

EXHIBIT D



US008982110B2

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

(10) **Patent No.:** **US 8,982,110 B2**
(45) **Date of Patent:** **Mar. 17, 2015**

(54) **METHOD FOR IMAGE TRANSFORMATION, AUGMENTED REALITY, AND TELEPERENCE**

(56) **References Cited**

(71) Applicant: **EyesMatch Ltd.**, Road Town, Tortola (VG)

5,230,039 A 7/1993 Grossman et al.
5,551,021 A 8/1996 Harada et al.

(Continued)

(72) Inventors: **Ofer Saban**, Vienna, VA (US); **Nissi Vilcovsky**, Tokyo (JP)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **Eyesmatch Ltd**, Road Town, Tortola (VG)

DE 19943355 A1 3/2001
DE 10031965 A1 1/2002

(Continued)

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

OTHER PUBLICATIONS

(21) Appl. No.: **14/253,831**

Extended Search Report for European Patent Application No. 06711263.1 dated Aug. 18, 2011.

(22) Filed: **Apr. 15, 2014**

(Continued)

(65) **Prior Publication Data**
US 2014/0225978 A1 Aug. 14, 2014

Primary Examiner — Vijay Shankar
(74) *Attorney, Agent, or Firm* — Nixon Peabody LLP; Joseph Bach, Esq.

Related U.S. Application Data

(63) Continuation-in-part of application No. 13/843,001, filed on Mar. 15, 2013, which is a continuation-in-part of application No. 13/088,369, filed on Apr. 17, 2011, now Pat. No. 8,624,883, which is a continuation of
(Continued)

(57) **ABSTRACT**

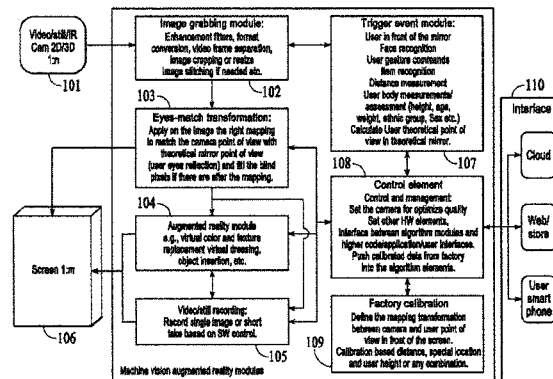
Computerized method for image transformation, augmented reality and telepresence. A camera generates a stream of images of the user; a processor detects the presence of the user in the stream of images and applies adaptive transformation mapping to the stream of images captured by the camera to generate modified images that appear to be captured from a different point of view of the camera's actual point of view. The modified images are displayed on a local and/or remote monitor for telepresence. The processor can also generate an avatar having body characteristics corresponding to body characteristics of a user appearing in the images. The processor may generate the avatar by analyzing registration pointers on the images of the camera. The processor may reside in the remote location, and the camera images transmitted over a network to the processor, and the modified images transmitted back from the processor to the monitor.

(51) **Int. Cl.**
G06F 3/038 (2013.01)
G06T 19/00 (2011.01)
(Continued)

(52) **U.S. Cl.**
CPC **G06T 19/006** (2013.01); **G02B 5/08** (2013.01); **G06F 3/011** (2013.01); **G09F 19/16** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC G06F 3/01; G06F 3/011; G06F 3/005
USPC 345/204-215; 348/333.01; 434/395
See application file for complete search history.

18 Claims, 16 Drawing Sheets



US 8,982,110 B2

Page 2

Related U.S. Application Data

- application No. 11/817,411, filed as application No. PCT/IL2006/000281 on Mar. 1, 2006, now Pat. No. 7,948,481.
- (60) Provisional application No. 60/656,885, filed on Mar. 1, 2005, provisional application No. 60/656,884, filed on Mar. 1, 2005, provisional application No. 61/738,957, filed on Dec. 18, 2012, provisional application No. 61/892,368, filed on Oct. 17, 2013, provisional application No. 61/862,025, filed on Aug. 4, 2013.
- (51) **Int. Cl.**
G02B 5/08 (2006.01)
G06F 3/01 (2006.01)
G09F 19/16 (2006.01)
G09F 27/00 (2006.01)
H04N 1/387 (2006.01)
H04N 1/62 (2006.01)
H04N 7/14 (2006.01)
G06T 11/00 (2006.01)
H04N 21/00 (2011.01)
G06T 3/00 (2006.01)
G06T 7/00 (2006.01)
G06T 15/20 (2011.01)
H04N 5/262 (2006.01)
H04N 5/272 (2006.01)
- (52) **U.S. Cl.**
 CPC *G09F 27/00* (2013.01); *H04N 1/387* (2013.01); *H04N 1/622* (2013.01); *H04N 7/144* (2013.01); *G06T 11/00* (2013.01); *H04N 21/00* (2013.01); *G06T 3/00* (2013.01); *G06T 7/00* (2013.01); *G06T 15/205* (2013.01); *H04N 5/2624* (2013.01); *H04N 5/2628* (2013.01); *H04N 2005/2726* (2013.01)
 USPC 345/204; 345/212; 345/214

