

Petitioner's Demonstratives

Google LLC
v.
EyesMatch Ltd.

IPR2024-00856

September 17, 2025

Patents at Issue

U.S. Patent No. 8,982,109
Devices, Systems and Methods of
Capturing and Displaying Appearances



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

(10) Patent No.: **US 8,982,109 B2**
(45) Date of Patent: **Mar. 17, 2015**

(54) **DEVICES, SYSTEMS AND METHODS OF CAPTURING AND DISPLAYING APPEARANCES** USPC 345/204; 345/212; 345/214

(58) **Field of Classification Search**
CPC G06F 3/005; G06F 3/01; G06F 3/011
USPC 345/204 to 215; 348/333.01; 349/395
See application file for complete search history.

(71) Applicants: **Nisil Vilcovsky**, Tokyo (JP); **Ofer Saban**, Vienna, VA (US)

(72) Inventors: Nissi Vilcovsky , Tokyo (JP); Ofer Saban , Vienna, VA (US)	(56) References Cited
(73) Assignee: Eyesmatch Ltd. , Road Town, Tortola (VG)	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 169 days.	5,230,039 A 5,551,021 A	7/1993 Grossman et al. 8/1996 Harada et al.
-------------	--	----------------------------	--

(Continued)

(21)	Appl. No.: 13/843,001	FOREIGN PATENT DOCUMENTS		
(22)	Filed: Mar. 15, 2013	DE	19943355	A1 3/2001
(65)	Prior Publication Data	DE	10031965	A1 1/2002

US 2013/0229482 A1	Sep. 5, 2013	(Continued)
Related U.S. Application Data		OTHER PUBLICATIONS
(63) 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 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. 60/656,884, filed on Mar. 1, 2005, provisional application No. 60/656,885, filed on Mar. 1, 2005, provisional application No. 60/738,967, filed on Dec. 18, 2005.

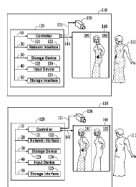
(51) **Int. Cl.**
G06F 3/038 (2013.01)
H04N 7/15 (2006.01)

(52) U.S. Cl. CPC .. *H04N 7/15* (2013.01); *G02B 5/08* (2013.01);

G09F 19/16 (2013.01); *G09F 27/00* (2013.01);
H04N 7/144 (2013.01); *G06F 3/011* (2013.01);
H04N 1/622 (2013.01); *G06T 3/00* (2013.01);
H04N 5/2624 (2013.01); *A47F 2007/195*

(2013.01); H04N 2005/2726 (2013.01); H04N
5/2628 (2013.01) **18 Claims, 18 Drawing Sheets**

18 Claims, 18 Drawing Sheets



'110 Patent is a
Continuation-in-Part
of '109 Patent

U.S. Patent No. 8,982,110
Method for Image Transformation,
Augmented Reality, and Telepresence



(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
U.S. PATENT DOCUMENTS

(71) Applicant: EyesMatch Ltd. , Road Town, Tortola (VG)	5,230,039 A 5,551,021 A	7/1993 Grossman et al. 8/1996 Harada et al.
(72) Inventors: Ofer Sahar , Vienna, VA (US); Nissi		(Continued)

		FOREIGN PATENT DOCUMENTS	
(73)	Assignee: Eyematch Ltd. , Road Town, Tortola (VG)	DE	19943355 A1 3/2001
		DE	10031965 A1 1/2002

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

(21) Appl. No.: **14/253,831**
(22) Filed: **Apr. 15, 2014**

(65) **Prior Publication Data**
US 2014/0225978 A1 Aug. 14, 2014
Related U.S. Application Data
Primary Examiner—Vijay Shankar
(74) *Attorney, Agent, or Firm*—Nixon Peabody LLP;
Joseph Bach, Esq.

(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,

(51) Int. Cl.

(2) U.S. GPO (2013.01)
G06F 3/038 (2013.01)
G06T 19/00 (2011.01)
(Continued)

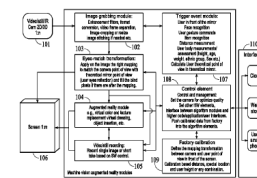
(52) U.S. Cl.
CPC *G06T 19/006* (2013.01); *G02B 5/08*
(2013.01); *G06F 3/011* (2013.01); *G09F 19/16*
(2013.01);

(58) **Field of Classification Search**
CPC G06F 3/01; G06F 3/011; G06F 3/005
USPC 345/204-215; 348/333.01; 434/295

See application file for complete search history.

18 Claims, 16 Drawing Sheets

18 Claims, 16 Drawing Sheets



IPR2024-00856: '109 Patent (Ex. 1001), Cover.

IPR2024-00810: '110 Patent (Ex. 1001). Cover.

The '109 Patent

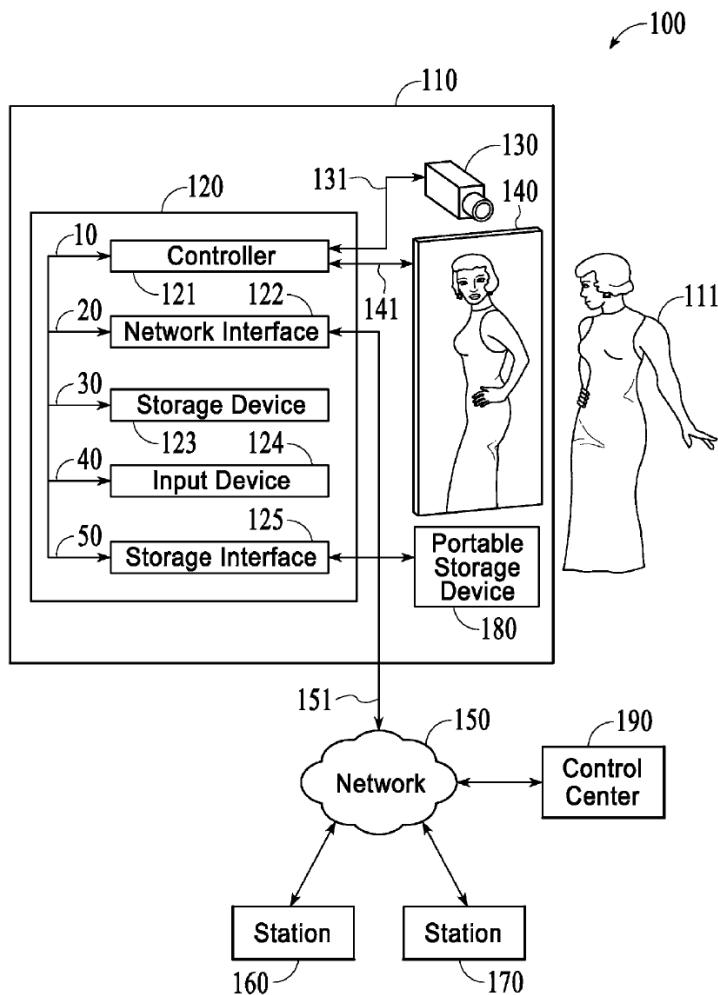


FIG. 1

The '109 Patent describes “enabling appearance comparison” using “a mirror-display device” (e.g., LCD), “imaging device” (e.g., video camera), and “image control unit.”

Reference is made to FIG. 1, which schematically illustrates an interactive system 100 in accordance with some demonstrative embodiments of the invention.

