



(12) **United States Patent**
Murphy et al.

(10) **Patent No.:** **US 9,785,796 B1**
(45) **Date of Patent:** ***Oct. 10, 2017**

(54) **APPARATUS AND METHOD FOR
AUTOMATED PRIVACY PROTECTION IN
DISTRIBUTED IMAGES**

(71) Applicant: **Snap Inc.**, Venice, CA (US)

(72) Inventors: **Robert Murphy**, Venice, CA (US);
Evan Spiegel, Los Angeles, CA (US)

(73) Assignee: **Snap Inc.**, Venice, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/212,095**

(22) Filed: **Jul. 15, 2016**

Related U.S. Application Data

(63) Continuation of application No. 14/723,400, filed on May 27, 2015, now Pat. No. 9,396,354.

(60) Provisional application No. 62/004,168, filed on May 28, 2014.

(51) **Int. Cl.**

G06F 21/62 (2013.01)
G06F 21/10 (2013.01)
G06Q 50/00 (2012.01)
G06K 9/00 (2006.01)
H04L 12/58 (2006.01)

(52) **U.S. Cl.**

CPC **G06F 21/6245** (2013.01); **G06F 21/10** (2013.01); **G06K 9/00288** (2013.01); **G06Q 50/01** (2013.01); **H04L 51/10** (2013.01); **G06F 2221/0724** (2013.01)

(58) **Field of Classification Search**

CPC .. **G06F 21/6245**; **G06F 21/10**; **G06K 9/00268**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,004,394	B2	2/2006	Kim
7,856,449	B1	12/2010	Martino et al.
8,001,204	B2	8/2011	Burtner et al.
8,098,904	B2	1/2012	Ioffe et al.
8,112,716	B2	2/2012	Kobayashi
8,276,092	B1	9/2012	Narayanan et al.
8,279,319	B2	10/2012	Date
8,312,086	B2	11/2012	Velusamy et al.
8,312,097	B1	11/2012	Siegel et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2887596	A1	6/2016
WO	2014/194262	A2	12/2014
WO	2016/007285	A1	1/2016

OTHER PUBLICATIONS

International Search Report and Written Opinion issued to international patent application No. PCT/US2015/037251, Sep. 29, 2015, 7 pgs.

(Continued)

Primary Examiner — Oleg Korsak

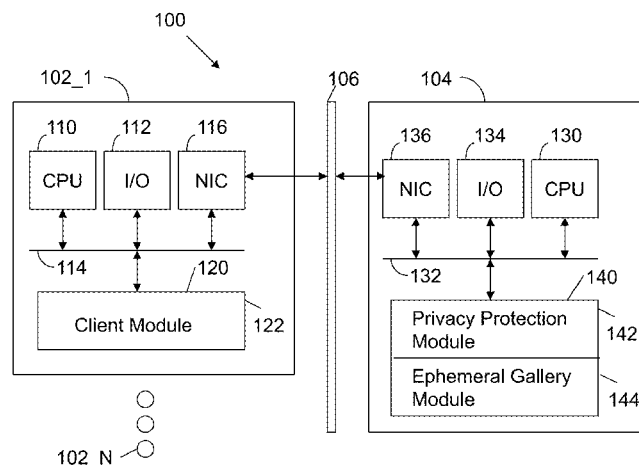
(74) *Attorney, Agent, or Firm* — Cooley LLP

(57)

ABSTRACT

A method executed by a computer includes receiving an image from a client device. A facial recognition technique is executed against an individual face within the image to obtain a recognized face. Privacy rules are applied to the image, where the privacy rules are associated with privacy settings for a user associated with the recognized face. A privacy protected version of the image is distributed, where the privacy protected version of the image has an altered image feature.

14 Claims, 10 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

8,379,130	B2	2/2013	Forutanpour et al.	2009/0024956	A1	1/2009	Kobayashi
8,405,773	B2	3/2013	Hayashi et al.	2009/0040324	A1	2/2009	Nonaka
8,418,067	B2	4/2013	Cheng et al.	2009/0042588	A1	2/2009	Lottin et al.
8,428,453	B1	4/2013	Spiegel et al.	2009/0058822	A1	3/2009	Chaudhri
8,471,914	B2	6/2013	Sakiyama et al.	2009/0079846	A1	3/2009	Chou
8,560,612	B2	10/2013	Kilmer et al.	2009/0089678	A1	4/2009	Sacco et al.
8,687,021	B2	4/2014	Bathiche et al.	2009/0132453	A1	5/2009	Hangartner et al.
8,744,523	B2	6/2014	Fan et al.	2009/0132665	A1	5/2009	Thomsen et al.
8,745,132	B2	6/2014	Obradovich	2009/0160970	A1	6/2009	Fredlund et al.
8,775,407	B1	7/2014	Huang	2009/0265647	A1	10/2009	Martin et al.
8,775,972	B2	7/2014	Spiegel	2010/0082693	A1	4/2010	Hugg et al.
8,788,680	B1	7/2014	Naik	2010/0131880	A1	5/2010	Lee et al.
8,797,415	B2	8/2014	Arnold	2010/0131895	A1	5/2010	Wohlert
8,856,349	B2	10/2014	Jain et al.	2010/0156933	A1	6/2010	Jones et al.
8,909,725	B1	12/2014	Sehn	2010/0159944	A1	6/2010	Pascal et al.
8,914,752	B1	12/2014	Spiegel	2010/0161831	A1	6/2010	Haas et al.
9,026,943	B1	5/2015	Spiegel	2010/0183280	A1	7/2010	Beauregard et al.
9,037,577	B1	5/2015	Saylor et al.	2010/0185665	A1	7/2010	Horn et al.
9,083,770	B1	7/2015	Dröse et al.	2010/0191631	A1	7/2010	Weidmann
9,094,137	B1	7/2015	Sehn	2010/0214436	A1	8/2010	Kim et al.
9,098,832	B1	8/2015	Scardino	2010/0223128	A1	9/2010	Dukellis et al.
9,113,301	B1	8/2015	Spiegel et al.	2010/0223343	A1	9/2010	Bosan et al.
9,225,897	B1	12/2015	Sehn	2010/0257196	A1	10/2010	Waters et al.
9,237,202	B1	1/2016	Sehn	2010/0281045	A1	11/2010	Dean
9,276,886	B1	3/2016	Samaranayake	2010/0306669	A1	12/2010	Della Pasqua
9,396,354	B1	7/2016	Murphy et al.	2011/0004071	A1	1/2011	Faiola et al.
9,407,712	B1	8/2016	Sehn	2011/0040783	A1	2/2011	Uemichi et al.
9,407,816	B1	8/2016	Sehn	2011/0040804	A1	2/2011	Peirce et al.
2002/0047868	A1	4/2002	Miyazawa	2011/0050909	A1	3/2011	Ellenby et al.
2002/0078456	A1	6/2002	Hudson et al.	2011/0050915	A1	3/2011	Wang et al.
2002/0122659	A1	9/2002	McGrath et al.	2011/0102630	A1	5/2011	Rukes
2002/0144154	A1	10/2002	Tomkow	2011/0141025	A1	6/2011	Tsai
2003/0016247	A1	1/2003	Lai et al.	2011/0145564	A1	6/2011	Moshir et al.
2003/0037124	A1	2/2003	Yamaura et al.	2011/0184980	A1	7/2011	Jeong et al.
2003/0052925	A1	3/2003	Daimon et al.	2011/0197194	A1	8/2011	D'Angelo et al.
2003/0126215	A1	7/2003	Udell et al.	2011/0202968	A1	8/2011	Nurmi
2003/0164856	A1	9/2003	Prager et al.	2011/0211534	A1	9/2011	Schmidt et al.
2004/0027371	A1	2/2004	Jaeger	2011/0213845	A1	9/2011	Logan et al.
2004/0111467	A1	6/2004	Willis	2011/0255736	A1	10/2011	Thompson et al.
2004/0203959	A1	10/2004	Coombes	2011/0273575	A1	11/2011	Lee
2004/0243531	A1	12/2004	Dean	2011/0283188	A1	11/2011	Farrenkopf et al.
2005/0078804	A1	4/2005	Yomoda	2011/0286586	A1	11/2011	Saylor et al.
2005/0097176	A1	5/2005	Schatz et al.	2011/0320373	A1	12/2011	Lee et al.
2005/0102381	A1	5/2005	Jiang et al.	2012/0028659	A1	2/2012	Whitney et al.
2005/0104976	A1	5/2005	Currans	2012/0036443	A1	2/2012	Ohmori et al.
2005/0114783	A1	5/2005	Szeto	2012/0054797	A1	3/2012	Skog et al.
2005/0122405	A1	6/2005	Voss et al.	2012/0062805	A1	3/2012	Candelore
2005/0193340	A1	9/2005	Amburgey et al.	2012/0108293	A1	5/2012	Law et al.
2005/0193345	A1	9/2005	Klassen et al.	2012/0110096	A1	5/2012	Smarr et al.
2005/0198128	A1	9/2005	Anderson et al.	2012/0113143	A1	5/2012	Adhikari et al.
2005/0223066	A1	10/2005	Buchheit et al.	2012/0113272	A1	5/2012	Hata
2006/0114338	A1	6/2006	Rothschild	2012/0131507	A1	5/2012	Sparandara et al.
2006/0270419	A1	11/2006	Crowley et al.	2012/0131512	A1	5/2012	Takeuchi et al.
2007/0040931	A1	2/2007	Nishizawa	2012/0143760	A1	6/2012	Abulafia et al.
2007/0064899	A1	3/2007	Boss et al.	2012/0150978	A1	6/2012	Monaco et al.
2007/0073823	A1	3/2007	Cohen et al.	2012/0163664	A1	6/2012	Zhu
2007/0082707	A1	4/2007	Flynt et al.	2012/0166971	A1	6/2012	Sachson et al.
2007/0192128	A1	8/2007	Celestini	2012/0169855	A1	7/2012	Oh
2007/0214216	A1	9/2007	Carrer et al.	2012/0173991	A1	7/2012	Roberts et al.
2007/0233801	A1	10/2007	Eren et al.	2012/0176401	A1	7/2012	Hayward et al.
2007/0243887	A1	10/2007	Bandhole et al.	2012/0184248	A1	7/2012	Speede
2007/0255456	A1	11/2007	Funayama	2012/0200743	A1	8/2012	Blanchflower et al.
2008/0025701	A1	1/2008	Ikeda	2012/0210244	A1	8/2012	deFrancisco Lopez et al.
2008/0033930	A1	2/2008	Warren	2012/0212632	A1	8/2012	Mate et al.
2008/0049704	A1	2/2008	Witteman et al.	2012/0220264	A1	8/2012	Kawabata
2008/0055269	A1	3/2008	Lemay et al.	2012/0233000	A1	9/2012	Fisher et al.
2008/0104503	A1	5/2008	Beall et al.	2012/0236162	A1	9/2012	Imamura
2008/0207176	A1	8/2008	Brackbill et al.	2012/0239761	A1	9/2012	Linner et al.
2008/0222545	A1	9/2008	Lemay et al.	2012/0250951	A1	10/2012	Chen
2008/0256446	A1	10/2008	Yamamoto	2012/0278387	A1	11/2012	Garcia et al.
2008/0266421	A1	10/2008	Takahata et al.	2012/0278692	A1	11/2012	Shi
2008/0270938	A1	10/2008	Carlson	2012/0281129	A1	11/2012	Wang et al.
2008/0313346	A1	12/2008	Kujawa et al.	2012/0299954	A1	11/2012	Wada et al.
2009/0006565	A1	1/2009	Velusamy et al.	2012/0304080	A1	11/2012	Wormald et al.
2009/0015703	A1	1/2009	Kim et al.	2012/0307096	A1	12/2012	Ford et al.
				2012/0323933	A1	12/2012	He et al.
				2013/0024757	A1	1/2013	Doll et al.
				2013/0050260	A1	2/2013	Reitan
				2013/0057587	A1	3/2013	Leonard et al.

