

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MAGIC LEAP, INC.
Petitioner,

v.

PERCEPT TECHNOLOGIES INC.
Patent Owner.

Patent No. 8,696,113

Inter Partes Review No. IPR2023-00495

PETITION FOR *INTER PARTES* REVIEW

UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.*

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Declaration of Dr. Joseph J. LaViola Jr. in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 8,696,113	EX-1003
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I. INTRODUCTION

Petitioner Magic Leap, Inc. (“Petitioner” or “Magic Leap”) petitions for *inter partes* review of claims 1-3 and 12-14 of U.S. Patent No. 8,696,113 (“the ’113 Patent” (EX-1001)). The ’113 Patent is directed to a wearable optics device with a dynamic eye tracking mechanism. The challenged claims do not present any patentable improvement over the prior art, as set forth in this Petition and in the supporting Declaration of Dr. Joseph J. LaViola Jr. (EX-1003).

Accordingly, Petitioner requests that the Board institute *inter partes* review of the ’113 Patent and cancel the challenged claims at the conclusion of the instituted proceeding.

II. SUMMARY OF THE ’113 PATENT

A. Background Of The ’113 Patent

As shown in Fig. 5C below, the ’113 Patent describes a wearable optics device 560 that includes a lens 601 and a dynamic eye tracking mechanism. (EX-1001, 7:35-8:39.) The lens can include “one or more lens material layers.” (EX-1001, 6:59-67.)

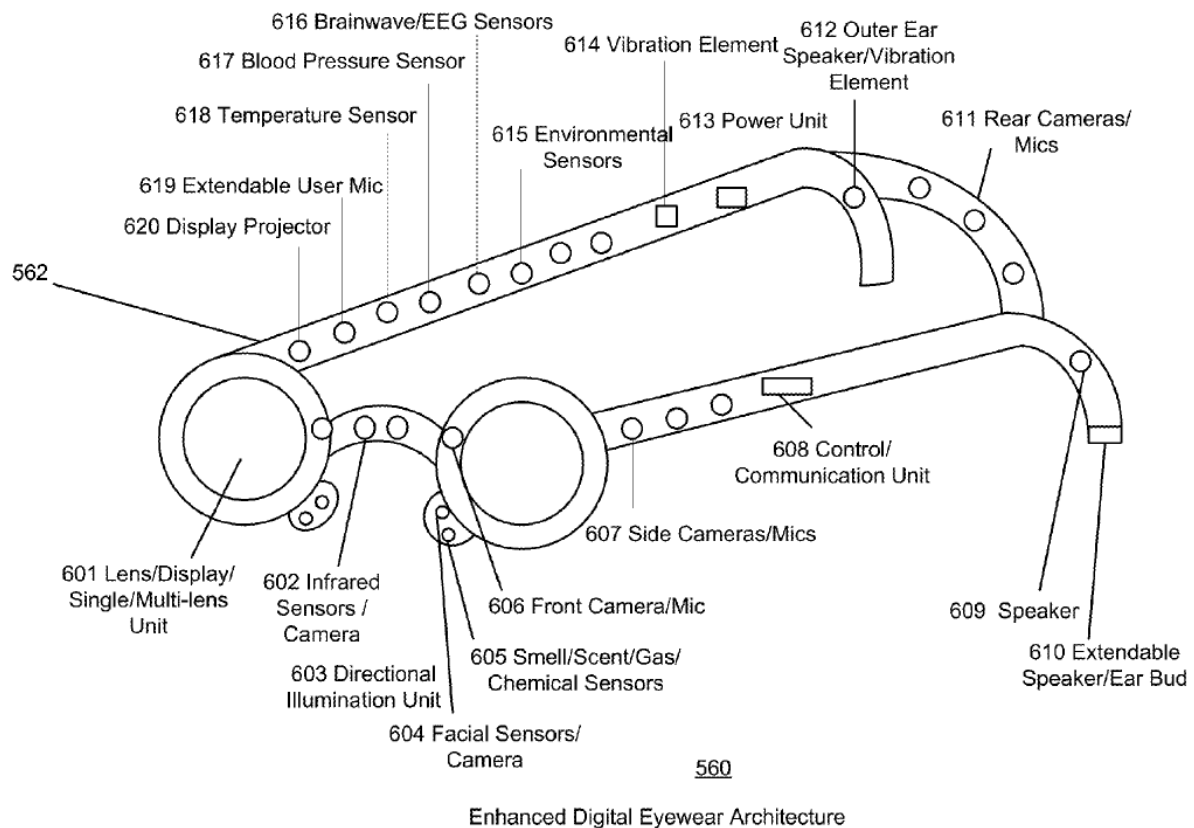


Figure 5C

(EX-1001, 7:35-8:12, Fig. 5C.)

According to the '113 Patent, “optical and perceptual parameters” can be “measured and used as inputs, controls, or feedback elements” to improve the device. (EX-1001, 7:1-6.) The perceptual parameters are described as including: “optical expression, voice, brain wave, environmental, audio, video, navigational, augmented reality, algorithmic, spatial, cognitive, interpretive.” (EX-1001, 7:14-17.) The optical parameters are described as including: “ciliary, pupil, corneal, lens, iris, eye lid, retina measurements.” (EX-1001, 7:24-26.)

All of the challenged claims recite that the dynamic eye tracking mechanism utilizes “any of” certain optical parameter measurements. (EX-1001, 14:21-16:22.) The challenged claims also recite that an “optical/perceptual parameter based operating system” is “utilized.”¹ (EX-1001, 14:21-16:22.) The ’113 Patent does not use or define the claim term “optical/perceptual parameter based operating system.” (EX-1003, ¶28.) Instead, the ’113 Patent refers to Fig. 19 as illustrating “an optical/perceptual operating system 1900 with the wearable optics device”:

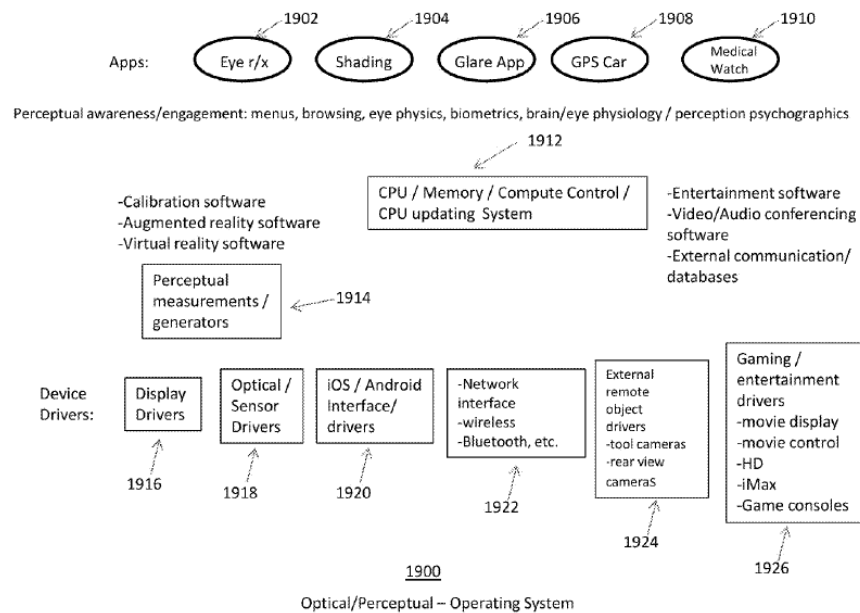


Figure 19

¹ The challenged claims alternately refer to “an optical/perceptual parameter based operating system” and “the optical/perceptual based operating system.” These terms are understood to refer to the same element. (EX-1003, ¶28.)

(EX-1001, 12:31-48, Fig. 19; EX-1003, ¶28.)

B. Priority Date

The application (Appl. No. 13/841,141) that became the '113 Patent is a continuation-in-part of Appl. No. 13/739,929 (now U.S. Patent No. 9,010,929 or '929 Patent), and was filed on March 15, 2013.² The '113 Patent claims priority to a series of applications dating to Oct. 7, 2005. (EX-1002, 224-25.) However, as shown in exhibits EX-1013 through EX-1018, Appl. No. 13/841,141 introduced (and claimed) new matter not found in any of the other applications in the chain of priority. (See EX-1013 through EX-1018 (applications to which the '113 Patent claims priority, as filed with the USPTO).) Thus, based on the disclosures of the '113 Patent and the applications in its priority chain, and based further on the nature and scope of the claims, and the existing knowledge in the field, the challenged claims are not entitled to a priority date earlier than March 15, 2013.

² The cover page of the '113 Patent, under “Related U.S. Application Data,” incorrectly identifies the '113 Patent as a “continuation” of Appl. No. 13/739,929. (EX-1001, Cover Page.) The '113 Patent is in fact a *continuation-in-part* of Appl. No. 13/739,929, as correctly identified in the '113 Patent specification under “CROSS-REFERENCE TO RELATED APPLICATION,” and in the Application Data Sheet as filed by the applicant. (EX-1001, 1:8-10; EX-1002, 224.)

(EX-1003, ¶¶29-35.)

For example, all challenged claims of the '113 Patent recite an “optical/perceptual parameter based operating system.” (EX-1001, 14:21-16:22.) While the written description requirement does not require any particular form of disclosure, *Ariad Pharm. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010), no mention of an operating system—let alone the claimed “optical/perceptual parameter based operating system”—is found in any priority document outside of the March 15, 2013 disclosure. (EX-1013 through EX-1018; EX-1003, ¶32.) Moreover, according to the declaration of Dr. Joseph J. LaViola Jr., based on the existing knowledge in the field, a POSITA would not recognize “optical/perceptual parameter based operating system” as a term of art. (EX-1003, ¶32.) That is, the term derives its meaning from the 2013 disclosure.

Likewise for the challenged claims’ recitation of a dynamic eye tracking mechanism that utilizes “optical parameter measurements” that include “any of ciliary measurements, pupil measurements, corneal measurements, eye lens measurements, iris measurements, eye lid measurements, retina measurements.” (EX-1001, 14:21-16:22.) No support for a dynamic eye tracking mechanism utilizing these claimed optical parameter measurements is found in any disclosure prior to the March 15, 2013 new matter. (EX-1013 through EX-1018; EX-1003, ¶34.)

For the Patent Owner to argue otherwise would be at odds with the prosecution history of the '113 Patent. For example, the Examiner rejected Appl. No. 13/841,141 based on prior art references after Oct. 7, 2005, thus declining to apply a priority date of Oct. 7, 2005. (*See, e.g.*, EX-1002, 93-100, 132-139.) The applicant responded to these rejections by narrowing the claims in an attempt to distinguish the references as opposed to challenging their prior art status. (*See, e.g.*, EX-1002, 72-80, 114-126.) At no time during prosecution did the applicant assert that the claims were entitled to an earlier filing date than March 15, 2013. Instead, the applicant repeatedly highlighted the new matter filed on March 15, 2013 as support for its claim amendments.

For example, in response to a prior art rejection, the applicant directed the Examiner to paragraphs 105 and 106 as support for the claimed optical/perceptual parameter based operating system; and to paragraphs 66 and 67 as support for the claimed optical/perceptual parameters. (EX-1002, 122-24.) Each of these specific paragraphs identified by the applicant was introduced in the new matter filed on March 15, 2013. The applicant emphasized this point repeatedly: in the applicant's telephonic interview with the examiner, the applicant again "pointed to paragraph [0067] to provide support for, and examples of, optical perceptual parameters." (EX-1002, 114.)

Consistent with the applicant's conduct during prosecution, during claim

construction in the related district court action, Patent Owner never cited a single passage from any priority document outside of the March 15, 2013 disclosure to support its construction of an “optical/perceptual parameter based operating system.” (EX-1008, EX-1010.)

Accordingly, for the purposes of this Petition, Petitioner assumes a priority date of March 15, 2013 for the challenged claims. (EX-1003, ¶35.)

C. Prosecution History Of The ’113 Patent

The application that became the ’113 Patent was allowed after being rejected over various prior art references. While the prosecution histories of the ’113 Patent and its parents are lengthy, for the purposes of the Petition, the exchange between the Examiner and the applicant in 2013 is most relevant.

Specifically, in a Final Office Action dated November 25, 2013, the Examiner rejected the claims under § 102 and § 103, citing Osterhout (U.S. Patent Appl. Publ. No. 2011/0213664 (“Osterhout”) (EX-1005)). (EX-1002, 93-100.) The Examiner found that Osterhout disclosed the claimed optical/perceptual parameter based operating system. (EX-1002, 93-95.) Rather than challenge this finding, the applicant, in a response dated December 23, 2013, amended all independent claims to recite that the claimed dynamic eye tracking mechanism utilizes “any of” certain optical parameter measurements. (EX-1002, 72-80.) This amendment led to an allowance of the claims. (EX-1002, 20-28.)