According to some demonstrative embodiments of the invention, system 100 may include an interactive imaging and display station 110, which may include an image control unit 120, an imaging device 130 (e.g., a still or video camera), and a mirror-display device 140 (e.g., a flat panel display). Image control unit 120 may include a controller 121, a network interface 122, a storage device 123, an input device 124, all of which elements are described in detail below.

The '109 Patent

The camera sits above the display tilted downwards, which causes distortion

To enable capturing the entire body of the user at any distance, in one embodiment the camera is located at the top of the screen and tilted downwards to allow maximum dynamic range of the user's movement in front of the screen. As depicted in FIG. 8, because the camera is tilted downwards, the projection distortion is much larger and noticeable. The closer the user is to the camera, the more distorted his image becomes. The nature of the distortion is mainly projection distortion—the user look shorter and the upper body looks larger. In this configuration the image of the user also got smaller as he was further away from the screen. On the other hand, the effective/usable FOV of the camera will cover a larger area in front of the screen, and will allow the user to get much closer to the screen and still see an entire body image.

40

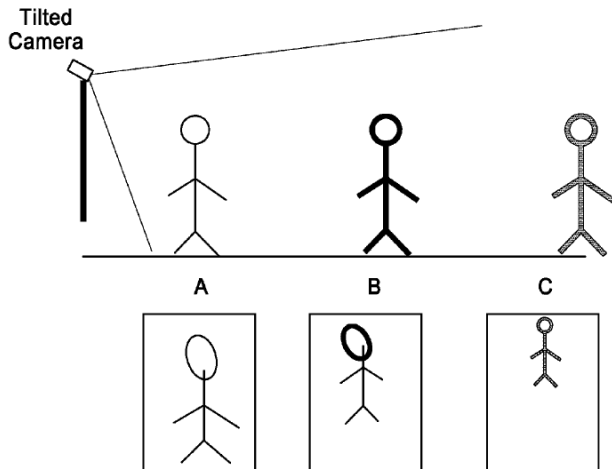


FIG. 8

The computerized method receives as an input the image captured by the camera and performs a transformation of the image to correct the point of view and field of view of the camera to fit with the view point that would occur with a conventional mirror. That is, when the user moves closer or further from the mirror, the view point that would have been reflected in the mirror would have been different from that captured by the camera. Embodiments of the inventive computerized method incorporate an adaptive POV (point of view) and Adaptive FOV modules based on tracking the position of the user.

50

55

In the above described embodiments, the transformation mapping corrected the image obtained by the cameras and provided an image that mimics an image that would have reflected from a mirror. The following embodiment, illus-

5

The image is transformed to mimic a reflection of a mirror

'109 Patent - Grounds of Unpatentability

Claims Challenged	References
1-6, 8, 17	Rosenberg + Nakazawa
1-6, 8, 11, 17	Rosenberg + Nakazawa + Hatanaka
1-6, 8, 17	Rosenberg + Nakazawa + Tripathi
Dependent claims	Additional secondary references added to combinations above (not disputed)

- All claims of the '109 Patent are challenged
- Claim 1 is the only independent claim
- Patent Owner has not separately argued any dependent claims

'109 Patent - Representative Claim 1

"Mirror Mimicking"

Independent Claim 1	Disputed?
1[Pre] A method for operating a system having a monitor, a camera, and a processor, so as to display a mirror-mimicking image on the monitor, by performing non-ordered steps comprising:	NO
1[a] obtaining a digital image from a camera;	NO
1[b] flipping the image about a vertical axis so as to reverse right and left sides of the image;	NO
1[c] applying a transformation mapping to the image to modify the image such that it appears to mimic a reflection of a mirror;	YES
1[d] resizing the image to reduce variations caused by changes in object's distance to the camera;	NO
1[e] displaying the image on the monitor after performing the flipping, transformation mapping, and resizing;	NO
1[f] wherein the non-ordered steps are performed on a series of images of a live video feed from the camera;	NO
1[g] determining distance to a user appearing in the live video feed; and,	NO
1[h] varying rate at which the non-ordered steps are performed on the series of images according to the distance.	YES

"Varying Rate"

Claim Construction

Paper	Claim Construction Position
Petition	No claim construction is necessary
Patent Owner's Preliminary Response	
Institution Decision	
Deposition of Petitioner's Expert	Petitioner's Expert: Magistrate Judge's recommended construction consistent with original positions
Patent Owner's Response	Argues for Magistrate Judge's recommended construction
Deposition of Patent Owner's Expert	Patent Owner's Expert: Applied Magistrate Judge's recommended construction without analysis
Petitioners' Reply	No claim construction is necessary
Patent Owner's Sur-Reply	Argues for Magistrate Judge's recommended construction

IPR2024-00856: Petition (Paper 1), 8; Patent Owner's Preliminary Response (Paper 12), 13;
 IPR2024-00856: Institution Decision (Paper 15), 14-16; Patent Owner's Response (Paper 22), 14-20;
 IPR2024-00856: Petitioners' Reply (Paper 26), 1-12, 18-24; Patent Owner's Sur-reply (Paper 32), 2-9;
 IPR2024-00856: Karam Tr. (Ex. 2012), 43:24-44:10, 47:1-51:3, 84:11-88:21, 254:3-255:8, 258:5-25; Forsyth Tr. (Ex. 1046), 75:7-86:17.

Claim Construction: “Mirror Mimicking”

Term	Claim Language	Patent Owner Response: 3-part construction	Petitioners
mirror mimicking	'109-1[c] “image . . . appears to mimic a reflection of a mirror;” '110-1[f] “mirror tracking mode”	1. “user sees their reversed reflection . . . 2. at roughly double the distance from the camera . . . 3. and roughly the same size regardless of the user movement”	No construction is needed because prior art renders obvious under any reasonable construction.

- No construction is needed
- Petition prior art renders “mirror mimicking” obvious under any reasonable construction
- Patent Owner has not presented claim construction analysis and Patent Owner’s expert “took no position” on claim construction
- Board is not bound by Magistrate Judge’s recommendations in district court

IPR2024-00856: Patent Owner’s Response (Paper 22), 18-19, citing Claim Construction Order (Ex. 2008), 14-19;
IPR2024-00810: Patent Owner’s Response (Paper 27), 13-14, citing Claim Construction Order (Ex. 2008), 41.

Patent Owner Did Not Present Analysis or Evidence to Support Claim Construction Position

- Patent Owner only referred to positions taken in district court

Having now obtained a narrow construction of “appears to mimic a mirror” in the district court, Samsung should be held to that construction here and the same construction should be adopted here, for the reasons articulated by Samsung and its expert, and adopted by the district court. Ex.2009 at 12-14, Ex.2010, ¶¶58-65, Ex.2008 at 14-19. As addressed below, given Samsung’s complete failure to address (or even disclose to the Board) its own construction, and how its asserted Grounds meet that construction, the claims should be found not unpatentable for that reason alone.

Patent Owner's Expert "Did Not Analyze the Construction"

3 Q Did you review any of the related
4 briefing in the District Court relating to claim
5 construction?

6 A No. Or I have no recall of reviewing
7 that.

16 Q You did not provide opinions under any
17 other construction of this limitation. Correct?

18 A That's correct.

12 A Again, I've been provided the
13 construction that the District Court supplied, and
14 I adopted that construction because it came from
15 the District Court. I did not analyze the
16 construction in any detail because I assumed that
17 the district -- well, there is a document, the
18 District Court does that.