(56)

References Cited**U.S. PATENT DOCUMENTS**

2013/0059607 A1 3/2013 Herz et al.
 2013/0060690 A1 3/2013 Oskolkov et al.
 2013/0063369 A1 3/2013 Malhotra et al.
 2013/0067027 A1 3/2013 Song et al.
 2013/0071093 A1 3/2013 Hanks et al.
 2013/0085790 A1 4/2013 Palmer et al.
 2013/0128059 A1 5/2013 Kristensson
 2013/0145286 A1 6/2013 Feng et al.
 2013/0169822 A1 7/2013 Zhu et al.
 2013/0173729 A1 7/2013 Starenky et al.
 2013/0182133 A1 7/2013 Tanabe
 2013/0185131 A1 7/2013 Sinha et al.
 2013/0194301 A1 8/2013 Robbins et al.
 2013/0198176 A1 8/2013 Kim
 2013/0222323 A1 8/2013 McKenzie
 2013/0227476 A1 8/2013 Frey
 2013/0232194 A1 9/2013 Knapp et al.
 2013/0263031 A1 10/2013 Oshiro et al.
 2013/0265450 A1 10/2013 Barnes, Jr.
 2013/0290443 A1 10/2013 Collins et al.
 2013/0304646 A1 11/2013 de Geer
 2013/0344896 A1 12/2013 Kirmse et al.
 2013/0346869 A1 12/2013 Asver et al.
 2013/0346877 A1 12/2013 Borovoy et al.
 2014/0011538 A1 1/2014 Mulcahy et al.
 2014/0019264 A1 1/2014 Wachman et al.
 2014/0032682 A1 1/2014 Prado et al.
 2014/0047016 A1 2/2014 Rao
 2014/0047045 A1 2/2014 Baldwin et al.
 2014/0047335 A1 2/2014 Lewis et al.
 2014/0049652 A1 2/2014 Moon et al.
 2014/0052485 A1 2/2014 Shidfar
 2014/0052633 A1 2/2014 Gandhi
 2014/0057660 A1 2/2014 Wager
 2014/0082651 A1 3/2014 Sharifi
 2014/0089314 A1 3/2014 Iizuka et al.
 2014/0122658 A1 5/2014 Haeger et al.
 2014/0122787 A1 5/2014 Shalvi et al.
 2014/0129953 A1 5/2014 Spiegel
 2014/0143143 A1 5/2014 Fasoli et al.
 2014/0149519 A1 5/2014 Redfern et al.
 2014/0155102 A1 6/2014 Cooper et al.
 2014/0173457 A1 6/2014 Wang et al.
 2014/0189592 A1 7/2014 Benchenaa et al.
 2014/0201527 A1 7/2014 Krivorot

2014/0207679 A1 7/2014 Cho
 2014/0214471 A1 7/2014 Schreiner, III
 2014/0222564 A1 8/2014 Kranendonk et al.
 2014/0279061 A1 9/2014 Elimeliah et al.
 2014/0279436 A1 9/2014 Dorsey et al.
 2014/0280537 A1 9/2014 Pridmore et al.
 2014/0282096 A1 9/2014 Rubinstein et al.
 2014/0298210 A1 10/2014 Park et al.
 2014/0317302 A1 10/2014 Naik
 2014/0325383 A1 10/2014 Brown et al.
 2014/0359024 A1 12/2014 Spiegel
 2014/0359032 A1 12/2014 Spiegel et al.
 2015/0046278 A1 2/2015 Pei et al.
 2015/0071619 A1 3/2015 Brough
 2015/0094106 A1 4/2015 Grossman et al.
 2015/0116529 A1 4/2015 Wu et al.
 2015/0172534 A1 6/2015 Miyakawa et al.
 2015/0365795 A1 12/2015 Allen et al.
 2016/0006927 A1 1/2016 Sehn

OTHER PUBLICATIONS

Fajman, "An Extensible Message Format for Message Disposition Notifications", Request for Comments: 2298, National Institutes of Health, Mar. 1998, 28 pgs.
 Supplementary European Search Report issued to EP Application No. 14804343.3, Sep. 29, 2016, 11 pgs.
 iVisit, "iVisit Mobile Getting Started", Dec. 4, 2013, iVisit, pp. 1-16.
 Melanson, Mike, "This text message will self destruct in 60 seconds", available on Feb. 11, 2011, retrieved from readwrite.com on Feb. 18, 2015, link: http://readwrite.com/2011/02/11/this_text_message_will_self_destruct_in_60_seconds, referred to herein after as READ-WRITE.
 Sawers, Paul, "Snapchat for iOS Lets You Send Photos to Friends and Set How long They're Visible for", May 7, 2012, <<http://thenextweb.com/apps/2012/05/07/Snapchat-for-ios-lets-you-send-photos-to-friends-and-set-how-long-theyre-visiblefor/#!xCjrp>>, pp. 1-5.
 Shein, "Ephemeral Data", Communications of the ACM, vol. 56, No. 9, Sep. 2013, pp. 20-22.
 Snapchat, "How Snaps Are Stored and Deleted", May 9, 2013, 3 pgs.
 Voxer Business, "Android Getting Started Guide", Feb. 1, 2014, 18 pgs., downloaded from <https://voxer.com/assets/AndroidGuide.pdf>.
 International Search Report and Written Opinion issued to International Patent Application No. PCT/US2014/040346, Mar. 23, 2015, 9 pgs.

