

MAGIC LEAP, INC
Petitioner,
v.
PERCEPT TECHNOLOGIES INC.
Patent Owner.

Case IPR2023-00494
Patent 9,010,929

Case IPR2023-00495
Patent 8,696,113

PATENT OWNER'S DEMONSTRATIVE EXHIBITS

IPR2023-00494 re U.S. Patent 9,010,929

Magic Leap v. Percept Technologies
IPRs2023-00494/2023-00495
Patent Owner's Demonstrative Exhibits -- Not Evidence
Percept Ex. 2001

U.S. Patent 9,010,929



US009010929B2

(12) **United States Patent**
Lewis

(10) **Patent No.:** **US 9,010,929 B2**
(45) **Date of Patent:** ***Apr. 21, 2015**

(54) **DIGITAL EYEWEAR**

(71) Applicant: **Percept Technologies Inc.**, Las Vegas, NV (US)

(72) Inventor: **Scott W. Lewis**, Los Gatos, CA (US)

(73) Assignee: **Percept Technologies Inc.**, Las Vegas, NV (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.: **13/739,929**

(22) Filed: **Jan. 11, 2013**

(65) **Prior Publication Data**
US 2014/0028967 A1 Jan. 30, 2014

Related U.S. Application Data

(60) Continuation of application No. 13/078,589, filed on Apr. 1, 2011, now Pat. No. 8,353,594, which is a continuation of application No. 12/621,423, filed on Nov. 18, 2009, now Pat. No. 7,918,556, which is a continuation of application No. 12/029,068, filed on Feb. 11, 2008, now Pat. No. 7,758,185, which is a division of application No. 11/245,756, filed on Oct. 7, 2005, now abandoned.

(51) **Int. Cl.**
G02C 11/00 (2006.01)
G09G 3/00 (2006.01)

(52) **U.S. Cl.**
CPC: G02C 11/10 (2013.01); **G09G 3/00** (2013.01)

(58) **Field of Classification Search**
USPC: 351/158; 385/8; 359/13; 630-633; 345/7-9
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,279,474 A 7/1981 Belgorod
4,300,818 A 11/1981 Schachar
4,650,197 A 4/1987 Wardman
5,305,012 A 4/1994 Fatti
5,552,841 A 9/1996 Gallorini et al.
5,583,795 A 12/1996 Smyth
5,671,035 A 9/1997 Barnes
5,751,260 A 5/1998 Nappi et al.
6,099,124 A 8/2000 Hsiao 351/202
6,222,508 B1 * 4/2001 Alvelda et al. 345/8
6,231,183 B1 5/2001 Dillon
(Continued)

OTHER PUBLICATIONS

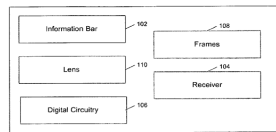
Claims from U.S. Appl. No. 11/246,873, filed Oct. 7, 2005.
(Continued)

Primary Examiner — Darryl J. Collins
(74) **Attorney, Agent, or Firm** — Sawyer Law Group, P.C.

(57) **ABSTRACT**

Improved eyewear is disclosed. The eyewear comprises a frame member and a lens. The eyewear also includes circuitry within the frame member for enhancing the use of the eyewear. A system and method in accordance with the present invention is directed to a variety of ways to enhance the use of eyeglasses. They are: (1) media focus, that is, utilizing the eyewear for its intended purpose and enhancing that use by using imaging techniques to improve the vision of the user; (2) telecommunications enhancements that allow the eyeglasses to be integrated with telecommunication devices such as cell phones or the like; and (3) entertainment enhancements that allow the eyewear to be integrated with devices such as MP3 players, radios, or the like.