Then, in the Examiner's reasons for allowance, the Examiner expressly incorporated certain remarks made by the applicant in its December 2013 response. (EX-1002, 24-28, 78-79.) In those remarks, the applicant asserted that the cited references did not meet the specific optical parameter measurements that the applicant added to the claims. (EX-1002, 78-79.) Thus, the Examiner allowed the claims based on the specific optical parameter measurements, thereby implying that the remaining limitations of the claims, such as the claimed optical/perceptual parameter based operating system, were met by the prior art. As set forth in this Petition, however, the prior art teaches the claimed optical parameter measurements, as well as all remaining limitations of the challenged claims. For example, according to the declaration of Dr. Joseph J. LaViola Jr., and as set forth herein, the Examiner overlooked express disclosure in Osterhout of the very same optical parameter measurements that led to the allowance of the claims. (EX-1003, ¶39.)

D. Level Of Ordinary Skill

Based on the disclosure of the '113 Patent and a priority date of March 15, 2013, a person of ordinary skill in the art ("POSITA") would have had a B.S. degree and a Masters degree in Computer Science, Computer Engineering, Electrical Engineering, Physics, or an equivalent field, as well as one to two years of academic or industry experience in wearable electronic devices or comparable

industry experience. (EX-1003, ¶21.)

III. CLAIM CONSTRUCTION

The Board construes claims under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); *see also* 83 Fed. Reg. 51,340 (Oct. 11, 2018) (Board adopting same claim construction standard used by Article III federal courts and the ITC). Under *Phillips*, claims are given their ordinary and customary meaning in light of the specification. 415 F.3d at 1315-17.

The '113 Patent is the subject of co-pending litigation as identified in Section VIII. Patent Owner asserts that Petitioner infringes claims 1 and 12 of the '113 Patent. The parties have exchanged briefing regarding the claim construction of certain terms of the challenged claims. (EX-1008 through EX-1011.) The parties' respective positions with respect to the terms of the '113 Patent are set forth in the chart below.

Petitioner does not believe any claim construction is necessary for this Petition, as the challenged claims are invalid under any reasonable interpretation of the claims.³

³ In the event trial is instituted, Petitioner reserves its right to address construction of any terms raised at trial, or in the related district court action. Petitioner further reserves the right to raise invalidity issues under 35 U.S.C. § 112, including

Claim Term	Patent Owner's Proposed Construction	Petitioner's Proposed Construction
dynamic eye tracking mechanism (parties agree)	mechanism for dynamically tracking the characteristics of the eye, including, for example, ciliary, pupil, corneal, retina, lens, iris, or eye lid measurements, blinks, squints, gaze direction, or eye movement	mechanism for dynamically tracking the characteristics of the eye, including, for example, ciliary, pupil, corneal, retina, lens, iris, or eye lid measurements, blinks, squints, gaze direction, or eye movement
a lens	plain and ordinary meaning	plain and ordinary meaning ⁴
optical/perceptual parameter based operating system	plain and ordinary meaning	operating system, not including a conventional mobile operating system such as Android or iOS, in which optical parameters and perceptual parameters are measured and used as inputs, controls, or feedback elements

IV. PRECISE REASONS FOR RELIEF REQUESTED

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 *et seq.* (including § 42.104(b)), Petitioner requests cancellation of claims 1-3 and 12-14 of the '113

indefiniteness, in the related district court action because such issues cannot be raised in an IPR petition.

⁴ Petitioner previously took the position that “a lens” should be construed to mean “a transmissive optical device which focuses a light beam by refraction.”

Patent based on the following references and the accompanying Declaration of Dr. Joseph J. LaViola Jr. (EX-1003).

Prior Art Reference	Abbreviation
U.S. Patent Appl. Pub. No. 2011/0213664A1 to Osterhout et al. (“Osterhout”)	Osterhout (EX-1005)
U.S. Patent No. 6,307,526 to Mann (“Mann ’526”)	Mann ’526 (EX-1006)
U.S. Patent No. 6,433,760 (“Vaissie”)	Vaissie (EX-1007)

The statutory grounds for the challenge of each claim are set forth below. Throughout the Petition, all statutory citations are pre-AIA based on a priority date of March 15, 2013.

Ground	35 U.S.C. §	Claims(s)	Prior Art Reference(s)
1	103	1-3, 12-14	Osterhout
2	103	1-3, 12-14	Mann ’526, Vaissie

Below, Petitioner discusses why the challenged claims are unpatentable, including by specifying how and where the prior art satisfies each limitation of each challenged claim, as required by 37 C.F.R. § 42.104(b)(4).⁵ Petitioner’s showing establishes a reasonable likelihood that it will prevail on each ground of

⁵ Petitioner also shows how each claim preamble is satisfied, but does not concede that any preamble is limiting for any ground in the Petition.

invalidity as to each challenged claim.

V. OSTERHOUT RENDERS OBVIOUS CLAIMS 1-3 AND 12-14

A. Ground 1: Claims 1-3 And 12-14 Are Obvious In View Of Osterhout

1. Summary of Osterhout

Osterhout is a U.S. patent application that was filed on Feb. 28, 2011 and published on Sept. 1, 2011. Osterhout is thus prior art to the '113 Patent under at least 35 U.S.C. §§ 102(a), (b), and (e) based on the March 15, 2013 priority date of the challenged claims.

Osterhout discloses an “interactive head-mounted eyepiece worn by a user.” (EX-1005, [0019]; EX-1003, ¶45.) For example, an augmented reality eyepiece can have an optical assembly, with a see-through or translucent lens, that enables the wearer of the eyepiece to view the surrounding environment as well as a displayed image. (EX-1005, [0164], [0183]; EX-1003, ¶45.)

A projector of the optical assembly, which can include an LCoS display and a light source, can project the image light onto the lens. (EX-1005, [0164]; EX-1003, ¶46.) The eyepiece can be controlled by a processor with a memory and an operating system. (EX-1005, [0164]; EX-1003, ¶46.) Fig. 1 illustrates an embodiment of the eyepiece:

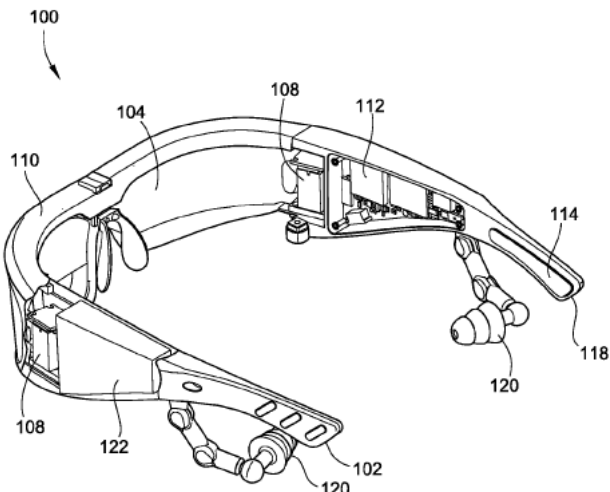


FIG. 1

(EX-1005, [0165], Fig. 1; EX-1003, ¶46.)

Fig. 72 shows a block diagram of Osterhout’s eyepiece system:

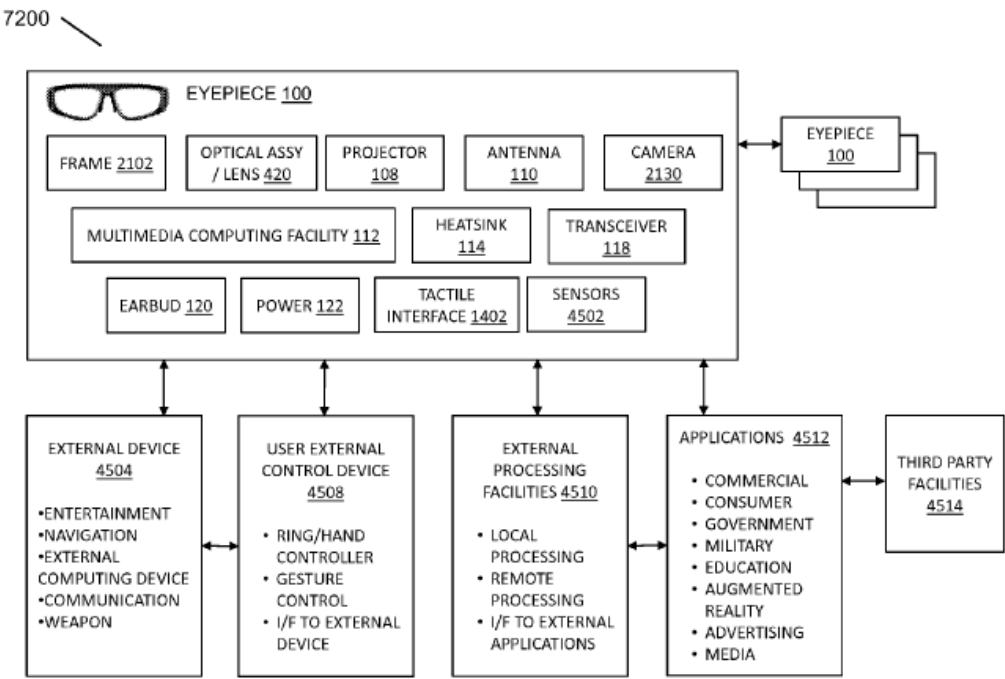


Fig. 72

(EX-1005, [0163], [0189], Fig. 72; EX-1003, ¶47.)

As seen in the figure, the eyepiece can include various sensors (such as sensors 4502 and cameras 2130); can interface with applications 4512 (such as for consumer, augmented reality, and media), external devices 4504, and control devices 4508; and can communicate with other eyepieces 100. (EX-1005, [0189], Fig. 72; EX-1003, ¶48.)

The eyepiece can include eye tracking devices for control. (EX-1003, ¶49.) For example, the eyepiece can “determine where the user is gazing, or the motion of the user’s eye, by tracking the eye through reflected light off the user’s eye.” (EX-1005, [0301]; EX-1003, ¶49.) The eye tracking information can be used to correlate the user’s line of sight with the projected image (*e.g.*, to determine a point in the projected image where the user is looking); and this information can be used in various control techniques. (EX-1005, [0301], [0304]; EX-1003, ¶49.) In some embodiments, commercially available retinal scanners can be used for eye tracking. (EX-1005, [0305]; EX-1003, ¶49.) In some embodiments, the eyepiece includes a camera that “views back to the wearer’s eye(s),” such that “eye movements or actions may be interpreted as command information.” (EX-1005, [0301], [0304]; EX-1003, ¶49.)

The eye tracking mechanism can make use of optical parameter measurements. (EX-1003, ¶50.) For example, “an eye tracking facility may use the corneal reflection and the center of the pupil as features to track over time; use

reflections from the front of the cornea and the back of the lens as features to track; image features from inside the eye, such as the retinal blood vessels, and follow these features as the eye rotates; and the like.” (EX-1005, [0301]; EX-1003, ¶50.) Other optical parameters, such as the electrical potential between the cornea and retina, can also be used. (EX-1005, [0301]; EX-1003, ¶50.) In some embodiments, a contact lens with embedded optical components can be used in conjunction with the eye tracking facility for measuring the motion of the user’s eye. (EX-1005, [0301]; EX-1003, ¶50.)

The eyepiece also includes head movement tracking, gesture recognition, voice recognition, and other features that use perceptual parameters such as voice, audio, video, and environmental parameters to control the eyepiece. (EX-1005, [0308]-[0311]; EX-1003, ¶51.) These features can be used in conjunction with the eye tracking described above to activate and execute commands. (EX-1005, [0309]; EX-1003, ¶51.) For example, a user of the eyepiece can use eye tracking to select an object in the display, and then perform a head motion (*e.g.*, tipping the head) to interact with the object. (EX-1005, [0309], [0311]; EX-1003, ¶51.) Other commands can include turning off the eyepiece projector, audio, camera, or sensors (*e.g.*, GPS); interacting with the display or the real world; or interacting with applications such as a web browser or an email application. (EX-1005, [0311]; EX-1003, ¶51.)