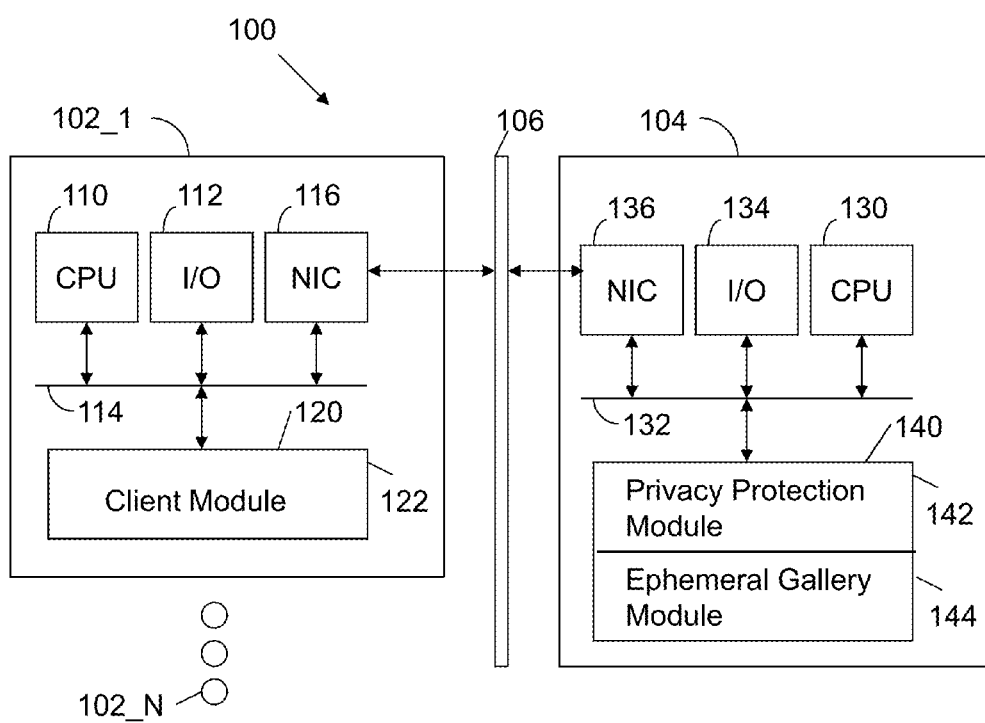


FIG. 1

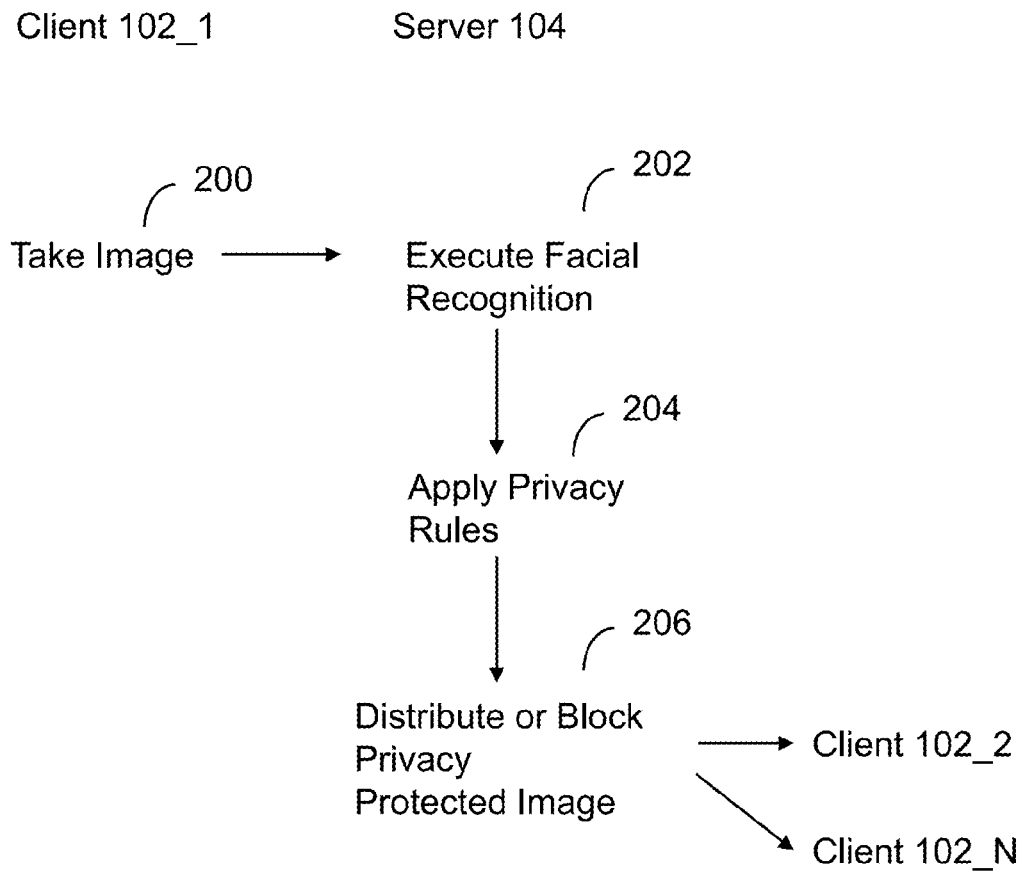


FIG. 2

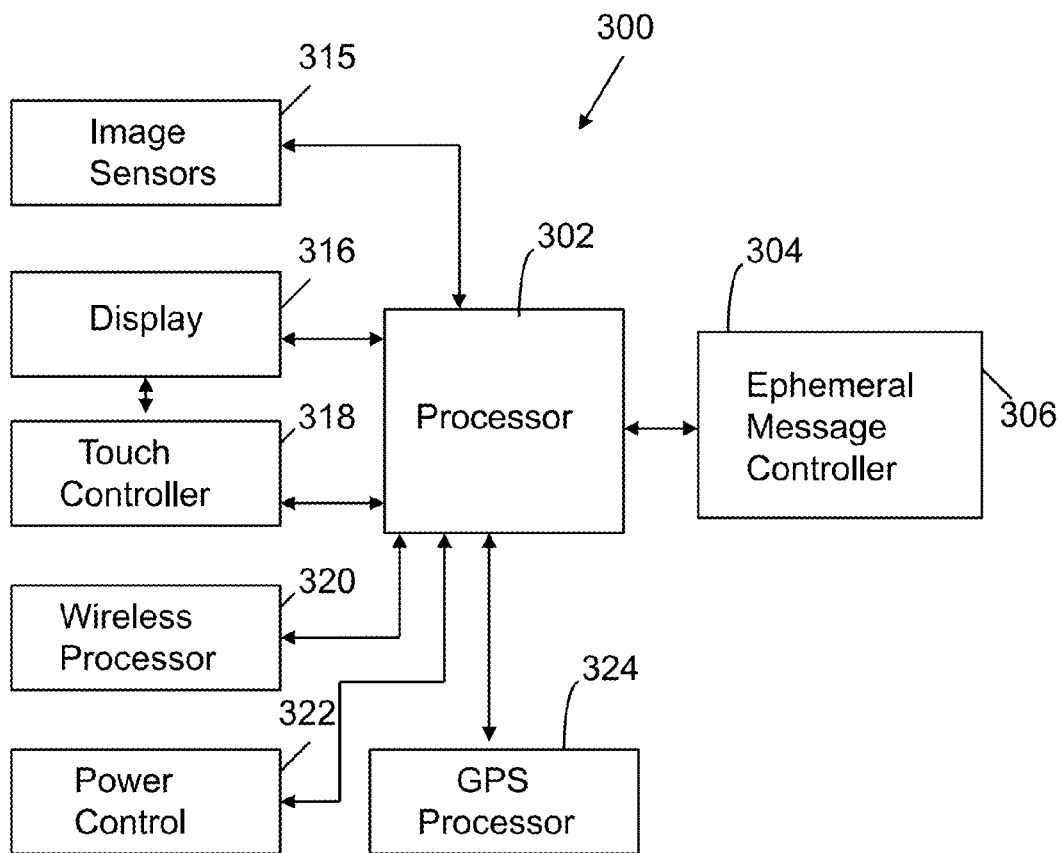


FIG. 3