22 Claims, 6 Drawing Sheets



100

What is claimed is:

1. Eyewear comprising:

a frame member;

a lens;

circuitry within the frame member for enhancing the use of

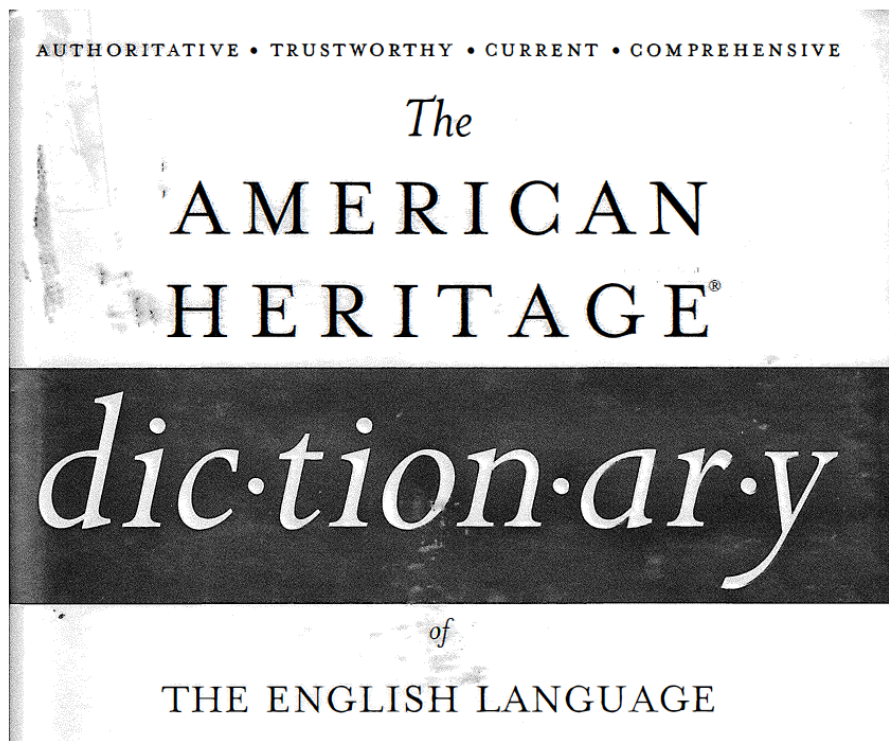
the eyewear; and

an eye sensor coupled to the frame member, the eye sensor

activating the circuitry responsive to eye motion of a

user; wherein an information bar is provided on the lens.

The Challenged Claims Require Circuitry that is Activated in Reaction to Eye Motion of the User



re•spon•sive (rl-sp6n'slv) adj.

1. Answering or replying; responding.
2. Readily reacting to suggestions, influences, appeals, or efforts: a responsive student.
3. Containing or using responses: responsive reading; responsive liturgy.

-re•spon'sive•ly adv.

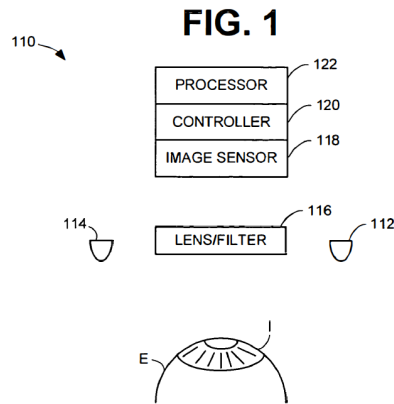
-re•spon'sive•ness n.