2. Claim 1

Osterhout meets each limitation of claim 1, as described below. (EX-1003, ¶52.)

a. [Pre] *A wearable optics device comprising:*

The preamble is taught by Osterhout. (EX-1003, ¶53.) For example, Osterhout discloses an “interactive head-mounted eyepiece worn by a user.” (EX-1005, [0019]; EX-1003, ¶53.) The eyepiece includes an “optical assembly through which the user views a surrounding environment and displayed content.” (EX-1005, [0011]; EX-1003, ¶53.) Fig. 1 illustrates an embodiment of an augmented reality eyepiece 100:

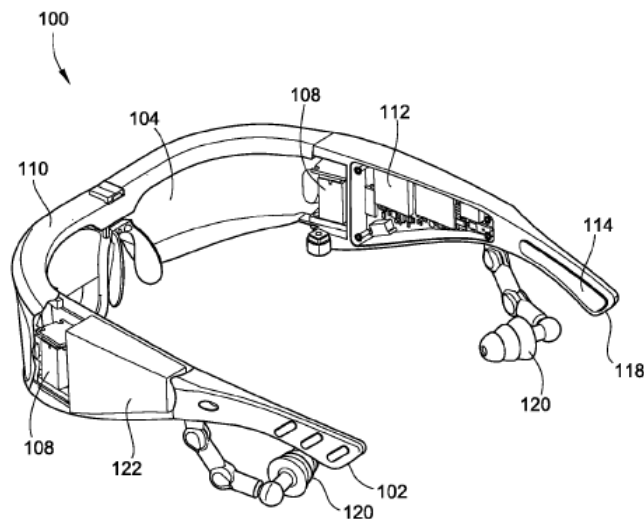


FIG. 1

(EX-1005, [0165], Fig. 1; EX-1003, ¶53.)

b. [A] *a lens; and*

Osterhout meets this element. (EX-1003, ¶54.) For example, Osterhout discloses that the augmented reality eyepiece can have a “see-through or translucent lens” which enables the wearer of the eyepiece to view the surrounding environment as well as a displayed image. (EX-1005, [0164]; EX-1003, ¶54.) Fig. 1 illustrates example lenses 104, which are part of eyepiece 100:

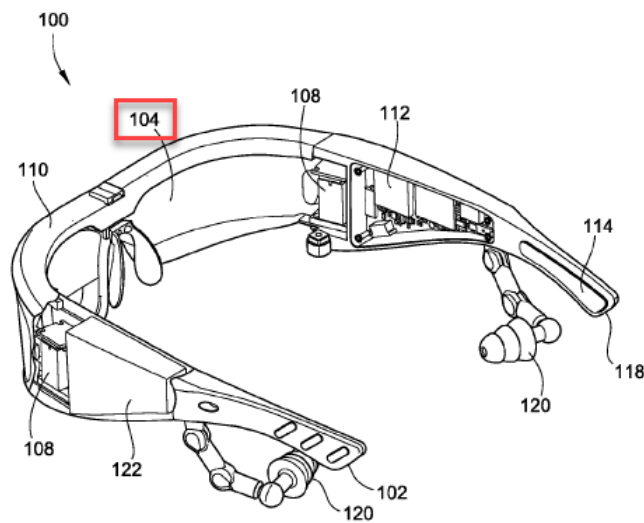


FIG. 1

(EX-1005, [0165], Fig. 1 (annotated); EX-1003, ¶54.)

As another example, Osterhout discloses that a “special contact lens may be provided to the user with an embedded optical component.” (EX-1005, [0301]; EX-1003, ¶55.)

c. [B] *a dynamic eye tracking mechanism in communication with the lens;*

Osterhout meets this element as described below. (EX-1003, ¶57.)

(i) dynamic eye tracking mechanism

Osterhout discloses that “the glasses may be equipped with eye tracking devices for tracking movement of the user’s eye, or preferably both eyes.” (EX-1005, [0305]; EX-1003, ¶58.) For example, Osterhout discloses an “eye tracking facility,” with which “the eyepiece may be able to determine where the user is gazing, or the motion of the user’s eye, by tracking the eye through reflected light off the user’s eye.” (EX-1005, [0301]; EX-1003, ¶58.) The eye tracking facility in Osterhout is an *eye tracking mechanism* that is *dynamic* at least because it tracks the motion of the eye. (EX-1003, ¶58.) For instance, the eye tracking facility “may use the corneal reflection and the center of the pupil as features to track over time.” (EX-1005, [0301]; EX-1003, ¶58.) This is consistent with the ’113 Patent’s description that “the iris, retina[,] cornea, pupil, ciliary, and lens can all be utilized either singly or in combination to enable the dynamic eye tracking mechanism.” (EX-1001, 9:42-46; EX-1003, ¶58.)

As another example, Osterhout discloses a “camera on the eyepiece that views back to the wearer’s eye(s).” (EX-1005, [0304]; EX-1003, ¶59.) Using the camera, “eye movements or actions may be interpreted as command information.” (EX-1005, [0304]; EX-1003, ¶59.) For instance, the camera can “correlate the viewing direction of the eye to a point on the display.” (EX-1005, [0304]; EX-1003, ¶59.) The eye movements can include, *e.g.*, “eye movements to the side, up

and down, side to side,” or “through a sequence of positions.” (EX-1005, [0304]; EX-1003, ¶59.) The camera is an *eye tracking mechanism* that is *dynamic* at least because it is a mechanism (a camera) for tracking eye movements, like the eye tracking facility described above. (EX-1003, ¶59.)

(ii) in communication with the lens

Osterhout describes in multiple instances that the dynamic eye tracking mechanism is in communication with the lens. (EX-1003, ¶60.) For example, Osterhout describes that the dynamic eye tracking mechanism detects eye movements such as the eye gazing toward “the corner of the lens of the eyepiece,” or “through a certain portion of the lens.” (EX-1005, [0304]; EX-1003, ¶60.) The dynamic eye tracking mechanism is thus *in communication with the lens*, at least because the dynamic eye tracking mechanism detects an eye gaze that is directed toward a specific part of the lens (*e.g.*, the corner), or through a certain portion of the lens. (EX-1003, ¶60.)

Moreover, because the lens is translucent, EX-1005 at [0164], the eye receives light rays that are transmitted via the lens. (EX-1003, ¶61.) Those light rays are detected by the dynamic eye tracking mechanism—for example, by a “camera on the eyepiece that views back to the wearer’s eye.” (EX-1005, [0304]; EX-1003, ¶61.) Osterhout thus teaches that the dynamic eye tracking mechanism may be in *optical* communication with the lens. (EX-1003, ¶61.)

Further, Osterhout discloses that the dynamic eye tracking mechanism can “correlate the viewing direction of the eye to a point on the display,” and that the eyepiece can interpret commands based on that point on the display. (EX-1005, [0304]; EX-1003, ¶62.) Because the display is projected on the lens, EX-1005 at [0164], the dynamic eye tracking mechanism is thus further in communication with the lens at least by correlating the viewing direction to a point on the lens. (EX-1003, ¶62.)

In another example in Osterhout, the eye tracking mechanism uses a “special contact lens,” described above, with an embedded optical component (such as a mirror or a magnetic field sensor) for measuring the motion of the eye. (EX-1005, [0301]; EX-1003, ¶63.) The eyepiece uses the contact lens to “track the motions of the eye.” (EX-1005, [0301]; EX-1003, ¶63.) The eye tracking mechanism is *in communication with the lens*, at least because the eye tracking mechanism is in communication with the embedded optical component of the contact lens to receive the measured motion of the eye and thus track the motion. (EX-1005, [0301]; EX-1003, ¶63.)

- d. [C] *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;*

Osterhout meets this element. (EX-1003, ¶64.) For example, Osterhout describes using optical components for “*measuring the motion of the eye.*” (EX-1005, [0301] (emphasis added); EX-1003, ¶64.) By the plain language of the claim, which recites that the optical parameter measurements include “any of” the various measurements recited, this element is met if the optical parameter measurements taught by Osterhout include even one of those recited measurements. (See *Intell. Ventures II LLC v. BITCO Gen. Ins. Corp.*, 2019 WL 999902, at *3-4 (E.D. Tex. Feb. 28, 2019) (construing “manage *any* content” to mean “manage *one or more* stored content”) (emphasis added).) However, as described below, Osterhout teaches not just one, but *multiple* of the recited optical parameter measurements. (EX-1003, ¶64.)

Osterhout describes that optical parameter measurements are utilized by the dynamic eye tracking mechanism to “determine where the user is gazing, or the motion of the user’s eye.” (EX-1005, [0301]; EX-1003, ¶65.) For example, Osterhout discloses that the dynamic eye tracking mechanism may use “the *corneal reflection* and the *center of the pupil* as features to track over time”; use

“*reflections from the front of the cornea* and the back of the lens as features to track”; and “image features from inside the eye, such as the *retinal blood vessels*, and follow these features as the eye rotates.” (EX-1005, [0301] (emphasis added); EX-1003, ¶65.) These features meet multiple of the claimed optical parameter measurements. (EX-1003, ¶65.) For example, tracking the center of the pupil meets a *pupil measurement* (i.e., the measured center of the pupil); tracking the corneal reflection meets a *corneal measurement* (i.e., the measured position of the cornea with respect to the reflection); and following the retinal blood vessels meets a *retina measurement* (i.e., the measured position of the retinal blood vessels). (EX-1005, [0301]; EX-1003, ¶65.)

As another example, electrical potentials of the cornea and the retina can be “measured and monitored” with electrodes. (EX-1005, [0301]; EX-1003, ¶66.) For example, an electrical potential is measured for “a dipole ... with its positive pole at the cornea, and its negative pole at the retina.” (EX-1005, [0301]; EX-1003, ¶66.) These measurements of electrical potential of the cornea and the retina meet at least a *corneal measurement* and a *retina measurement*, respectively, in addition to the other corneal and retina measurements described above. (EX-1003, ¶66.) The dynamic eye tracking mechanism can utilize these measurements to track eye movement. (EX-1005, [0301]; EX-1003, ¶66.)

In another example, Osterhout describes that the dynamic eye tracking

mechanism can use a camera to determine eye movements or actions including “blinking, repetitive blinking, blink count, blink rate,” and “eye open-closed.” (EX-1005, [0304]; EX-1003, ¶67.) A POSITA would have understood that blinking is the act of the eyelid closing and opening; and that detecting blinking using a camera includes using the camera to measure a position of the eyelid (*e.g.*, measuring whether the eyelid is in an open position or a closed position). (EX-1003, ¶67.) This meets the claimed *eye lid measurements*. (EX-1003, ¶67.) The dynamic eye tracking mechanism utilizes the eyelid measurements to, *e.g.*, generate “command information.” (EX-1005, [0304]; EX-1003, ¶67.)

e. [D] *wherein an optical/perceptual parameter based operating system is utilized,*

Osterhout meets this element.⁶ (EX-1003, ¶68.) For example, Osterhout discloses that a processor of the eyepiece includes an operating system. (EX-1005, [0164]; EX-1003, ¶68.)

A POSITA would have understood the operating system of the eyepiece’s processor to meet the claimed optical/perceptual parameter based operating

⁶ In the co-pending litigation, the Petitioner and the Patent Owner have proposed competing constructions for “optical/perceptual parameter based operating system” for the purposes of the litigation. This element is met under either party’s proposed construction.

system. (EX-1003, ¶69.) The operating system of Osterhout is based on optical parameters and further based on perceptual parameters.⁷ For example, the processor with the operating system “handl[es] the content for display to the user,” and handles “sensor information from the sensor.” (EX-1005, [0045]; EX-1003, ¶69.)

To the extent Osterhout does not expressly disclose that the processor’s *operating system* is the component that performs these tasks, it would have been obvious to a POSITA from Osterhout’s teachings. (EX-1003, ¶70.) For example, handling input (*e.g.*, sensor information from the sensor) and output (*e.g.*, content for display to the user) are among an operating system’s “main functions.” (EX-

⁷ In the co-pending litigation, the Patent Owner takes the position that the claimed “optical/perceptual parameter based operating system” may be based on “optical parameters or perceptual parameters,” and is not limited to requiring both types of parameters. (EX-1008, 11 (“There is no basis for requiring the operating system to be based on both ‘optical parameters and perceptual parameters.’”)) (emphasis in original) (citing EX-1001, 8:17-18, 12:66-67).) However, as shown herein, the operating system of Osterhout is based on optical parameters and/or perceptual parameters, and thus meets this limitation with or without the Patent Owner’s disjunctive interpretation of the term.

1019, 269 (“One of the main functions of an operating system is to control all the computer’s I/O (Input/Output) devices”); EX-1003, ¶70.) It would thus be obvious to the POSITA that, in a processor that includes an operating system, the operating system is the component that would perform those functions. (EX-1003, ¶70.)

The POSITA would have had a reasonable expectation of success in applying Osterhout’s operating system to perform handling content for display to the user, and handing sensor information from the sensor, at least because operating systems are a mature, commonly used, and well-understood type of software technology, and because I/O handling is a well-known operating system function. (EX-1019, 269; EX-1003, ¶70.) It would thus be obvious to the POSITA that, in a processor that includes an operating system, the operating system would perform those functions. (EX-1003, ¶70.)

Osterhout further teaches that the operating system performs these I/O functions based on optical and perceptual parameters, as described below. (EX-1003, ¶71.) The operating system is thus an *optical/perceptual parameter based operating system*. (EX-1003, ¶71.) Moreover, the eyepiece *utilizes* this operating system as described below. (EX-1003, ¶71.)

(i) *Optical parameters*

As one example of utilizing optical parameters, Osterhout’s processor “correlates the displayed content and the information from the sensor to indicate

the eye's line-of-sight relative to the projected image, and uses the line-of-sight information relative to the projected image, plus a user command indication, to invoke an action.” (EX-1005, [0045]; EX-1003, ¶72.) The line of sight information for the eye is “communicated to the processor as command instructions.” (EX-1005, [0046]; EX-1003, ¶72.) Handling input (*e.g.*, line-of-sight input from the user's eye) and controlling processor actions are among the main responsibilities of an operating system, so to the extent not expressly disclosed in Osterhout, it would have been obvious to the POSITA that the operating system in Osterhout is the component of Osterhout that would perform those functions. (EX-1019, 269, 5 (“the job of the operating system is to provide for an orderly and controlled allocation of the processors, memories, and I/O devices among the various programs competing for them.”); EX-1003, ¶72.) The POSITA would have enjoyed a reasonable expectation of success in doing so for at least the reasons described above with respect to element 1[D]. (EX-1003, ¶72.)