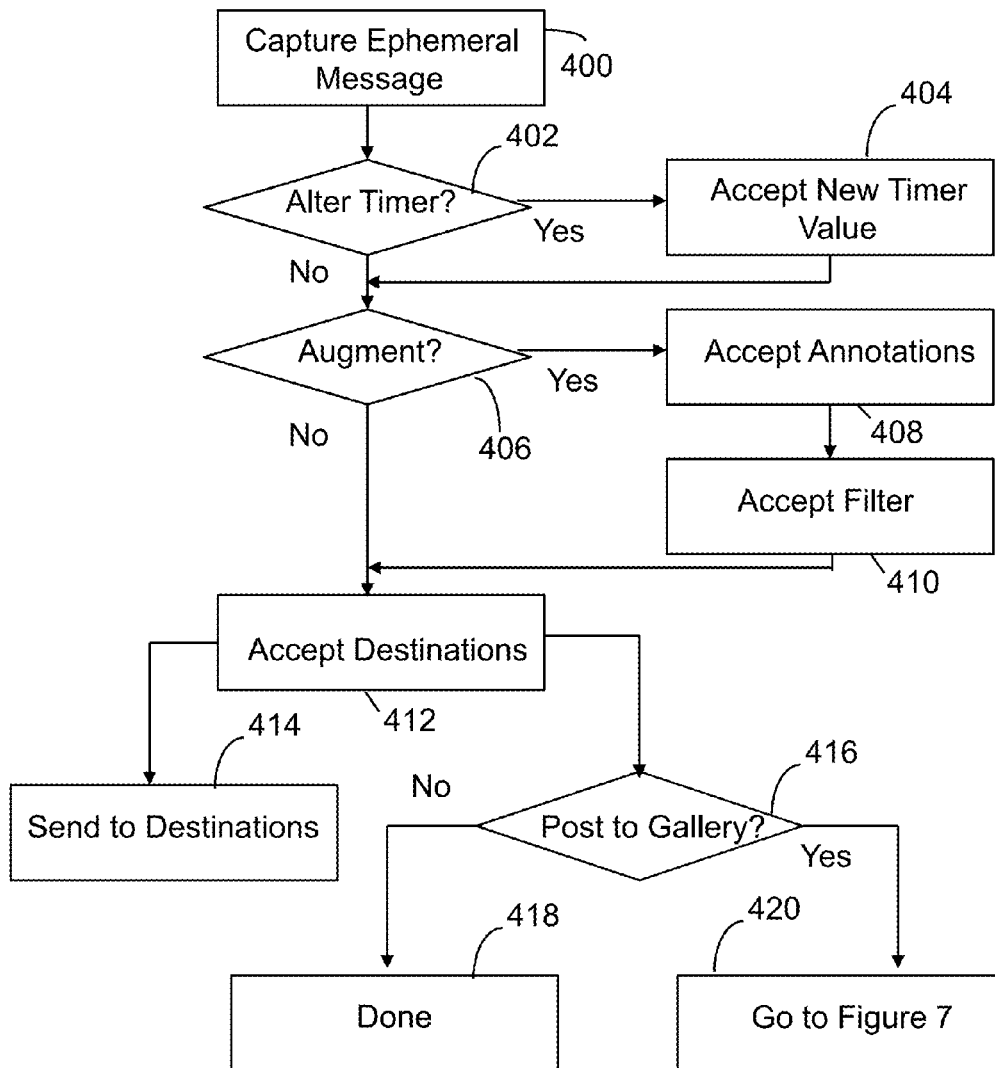


FIG. 4

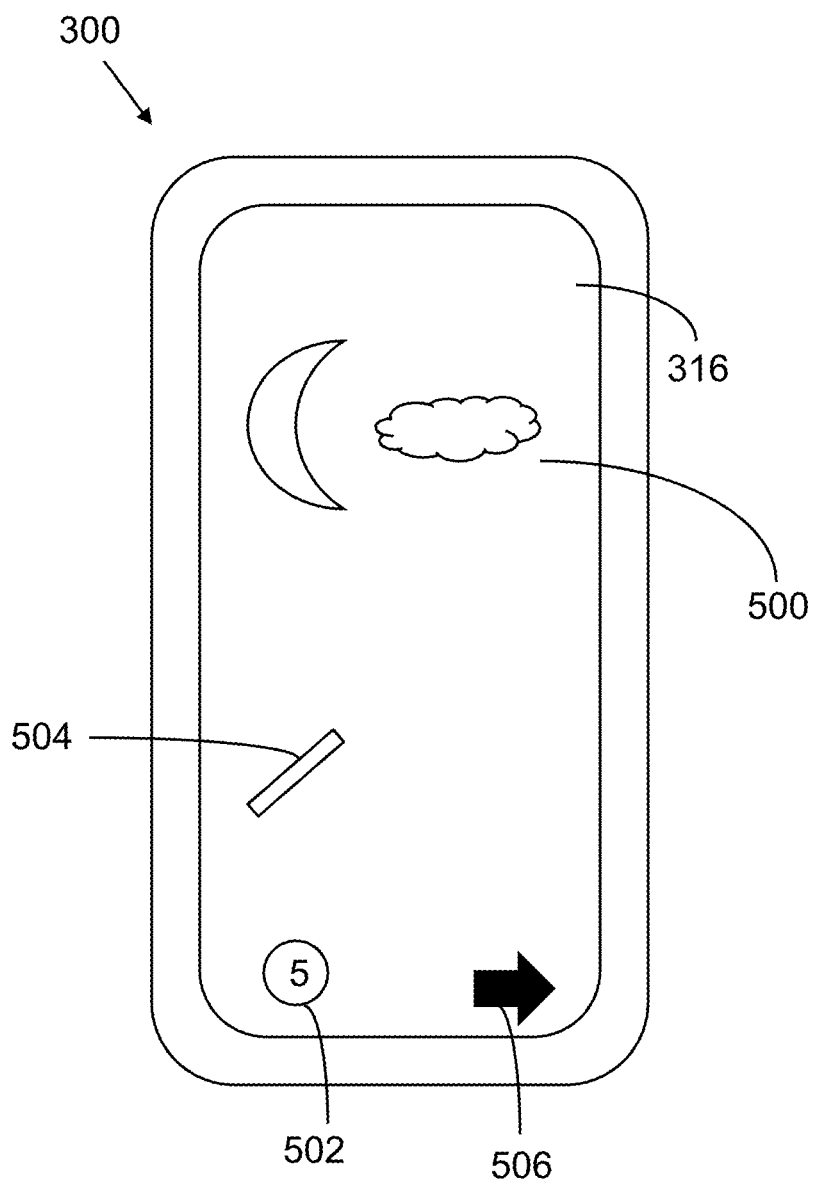


FIG. 5

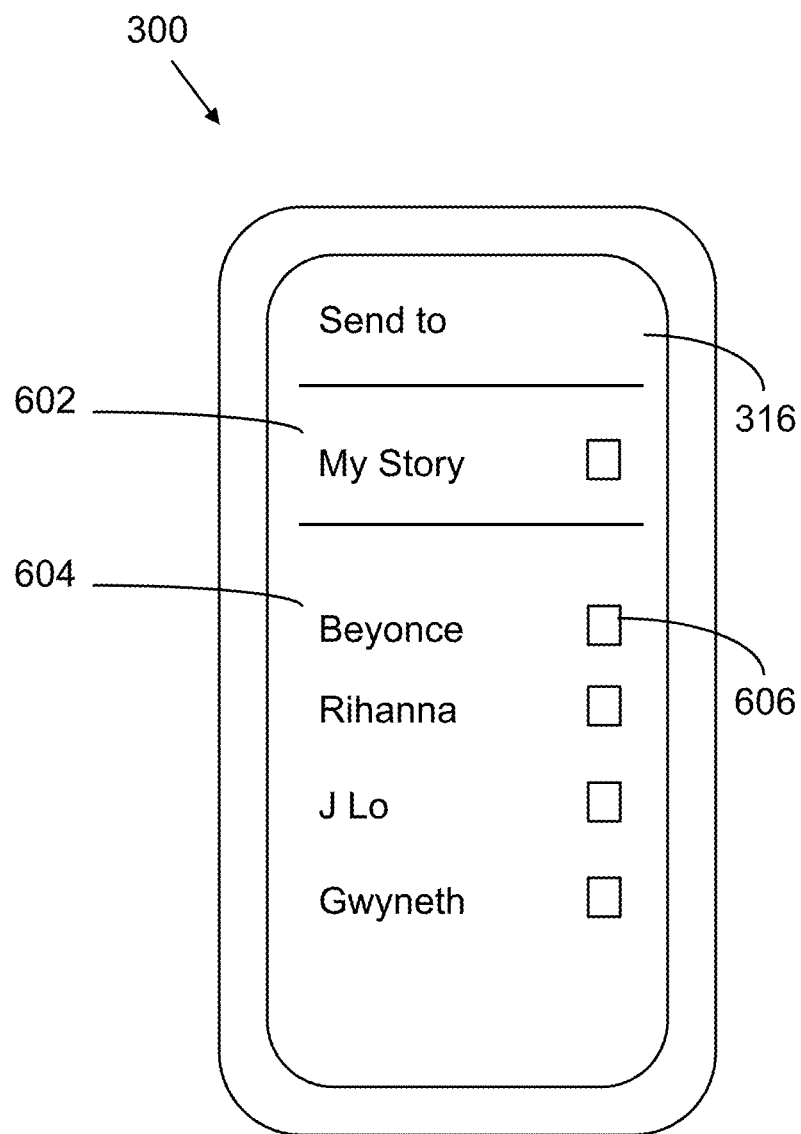


FIG. 6

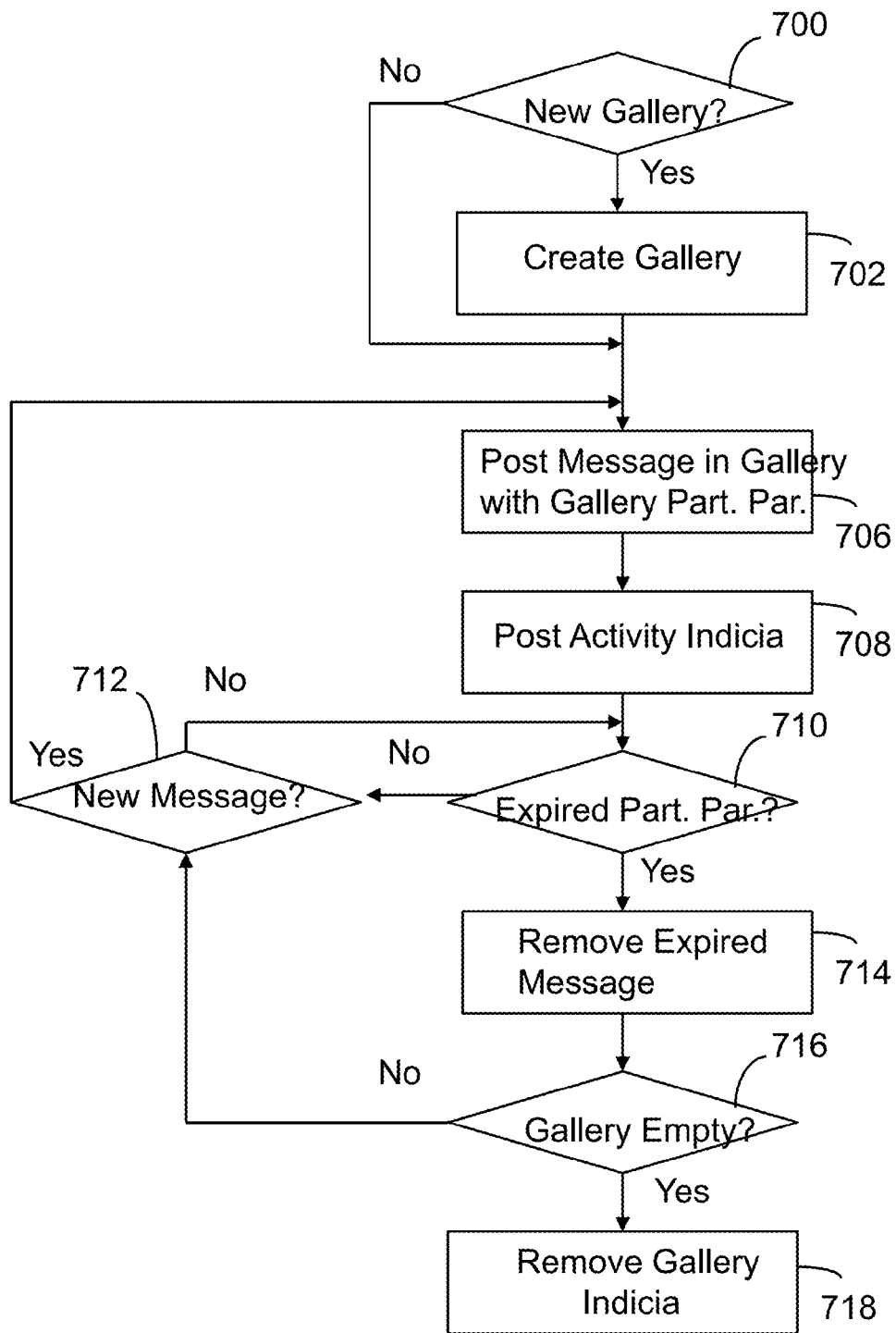


FIG. 7

800 Message_1	802 10 Seconds	804 120 Minutes Left
Message_2	5 Seconds	360 Minutes Left
Message_3	5 Seconds	1200 Minutes Left
Message_4	10 Seconds	1320 Minutes Left