Mann '895

	Office de la Propriété Intellectuelle du Canada Un organisme d'Industrie Canada	Canadian Intellectual Property Office An agency of Industry Canada	CA 2362895 A1 2002/12/26 (21) 2 362 895 (12) DEMANDE DE BREVET CANADIEN CANADIAN PATENT APPLICATION (13) A1
(22) Date de dépôt/Filing Date: 2001/11/13 (41) Mise à la disp. pub./Open to Public Insp.: 2002/12/26 (30) Priorité/Priority: 2001/06/26 (CA2351660) CA		(51) Cl.Int. ⁷ /Int.Cl. ⁷ G02B 27/01, G06F 3/14, G02C 9/00 (71) Demandeur/Applicant: MANN, STEVE, CA (72) Inventeur/Inventor: MANN, STEVE, CA	
(54) Titre : LUNETTES DE SOLEIL INTELLIGENTES OU AFFICHEUR D'INFORMATIONS INFORMATISEES INTEGRE DANS DES LUNETTES D'APPARENCE ORDINAIRE, EVENTUELLEMENT AVEC LICENCE (54) Title: SMART SUNGLASSES OR COMPUTER INFORMATION DISPLAY BUILT INTO EYEWEAR HAVING ORDINARY APPEARANCE, POSSIBLY WITH SIGHT LICENSE			
(57) Abrégé/Abstract: A wearable viewfinder or display apparatus for being incorporated into eyeglasses having an ordinary appearance is described. The wearable viewfinder or display provides eye safety by eliminating sharp objects and by matching eye contour with a low curvature or flat inward surface, but at the same time allows for a natural curvature outwardly, so that the outward facing surface of the eyeglass lens has a natural curvature, and therefore a natural (normal-looking to persons other than the wearer) appearance.			

Such an apparatus may also include a sight license feature. A sight license is a license to see. A sight license may be downloaded over the network to enable the eyeglasses to operate. For example, a retinal or iris scanner in the eyeglasses may license the eyeglasses to provide sight to the wearer, but not to others who might steal the eyeglasses.

Pemer



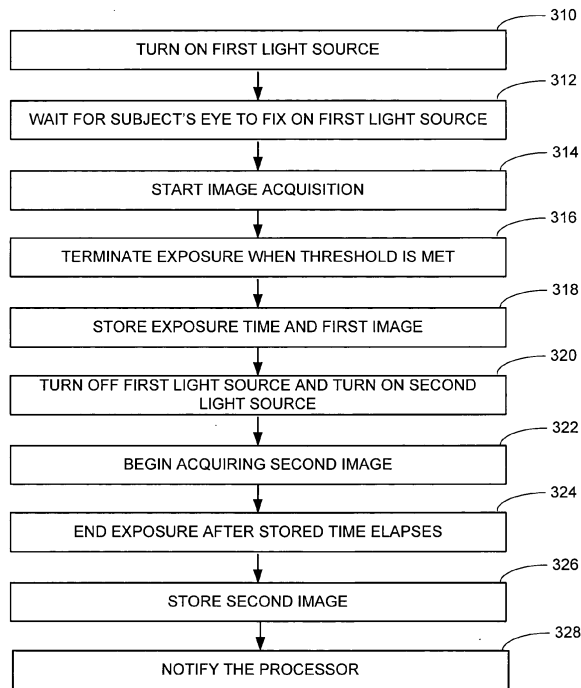
[0017] Reference is made to **FIG. 1**. An iris feature detector **110** includes a reflexive eye movement source **112-114**, optics **116**, a multiple image sensor **118**, a controller **120**, and a processor **122**. The eye movement source **112-114** may include first and second light sources **112** and **114** for causing reflexive motion of a subject's eye (**E**). For example, each light source **112** and **114** may include one or more light emitting diodes.

[0020] Once the eye (**E**) becomes fixed on the first light source **112**, the controller **120** turns off the first light source **112** and immediately causes the second light source **114** to illuminate. Reflexively, the eye moves quickly and becomes fixed on the illuminated second light source **114**. The "tracking interval" refers to the time interval between eye fixation on the first illuminated source **112** and eye fixation on the second illuminated source **114**.

[0030] The controller turns off the first light source and turns on the second light source (**320**), and commands the image sensor to begin acquiring the second image (**322**). Image acquisition is performed for an exposure time equal to the stored exposure time (**324**). Once the second image is acquired, it is stored in memory (**326**). The controller may then prompt the processor to process the first and second images (**328**).

Pemer

FIG. 3



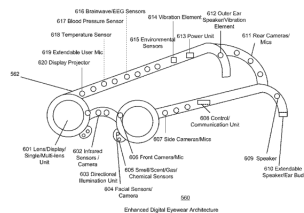
[0006] According to one aspect of the present invention, an iris feature detector includes a reflexive eye movement source; a multiple image sensor; a controller, and a processor. The controller causes the eye movement source to cause rapid eye motion, and the sensor to capture first and second iris images over a time interval in which only an iris can move in the first and second images. The processor determines differences between the first and second images.