An eye-tracking mechanism uses the line-of-sight information to invoke an action, as described for elements 1[B] and 1[C]. (EX-1005, [0301]; EX-1003, ¶73.) The line-of-sight information is used by the processor to “correlate the user's line of sight with respect to the projected image,” and used by the processor in “control techniques.” (EX-1005, [0301]; EX-1003, ¶73.) For example, “eye movements or actions may be interpreted as command information.” (EX-1005,

[0304]; EX-1003, ¶73.)

As described above, the eye tracking mechanism makes use of optical parameter measurements, including at least pupil measurements, corneal measurements, eyelid measurements, and retina measurements—four specific examples of optical parameter measurements specifically recited in claim 1. (EX-1003, ¶74.) For example, “an *eye tracking facility* may use the *corneal reflection* and the *center of the pupil* as features to track over time; use *reflections from the front of the cornea and the back of the lens* as features to track; image features from inside the eye, such as the *retinal blood vessels*, and follow these features as the eye rotates; and the like.” (EX-1005, [0301] (emphasis added); EX-1003, ¶74.) Other optical parameters, such as electrical potential between the cornea and retina, can also be used. (EX-1005, [0301]; EX-1003, ¶74.) In some embodiments, a contact lens with embedded optical components can be used in conjunction with the eye tracking facility for measuring the motion of the user’s eye. (EX-1005, [0301]; EX-1003, ¶74.)

These optical parameter measurements are used by the Osterhout operating system to perform operating system functions such as input/output handling. (EX-1019, 269; EX-1003, ¶75.) For example, the eyepiece “includes a user input interface ... to allow a user to control the device.” (EX-1005, [0306]; EX-1003, ¶75.) “Inputs used to control the device” can include an eye tracking device, as

described above. (EX-1005, [0306]; EX-1003, ¶75.) And as described above, the operating system of the eyepiece is utilized for the eye tracking device input. (EX-1003, ¶75.)

Eye control can be used to activate and execute commands for the eyepiece. (EX-1005, [0309]; EX-1003, ¶76.) Commands can also be terminated through eye control. (EX-1005, [0309]; EX-1003, ¶76.) Similarly, the eyepiece can be controlled through a microphone, such as using voice recognition. (EX-1005, [0310]; EX-1003, ¶76.) The Osterhout operating system provides these controls, at least via optical parameters associated with the eye tracking mechanism as described above. (EX-1003, ¶76.) Osterhout provides examples of commands that can be executed based on the optical parameters: turning on and off the eyepiece's projector, audio, camera, augmented reality projector, or GPS; interacting with the eyepiece's display through a user interface (*e.g.*, selecting displayed functions); performing actions using an embedded or external device; and controlling applications such as a web browser and an email application. (EX-1005, [0311]; EX-1003, ¶76.) A POSITA would have recognized these abilities as operating system functions, as described above. (EX-1019, 5, 269; EX-1003, ¶76.)

Accordingly, the Osterhout operating system is based on optical parameters. (EX-1003, ¶77.)

(ii) *Perceptual parameters*

The Osterhout operating system is further based on perceptual parameters. (EX-1003, ¶78.) The '113 Patent describes that perceptual parameters include “optical expression, voice, brain wave, environmental, audio, video, navigational, augmented reality, algorithmic, spatial, cognitive, interpretive.” (EX-1001, 14:8-11; EX-1003, ¶78.) Further, during prosecution, the patent applicant pointed to this same description in the '113 Patent specification as support for these claimed parameters. (EX-1002, 114.)

Osterhout includes multiple examples in which perceptual parameters are used by the operating system to handle user input and execute processes. (EX-1003, ¶79.) For example, the eyepiece includes head movement tracking, gesture recognition, voice recognition, and other features that use perceptual parameters such as voice, audio, video, and environmental parameters to control the eyepiece. (EX-1005, [0308]-[0311]; EX-1003, ¶79.) These features can be used in conjunction with the eye tracking described above to activate and execute commands. (EX-1005, [0309]; EX-1003, ¶79.) For example, a user of the eyepiece can use eye tracking to select an object in the display, and then perform a head motion (*e.g.*, tipping the head) to interact with the object. (EX-1005, [0309], [0311]; EX-1003, ¶79.) Osterhout teaches that head movement tracking and gesture recognition is based on video and spatial input, and thus corresponds to at

least the “video,” “spatial,” and “environmental” examples of perceptual parameters provided in the ’113 Patent. (EX-1005, [0289]-[0300]; EX-1003, ¶79.) Other commands can include turning off the eyepiece projector, audio, camera, or sensors (*e.g.*, GPS); interacting with the display or the real world; or interacting with applications such as a web browser or an email application. (EX-1005, [0311]; EX-1003, ¶79.)

Similarly, the eyepiece can be controlled through a microphone, such as using voice recognition. (EX-1005, [0310]; EX-1003, ¶80.) Voice recognition corresponds to at least the “voice,” “audio,” and “environmental” examples of perceptual parameters provided in the ’113 Patent. (EX-1003, ¶80.) The Osterhout operating system provides these controls, at least via the perceptual parameters for the head motion control and voice recognition. (EX-1003, ¶80.) Osterhout provides examples of such commands: turning on and off the eyepiece’s projector, audio, camera, augmented reality projector, or GPS; interacting with the eyepiece’s display through a user interface (*e.g.*, selecting displayed functions); performing actions using an embedded or external device; and controlling applications such as a web browser and an email application. (EX-1005, [0311]; EX-1003, ¶80.) A POSITA would have recognized these abilities as operating system functions, as described above, and would have understood them to be performed by the operating system of Osterhout. (EX-1003, ¶80.)

Accordingly, the Osterhout operating system is based on perceptual parameters, in addition to being based on optical parameters as described above. (EX-1003, ¶81.)

(i) *Disclosures of the '113 Patent*

The above teachings of Osterhout's operating system, and the eyepiece of Osterhout more generally, are consistent with the '113 Patent's description of the optical/perceptual parameter based operating system, which was endorsed by the patent applicant during prosecution of the '113 Patent. (EX-1003, ¶82.) For example, in response to a § 102 rejection, the patent applicant amended the claims to recite an "optical/perceptual parameter based operating system." (EX-1002, 118-26.) As support for its argument that the prior art did not meet the claimed optical/perceptual parameter based operating system, the patent applicant highlighted the following language in the specification, corresponding to column 12, lines 31-48 of the '113 Patent:

FIG. 19 illustrates an optical/perceptual operating system 1900 with the wearable optics device. As is seen a plurality of applications 1902-1910 interface with a processing system. The processing system includes a CPU, Memory, computer control and a CPU updating system 1912.

The applications include but are not limited to an eye prescription 1902, shading 1904, a glare application, 1906, GPS for navigation of a vehicle 1908 and a medical application 1910. The system would include perceptual measurement/generators 1914. These would include but are not limited to calibration software, augmented reality software, entertainment software, video/audio conferencing software and

external communication/databases. The system would also include one or more device drivers. They include but are not limited to display drivers 1916, optical/sensor drivers 1918, operating system drivers 1920, network drivers 1922, external remote object drivers 1924 and gaming/entertainment drivers 1926.

(EX-1002, 123-24.)

Fig. 19 of '113 Patent, illustrating the optical/perceptual parameter based operating system, is as follows:

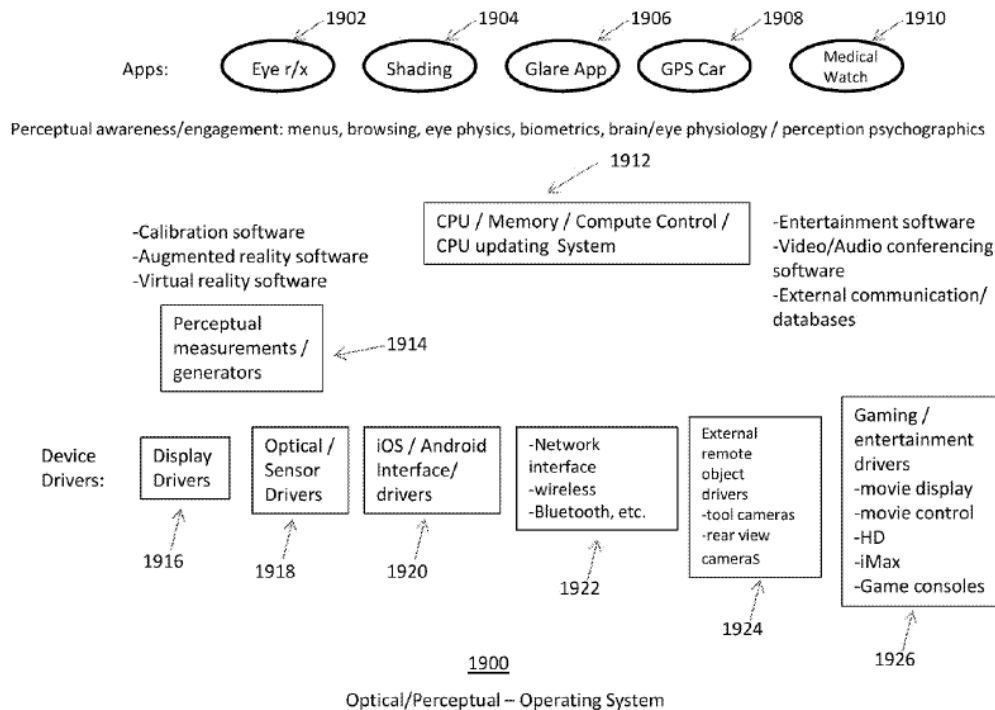


Figure 19

(EX-1001, Fig. 19.)

As the patent applicant highlighted, the operating system shown in the '113 Patent's Fig. 19 features applications 1902-1910—such as “GPS for navigation of a vehicle 1908” and “medical application 1910”—that interface with a processing

system. (EX-1001, 12:31-48; Fig. 19; EX-1002, 123-24; EX-1003, ¶86.) The processing system includes basic computer components: a CPU, memory, computer control, and a CPU updating system. (EX-1001, 12:31-48; Fig. 19; EX-1002, 123-24; EX-1003, ¶86.) The operating system includes “perceptual measurement/generators” that “include but are not limited to calibration software, augmented reality software, entertainment software, video/audio conferencing software and external communication/databases.” (EX-1001, 12:31-48; Fig. 19; EX-1002, 123-24; EX-1003, ¶86.) And the operating system uses drivers to interface with, *e.g.*, displays 1916; optical/sensors 1918; operating systems 1920; network interfaces 1922 (*e.g.*, wireless, Bluetooth); external remote objects 1924; and gaming/entertainment 1926. (EX-1001, 12:31-48; Fig. 19; EX-1002, 123-24; EX-1003, ¶86.)

All of these computing features are found in Osterhout’s eyepiece, as described above and as shown in Fig. 72 of Osterhout. (EX-1003, ¶87.)

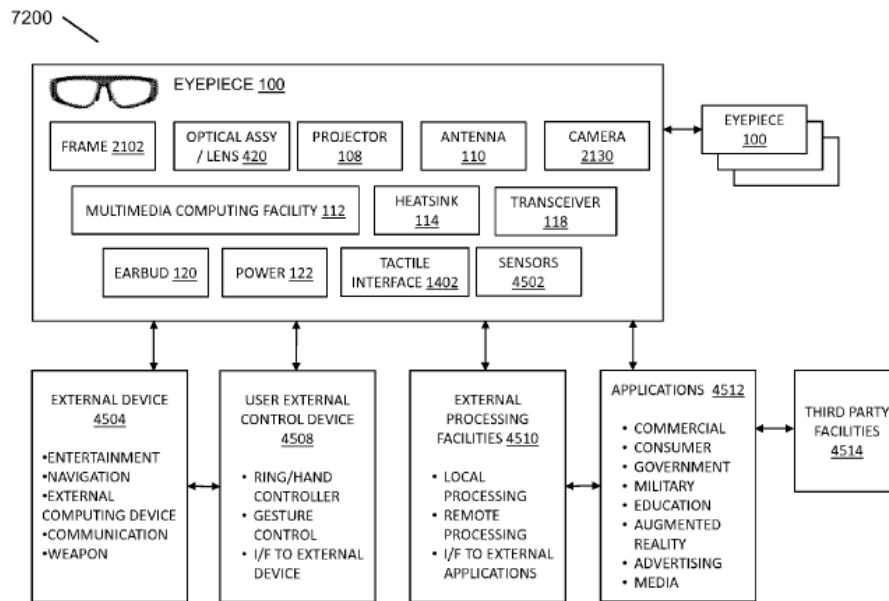


Fig. 72

(EX-1005, Fig. 72; EX-1003, ¶85.)