FIG. 8

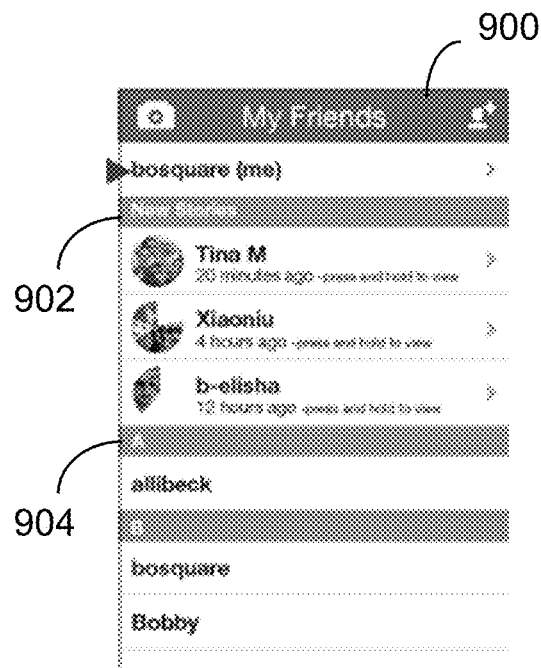


FIG. 9

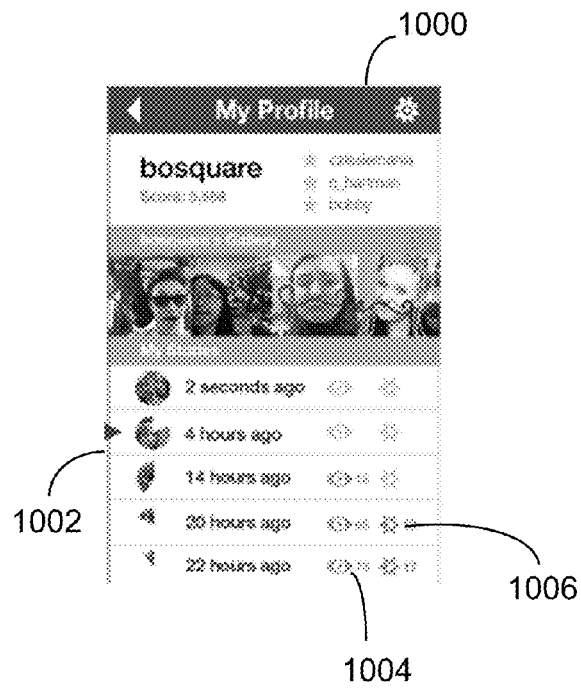


FIG. 10

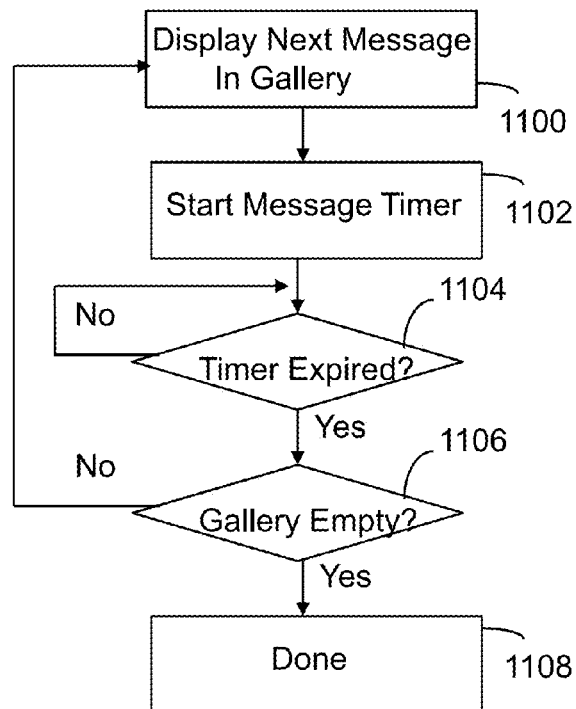


FIG. 11

1200

Our Story

1202

Authorized Accounts

Username

Display Name

Contact Email

Contact Phone

FIG. 12

1

APPARATUS AND METHOD FOR AUTOMATED PRIVACY PROTECTION IN DISTRIBUTED IMAGES

CROSS-REFERENCE TO RELATED INVENTION

This application is a continuation of U.S. patent application Ser. No. 14/723,400 filed May 27, 2015 which claims priority to U.S. Provisional Patent Application Ser. No. 62/004,168, filed May 28, 2014, the contents of which are incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates generally to digital images (e.g., digital photographs and videos). More particularly, this invention relates to techniques for automated privacy protection in distributed images.

BACKGROUND OF THE INVENTION

The ubiquity of digital equipment, such as smartphones and wearable technology, has created privacy concerns. In particular, large numbers of individuals are in a position to take and distribute images of another individual without the consent of the photographed or videoed individual. Accordingly, it would be desirable to provide techniques for automated privacy protection in digital image distribution.

SUMMARY OF THE INVENTION

A method executed by a computer includes receiving an image from a client device. A facial recognition technique is executed against an individual face within the image to obtain a recognized face. Privacy rules are applied to the image, where the privacy rules are associated with privacy settings for a user associated with the recognized face. A privacy protected version of the image is distributed, where the privacy protected version of the image has an altered image feature.

BRIEF DESCRIPTION OF THE FIGURES

The invention is more fully appreciated in connection with the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates a system configured in accordance with an embodiment of the invention.

FIG. 2 illustrates processing operations associated with an embodiment of the invention.

FIG. 3 illustrates components of an electronic device utilized in accordance with the invention.

FIG. 4 illustrates processing operations associated with an embodiment of the invention.

FIG. 5 illustrates an electronic device for capturing and augmenting an ephemeral message.

FIG. 6 illustrates an ephemeral message destination routing interface that may be used in accordance with an embodiment of the invention.

FIG. 7 illustrates ephemeral gallery processing operations associated with an embodiment of the invention.

FIG. 8 illustrates an ephemeral gallery data structure associated with an embodiment of the invention.

FIG. 9 illustrates ephemeral gallery indicia associated with an embodiment of the invention.

2

FIG. 10 illustrates ephemeral gallery indicia associated with another embodiment of the invention.

FIG. 11 illustrates operations performed in response to an ephemeral gallery view request.

FIG. 12 illustrates an account administration interface to establish an ephemeral gallery that receives ephemeral messages from multiple users.

Like reference numerals refer to corresponding parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates a system **100** configured in accordance with an embodiment of the invention. The system includes a set of client devices **102_1** through **102_N** connected to a server **104** via a network **106**, which may be any wired and/or wireless network. Each client device **102** includes standard components, such as a central processing unit **110** and input/output devices **112** connected via a bus **114**. The input/output devices **112** may include a touch display, a keyboard, camera, individual input buttons and the like associated with a smartphone or wearable technology (e.g., eye glasses or a watch with processing power and a wireless network communication module). A network interface circuit **116** is also connected to the bus **114** to provide connectivity to network **106**. A memory **120** is also connected to the bus **114**. The memory **120** stores a client module **122** with executable instructions to implement image capture and distribution operations. In particular, the client module **122** coordinates image capture operations and communicates with server **104**, which coordinates image distribution operations. The image may be a digital photograph or video.

The server **104** also includes standard components, such as a central processing unit **130**, a bus **132**, input/output devices **134** and a network interface circuit **136**. A memory **140** is also connected to the bus **132**. The memory **140** stores a privacy protection module **142**, which includes executable instructions to implement operations of the invention, as discussed in connection with FIG. 2. The memory **140** also stores an ephemeral gallery module **144**, which will be discussed below.

As shown in FIG. 2, a client device **102_1** executing a client module **122** takes an image **200**. The client module **122** coordinates the delivery of the image to the server **104**. The server **104** receives the image. The server **104** may also receive an image from another service, such as a gallery of photographs or videos. The privacy protection module **142** executes facial recognition **202** for any faces present in the image. Automated facial recognition techniques in images are known in the art. In one embodiment, the privacy protection module **142** processes a set of images of a user and generates a facial signature that is associated with a user name. Facial signatures and associated user names may be maintained for all users within a photograph sharing or video sharing application. These operations may be performed on server **104**. Alternately, the privacy protection module **142** coordinates calls to another networked server (not shown), which provides facial recognition services.

The next processing operation of FIG. 2 is to apply privacy rules **204**. The privacy rules are associated with privacy settings for a user associated with a recognized face. For example, the privacy rules and/or privacy settings may specify that a facial image of user A may only be distributed from images taken by user A's device. Another rule may specify that images that include A's face may only be distributed from or to devices or accounts previously

3

approved by A. For example, only usernames identified by user A may be allowed to distribute images that include user A (without the application of privacy rules). Similarly, images that include A's face may be distributed, without the privacy rules, to previously approved accounts or devices. Another rule may specify that a facial image of user B may only be distributed to friends in user B's social network. Another rule may specify that permission be obtained to distribute an image of a user that has privacy settings blocking such image distribution. For example, the privacy protection module 142 may automatically send a message on behalf of the user taking the image that seeks permission from the user that has privacy settings blocking such image distribution. The message may include the image and information on the user that took the image. Passwords or codes may be required for access to the image. That is, the viewer or message recipient may be required to obtain a password or code from the person in the image. In yet another embodiment, before being able to receive an image, the recipient may be prompted to send a request to the subject (i.e., the person in the picture) for permission to view the image. In response, a message is transmitted to the subject indicating that the recipient has requested access to view the image. The subject may then grant or deny access.

The final processing operation of FIG. 2 is to distribute or block privacy images 206 to various client devices, such as client 102_2 through 102_N. The privacy protected images have an altered image feature. The altered image feature may be a blurring of the facial image of a user that has requested privacy protection. Alternately, an emoticon, icon or brand may be placed over the face of the user that has requested privacy protection. The altered image may include a complete blocking of the face and body of the protected individual that has specified such privacy settings. Another embodiment restricts transmission or receipt of the privacy protected image (as opposed to transmitting or receiving a blurred image).