IPR2023-00495 re U.S. Patent 8,696,113

U.S. Patent 8,696,113



(12) United States Patent Lewis	(10) Patent No.: US 8,696,113 B2 (45) Date of Patent: *Apr. 15, 2014
(54) ENHANCED OPTICAL AND PERCEPTUAL DIGITAL EYEWEAR	(58) Field of Classification Search USPC 351/158; 385/8; 359/13; 630-633; 345/7-9
(71) Applicant: Percept Technologies Inc., Las Vegas, NV (US)	See application file for complete search history.
(72) Inventor: Scott W. Lewis, Las Vegas, NV (US)	(56) References Cited
(73) Assignee: Percept Technologies Inc., Las Vegas, NV (US)	U.S. PATENT DOCUMENTS
(*) 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.	4,300,818 A 11/1981 Schuchar 4,659,197 A 4/1987 Weinblatt 5,583,795 A * 12/1996 Smyth 702/150 5,671,035 A 9/1997 Barnes 5,751,260 A * 5/1998 Nagai et al. 345/8 6,222,508 B1 4/2001 Abolida et al. 6,231,183 B1 5/2001 Dillon 6,367,526 B1 10/2001 Mann 6,879,443 B2 4/2005 Spitzer et al. RE39,539 E 4/2007 Torch (Continued) OTHER PUBLICATIONS Claims from U.S. Appl. No. 11/246,873, filed Oct. 7, 2005. (Continued) Primary Examiner—Darryl J. Collins (74) Attorney, Agent, or Firm—Sawyer Law Group, P.C. (57) ABSTRACT Improved wearable optics is disclosed. The wearable optics comprises a frame member and a lens. The wearable optics also includes circuitry within the frame member for enhancing the use of the wearable optics. A system and method in accordance with the present invention is directed to a variety of ways to enhance the use of eyeglasses. They are: (1) media foci, that is, utilizing the wearable optics for its intended purpose and enhancing that use by using imaging techniques to improve the vision of the user; (2) telecommunications enhancements that allow the eyeglasses to be integrated with telecommunication devices such as cell phones or the like; and (3) entertainment enhancements that allow the wearable optics to be integrated with devices such as MP3 players, radios, or the like.
(21) Appl. No.: 13/841,141	
(22) Filed: Mar. 15, 2013	
(65) Prior Publication Data US 2013/0208234 A1 Aug. 15, 2013	
Related U.S. Application Data (60) Continuation of application No. 13/739,929, filed on Jan. 11, 2013, which is a continuation of application No. 13/078,589, filed on Apr. 1, 2011, now Pat. No. 8,353,594, which is a continuation of application No. 12/621,423, filed on Nov. 18, 2009, now Pat. No. 7,918,556, which is a continuation of application No. 12/029,068, filed on Feb. 11, 2008, now Pat. No. 7,758,185, which is a division of application No. 11/245,756, filed on Oct. 7, 2005, now abandoned.	17 Claims, 28 Drawing Sheets
(51) Int. Cl. G02B 27/01 (2006.01)	
(52) U.S. Cl. USPC 351/158; 345/8; 359/630	



What is claimed is:

1. A wearable optics device comprising:
a lens; and

a dynamic eye tracking mechanism in communication with the lens; wherein the dynamic eye tracking mechanism utilizes optical parameter measurements; wherein the optical parameter measurements include any of ciliary measurements, pupil measurements, corneal measurements, eye lens measurements, iris measurements, eye lid measurements, retina measurements; wherein an optical/perceptual parameter based operating system is utilized, wherein the wearable optics device is controlled by the optical/perceptual based operating system.