19 I -- looking at the construction, it
20 appears reasonable to me, but that is a
21 looking-at-the-construction answer rather than an
22 analysis. And again, I am in no position to
1 correct a district judge.

IPR2024-00856: Forsyth Tr. (Ex. 1046), 76:3-7, 78:6-18, 85:6-86:1.

19 A I understand that one way to interpret a
20 claim term is according to the ordinary and
21 customary meaning as understood by a person of
22 ordinary skill in the art. But under some

82

1 circumstances, if a district judge has told me
2 what a term means, then I must adopt that
3 construction.

IPR2024-00856: Forsyth Tr. (Ex. 1046), 81:19-82:3.

8 A There may be terms that the District
9 Court construed and that I did not list in the
10 '109 declaration. If that's the case, it's
11 because I didn't need the construction of the
12 term.

IPR2024-00856: Forsyth Tr. (Ex. 1046), 92:8-12.

Patent Owner's Counsel Emphasized: Expert "Provided No Opinion"

10 MS. SAPUTO: He provided no opinion on
11 whether he agreed with them. It's outside of
12 scope. My objection stands. You can ask your
13 questions, I'll make my objections.

Patent Owner's counsel confirmed that Dr. Forsyth "provided **no opinion**" on claim construction because "[i]t's **outside of scope**"

IPR2024-00856: Forsyth Tr. (Ex. 1046), 81:10-13.

Patent Owner's Expert Applied Three-Part Construction

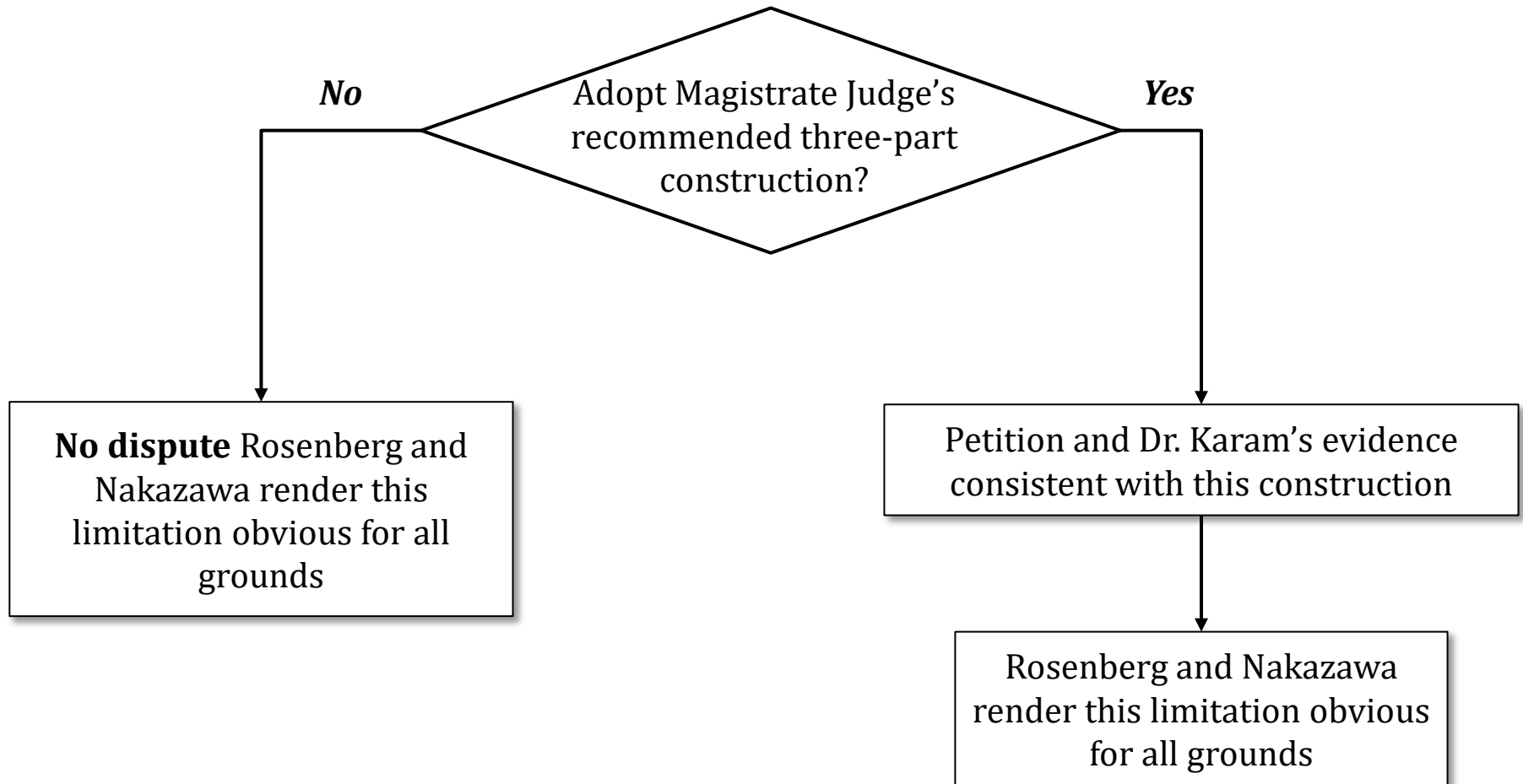
25. I understand that Petitioner Samsung is a Defendant in *EyesMatch Ltd. v. Samsung Electronics Co., Ltd., et al.*, No. 2:23-cv-363 (E.D. Tex.) (“the District Court Litigation”) in which the 109 Patent is also asserted. I understand that the District Court issued a claim construction order in the District Court Litigation. Ex.2008. I further understand that the PTAB will consider this claim construction order and may find the District Court’s reasoning to be persuasive. In reviewing Petitioners’ asserted prior art and forming my opinions in this Declaration, I have applied the constructions from the District Court Litigation Claim Construction Order.

Claim Construction: “Varying Rate”