For example, Osterhout describes that features of the eyepiece include “applications for use 4512, control technologies and external control devices 4508, associated external devices 4504, software, networking capabilities, integrated sensors 4502, external processing facilities 4510, associated third party facilities 4514, and the like.” (EX-1005, [0189], Fig. 72; EX-1003, ¶87.) Osterhout’s applications 4512 include, *e.g.*, GPS navigation applications (*e.g.*, NearestTube, Google Earth, Layar); and medical applications for monitoring a person’s “health and well-being.” (EX-1005, [0282], [0362]-[0363]; EX-1003, ¶87.) These correspond at least to the ’113 Patent’s GPS application 1908 and medical application 1910. (EX-1003, ¶87.)

Osterhout also describes a processing system with a processor, memory,

computer control (*e.g.*, by eye tracking as described above, or via other input devices such as a mouse), and updating capability (EX-1005, [0362], [0557], [0573]-[0582]; EX-1003, ¶88.) These computer features correspond at least to the features of the '113 Patent's processing system 1912. (EX-1003, ¶88.)

Osterhout also describes “calibration tables,” “augmented reality applications,” entertainment software (*e.g.*, “mobile on-line gaming” and “computer video games”), “video calling or video conference” software, and communication with external databases over a network (*e.g.*, a “database accessible over the Internet”). (EX-1005, [0190], [0223]-[0224], [0300], [0321]-[0322], [0352], [0389]; EX-1003, ¶89.) These correspond to the '113 Patent's examples of “perceptual measurement/generators” (*i.e.*, calibration software augmented reality software, entertainment software, video/audio conferencing software, and external communication/databases, respectively). (EX-1003, ¶89.)

Osterhout also teaches interfacing with displays (*e.g.*, display optics as described above), sensors (*e.g.*, sensors 4502 and cameras 2130, and as described above), operating systems (*e.g.*, Windows Mobile, Linux, or Android installed on a “bio-phone”), networking interfaces (*e.g.*, WLAN, Bluetooth), external remote objects (*e.g.*, external computing device 4504), and “mobile on-line gaming” and “computer video games” (EX-1005, [0164], [0176], [0273], [0323], [0389], [0455], Fig. 72; EX-1003, ¶90.) These correspond, respectively, to the '113

Patent’s displays 1916; optical/sensors 1918; operating systems 1920; network interfaces 1922 (*e.g.*, wireless, Bluetooth); external remote objects 1924; and gaming/entertainment 1926. (EX-1003, ¶90.) To the extent Patent Owner contends these interfaces require drivers—which are conventional and ubiquitous components of operating systems, *see* EX-1019 at 289-290—Osterhout teaches at least a “display driver” that is used to control a display, corresponding to the ’113 Patent’s display drivers 1916. (EX-1005, [0273]; EX-1003, ¶90.) And a POSITA would have understood that the operating system would similarly include drivers to interface with sensors, external remote objects, and other components. (EX-1003, ¶90.)

To be sure, Petitioner is not relying upon the ’113 Patent’s specification as prior art or comparing specifications of the ’113 Patent and Osterhout to establish unpatentability of claim 1. The term “optical/perceptual parameter based operating system” is not a term of art. (EX-1003, ¶91.) Thus, what the term encompasses as informed by the ’113 Patent specification is relevant, and Osterhout provides a nearly identical disclosure of such an operating system.

f. [E] *wherein the wearable optics device is controlled by the optical/perceptual based operating system.*

Osterhout meets this element as described for claim 1[D]. (EX-1003, ¶93.)

3. Claim 2

Osterhout meets each limitation of claim 2, as described below. (EX-1003, ¶94.)

a. [Pre] *The wearable optics system of claim 1,*

Osterhout meets the wearable optics system of claim 1 as described for claim 1. (EX-1003, ¶95.)

b. [A] *wherein the dynamic eye tracking is utilized to control the optical/perceptual based operating system.*

Osterhout meets this element as described for claim 1[D]. (EX-1003, ¶96.) For example, “a wearer may want to move an object to the right, and *through eye control* ... select the object”. (EX-1005, [0309]; EX-1003, ¶96.) A POSITA would have understood this disclosure to teach using the dynamic eye tracking to select an object in a user interface of the optical/perceptual parameter based operating system. (EX-1003, ¶96.)

4. Claim 3

Osterhout meets each limitation of claim 3, as described below. (EX-1003, ¶97.)

a. [Pre] *The wearable optics system of claim 1,*

Osterhout meets the wearable optics system of claim 1 as described for claim 1. (EX-1003, ¶98.)

b. [A] wherein applications are utilized to control sensors and communication of the wearable optics device.

Osterhout meets this element. (EX-1003, ¶99.) For example, Osterhout discloses various software applications 4512 that can interface with the eyepiece 100, such as shown (in red) in Fig. 72:

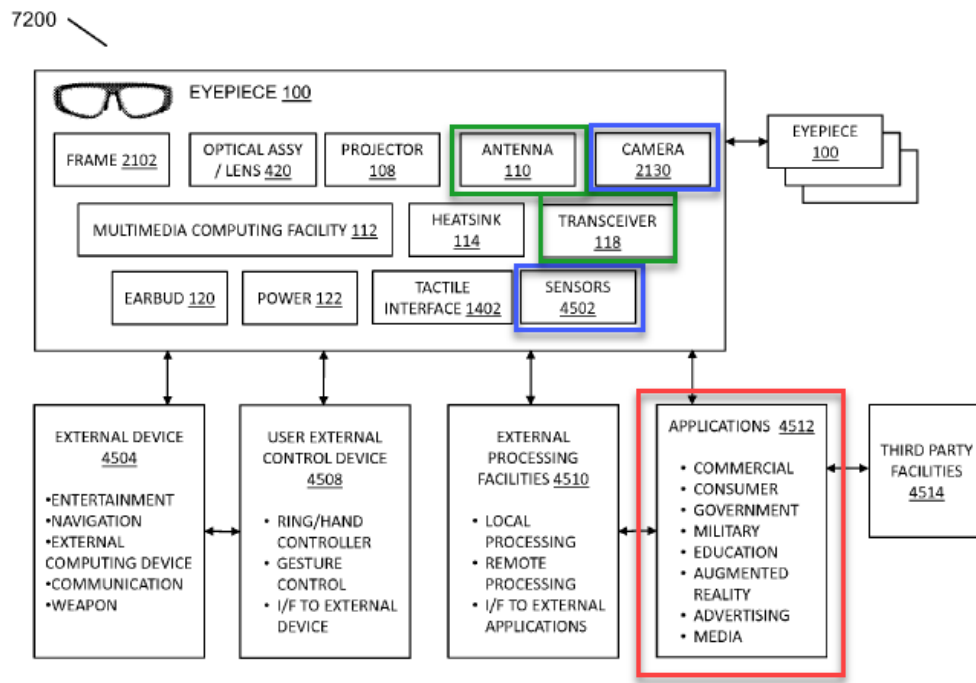


Fig. 72

(EX-1005, Fig. 72; EX-1003, ¶99.)

As seen in Fig. 72, applications 4512 can include those for augmented reality and media applications, among others. (EX-1005, [0189], Fig. 72; EX-1003, ¶100.) Osterhout teaches that applications are utilized to control sensors (in blue above) and communication (green) of the eyepiece 100. (EX-1003, ¶101.) For example a video calling or video conferencing application may control the

cameras (such as a forward facing camera embedded in the eyepiece), a microphone, and communicate with other users of the application via a network. (EX-1005, [0190], [0321]-[0337]; EX-1003, ¶101.) A POSITA would have understood this video calling or video conferencing application to control sensors (camera, microphone) and communication (exchange of audio/video data over a network) of the eyepiece 100. (EX-1003, ¶101.)

5. Claim 12

Osterhout meets each limitation of claim 12, as described below. (EX-1003, ¶102.)

a. [Pre] *A wearable optics device comprising:*

The preamble is taught by Osterhout as described for claim 1[Pre]. (EX-1003, ¶103.)

b. [A] *a lens; and*

Osterhout meets this element as described for claim 1[A]. (EX-1003, ¶104.)

c. [B] *a dynamic eye tracking mechanism in communication with the lens;*

Osterhout meets this element as described for claim 1[B]. (EX-1003, ¶105.)

- d. **[C] *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;***

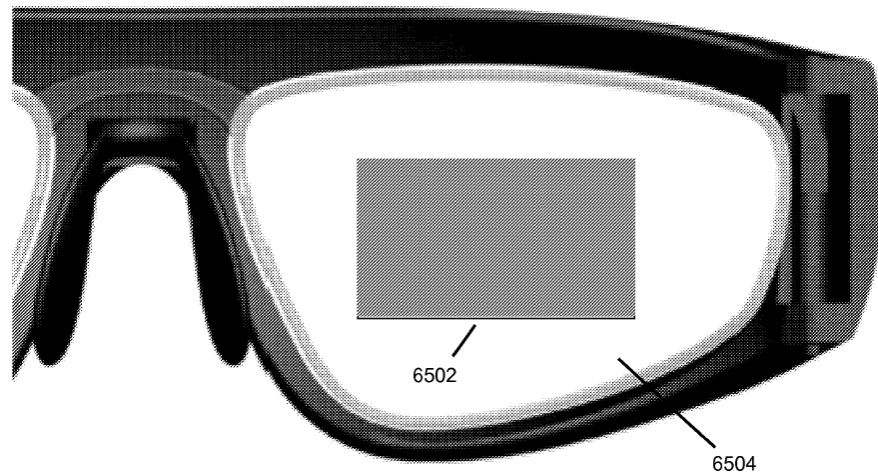
Osterhout meets this element as described for claim 1[C]. (EX-1003, ¶106.)

- e. **[D] *wherein an optical/perceptual parameter based operating system is utilized,***

Osterhout meets this element as described for claim 1[D]. (EX-1003, ¶107.)

- f. **[E] *wherein the lens includes a plurality of layers.***

Osterhout meets this element. (EX-1003, ¶108.) For example, Osterhout discloses that “the optical assembly includes an *electrochromic layer* that provides a display characteristic adjustment”. (EX-1005, [0019] (emphasis added); EX-1003, ¶108.) Similarly, the lens may include “integral chromic material” or a “chromic coating” to change the opacity of at least a portion of the lens. (EX-1005, [0193]; EX-1003, ¶108.) Fig. 65 illustrates an example, showing an electrochromic layer 6502 of the lens 6504:



(EX-1005, [0019], [0193], Fig. 65; EX-1003, ¶108.)

A POSITA would have understood the electrochromic layer, integral chromic material, and/or chromic coating to teach that *the lens includes a plurality of layers*. (EX-1003, ¶109.) For example, as shown in Fig. 65 above, the lens 6504 includes a first layer that includes a chromic portion 6502 (which may be an electrochromic layer); and at least a second layer that does not include the chromic portion 6502. (EX-1005, [0193], Fig. 65; EX-1003, ¶109.) Further, Osterhout explains that there may be a “plurality” of such chromic portions on the lens, such as “large portions of the lens,” “sub-portions of the projected area,” and “programmable areas of the lens.” (EX-1005, [0193]; EX-1003, ¶109.) The dynamic eye tracking system is in communication with this lens as discussed above for claim 1. (EX-1003, ¶109.)

Other lens layers are disclosed. (EX-1003, ¶110.) For example, Osterhout discloses that a “300 nm deep absorbing and anti-reflective layer is added to the

glasses,” in order to improve night vision capabilities. (EX-1005, [0248]; EX-1003, ¶110.) A POSITA would have understood this anti-reflective layer to be added to the lens of the glasses, such that the lens includes a plurality of layers (*e.g.*, a first layer that includes the anti-reflective layer, and at least a second layer that does not). (EX-1003, ¶110.) The POSITA would further understand that this anti-reflective layer could be added to a lens that includes a chromic layer as described above. (EX-1003, ¶110.)

In addition, as described for claim 1, a “special contact lens” may be provided to the user to track the motions of the eye. (EX-1005, [0301]; EX-1003, ¶111.) The contact lens can include an “embedded optical component,” such as a mirror or magnetic field sensor. (EX-1005, [0301]; EX-1003, ¶111.) The POSITA would have understood this to teach a *plurality of layers*: for example, a first layer of the contact lens that includes an embedded optical component, such as the mirror or the magnetic field sensor, and at least a second layer of the contact lens that does not include it. (EX-1003, ¶111.) The dynamic eye tracking system is in communication with this lens as discussed above for claim 1: for example, the embedded optical component of the contact lens is used by the dynamic eye tracking system for “measuring the motion of the eye.” (EX-1005, [0301]; EX-1003, ¶111.)

6. Claim 13

Osterhout meets each limitation of claim 13, as described below. (EX-1003, ¶112.)

a. [Pre] *The wearable optics system of claim 12,*

Osterhout meets the wearable optics system of claim 12 as described for claim 12. (EX-1003, ¶113.)

b. [A] *wherein the dynamic eye tracking is utilized to control the optical/perceptual based operating system.*

Osterhout meets this element as described for claim 2[A]. (EX-1003, ¶114.)