Magic Leap v. Percept Technologies
IPRs2023-00494/2023-00495
Patent Owner's Demonstrative Exhibits -- Not Evidence
Percept Ex. 2001

IPR2023-00495
Ex. 1001 @ 14:21-33

Osterhout

	
US 20110213664A1	
(19) United States	
(12) Patent Application Publication	(10) Pub. No.: US 2011/0213664 A1
Osterhout et al.	(43) Pub. Date: Sep. 1, 2011
(54) LOCAL ADVERTISING CONTENT ON AN INTERACTIVE HEAD-MOUNTED EYEPIECE	61/382,578, filed on Sep. 14, 2010, provisional application No. 61/410,983, filed on Nov. 8, 2010, provisional application No. 61/429,445, filed on Jan. 3, 2011, provisional application No. 61/429,447, filed on Jan. 3, 2011.
(75) Inventors:	Ralph F. Osterhout , San Francisco, CA (US); John D. Haddick , Berkeley, CA (US); Robert Michael Lohse , Palo Alto, CA (US); Kellie A. Wilder , Berkeley, CA (US); Nicholas R. Polanko , San Francisco, CA (US); Robert W. King, III , San Francisco, CA (US)
(73) Assignee:	OSTERHOUT GROUP, INC. , San Francisco, CA (US)
(21) Appl. No.:	13/037,335
(22) Filed:	Feb. 28, 2011
Related U.S. Application Data	
(60)	Provisional application No. 61/308,973, filed on Feb. 28, 2010, provisional application No. 61/373,791, filed on Aug. 13, 2010, provisional application No.

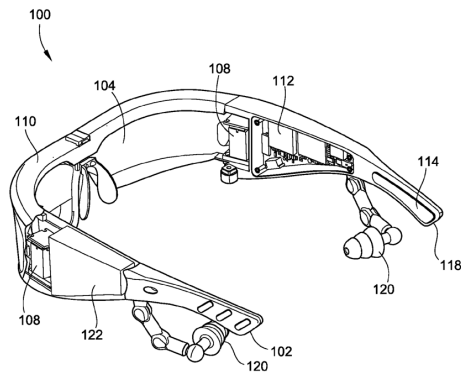
Publication Classification

(51) **Int. Cl.**
G06Q 30/00 (2006.01)

(52) **U.S. Cl.** **705/14.58**

(57) **ABSTRACT**

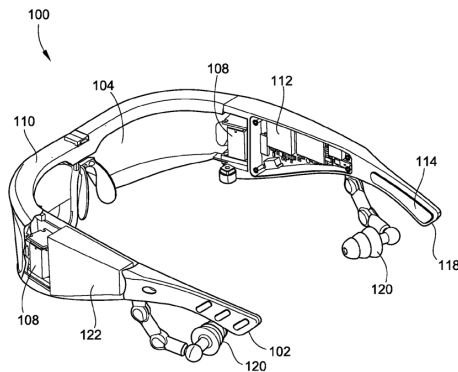
This disclosure concerns an interactive head-mounted eyepiece including an optical assembly through which the user views a surrounding environment and displayed content. The displayed content includes a local advertisement, wherein the location of the eyepiece is determined by an integrated location sensor and wherein the local advertisement has a relevance to the location of the eyepiece. The head mounted eyepiece may also include an audio device and the displayed content may comprise local advertisements and audio.



[0164] The present disclosure relates to eyepiece electro-optics. The eyepiece may include projection optics suitable to project an image onto a see-through or translucent lens, enabling the wearer of the eyepiece to view the surrounding environment as well as the displayed image.