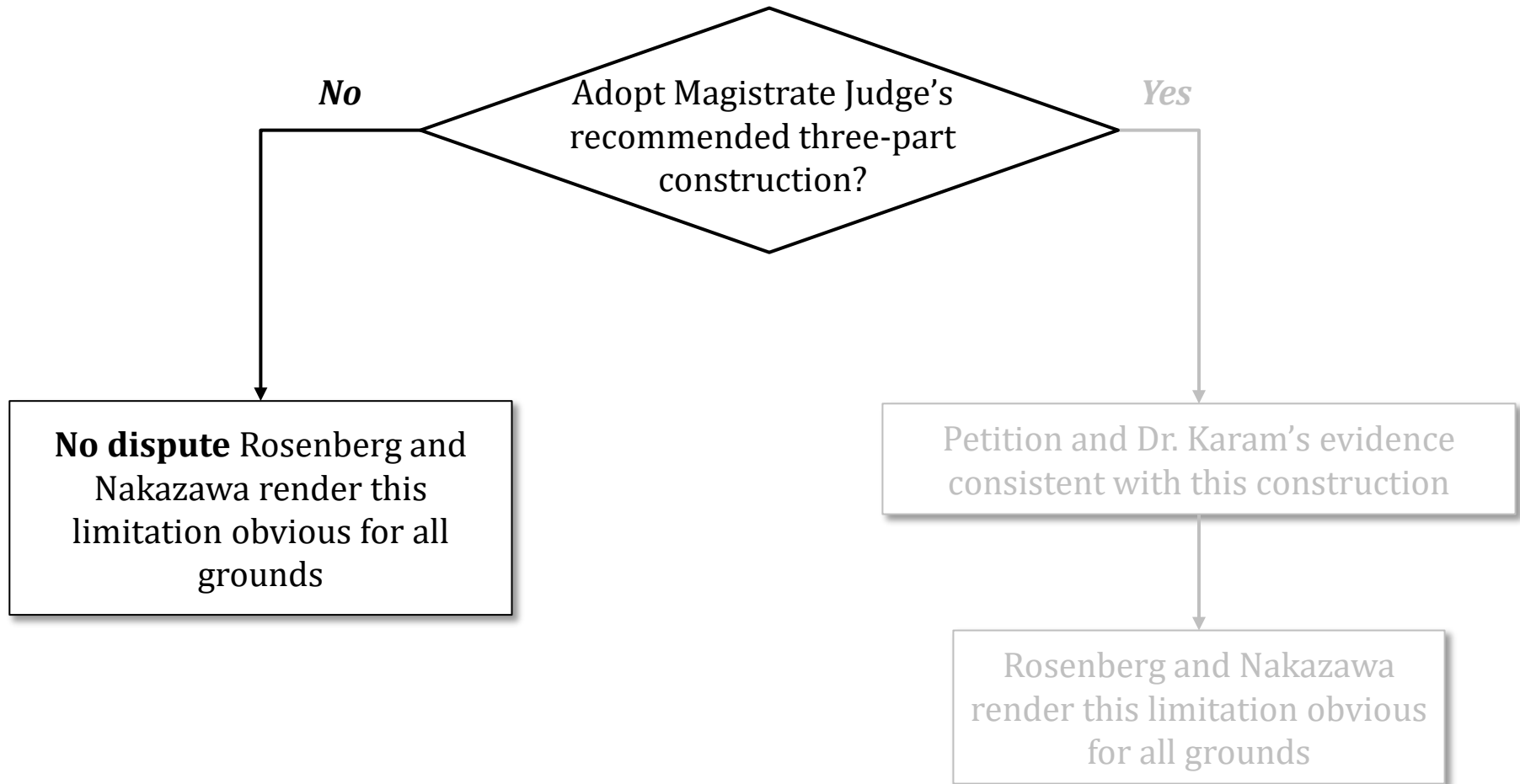
Term	Claim Language	Patent Owner	Petitioners
“varying rate” '109-1[h]	“varying rate at which the non-ordered steps are performed on the series of images according to the distance”	“varying rate at which one or more non-ordered steps are performed on the series of images according to the distance”	No construction is needed because prior art renders obvious under any reasonable construction.

- No construction needed
- Patent Owner does not argue that claim construction impacts obviousness
- Patent Owner has not presented claim construction analysis or evidence

“Mirror Mimicking” (Limitation 1[c])



“Mirror Mimicking” (Limitation 1[c])



Rosenberg Discloses a Digital Mirror System that Mimics a Conventional Mirror

- Rosenberg discloses
 - capturing a video image
 - left-right flipping the image
 - scaling the image
 - displaying image size to appear like a traditional life-size mirror image
 - user given “a visual impression that he or she is standing before a traditional wall mirror”

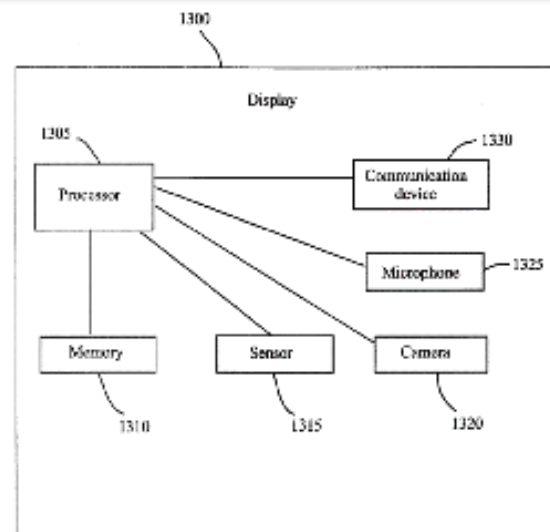


Fig. 13

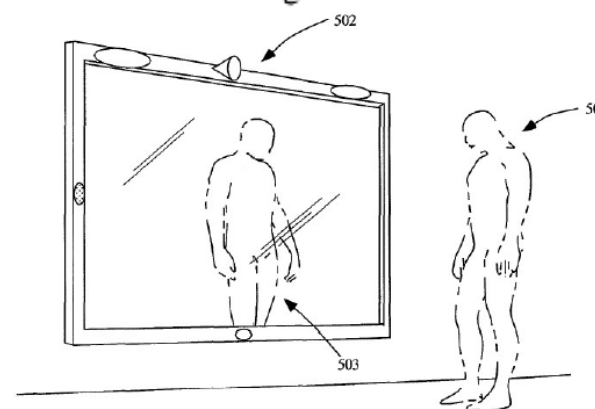


Fig. 5

Rosenberg Discloses “Transformation Mapping” to Mimic a Mirror

'109 Patent

distance to the screen. Depending on the position and FOV of the camera, an x-y translation of the image may also be required.

5 In practice, it has been shown that performing tilt, elevation, and scale translations provides a rather convincing image that only needs to be right-to-left reversed to very effectively mimic a mirror reflection. For further improvements, one may also use barrel-effect transformation and fish-eye transformation. Additionally, one may add depth

