a maximum value of correlation values between local regions set for each of the plurality of reference image regions and the image region as the authentication target is equal to or greater than a first threshold serving as a criterion for similarity and less than a second threshold serving as a criterion for match, the identifying means identifies a position in a local region corresponding to the maximum value as a position in the one reference image region corresponding to the image region as the authentication target.

[Claim 14]

An authenticating system comprising a terminal apparatus and an authenticating apparatus, wherein the terminal apparatus includes

reading means that reads a surface of a target object possessed by a user, and

means that transmits an image region as an authentication target read by the reading means together with an authentication request from the user,

wherein the authenticating apparatus includes

receiving means that receives the image region as the authentication target and the authentication request transmitted,

identifying means that identifies a position corresponding to the image region as the authentication target and one reference image region corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects, and

authenticating means that executes authentication in response to the authentication request based on the identified position, and

wherein if a maximum value of correlation values between local regions set for each of the plurality of reference image regions and the image region as the authentication target is equal to or greater than a first threshold serving as a criterion for similarity and less than a second threshold serving as a criterion for match, the identifying means identifies a position in a local region corresponding to the maximum value as a position in the one reference image region corresponding to the image region as the authentication target.

[Claim 15]

A program for causing a computer to function as:

receiving means that receives an image region as an authentication target read from a surface of a target object possessed by a user together with an authentication request from the user;

identifying means that identifies a position corresponding to the image region as the authentication target and one reference image region corresponding to the image region as the authentication target in a plurality of previously stored reference image regions read from respective surfaces of a plurality of target objects;

authenticating means that executes authentication in response to the authentication request based on the identified position,

wherein if a maximum value of correlation values between local regions set for each of the plurality of reference image regions and the image region as the authentication target is equal to or greater than a first threshold serving as a criterion for similarity and less than a second threshold serving as a criterion for match, the identifying means identifies a position in a local region corresponding to the maximum value as a position in the one reference image region corresponding to the image region as the authentication target.