Osterhout

 US 20110213664A1	
(19) United States (12) Patent Application Publication Osterhout et al.	
(10) Pub. No.: US 2011/0213664 A1 (43) Pub. Date: Sep. 1, 2011	
(54) LOCAL ADVERTISING CONTENT ON AN INTERACTIVE HEAD-MOUNTED EYEPIECE	
(75) Inventors: Ralph F. Osterhout , San Francisco, CA (US); John D. Haddick , Berkeley, CA (US); Robert Michael Lohse , Palo Alto, CA (US); Kellie A. Wilder , Berkeley, CA (US); Nicholas R. Polinko , San Francisco, CA (US); Robert W. King, III , San Francisco, CA (US)	
(73) Assignee: OSTERHOUT GROUP, INC. , San Francisco, CA (US)	
(21) Appl. No.: 13/037,335 (22) Filed: Feb. 28, 2011	
(60) Related U.S. Application Data Provisional application No. 61/308,973, filed on Feb. 28, 2010, provisional application No. 61/573,791, filed on Aug. 13, 2010, provisional application No.	
61/382,578, filed on Sep. 14, 2010, provisional application No. 61/410,983, filed on Nov. 8, 2010, provisional application No. 61/429,445, filed on Jan. 3, 2011, provisional application No. 61/429,447, filed on Jan. 3, 2011.	
Publication Classification	
(51) Int. Cl. G06Q 30/00 (2006.01)	
(52) U.S. Cl. 705/14.58	
ABSTRACT	
This disclosure concerns an interactive head-mounted eyepiece including an optical assembly through which the user views a surrounding environment and displayed content. The displayed content includes a local advertisement, wherein the location of the eyepiece is determined by an integrated location sensor and wherein the local advertisement has a relevance to the location of the eyepiece. The head mounted eyepiece may also include an audio device and the displayed content may comprise local advertisements and audio.	



[0304] In embodiments, control of the eyepiece may be enabled through eye movement, an action of the eye, and the like. For instance, there may be a camera on the eyepiece that views back to the wearer's eye(s), where eye movements or actions may be interpreted as command information, such as through blinking, repetitive blinking, blink count, blink rate, eye open-closed, gaze tracking, eye movements to the side, up and down, side to side, through a sequence of positions, to a specific position, dwell time in a position, gazing toward a fixed object (e.g. the corner of the lens of the eyepiece), through a certain portion of the lens, at a real-world object, and the like. In addition, eye control may enable the viewer to focus on a certain point on the displayed image from the eyepiece, and because the camera may be able to correlate the viewing direction of the eye to a point on the display, the eyepiece may be able to interpret commands through a combination of where the wearer is looking and an action by the wearer (e.g. blinking, touching an interface device, movement of a position sense device, and the like). For example, the viewer may be able to look at an object on the display, and select that object through the motion of a finger enabled through a position sense device.

Osterhout



US 20110213664A1

(19) **United States**

(12) **Patent Application Publication**
Osterhout et al.

(10) Pub. No.: US 2011/0213664 A1
(43) Pub. Date: Sep. 1, 2011

(54) **LOCAL ADVERTISING CONTENT ON AN INTERACTIVE HEAD-MOUNTED EYEPIECE**

61/382,578, filed on Sep. 14, 2010, provisional application No. 61/410,983, filed on Nov. 8, 2010, provisional application No. 61/429,445, filed on Jan. 3, 2011, provisional application No. 61/429,447, filed on Jan. 3, 2011.

(75) Inventors: **Ralph F. Osterhout**, San Francisco, CA (US); **John D. Haddick**, Berkeley, CA (US); **Robert Michael Lohse**, Palo Alto, CA (US); **Kellie A. Wilder**, Berkeley, CA (US); **Nicholas R. Polinko**, San Francisco, CA (US); **Robert W. King, III**, San Francisco, CA (US)

Publication Classification

(51) **Int. Cl.**
G06Q 30/00 (2006.01)

(52) U.S. Cl. 705/14.58

(73) Assignee: **OSTERHOUT GROUP, INC.**, San Francisco, CA (US)

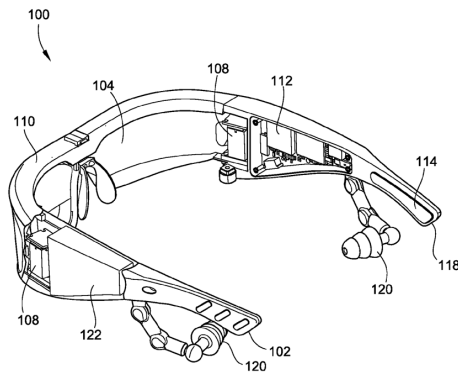
(21) Appl. No.: 13/037,335
(22) Filed: Feb. 28, 2011

Related U.S. Application Data

(60) Provisional application No. 61/308,973, filed on Feb. 28, 2010, provisional application No. 61/373,791, filed on Aug. 13, 2010, provisional application No.