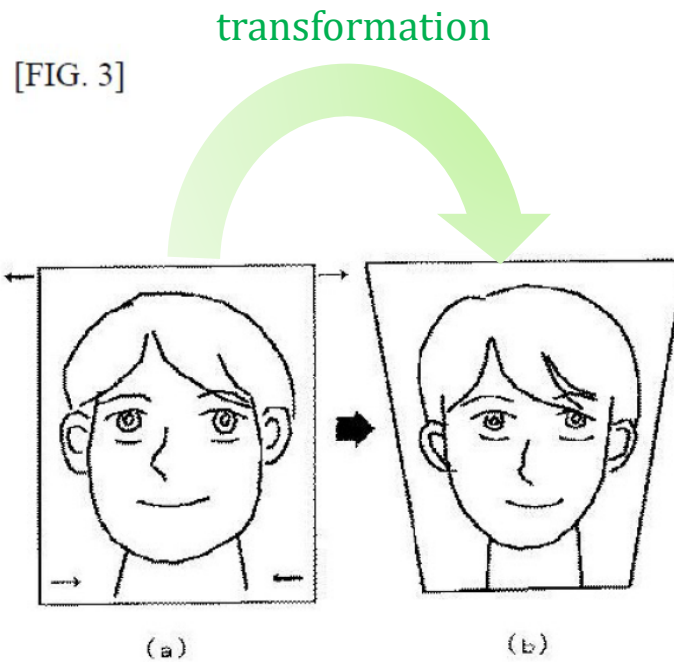
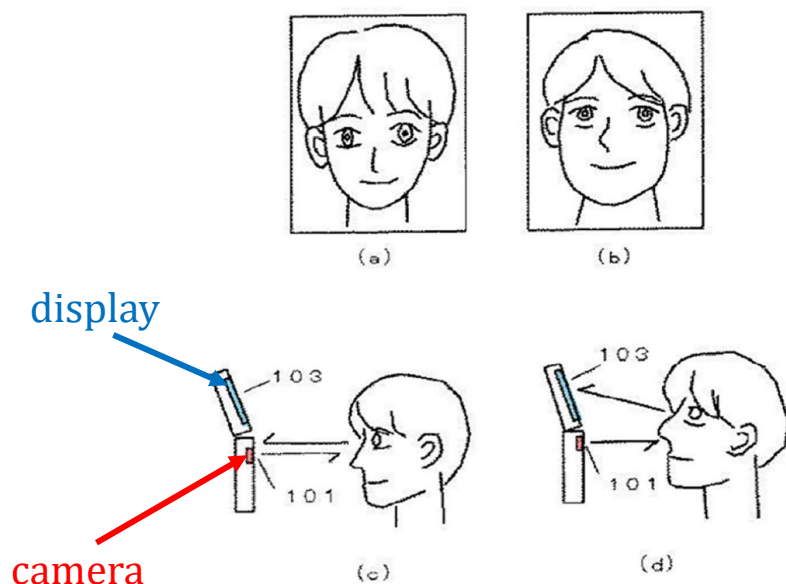
Rosenberg

[0077] FIG. 5 illustrates a computer rendering of a human user 501 standing in front of a wall-mounted embodiment of the advanced digital mirror system 502 according to at least one embodiment of the present invention. The user's image is captured as a real-time video image by a camera upon or within the digital mirror 502 as described previously. A representation of that real-time video image is then displayed upon the wall mounted screen of the digital mirror 502 with a displayed size and scaling such that it appears like a traditional life-size mirror image 503. In a traditional mirror emulation mode, the real-time video image is left-right inverted prior to display upon the screen. Thus the user 501 standing before the digital display is given the visual impression that he or she is standing before a traditional wall mirror, viewing a traditional mirror image of himself or herself.

Nakazawa Discloses “Transformation Mapping” to Correct Distortion

- Nakazawa corrects distortion when the image point of view does not match the user point of view
- Nakazawa discloses “transformation mapping” because Nakazawa’s distortion correction performs a tilt transformation as disclosed in the ’109 Patent

[FIG. 2]



IPR2024-00856: Petition (Paper 1), 22-25; Petitioners’ Reply (Paper 26), 10;
IPR2024-00856: Nakazawa (Ex. 1007), FIGS. 2-4 (annotated), [0001]-[0003], [0008], [0031]-[0035].

Motivation to Combine Rosenberg and Nakazawa for “Mirror Mimicking”

- Rosenberg’s above-screen camera would cause distortion due to camera position or eye level
- One skilled would have been motivated to address this using Nakazawa’s distortion correction to provide a realistic mirror image

Rosenberg mirror mimicking

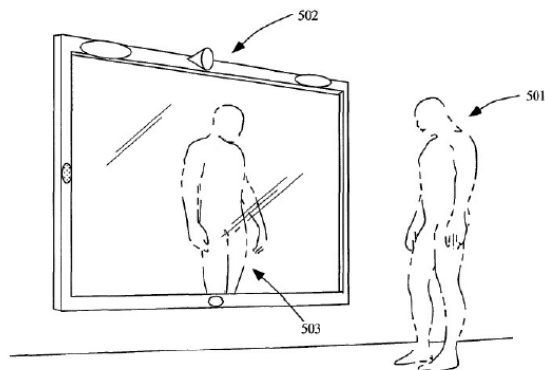
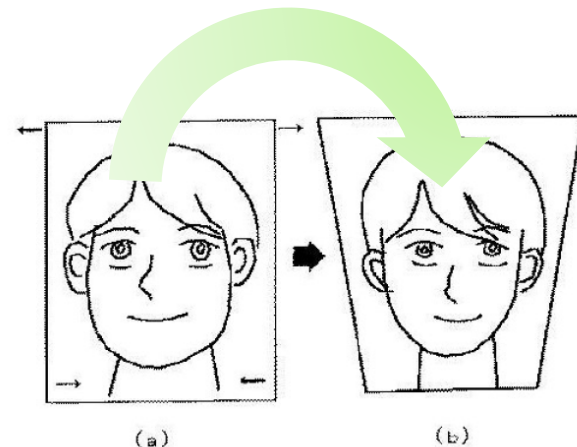


Fig. 5

Nakazawa transformation

[FIG. 3]