7. Claim 14

Osterhout meets each limitation of claim 14, as described below. (EX-1003, ¶115.)

a. [Pre] *The wearable optics system of claim 12,*

Osterhout meets the wearable optics system of claim 12 as described for claim 12. (EX-1003, ¶116.)

b. [A] *wherein applications are utilized to control sensors and communication of the wearable optics device.*

Osterhout meets this element as described for claim 3[A]. (EX-1003, ¶117.)

VI. MANN '526 IN VIEW OF VAISSIE RENDERS OBVIOUS CLAIMS 1-3 AND 12-14

A. Ground 2: Claims 1-3 And 12-14 Are Obvious In View Of Mann '526 And Vaissie

1. Summary of Mann '526

Mann '526 is a U.S. patent that was filed on Oct. 15, 1998 and issued on Oct. 23, 2001. Mann '526 is thus prior art to the '113 Patent under at least 35 U.S.C. §§ 102(a), (b), and (e).

Mann '526 discloses a wearable camera and viewfinder that is built into a wearable device, such as eyeglasses. (EX-1006, 3:16-18, 11:30-32; EX-1003, ¶120.) Fig. 1 illustrates an embodiment, showing, *e.g.*, eyeglass frames 100, lenses 105, and cameras 110 and 120:

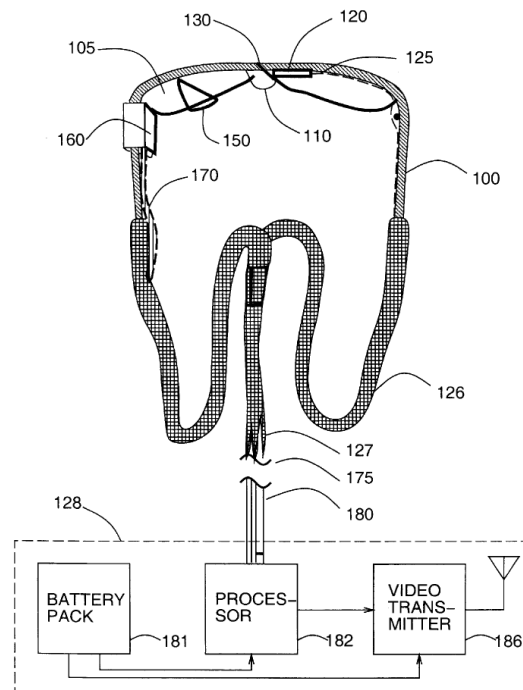


FIG. 1

(EX-1006, 11:30-32, Fig. 1; EX-1003, ¶120.)

As shown in Fig. 1, the eyeglasses can be in communication via connection 180 with a processor 182, which may contain a computer. (EX-1006, 12:25-31, Fig. 1; EX-1003, ¶121.) A viewfinder inside the glasses frames can include an electronic display, which can present the user with “information overlaid on top of his or her visual field of view.” (EX-1006, 5:48-51, 9:35-37, 12:39-44, 12:63-67; EX-1003, ¶121.) The viewfinder can be controlled by an “eye-tracking mechanism that causes the focus of the camera to be based on where the user is looking.” (EX-1006, 6:21-27; EX-1003, ¶122.)

Processor 182 can present a “reality window manager” (RWM) that may be driven by an eyetracker. (EX-1006, 26:10-19, Figs. 1C, 1D; EX-1003, ¶125.) Fig. 1C shows an example view of an RWM on a display, including a viewfinder 192 and terminal windows 194, 196 of the X-windows graphical user interface:

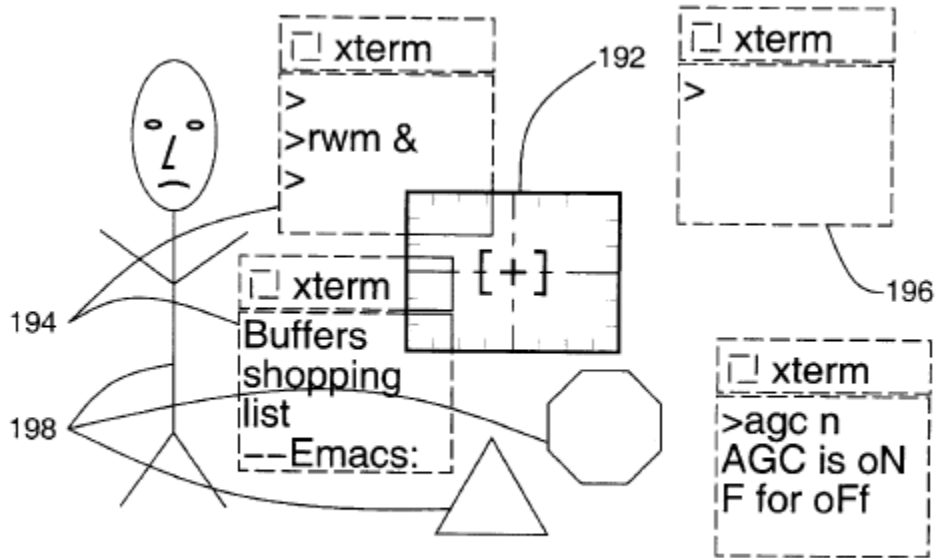


FIG. 1C

(EX-1006, 14:22-25, Fig. 1C; EX-1003, ¶125.)

Head tracking and eye tracking are used to interact with the viewfinder and the graphical user interface, such that “the viewfinder is the mouse/cursor: the wearer’s head is the mouse, and the center of the viewfinder is the cursor.” (EX-1006, 14:32-65; EX-1003, ¶127.) The head tracking and eye tracking can be used together to position viewfinder reticle 192 over a particular terminal window 194, and activate the terminal window, such that commands can be entered in the terminal window. (EX-1006, 14:32-35, 14:55-15:13; EX-1003, ¶128.) For instance, the user “selects window 196 by looking at it,” and then enters a command, such as to instruct a camera to start or stop recording. (EX-1006, 14:55-15:13; EX-1003, ¶128.)

2. Summary of Vaissie

Vaissie is a U.S. patent that was filed on Dec. 23, 1999 and issued on Aug. 13, 2002. Vaissie is thus prior art to the '113 Patent under at least 35 U.S.C. §§ 102(a), (b), and (e).

Vaissie discloses using an eye tracker in a “head mounted display that has an integrated eye-tracking function.” (EX-1007, 1:56-58; EX-1003, ¶130.) To perform eye tracking, a light source (*e.g.*, one or more near-infrared LEDs) illuminates the cornea of the eye via a beam splitter. (EX-1007, 3:16-31; EX-1003, ¶130.) A camera (*e.g.*, a CCD camera) detects a reflected light image reflected in the cornea. (EX-1007, 3:16-31; EX-1003, ¶130.) This provides an image of the eye to a computer, which processes the image to identify the location of pupil 42 and thus the user’s sight direction. (EX-1007, 3:39-46, Fig. 4; EX-1003, ¶130.) For example, with respect to Fig. 7b below, the computer measures a pupil center 72 and a corneal reflection barycenter 74, and determines the sight direction based on the vector PH based on the pupil center and the corneal reflection barycenter:

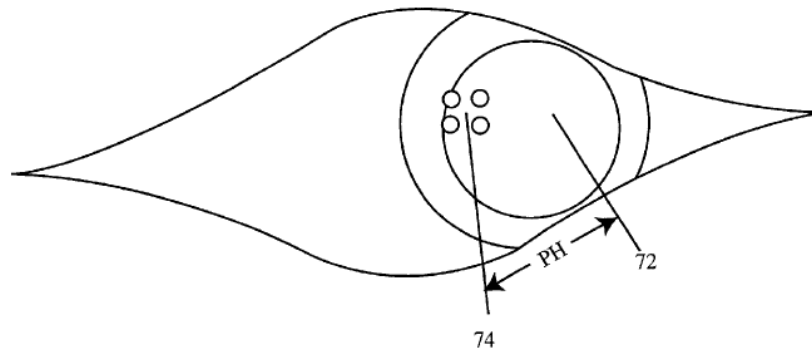


Figure 7b

(EX-1007, 3:59-4:3, Fig. 7b; EX-1003, ¶130.)

3. Claim 1

Mann '526 in view of Vaissie meets each limitation of claim 1, as described below. (EX-1003, ¶131.)

a. Element [Pre]

The preamble is taught by Mann '526 in view of Vaissie. (EX-1003, ¶132.)

For example, Mann '526 discloses a “wearable camera and viewfinder” that is “built into eyeglass frames 100, typically containing two eyeglass lenses 105.” (EX-1006, 3:16-18, 11:30-32; EX-1003, ¶132.) Fig. 1 illustrates an example:

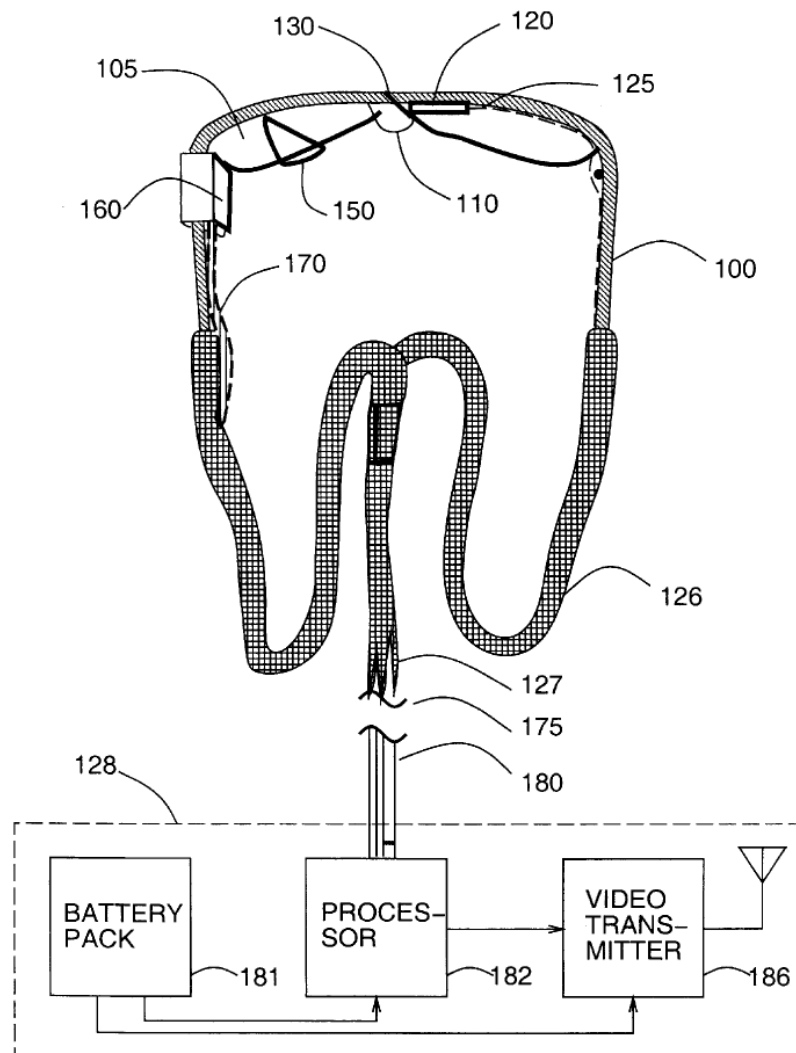


FIG. 1

(EX-1006, 11:30-32, Fig. 1; EX-1003, ¶132.)

b. Element [A]

Mann '526 in view of Vaissie meets this element. (EX-1003, ¶133.) For example, Mann '526 discloses a “wearable camera and viewfinder” that is “built into eyeglass frames 100, typically containing two eyeglass lenses 105.” (EX-1006, 3:16-18, 11:30-32; EX-1003, ¶133.) Fig. 1 illustrates an example:

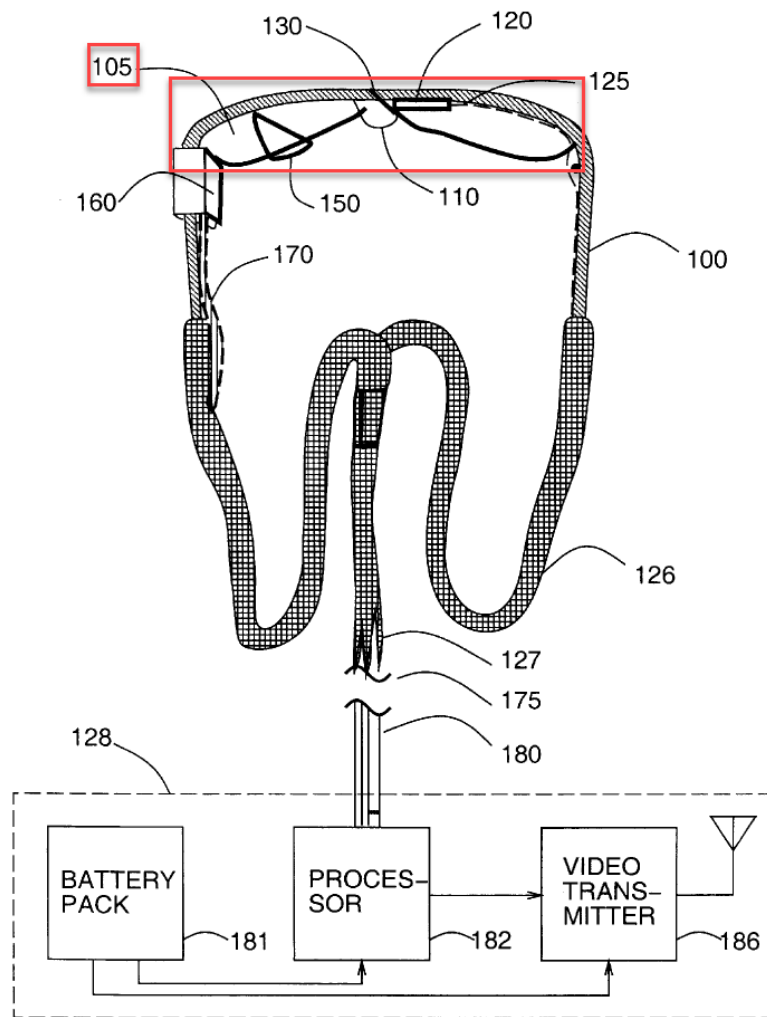


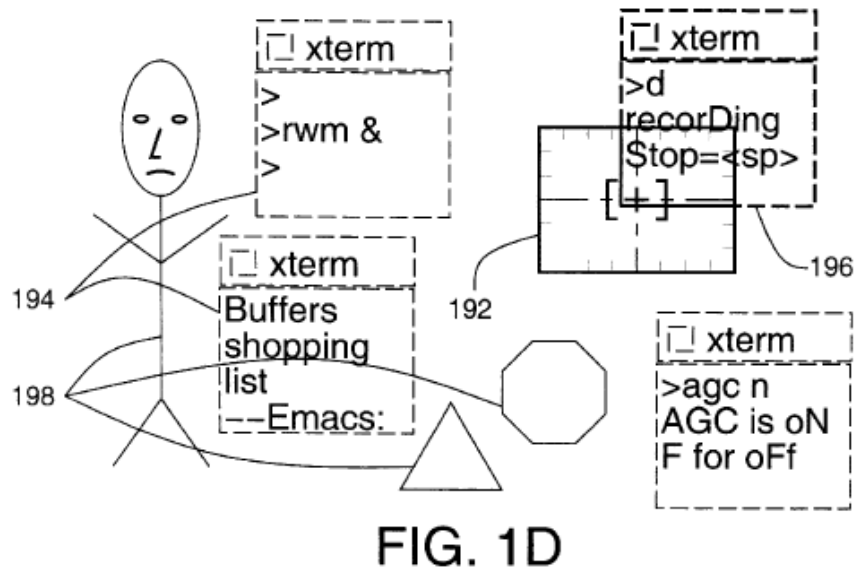
FIG. 1

(EX-1006, 11:30-32, Fig. 1 (annotated); EX-1003, ¶133.)

c. Element [B]

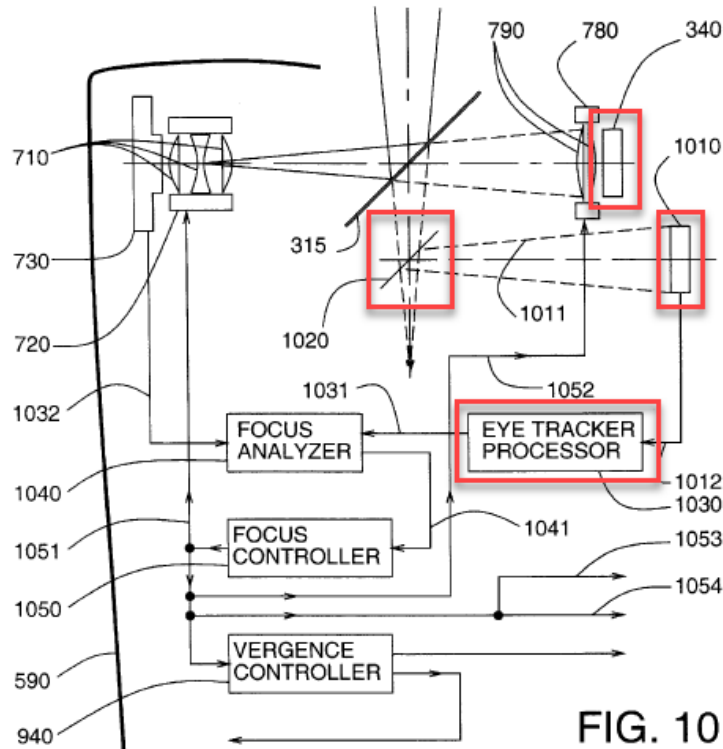
Mann '526 in view of Vaissie meets this element. (EX-1003, ¶134.) For example, Mann '526 discloses a viewfinder with a focusing mechanism that is “controlled by an automatic focusing mechanism of a camera system, and in which the apparatus comprises an *eye-tracking mechanism* that causes the focus of the

camera to be based on where the user is looking.” (EX-1006, 6:21-27 (emphasis added); EX-1003, ¶134.) The eye tracking mechanism can be used to control a cursor position in a “reality window manager,” such as the cursor within viewfinder 192 in Fig. 1D:



(EX-1006, 26:10-19, Figs. 1C, 1D; EX-1003, ¶134.)

Fig. 10 illustrates an example of the eye-tracking mechanism:



(EX-1006, 24:66-25:32, Fig. 10 (annotated); EX-1003, ¶135.)

Fig. 10 shows a left-eye portion of Mann '526's wearable camera system, in which the camera focus and vergence are driven by the output of the eye tracking mechanism. (EX-1006, 24:66-25:1, Fig. 10; EX-1003, ¶136.) The eyetracker 1010 includes a camera and infrared light sources. (EX-1006, 25:1-4, Fig. 10; EX-1003, ¶136.) The eyetracker 1010 illuminates the eye (*e.g.*, via the infrared light sources); and observes (*e.g.*, via the camera) the eye via light rays reflected in beamsplitter 1020. (EX-1006, 25:1-7, Fig. 10; EX-1003, ¶136.) The eyetracker 1010 thus “reports the direction of eye gaze,” via a signal 1012 provided to an eye tracker processor 1030. (EX-1006, 25:7-11, Fig. 10; EX-1003, ¶136.) The eye

tracker processor 1030 converts the eye gaze direction into X and Y coordinates, corresponding to the screen coordinates of a viewfinder screen 340. (EX-1006, 25:7-11, Fig. 10; EX-1003, ¶136.) The viewfinder 340 is visible to the user via reflection in mirror 315. (EX-1006, 25:5-7, Fig. 10; EX-1003, ¶136.) The X and Y coordinates indicate where on the viewfinder screen 340 the user is looking. (EX-1006, 25:11-13, Fig. 10; EX-1003, ¶136.)

The eye tracking mechanism is *dynamic* at least because it tracks the “direction of eye gaze” as the user’s eye moves; and causes “movement of the cursor” (such as shown in Figs. 1C and 1D) and/or an adjustment of focus by a servo mechanism 720, in accordance with the tracked eye movement. (EX-1006, 24:66-25:32, 26:10-19, Fig. 10; EX-1003, ¶137.)

The dynamic eye tracking mechanism is *in communication with the lens* at least because the eye tracking mechanism is in optical communication with the lens, *e.g.*, by the eye tracking mechanism receiving light rays from the lens. (EX-1003, ¶138.) For example, the camera of the eye tracking mechanism 1010 captures an image of the eye by capturing light rays transmitted by the lens and reflected in the eye. (EX-1003, ¶138.) These light rays are shown in Fig. 3, in which rays 311 and 321, after being transmitted by the lens, “pass through the apparatus and enter directly into the eye without being deflected by two-sided mirror 315.” (EX-1006, 18:21-26, Fig. 3; EX-1003, ¶138.) The mirror 315 of Fig.

3 is also present in the example of the eye tracking mechanism in Fig. 10 above.

(EX-1003, ¶138.) The light rays 311 and 321 from the lens are thus captured by the eye tracking mechanism. (EX-1003, ¶138.)

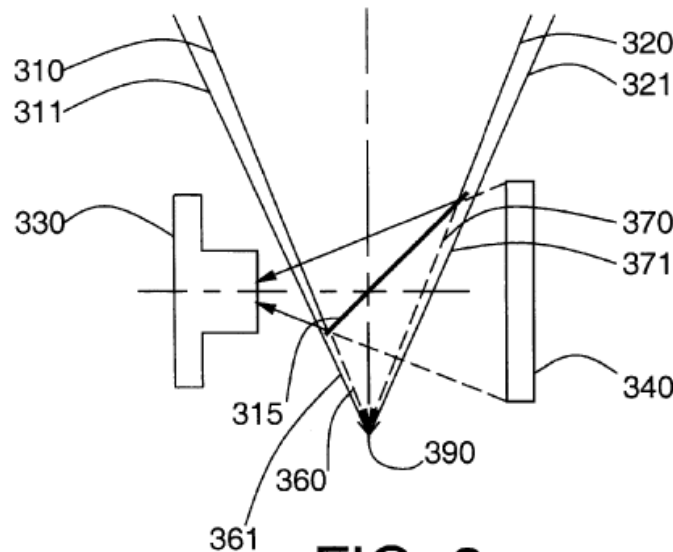


FIG. 3

(EX-1006, 18:21-26, Fig. 3; EX-1003, ¶138.)

In addition, Mann '526 expressly suggests that a partially transparent beamsplitter 415 can be “installed in place of mirror 315.” (EX-1006, 18:62-19:21; EX-1003, ¶139.) To the extent not expressly disclosed by Mann '526, it would have been obvious to a POSITA to install the beamsplitter in place of mirror 315 in communication with the eye tracking mechanism—such as shown in the embodiment shown in Fig. 10—such that the beamsplitter transmits light rays from the lens to the eye tracking mechanism. (EX-1006, 18:62-19:21, Fig. 4, Fig. 10; EX-1003, ¶139.) In this configuration, because “only a portion of the rays” from

the lens are reflected by the beamsplitter, as shown with respect to light rays 310 in Fig. 4 below, remaining light rays are transmitted to the eye tracking mechanism from the lens via the beamsplitter, such that the eye tracking mechanism is in optical communication with the lens, in addition to the optical communication described above. (EX-1006, 18:62-19:21, Fig. 4, Fig. 10; EX-1003, ¶139.)

The POSITA would have been motivated to make this expressly suggested modification to realize an advantage described in Mann '526: to “permit others to make full eye-contact with the wearer.” (EX-1006, 18:62-19:15, Fig. 4, Fig. 10; EX-1003, ¶139.) Further, the POSITA would have enjoyed a reasonable expectation of success at least because Mann '526 specifies, on a component-by-component basis, how this modification would be made. (EX-1006, 18:62-19:15, Fig. 3, Fig. 4, Fig. 10; EX-1003, ¶139.)

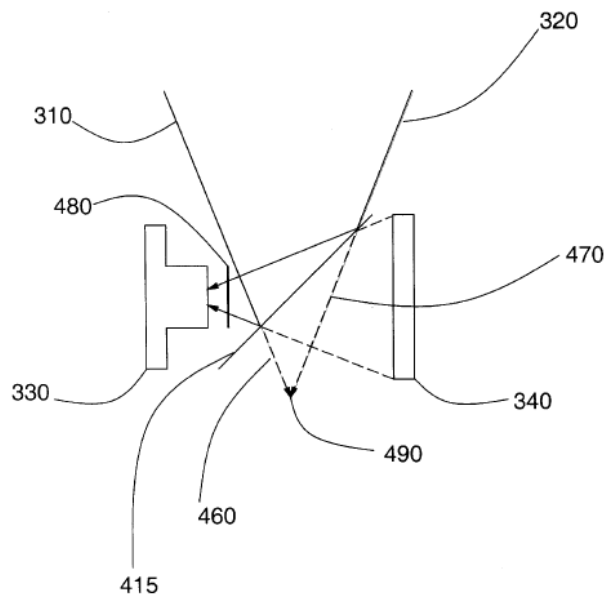


FIG. 4

(EX-1006, Fig. 4; EX-1003, ¶139.)

d. Element [C]

Mann '526 in view of Vaissie meets this element. (EX-1003, ¶140.)

(i) Mann '526 in combination with Vaissie

To the extent that Mann '526 alone does not teach this limitation, it is taught by Mann '526 in combination with Vaissie. (EX-1003, ¶143.) Vaissie describes eye tracking in a “head mounted display that has an integrated eye-tracking function,” such as the eyewear described in Mann '526. (EX-1007, 1:56-58; EX-1003, ¶143.) Vaissie explains that, as in Mann '526, a light source (*e.g.*, one or more near-infrared LEDs) illuminates the cornea of the eye via a beam splitter. (EX-1007, 3:16-31; EX-1003, ¶143.) In Vaissie, also as in Mann '526, a camera (*e.g.*, a CCD camera) detects a reflected light (*e.g.*, visible light) image reflected in the cornea. (EX-1007, 3:16-31; EX-1003, ¶143.) This provides an image of the eye to a computer, which processes the image to identify the location of the pupil and thus the user's sight direction. (EX-1007, 3:39-46, Fig. 4; EX-1003, ¶143.)