(57) **ABSTRACT**

This disclosure concerns an interactive head-mounted eyepiece including an optical assembly through which the user views a surrounding environment and displayed content. The displayed content includes a local advertisement, wherein the location of the eyepiece is determined by an integrated location sensor and wherein the local advertisement has a relevance to the location of the eyepiece. The head mounted eyepiece may also include an audio device and the displayed content may comprise local advertisements and audio.



Alternatively, the eyepiece may use other techniques to track the motions of the eye, such as with components surrounding the eye, mounted in contact lenses on the eye, and the like. For instance, a special contact lens may be provided to the user with an embedded optical component, such as a mirror, magnetic field sensor, and the like, for measuring the motion of the eye.

Magic Leap v. Percept Technologies
IPRs2023-00494/2023-00495
Patent Owner's Demonstrative Exhibits -- Not Evidence
Percept Ex. 2001

IPR2023-00495
Ex. 1005 @ [0301]
PO Response at 12-13; PO Sur-reply @ 11

Mann '526

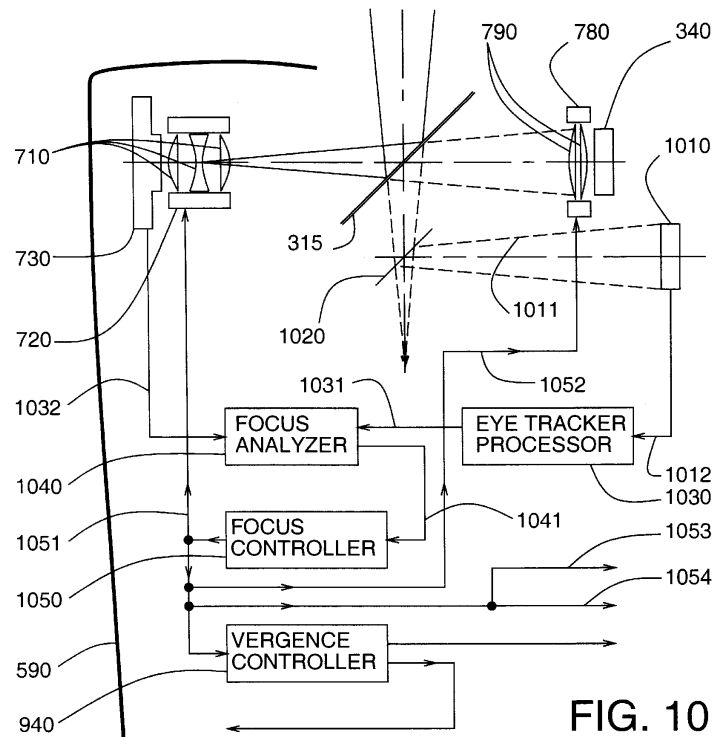


FIG. 10

FIG. 10 depicts the left eye portion of an embodiment of the wearable camera system where the camera focus and vergence are driven by the output of an eyetracker. Eyetracker assembly 1010 (comprising camera and infrared light sources) illuminates and observes the eyeball by way of rays of light 1011 that partially reflect off beamsplitter 1020. Beamsplitter 1020 also allows the wearer to see straight through to mirror 315 and thus see virtual light from viewfinder 340. The eyetracker 1010 reports the direction of eye gaze and conveys this information as a signal 1012 to eye tracker processor 1030 which converts this direction into “X” and “Y” coordinates that correspond to the screen coordinates of viewfinder screen 340.