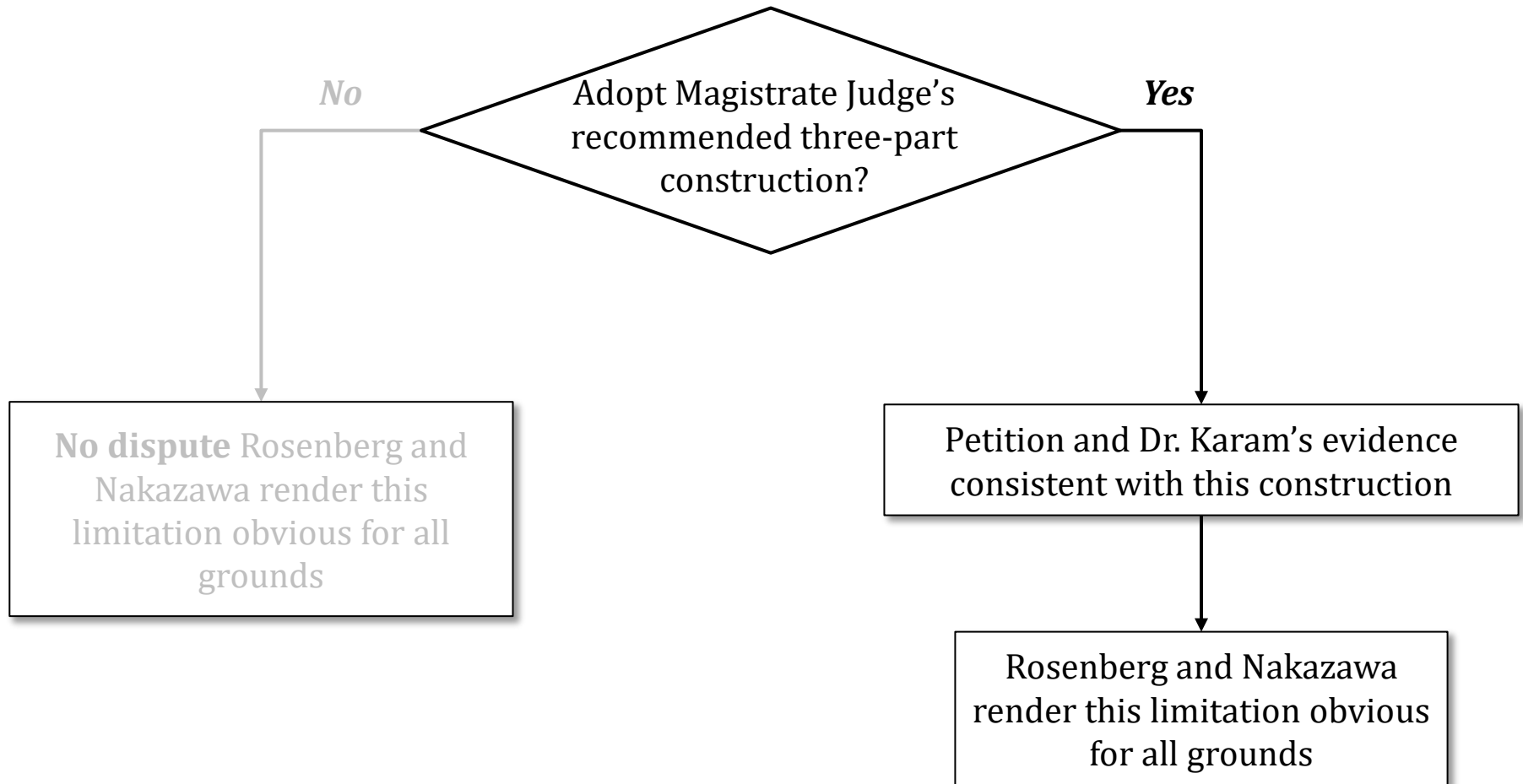


Rosenberg and Nakazawa disclose all that is needed for “mirror mimicking” in claim 1.

IPR2024-00856: Petition (Paper 1), 14-17; Patent Owner’s Response (Paper 22), 32-33.

IPR2024-00856: Petitioners’ Reply (Paper 26), 17-18; Rosenberg (Ex. 1005), FIG. 5; Nakazawa (Ex. 1007), FIG. 3.

“Mirror Mimicking” (Limitation 1[c])



'109 Patent: Properties of Conventional Mirrors Were Well known

may appear at different levels. Another difference from a camera is that when one looks at a mirror, one's image appears to be reversed (e.g., if one raises one's right hand, his left hand will appear to go up in the mirror). However, a

"reversed reflection"

"double the distance"

Double distance $2 \times D1$

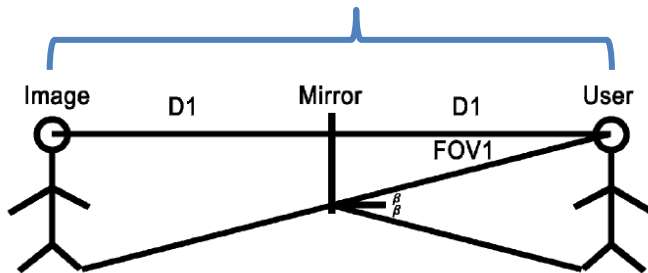


FIG. 5A

"same size"

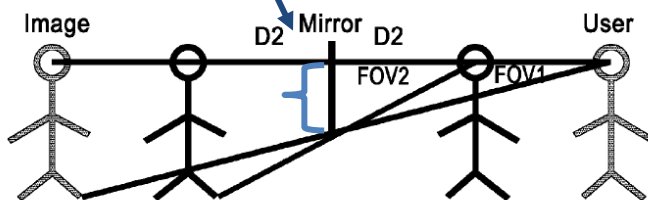


FIG. 5B

"same size"

When a user looks at himself in the mirror what he actually sees is the reflection of himself as if he was standing at a distance that is double the distance from him to the mirror. This is illustrated in FIG. 5A, wherein the user standing at distance $D1$ sees himself at a distance equal to twice $D1$. Similarly, as shown in FIG. 5B, a user standing at distance $D2$ will see himself at a distance $2 \times D2$. In addition, the angle of the user's Field of View (FOV) changes when the user changes the distance, e.g., gets closer, to the mirror. The FOV is limited by the specular reflecting angle (β) from the mirror to the user's eye and to the edge of the visible image on all sides of the mirror (four sides for a rectangular or square mirror). In FIG. 5B the bottom of the vertical FOV is illustrated as double the angle (β) formed by the lines connecting the user's eyes to the bottom of the mirror and reflecting to the user's shoes. Consequently, as illustrated in FIG. 5B, when the user approaches the mirror, the FOV angle increases, which is why he continues to see the same size reflection ($FOV1 < FOV2$), so that the user actually sees himself roughly at the same size, but closer. This is a noticeable difference

Patent Owner's Expert: Properties of Conventional Mirrors Have Been Known for "Millennia"

B. General Optical Properties of a Conventional Mirror

67. With a conventional mirror, the image of the person looking into the mirror appears left-right reversed.

68. With a conventional mirror, the image of the person looking into the mirror appears at approximately double the distance that the person is standing from the mirror.

69. With a conventional mirror, the image of the person looking into the mirror is always approximately the same size regardless of the person's movement toward or away from the mirror.

IPR2024-00856: Forsyth Decl. (Ex. 2013), ¶¶67-70.

9 Q So would a POSITA would have understood
10 that a conventional mirror would include these
11 properties?

12 MS. SAPUTO: Objection. Vague.

13 A A POSITA should certainly have known
14 that.

6 Q Why do you think they should have known?

7 A Why do I think they should have known?

8 And what I'm referring to there is double the
9 distance to the mirror and roughly the same size.
10 Because those had been known for millennia and
11 they're standard simple exercises in geometry.

IPR2024-00856: Forsyth Tr. (Ex. 1046), 32:9-14.

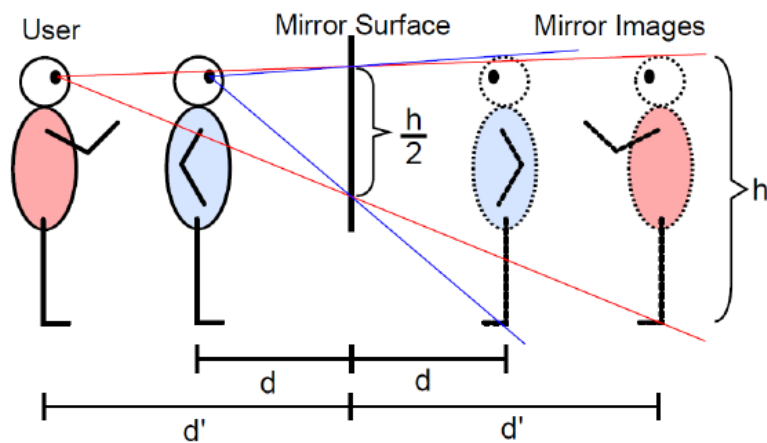
IPR2024-00856: Forsyth Tr. (Ex. 1046), 157:6-11.

Dr. Karam's Declaration Describes "Mirror Mimicking" Consistent with Three-Part Construction

47. This mirror effect was also well known to a person of ordinary skill in the art, and left-right inversion was performed on camera-captured images to mimic mirror reflections. For example, Rosenberg discloses inverting left-right of camera-captured images by flipping the image pixels around a vertical axis so that the right side of the user appears on the right side of the display, and the left side of the user appears on the left side of the display (from the user's perspective). Rosenberg (Ex. 1005), [0003], [0026]-[0027], [0035], [0041], [0061], [0068], [0077], [0083]. This

"reversed reflection"

"double the distance"



43. This "mirror effect" was well known to a person of ordinary skill in the art. For example, as Straka (Ex. 1023) explains:

A virtual mirror needs to simulate the properties of a real mirror as accurate as possible. When standing in front of a mirror at a distance d , the mirror image of oneself appears exactly at the same distance but behind the mirror. However, even though this distance can change, the size of the user in the mirror image when projected on the mirror surface stays constant at half the height h of the user.