| | | | |
|--------------|----|--------|------------------|
| 2007/0040033 | A1 | 2/2007 | Rosenberg |
| 2007/0120954 | A1 | 5/2007 | Allen et al. |
| 2007/0132863 | A1 | 6/2007 | Deguchi |
| 2008/0056564 | A1 | 3/2008 | Lindbloom |
| 2008/0151092 | A1 | 6/2008 | Vilcovsky |
| 2009/0051779 | A1 | 2/2009 | Rolston |
| 2009/0091710 | A1 | 4/2009 | Huebner |
| 2010/0097442 | A1 | 4/2010 | Lablans |
| 2010/0169411 | A1 | 7/2010 | Colton et al. |
| 2010/0190510 | A1 | 7/2010 | Maranhas et al. |
| 2010/0191578 | A1 | 7/2010 | Tran et al. |
| 2011/0199294 | A1 | 8/2011 | Vilcovsky |
| 2011/0210970 | A1 | 9/2011 | Segawa |
| 2012/0120184 | A1 | 5/2012 | Fornell et al. |
| 2012/0154872 | A1 | 6/2012 | Reddy |
| 2012/0169850 | A1 | 7/2012 | Kim et al. |
| 2012/0177284 | A1 | 7/2012 | Wang |
| 2012/0229637 | A1 | 9/2012 | Mooradian et al. |
| 2012/0233089 | A1 | 9/2012 | Calman et al. |
| 2013/0083015 | A1 | 4/2013 | Hernandez |
| 2013/0088562 | A1 | 4/2013 | Hong et al. |
| 2013/0229482 | A1 | 9/2013 | Vilcovsky et al. |
| 2014/0225977 | A1 | 8/2014 | Vilcovsky et al. |
| 2014/0226000 | A1 | 8/2014 | Vilcovsky et al. |
| 2014/0226900 | A1 | 8/2014 | Saban et al. |

FOREIGN PATENT DOCUMENTS

| | | | |
|----|-------------|----|---------|
| EP | 1372092 | A1 | 12/2003 |
| EP | 1376207 | A1 | 1/2004 |
| EP | 1859432 | A2 | 11/2007 |
| WO | 00/22955 | A1 | 4/2000 |
| WO | 2006/092793 | A2 | 9/2006 |
| WO | 2014/100250 | A2 | 6/2014 |

OTHER PUBLICATIONS

- Office Action for European Patent Application No. 06711263.1 dated Jun. 21, 2012.
- Office Action for European Patent Application No. 06711263.1 dated Jun. 25, 2013.
- Decision to Refuse for European Patent Application No. 06711263.1 dated Nov. 4, 2014.
- Office Action for U.S. Appl. No. 13/088,369 dated Nov. 2, 2012.
- Office Action for U.S. Appl. No. 13/088,369 dated Apr. 9, 2013.
- Notice of Allowance for U.S. Appl. No. 13/088,369 dated Sep. 3, 2013.
- International Search Report and Written Opinion for PCT/IL2006/000281 dated Jun. 12, 2007.
- International Preliminary Report on Patentability for PCT/IL2006/000281 dated Sep. 20, 2007.
- Office Action for U.S. Appl. No. 11/817,411 mailed on Jul. 21, 2010.
- Notice of Allowance for U.S. Appl. No. 11/817,411 mailed on Feb. 3, 2011.
- International Search Report and Written Opinion for PCT/US2013/076253 dated May 6, 2014.
- Notice of Allowance for U.S. Appl. No. 14/253,800 dated Oct. 24, 2014.
- Invitation to Pay Additional Fees and, Where Applicable, Protest Fee for PCT/US2014/034333 dated Aug. 8, 2014.
- Notice of Allowance for U.S. Appl. No. 13/843,001 mailed on Dec. 5, 2014.
- International Search Report and Written Opinion for PCT/US2014/034333 dated Dec. 17, 2014.
- Notice of Allowance for U.S. Appl. No. 14/253,827 dated Dec. 15, 2014.