The privacy protected image may also be saved in a privacy protected format. In this case, the client 102_1 can only access a privacy protected image. Thus, if the user of client 102_1 has taken an image of an individual with privacy settings limiting which users can see such an image and such users do not include the user of client 102_1, then the user of client 102_1 only has access to a privacy protected format. This limits the user of client 102_1, but it allows individuals with privacy settings to control how other users capture them.

In an alternate embodiment, the facial recognition operation is used not for privacy purposes, but for enhancing the digital photograph in some specified manner. For example, the facial recognition operation may be used to add content, such as a sticker, text or an advertisement, which do not necessarily protect privacy or hide identity, but do provide an enhanced image.

In one embodiment, the image is ephemeral. That is, the image is configured for purposeful, and automatic, deletion after a certain period of time or after a certain action has been taken, such as viewing the image once. Thus, in these embodiments, privacy protected ephemeral images may be transmitted and distributed via any manner of communication, including, e.g., chat and other mobile application client, instant messenger, email, text/SMS, etc. The criteria for deleting the image are typically set by the individual taking the image. However, default criteria may be used (e.g., a single five second viewing period available for a twenty-four hour period).

4

The ephemeral images may be combined in an ephemeral gallery curated by the ephemeral gallery module 144. FIG. 3 illustrates an electronic device 300. In one embodiment, the electronic device 300 is a smartphone with a processor 302 in communication with a memory 304. The processor 302 may be a central processing unit and/or a graphics processing unit. The memory 304 is a combination of flash memory and random access memory. The memory 304 stores an ephemeral message controller 306 to implement operations of the invention. The ephemeral message controller 306 may include executable instructions to access a server which coordinates operations disclosed herein. Alternately, the ephemeral message controller 306 may include executable instructions to coordinate some of the operations disclosed herein, while the server implements other operations.

The display time for the ephemeral message is typically set by the message sender. However, the display time may be a default setting or a setting specified by the recipient. Regardless of the setting technique, the message is transitory (i.e., the message is deleted or otherwise made inaccessible after a certain period of time or after a certain action has been taken).

The processor 302 is also coupled to image sensors 315. The image sensors 315 may be known digital image sensors, such as charge coupled devices. The image sensors capture visual media, which is presented on display 316.

A touch controller 318 is connected to the display 316 and the processor 302. The touch controller 318 is responsive to haptic signals applied to the display 316. In one embodiment, the ephemeral message controller 306 monitors signals from the touch controller 318. If haptic contact is observed by the touch controller 318 in connection with indicia of an ephemeral gallery, then the ephemeral gallery is displayed to the user as a sequence of ephemeral messages.

The electronic device 300 may also include other components commonly associated with a smartphone, such as a wireless signal processor 320 to provide connectivity to a wireless network. A power control circuit 322 and a global positioning system processor 324 may also be utilized. While many of the components of FIG. 3 are known in the art, new functionality is achieved through the ephemeral message controller 306 operating in conjunction with a server (e.g., server 104).

FIG. 4 illustrates processing operations associated with the ephemeral message controller 306. Initially, an ephemeral message is captured 400. FIG. 5 illustrates electronic device 300 and touch display 316 with a photograph 500 operative as an ephemeral message.

The next processing operation of FIG. 4 is to determine whether to alter a timer or a message duration parameter 402. FIG. 5 illustrates an example of indicia 502 of a message duration parameter. In this example, the indicia indicates a default of 5 seconds as the message duration parameter. If the indicia is engaged (e.g., through haptic contact), then a prompt may be supplied for a new message duration parameter (e.g., 10 seconds). Such activity (402—Yes) results in the acceptance of the new timer value 404. If a new timer value is specified or no alteration of a timer transpires (402—No) control proceeds to block 406. The user may be prompted to augment the ephemeral message. As shown in FIG. 5, a drawing tool 504 may be supplied to allow a user to add a hand drawn message. The drawing tool 504 may be manipulated by haptic contact to enter a message or annotation of visual media. Alternately or in addition, a keyboard may be used to type augment a mes-

sage. For example, a tap on the touch display **316** may result in a keyboard being displayed, which allows a user to enter a typed message.

As shown in FIG. **4**, annotations may be accepted **408** in this manner. Augmentation may also be in the form of photograph filters. That is, photograph filters may be accepted **410**. For example, a first right-to-left swipe motion on the touch display **316** may drag a first filter on top of the photograph. A second right-to-left swipe motion on the touch display **316** may drag a second filter on top of the photograph. Filter processing of this type is described in commonly owned U.S. Ser. No. 14/325,270, filed Jul. 7, 2014, the contents of which are incorporated herein by reference.

The next operation of FIG. **4** is to accept destinations **412**. As more fully described below, a destination may be used to identify intended recipients of a message or a location or “gallery” where one or more messages may be accessed. FIG. **5** illustrates an icon **506** to invoke a destination list. Haptic contact on the icon may result in a destination list of the type shown in FIG. **6**. FIG. **6** illustrates an electronic device **300** displaying a destination list. The destination list may include a destination of “My Story” **602**, where “My Story” is a reference to an ephemeral gallery of ephemeral messages. The destination list may also include friends or contacts section **604** listing various friends that may be ephemeral message recipients. Haptic contact with a box **606** associated with a listed individual or story places the corresponding individual or story on a destination list.

Returning to FIG. **4**, after the destination list is specified, the ephemeral message is sent to the specified destinations **414**. For example, the ephemeral message is sent to friends selected from section **604**, if any. A check is also made to determine whether the message should be posted to an ephemeral gallery **416**. If not (**416**—No), processing is completed. If so (**416**—Yes), the processing of FIG. **7** is performed **420**. Thus, it is possible to send a message to one or more friends and/or post to an ephemeral gallery.

The ephemeral gallery module **144** may include instructions to coordinate the processing operations of FIG. **4**. These operations may be controlled by the ephemeral gallery module **144** or they may be performed in conjunction with selective operations performed by the ephemeral message controller **306**.

FIG. **7** illustrates ephemeral gallery module **144** operations performed in accordance with an embodiment of the invention. The first operation of FIG. **7** is to determine whether a new gallery is needed **700**. As discussed in connection with FIG. **6**, designating “My Story” **602** as a message recipient results in a post of an ephemeral message to an ephemeral gallery. If a gallery does not exist (**700**—Yes), then a new gallery is created **702**. Alternately, if a gallery does exist and a user wants to create a new gallery, then the new gallery is created **702**. The user may be supplied a prompt to indicate whether an existing gallery should be used or a new gallery should be designated.

The message is then posted in the gallery with a gallery participation parameter **706**. The gallery participation parameter is an ephemeral period of time that the ephemeral message will continue to exist in the gallery. For example, a first ephemeral message posted to the gallery may have a default gallery participation parameter of 24 hours. In other instances, the gallery participation parameter may be set by a user. The gallery participation parameter value decreases with the passage of time. Thus, in this embodiment, an

ephemeral message gallery subsists for as long as the gallery participation parameter of the last message posed to the gallery.

In another embodiment, a gallery timer may be assigned to a gallery by a user. The gallery timer may be used to establish a lifespan of an associated gallery and messages posted to this gallery subsist for no longer than the life of the gallery. Thus, in some embodiments, all messages posted to such a gallery will subsist for the duration of the life of the gallery (regardless of posting time). In other embodiments, messages may be submitted with a gallery participation parameter. In these embodiments, messages expire and become inaccessible at the earlier of the gallery participation parameter or the remaining life of the gallery.

The next processing operation of FIG. **7** is to post activity indicia **708**. Examples of activity indicia are provided below. A check is then made to determine whether there is an expired participation parameter **710**. If so (**710**—Yes), the ephemeral message associated with the expired participation parameter is removed from the ephemeral gallery **714**. If as a result of this removed message the gallery is empty (**716**—Yes), then the ephemeral gallery ephemeral gallery terminates and indicia of the gallery is removed **718**. If the gallery is not empty (**716**—No), a check is made for a new message **712**. If a new message exists (**712**—Yes), then processing returns to block **706**. If a new message does not exist (**712**—No), then processing returns to block **710**. If an expired participation parameter does not exist (**710**—No), then a check is made once again for a new message **712**.