Straka (Ex. 1023), 637. Straka illustrates this effect in Figure 1(b) below:

"same size"

Dr. Karam's Declaration: Rosenberg Discloses "Mirror Mimicking" Consistent with Three-Part Construction

123. Rosenberg discloses that the processor takes the real-time digital video images captured by the camera and left-right inverts them by flipping the image pixels around a vertical centerline ("vertical axis") so that the right side of the user appears on the right side of the display, and the left side of the user appears on the left side of the display (from the user's perspective). E.g., Rosenberg (Ex. 1005), [0002]-[0003], [0026]-[0027], [0035], [0041], [0061], [0068], [0077], [0083]. This

Rosenberg discloses
"reversed reflection"

Rosenberg discloses "double
the distance" and "same size"

Straka (Ex. 1023), 641. So too does Rosenberg disclose a digital mirror system that simulates a real mirror. See, e.g., Rosenberg (Ex. 1005), [0027]-[0028]. Rosenberg discloses scaling real-time video images captured by the camera so that they appear like traditional, life-size mirror images. Rosenberg (Ex. 1005), [0077].

125. Rosenberg discloses performing left-right inversion (flipping pixels along a vertical axis) and scaling the video images so the user is given the impression that he or she is standing before a traditional wall mirror, viewing a mirror image ("such that it appears to mimic a reflection of a mirror"). See, e.g., Rosenberg (Ex. 1005), [0003], [0026]-[0027], [0035], [0041], [0061], [0068], [0077], [0083].

132. Like the '109 Patent, Rosenberg discloses scaling the real-time video images from the camera so they appear like traditional life-size mirror images. Rosenberg (Ex. 1005), [0077]. A person of ordinary skill in the art would have understood that Rosenberg's scaling ("resizing the image") would have adjusted the size of the image such that the user would appear to be the same size, mimicking a reflection in a mirror even if the size of the video image from the camera would vary

Dr. Karam's Deposition: Opinions Are Consistent with Three-Part Construction

1 A. I did apply -- this is consistent
2 with my declaration, and I do have the
3 background -- you can look at the background
4 in my '109 declaration. It illustrates this.
5 So let me pull it -- one moment.

6 So if we go to the technology
7 background -- so if you go to paragraph 43,
8 and also on page 24/25 of my declaration for
9 the '109 patent, you can see Figure 1(b)
10 there, like on page 25 of the '109
11 declaration, my '109 declaration, illustrating
12 this same principle.

13 This is what's known as like in
14 Straka, Exhibit 1023 in my declaration, as
15 prior art. For the '109 and '110, it's prior
16 art.

17 And it does show Figure 1(b),
18 which looks like Figure 5(b) of the '109
19 patent, which is also prior art because it's
20 the background. This is in the background of
21 '109. And '109 also assert that this is prior
22 art.

23 And a POSITA would know that.
24 So these figures are consistent
25 with the claim construction that was issued by

IPR2024-00856: Karam Tr. (Ex. 2012), 48:21-50:1.

16 And a POSITA would understand the
17 traditional life-size mirror to have the
18 characteristics as construed in the Court and
19 as also on page 25, the background that I
20 showed.

IPR2024-00856: Karam Tr. (Ex. 2012), 60:16-20.

12 A POSITA would understand what a
13 traditional mirror mode -- which I also stated
14 in my declaration as the background, you know.

15 And also, I'm linking it to
16 Rosenberg here, on paragraph 43 -- to
17 simulate -- look. So it's very clear. On
18 page 25 of my declaration, page 25:

19 "To simulate this mirror effect
20 using a digital camera, Straka sets
21 a focal length of a virtual mirror
22 to be twice the user-mirror
23 distance. So too does Rosenberg
24 disclose a digital mirror system
25 that simulates a real mirror."

1 And we just defined what
2 simulates a real mirror in the paragraph
3 preceding this. See Rosenberg paragraph 25 to
4 27 -- sorry, 27 to 28:

5 "Rosenberg discloses scaling
6 real-time video images captured by
7 the camera so that they appear like
8 traditional life-size mirror
9 images."

10 So -- and also we're talking
11 about to simulate a real mirror. We're using
12 the same term as Straka. Straka is saying a
13 virtual mirror to simulate the properties of a
14 real mirror, and these are the properties.

15 So it's very -- so I do disclose
16 that, or I do state that.

IPR2024-00856: Karam Tr. (Ex. 2012), 108:12-109:16.

Dr. Karam's Deposition: Opinions Are Consistent with Three-Part Construction

3 Q. So my question is a little bit
4 different. My question is: Do you agree that
5 the term "it appears to mimic a reflection of
6 a mirror" that's used in the '109 patent, and
7 we have a similar construction for mirror
8 tracking mode in the '110 patent, but do you
9 agree at least where it appears to mimic a
10 reflection of a mirror, that term should be
11 limited to mean an image where the user sees
12 their reversed reflection appearing at roughly
13 double the distance from the camera and the
14 reflection maintains roughly the same size
15 regardless of the user movement?

16 MS. WELSH: Objection.

17 A. You know, when I did my
18 declaration, I did it and opined more
19 generally. But with the prior art and the
20 embodiment -- embodiments, I considered the
21 prior art.

22 And the grounds that I put in my
23 declaration, these are consistent with -- they
24 are still consistent with the court
25 construction. They apply to it. Especially

IPR2024-00856: Karam Tr. (Ex. 2012), 254:3-25.

1 when we talk about real conventional, I agree
2 with that, like real mirror, conventional
3 mirror.

4 You have an enhanced mirror mode
5 that can be more general and more broad. And
6 it was more general for me that my grounds
7 apply to general and also to the court
8 construction. It's consistent with it.

IPR2024-00856: Karam Tr. (Ex. 2012), 255:1-8.

1 Do you mean the construction that
2 you applied is broader or the understanding
3 you applied is broader than the construction?
4 MS. WELSH: Objection, form.

5 A. In my embodiments, I cover -- or
6 in my grounds, I cover this construction; like
7 a traditional mirror, conventional mirror,
8 it's consistent with that. For some elements,
9 it's also some enhanced mirror.

10 So it depends which elements
11 we're talking about. Here, it's for this
12 element, my opinions are consistent with
13 traditional mirror.

14 BY MS. SAPUTO:

15 Q. So I'm not asking you about
16 consistent. I'm asking whether you applied
17 this construction.

18 A. The grounds I provided are
19 consistent with the district court claim
20 construction.

IPR2024-00856: Karam Tr. (Ex. 2012), 191:1-20.