* cited by examiner

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|--------------|------|---------|---------------------------------|
| 5,923,776 | A | 7/1999 | Kangar-Parsi |
| 5,937,081 | A | 8/1999 | O'Brill et al. |
| 6,195,467 | B1 | 2/2001 | Asimopoulos et al. |
| 6,366,694 | B1 | 4/2002 | Acharya |
| 6,417,850 | B1 | 7/2002 | Kang |
| 7,500,755 | B2 * | 3/2009 | Ishizaki et al. 353/28 |
| 7,874,481 | B2 * | 1/2011 | Silverbrook et al. 235/383 |
| 7,874,681 | B2 | 1/2011 | Huebner |
| 7,948,481 | B2 | 5/2011 | Vilcovsky |
| 8,000,727 | B1 | 8/2011 | Bushman et al. |
| 8,624,883 | B2 | 1/2014 | Vilcovsky |
| 2002/0049546 | A1 | 4/2002 | Shimomura |
| 2002/0196333 | A1 | 12/2002 | Gorischek |
| 2003/0085866 | A1 | 5/2003 | Bimber et al. |
| 2003/0110099 | A1 | 6/2003 | Trajkovic et al. |
| 2003/0146901 | A1 | 8/2003 | Ryan |
| 2005/0018140 | A1 | 1/2005 | Ishizaki et al. |
| 2005/0047629 | A1 | 3/2005 | Farrell et al. |
| 2005/0259158 | A1 | 11/2005 | Jacob et al. |
| 2006/0007303 | A1 | 1/2006 | Milton |
| 2006/0158534 | A1 | 7/2006 | Gotohda |
| 2006/0178902 | A1 | 8/2006 | Vicars et al. |

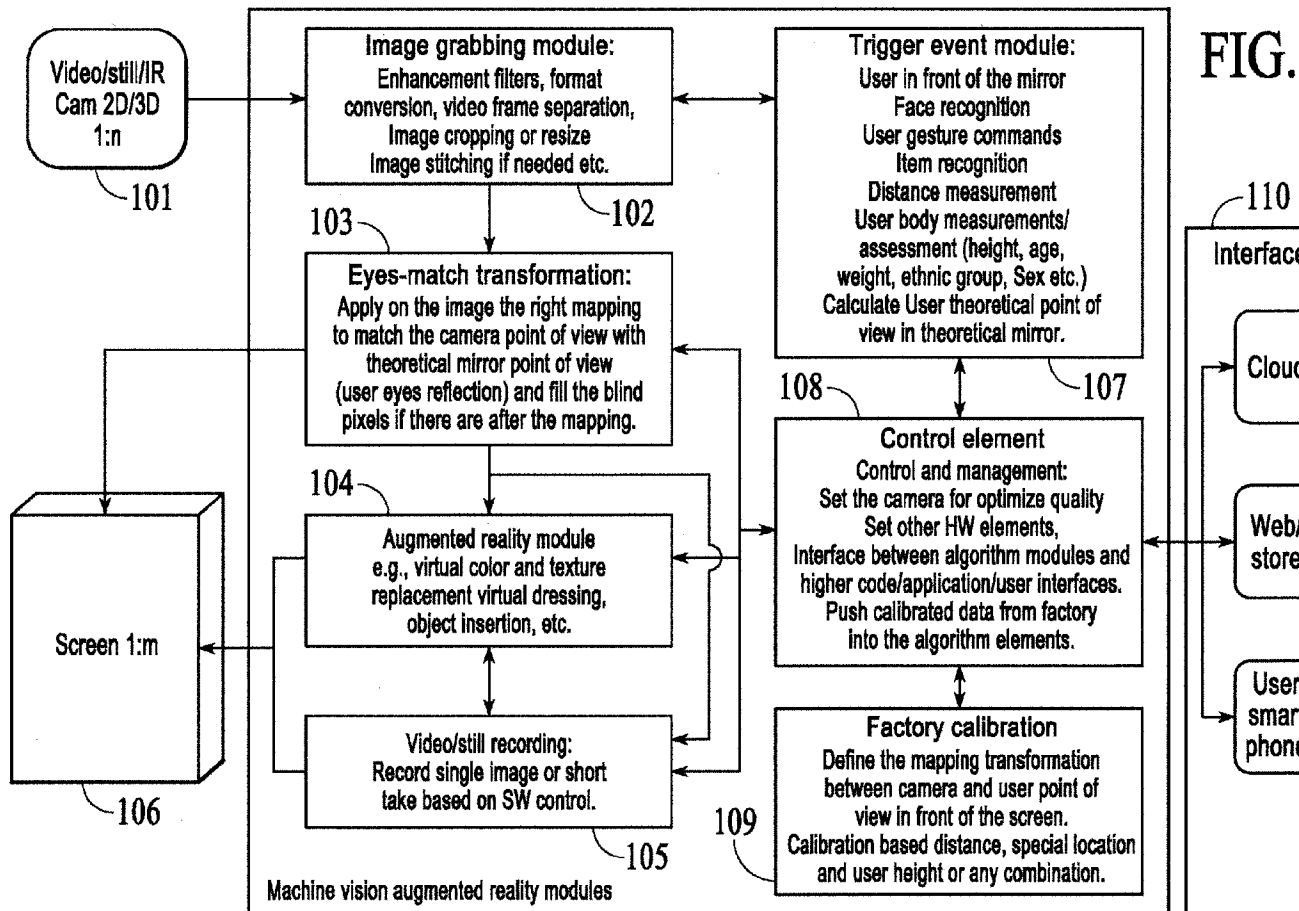


FIG.