Mann '526

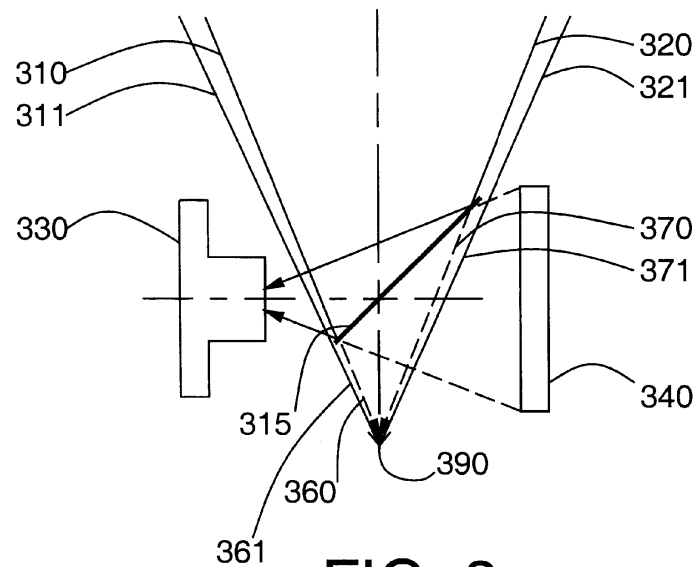


FIG. 3

Accordingly, FIG. 3 illustrates a system whereby rays of light spanning a visual angle from ray, **310** to ray **320** enter the apparatus and are intercepted by a two-sided mirror **315**, typically mounted at a 45 degree angle with respect to the optical axis of a camera **330**. These rays of light enter camera **330**. Camera **330** may be a camera that is completely

...

Thus the portion of the field of view spanned by rays **310** to **320** which emerges as virtual light, will align with the surrounding view that is not mediated by the apparatus, such as rays **311** and **321** which pass through the apparatus and enter directly into the eye without being deflected by two-sided mirror **315**.

Mann '526

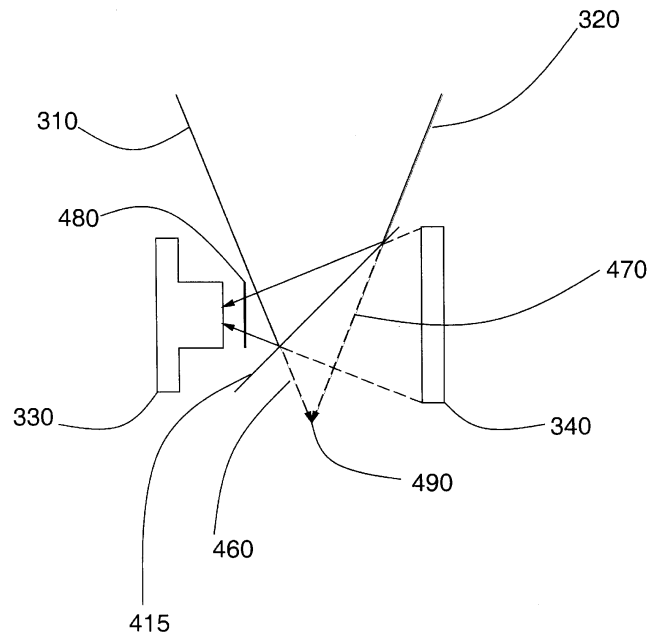


FIG. 4

The apparatus of FIG. 3 does not permit others to make full eye-contact with the wearer. Accordingly, FIG. 4 depicts a similar apparatus in which only a portion of the rays of the leftmost ray of light **310** is deflected by beamsplitter **415** which is installed in place of mirror **315**. The visual angle subtended by incoming light ray **310** to light ray **320** is deflected by way of beamsplitter **415** into camera **330**. Output from this camera is displayed on television **340**, possibly after processing on a body-worn computer or processing at one or more remote sites or a combination of local and remote image processing or the like. A partial reflection of television **340** is visible to the eye of the wearer by way of beamsplitter **415**.