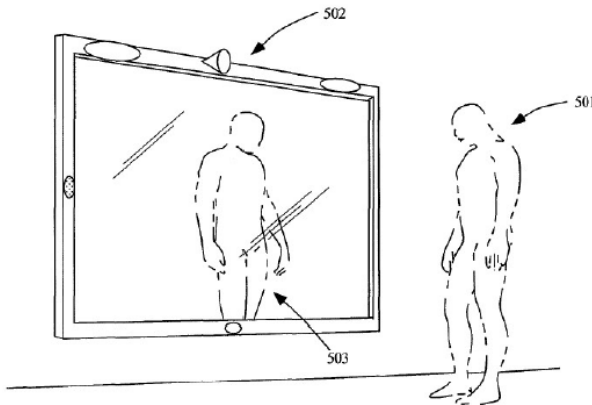
“Varying Rate” (Limitation 1[h])

- “Varying rate” limitation is obvious over three combinations
 - Rosenberg and Nakazawa (Ground 1)
 - Rosenberg/Nakazawa and Hatanaka (Ground 2)
 - Rosenberg/Nakazawa and Tripathi (Ground 3)

IPR2024-00856: Institution Decision (Paper 15), 14-16; Patent Owner’s Response (Paper 22), 33-36, 43-50, 55-59;
IPR2024-00856: Petitioners’ Reply (Paper 26), 18-25; Patent Owner’s Sur-reply (Paper 32), 19-24;
IPR2024-00856: Claim Construction Order (Ex. 2008), 28.

Rosenberg/Nakazawa: “Varying Rate”

- Rosenberg varies the rate of image processing (flipping, resizing, combined with Nakazawa’s correction) when switching from picture frame to mirroring based on user distance



Rosenberg

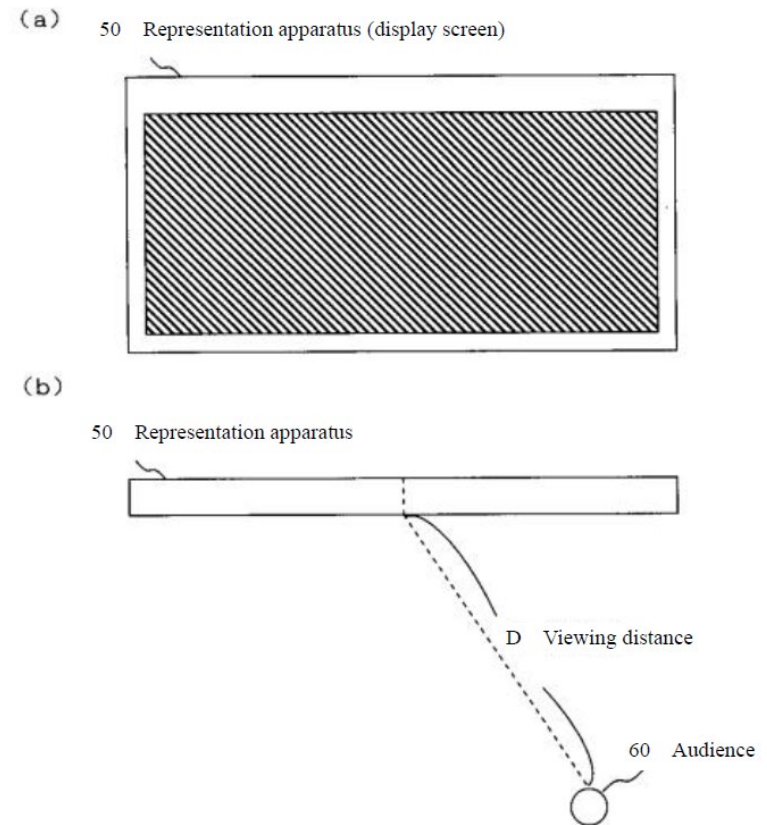
[0056] Another aspect of the multi-function product embodiments described above are the innovative methods by which the system intelligently switches between operational states. As described above, a multi-state embodiment of the present invention may include a digital picture frame state and a digital mirroring state that are operative at different moments in time. Software routines are included for automatically switching between states based upon one or more sensor readings. As described previously the system may include a proximity and/or motion sensor operative to detect if a person is standing and/or moving in an area or region in front of the display screen. The proximity and/or motion sensor, for example, may be configured to detect whether a person (or other moving object) comes within an area that extends six to eight feet in front of the screen area.

Rosenberg/Nakazawa and Hatanaka: “Varying Rate”

- Hatanaka adjusts frame rate and other parameters according to viewing distance, e.g., to conserve power
- One skilled would have modified Rosenberg/Nakazawa in view of Hatanaka to reduce the rate of image processing when the user moves away from the display to improve image processing and power efficiency.

Hatanaka

Figure 2



IPR2024-00856: Petition (Paper 1), 47-50; Petitioners' Reply (Paper 26), 20-23;

IPR2024-00856: Karam Decl. (Ex. 1004), ¶¶188-204;

IPR2024-00856: Hatanaka (Ex. 1009), FIG. 2, [0008], [0012], [0018], [0023], [0028]-[0029], [0037]-[0039].

Rosenberg/Nakazawa and Tripathi: “Varying Rate”

- Tripathi adjusts the display frame rate in response to content type (static/dynamic) or power supply to conserve power
- One skilled would have been motivated to adjust the rate of the image processing in Rosenberg/Nakazawa to:
 - improve power efficiency when the user is stationary or outside the mirror’s vicinity
 - improve user experience when the user is within the mirror’s vicinity

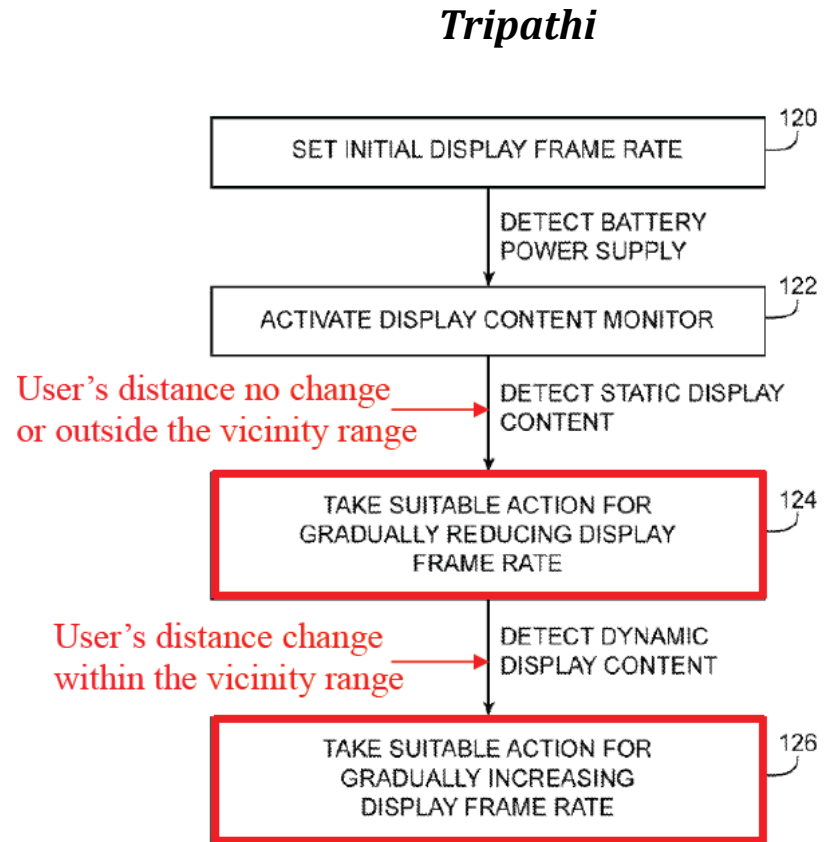


FIG. 10