Copy provided by USPTO from the PIRS Image Database on 06-17-2020

Copy provided by USPTO from the PIRS Image Database on 06-17-2020

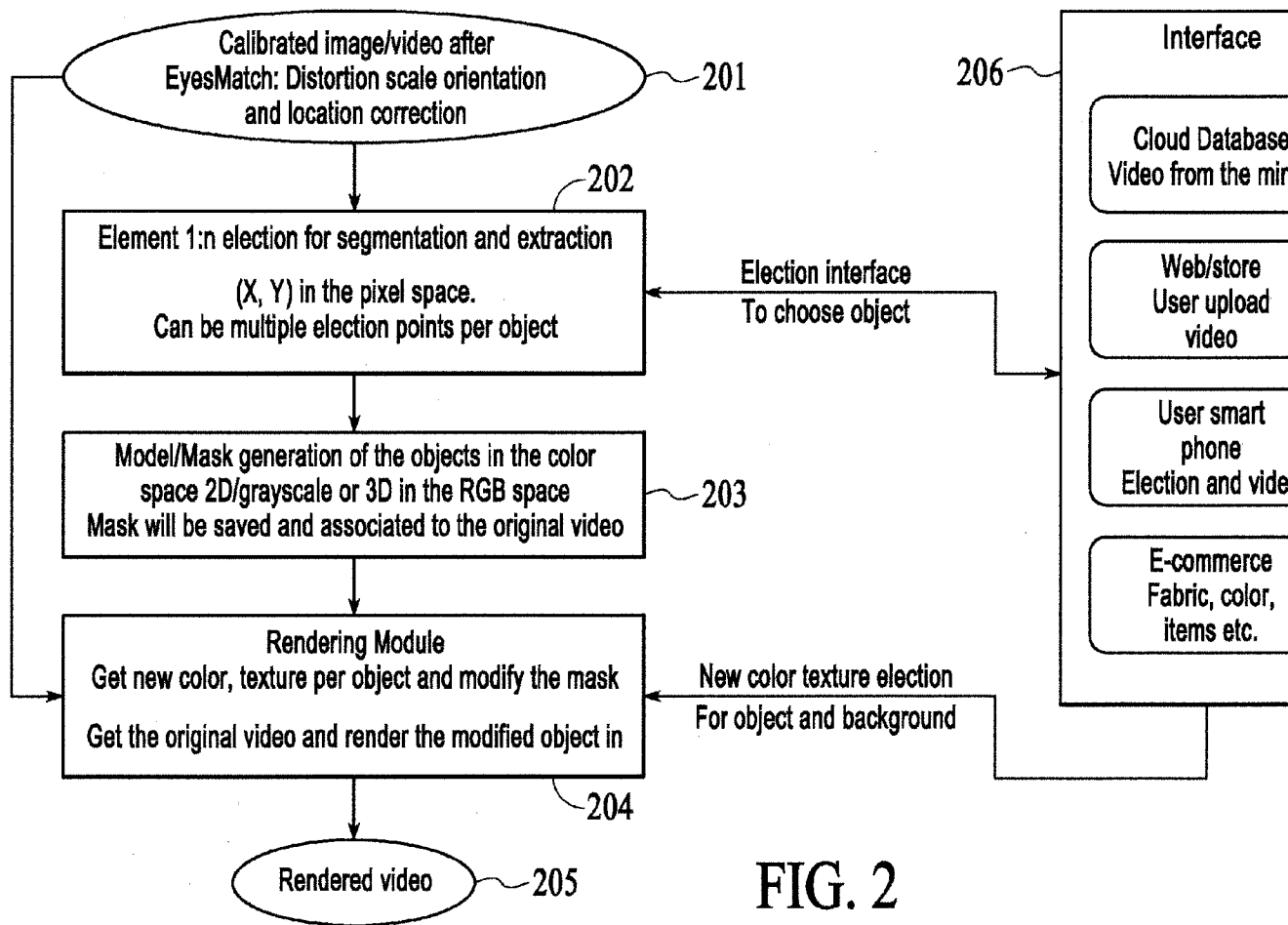


FIG. 2

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.