FIG. **8** illustrates a data structure for an ephemeral message gallery. A first column **800** may have a list of messages. Another column **802** may have a list of message duration parameters for individual messages. Another column **804** may have a list of gallery participation parameters for individual messages. Observe in this example that the values in column **802** add up to 30 seconds. Thus, the ephemeral message gallery in this example has four messages that will take 30 seconds to display. Further observe that the oldest message (Message_1) is displayed first and will be removed in 120 minutes. In this example, the newest message (Message_4) will remain in the ephemeral gallery for 1320 minutes at which point the ephemeral gallery will expire, unless another message is posted. The arrival of a new message alters the gallery timer, but does not alter gallery participation parameters.

FIG. **9** illustrates an interface **900** with a section **902** that designates available ephemeral message galleries (stories) and a section **904** with a listing of friends (available destinations for an ephemeral message). Observe that section **902** has indicia of ephemeral message gallery activity. FIG. **9** provides example indicia of the time that the last message was posted to the ephemeral message gallery. FIG. **9** also provides example graphical indicia of the amount of time remaining for an ephemeral message gallery. Observe that the first entry was posted 20 minutes ago and therefore has a full circle indicative of the time remaining for that ephemeral message gallery. On the other hand, the third entry was posted 12 hours ago and has approximately half a circle to indicate the time remaining for that ephemeral message gallery. This example contemplates a 24 hour period for an ephemeral message gallery. Naturally, other time periods may be utilized in accordance with embodiments of the invention.

FIG. **10** illustrates an interface **1000** with information on a user’s stories. Individual stories **1002** have indicia of the amount of time remaining. Indiciu **1004** of the number of ephemeral gallery views is also provided. Indiciu **1006** of

screenshots taken of an ephemeral message is also provided. This information is significant since the intent of the message was that it be ephemeral. If a message recipient overrides this intent by taking a screen shot, then the message sender is advised.

FIG. 11 illustrates processing operations performed by the ephemeral gallery module 144 in response to a request for an ephemeral message gallery. As shown in FIG. 6, a user receives a list of 602 of available stories. Haptic contact with indicia of a story is operative as a request to view an ephemeral message gallery.

The first operation in FIG. 11 is to display the next message in the gallery 1100. In the example of FIG. 8, the oldest message is the first message to be displayed. A message timer is then started 1102. The message timer expires at the end of the message duration parameter for the displayed ephemeral message. In the example of FIG. 8, the first message (Message_1) is displayed for 10 seconds. Block 1104 checks for the timer to expire. Upon expiration of the timer (1104—Yes), a check is made to determine if the gallery is empty 1106. If so (1106—Yes), processing is completed 1108. If not (1106—No), processing returns to block 1100. This processing loop is repeated until the gallery is empty.

FIG. 12 illustrates an account administration interface 1200 to establish an ephemeral gallery that receives ephemeral messages from multiple users. Such a feature may be used to facilitate celebrity or organizational accounts where numerous authorized users are allowed to post on behalf of a single account. In one embodiment, a username, display name, contact email and contact phone are specified by an account administrator. An authorized accounts prompt 1202 allows the account administrator to add other users to the ephemeral gallery. For example, activation of the prompt 1202 may result in prompts for a username, display name, contact email and/or contact phone. Alternately, activation of the prompt 1202 may result in an interface of the type shown in FIG. 6 through which authorized accounts may be added. Similar interfaces may be used for specifying privacy settings, such as which accounts are authorized to receive images of an individual.

Although the embodiments described in FIGS. 3-12 depict the use of privacy protection concepts in the context of an ephemeral gallery, it is to be understood that other embodiments contemplate the application of the concepts in these figures to privacy protection in any communication protocols, including, e.g., chat, SMS, IM, other mobile, email, etc.

An embodiment of the present invention relates to a computer storage product with a non-transitory computer readable storage medium having computer code thereon for performing various computer-implemented operations. The media and computer code may be those specially designed and constructed for the purposes of the present invention, or they may be of the kind well known and available to those having skill in the computer software arts. Examples of computer-readable media include, but are not limited to: magnetic media, optical media, magneto-optical media and hardware devices that are specially configured to store and execute program code, such as application-specific integrated circuits (“ASICs”), programmable logic devices (“PLDs”) and ROM and RAM devices. Examples of computer code include machine code, such as produced by a compiler, and files containing higher-level code that are executed by a computer using an interpreter. For example, an embodiment of the invention may be implemented using JAVA®, C++, or other object-oriented programming lan-

guage and development tools. Another embodiment of the invention may be implemented in hardwired circuitry in place of, or in combination with, machine-executable software instructions.

The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that specific details are not required in order to practice the invention. Thus, the foregoing descriptions of specific embodiments of the invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed; obviously, many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, they thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the following claims and their equivalents define the scope of the invention.

The invention claimed is:

1. A method executed by a computer, comprising:
 - receiving an image from a client device;
 - executing a facial recognition technique against an individual face within the image to obtain a recognized face;
 - applying privacy rules to the image; and
 - distributing a privacy protected version of the image, wherein the privacy protected version of the image has an altered image feature, wherein the privacy protected version of the image is distributed to an ephemeral gallery including a collection of ephemeral images shown in sequence, and wherein the ephemeral gallery is available for an ephemeral period of time, wherein each ephemeral image has an associated message duration parameter that indicates a display duration for the corresponding ephemeral image during viewing of the ephemeral gallery, and each ephemeral image has a gallery participation parameter that indicates a time value for continued availability of the corresponding ephemeral image in the ephemeral gallery, wherein a particular one of the plurality ephemeral images is removed from the ephemeral gallery in response to the identification of an expired gallery participation parameter corresponding to the particular ephemeral image, and wherein the ephemeral gallery is eliminated upon expiration of either a gallery timer or upon expiration of the gallery participation parameter of a last ephemeral image in the ephemeral gallery, the last ephemeral image being that one of the plurality of ephemeral images which was posted to the ephemeral gallery last.
2. The method of claim 1 wherein the altered image feature is a blurred image of the recognized face.
3. The method of claim 1 wherein the altered image feature is a block over the recognized face.
4. The method of claim 3 wherein the block is selected from an emoticon, an icon and a brand.
5. The method of claim 1 wherein the altered image feature is a block over the recognized face and the body associated with the recognized face.
6. The method of claim 1 wherein executing includes making network calls to a machine supplying facial recognition services.
7. A method executed by a computer, comprising:
 - receiving an image from a client device;

9

executing a facial recognition technique against an individual face within the image to obtain a recognized face;

applying privacy rules to the image; and

limiting distribution of the image in accordance with the privacy rules and selectively distributing the image to an ephemeral gallery including a collection of ephemeral images shown in sequence, wherein the ephemeral gallery is available for an ephemeral period of time, wherein each ephemeral image has an associated message duration parameter that indicates a display duration for the corresponding ephemeral image during viewing of the ephemeral gallery, and each ephemeral image has a gallery participation parameter that indicates a time value for continued availability of the corresponding ephemeral image in the ephemeral gallery, wherein a particular one of the plurality ephemeral images is removed from the ephemeral gallery in response to the identification of an expired gallery participation parameter corresponding to the particular ephemeral image, and wherein the ephemeral gallery is eliminated upon expiration of either a gallery timer or upon expiration of the gallery participation parameter of a last ephemeral image in the ephemeral gallery, the

10

last ephemeral image being that one of the plurality of ephemeral images which was posted to the ephemeral gallery last.

8. The method of claim 7 wherein limiting distribution of the image includes blocking the distribution of the image.

9. The method of claim 7 wherein limiting distribution of the image includes limiting distribution of the image to members of the social network associated with the recognized face.

10. The method of claim 7 wherein limiting distribution of the image includes soliciting permission from the user associated with the recognized face prior to distribution of the image.

11. The method of claim 7 further comprising distributing a privacy protected version of the image, wherein the privacy protected version of the image has an altered image feature.

12. The method of claim 11 wherein the altered image feature is a blurred image of the recognized face.

13. The method of claim 11 wherein the altered image feature is a block over the recognized face, wherein the block is selected from an emoticon, an icon and a brand.

14. The method of claim 11 wherein the altered image feature is a block over the recognized face and the body associated with the recognized face.

* * * * *