Vaissie explains a process for how the image is processed to determine the user's eye gaze direction. (EX-1003, ¶144.) Fig. 7a below represents “an image of the pupil, cornea and iris of a user's eye,” with reflections of the light source (*e.g.*, 4 LEDs), when the user gazes straight ahead:

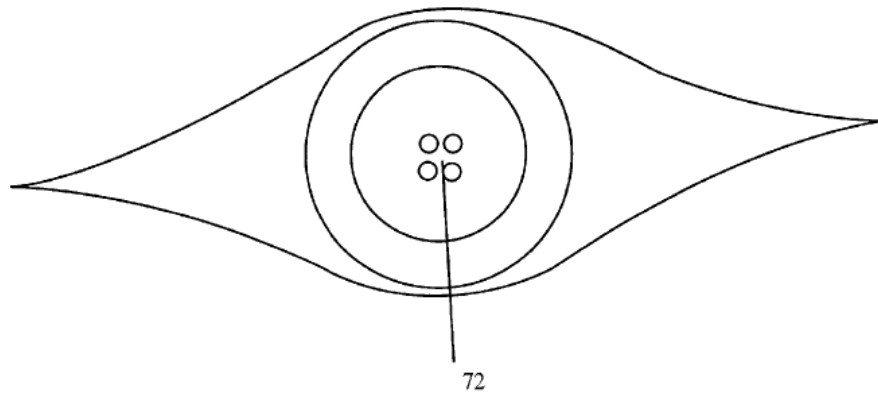


Figure 7a

(EX-1007, 3:59-61, Fig. 7a; EX-1003, ¶144.)

When the user is gazing off axis, “the reflections of the 4 LEDs on an image of the pupil, cornea and iris of the user’s eye” are as represented in Fig. 7b:

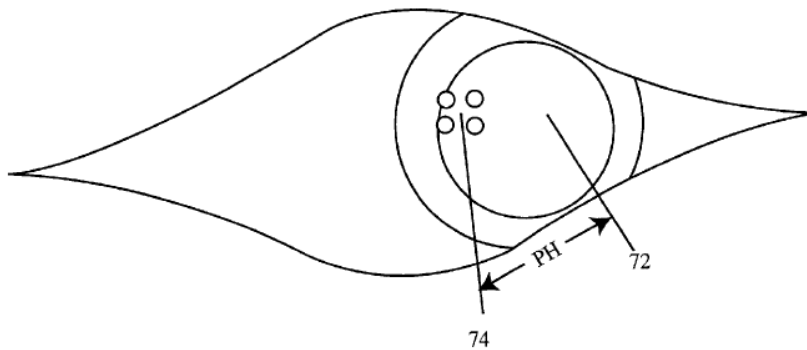


Figure 7b

(EX-1007, 3:61-64, Fig. 7b; EX-1003, ¶145.)

Vaissie explains that the “location of the LEDs when the eye rotates” is computed by measuring the “location of the center 72, of the entrance pupil,” and measuring the “barycenter of the images of the LEDs,” which are reflected in the cornea. (EX-1007, 3:64-4:3, Fig. 7b; EX-1003, ¶146.) A vector PH from the

center of the entrance pupil 72 to the barycenter of the cornea reflections 74 is then measured, as shown in Fig. 7b, and used to “determine the sight direction with respect to the axis of the reference point.” (EX-1007, 3:64-4:3, Fig. 7b; EX-1003, ¶146.)

Mann ’526 in view of Vaissie thus teaches that the dynamic eye tracking mechanism utilizes *optical parameter measurements*; and that the optical parameter measurements include at least *pupil measurements* (e.g., the center of entrance pupil 72) and *corneal measurements* (e.g., the barycenter of the cornea reflections 74), as recited in the claim. (EX-1003, ¶147.) As explained in Vaissie, these optical parameter measurements are used to measure vector PH, from which the user’s eye gaze direction can be determined. (EX-1003, ¶147.)

**(1) Motivation to Combine Mann ’526
and Vaissie with Reasonable
Expectation of Success**

To the extent that Mann ’526 alone does not teach a POSITA how to practice this limitation, the POSITA would have been motivated to combine Mann ’526 and Vaissie to meet the claim limitations with reasonable expectation of success. (EX-1003, ¶148.)

First, Mann ’526 does not expressly disclose how to perform eye tracking using its own dynamic eye tracking mechanism. (EX-1003, ¶149.) For example, while Mann ’526 discloses that an eye tracking mechanism includes a camera and

infrared light sources, that the eye tracking mechanism “illuminates and observes the eyeball,” and that the eye tracking mechanism “reports the direction of eye gaze,” Mann ’526 does not expressly disclose how the direction of the eye gaze is determined. (EX-1006, 24:66-25:31, Fig. 10; EX-1003, ¶149.) So, to the extent Mann ’526 alone does not teach this process to the POSITA, the POSITA would have been motivated to identify a reference that explains how to use Mann ’526’s eye tracking mechanism to perform eye tracking (*e.g.*, report the direction of eye gaze). (EX-1003, ¶149.)

Second, Vaissie expressly suggests its inclusion in a “head mounted display that has an integrated eye-tracking function,” just like the head-mounted display in Mann ’526. (EX-1007, 1:56-58; EX-1003, ¶150.) Vaissie explains that implementing Vaissie’s eye tracking in head-mounted devices can advantageously allow “physically challenged people” to interact with such devices. (EX-1007, 1:40-53; EX-1003, ¶150.) Additional advantages include enhancing local images, correcting for depth perception difficulties, and increased resolution of visual displays. (EX-1007, 1:45-53; EX-1003, ¶150.) The POSITA would have been motivated to combine Vaissie’s eye tracking with the head-mounted device of Mann ’526 to realize these advantages. (EX-1003, ¶150.)

Third, the eye tracking described in Vaissie utilizes components analogous to those already found in Mann ’526’s eyewear. (EX-1003, ¶151.) For example,

Vaissie’s light source—with “at least one, but preferably four, near infrared LEDs” that emit light toward the cornea of the eye—is analogous to the “infrared light sources” of the eye tracker 1010 in Mann ’526, which “illuminates ... the eyeball” via light rays 1011. (EX-1007, 3:1-5, 3:16-31; EX-1006, 24:66-25:4, Fig. 10; EX-1003, ¶151.) Vaissie’s CCD camera, which images the cornea, is analogous to Mann ’526’s camera that “observes the eyeball” and can include a CCD image sensor. (EX-1007, 3:16-31; EX-1006, 7:2-4, 24:66-25:4, Fig. 10; EX-1003, ¶151.) And Vaissie discloses using a beam splitter to deliver light from the light source to the eye — analogous to beam splitter 1020 of Mann ’526. (EX-1007, 3:16-31; EX-1006, 24:66-25:4, Fig. 10; EX-1003, ¶151.) Thus, the combination of Vaissie and Mann ’526 would have been predictable and provided a reasonable expectation of success, at least because the combination would have used analogous and well understood components from both references in analogous ways, and in a predictable manner. (EX-1003, ¶151.)

e. Element [D]

Mann ’526 in view of Vaissie meets this element as described below. (EX-1003, ¶152.)

(i) Operating System

Mann ’526 in view of Vaissie teaches an operating system. (EX-1003, ¶153; *see also* U.S. Pat. Appl. Pub. No. 2008/0024594 at [0212] (“An[] xterm *operating*

system suitable and of a type for use in the present invention is *that put forth in the Mann ['526] patent.*)” (emphasis added).) For example, Mann ’526 discloses that processor 182, which can include a computer, can present a “reality window manager” (RWM) such as shown in Fig. 1C:

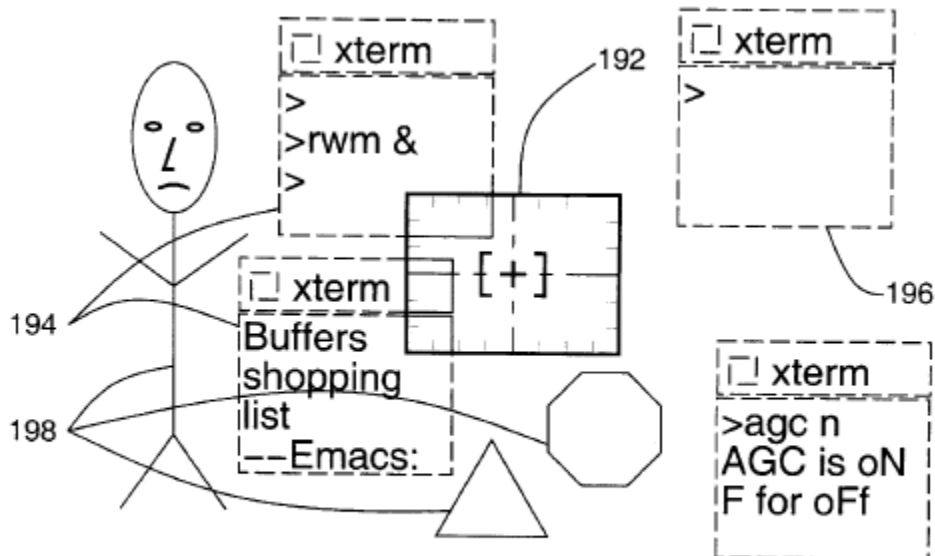


FIG. 1C

(EX-1006, 14:22-25, 26:10-18, Fig. 1C; EX-1003, ¶153.)

Visible in Fig. 1C are “xterm” terminal windows 194, 196 in the RWM, which may be windows of the “commonly-used X-windows graphical user interface.” (EX-1006, 14:22-25; EX-1003, ¶154.) As a POSITA would have recognized, X-windows is a standard windowing system application for the popular UNIX operating system, and was commonly distributed with and used with various other operating systems by the 2013 priority date of the ’113 Patent. (EX-1019, 356; EX-1020, 485; EX-1003, ¶154.) The POSITA would thus

recognize Mann '526's terminal windows as belonging to such a windowing system. (EX-1003, ¶154.)

The POSITA would have understood that X-windows, and other windowing systems such as disclosed in Mann '526, are ubiquitous features of operating systems. (EX-1003, ¶155.) In some operating systems, a windowing system (such as X-windows) can include a client application executed by the operating system. (EX-1019, 356; EX-1003, ¶155.) In some operating systems, such as Microsoft Windows, a windowing system is part of the operating system kernel. (EX-1019, 357; EX-1003, ¶155.) As the POSITA would have understood, a component that runs in the operating system kernel, like the windowing system in Microsoft Windows, is part of that operating system. (EX-1019, 3 (“Everything running in kernel mode is clearly part of the operating system.”); EX-1003, ¶155.)

The POSITA would thus understand Mann '526 to teach an *operating system*, such as may execute on processor 182—at least by Mann '526's disclosure of X-windows and xterm terminal windows, as described above, particularly given their close association with the UNIX operating system. (EX-1006, 14:21-27; EX-1003, ¶156.) Moreover, as Mann '526 discloses, terminal windows can be used to provide commands to processes executing on processor 182. (EX-1006, 14:42-45; EX-1003, ¶156.) For example, Mann '526 discloses that a terminal window “can accept commands.” (EX-1006, 14:42-45; EX-1003, ¶156.) Further, a terminal

window can have “programs running in it.” (EX-1006, 14:42-45; EX-1003, ¶156.) For example, Mann ’526 illustrates an example of a well-known text editor program, Emacs, running in an xterm window. (EX-1006, 14:22-25, Fig. 1C; EX-1003, ¶156.)

A terminal window can also provide a command-line interface for inputting and executing commands from a user. (EX-1019, 360; EX-1003, ¶156.) Fig. 1D of Mann ’526 shows several such examples in xterm windows 194 and 196. (EX-1006, Fig. 1D; EX-1003, ¶156.) As the POSITA would have recognized, managing processes executing on a processor, such as processor 182, is a function performed by an operating system. (EX-1003, ¶156.)

To the extent not expressly disclosed by Mann ’526, an operating system would have been obvious to a POSITA from the teachings of Mann ’526 in view of Vaissie. (EX-1003, ¶157.) The POSITA would have found it obvious to include an operating system, and would have had a reasonable expectation of success in doing so, for the reasons described below. (EX-1003, ¶157.)

Mann ’526 discloses a computer system of sufficient complexity that an operating system would be a logical inclusion. (EX-1019 at 5 (“the operating system is there to manage all the pieces of a complex system.”); EX-1003, ¶158.) For example, Mann ’526’s computer system includes various components: inputs (*e.g.*, cameras 110 and 120, and eye tracking and head tracking inputs, as described

above); outputs (*e.g.*, display 160); a processor (*e.g.*, processor 182), which may itself include multiple processors (*e.g.*, vision analysis processor 183, information processor 184, graphics synthesis processor 185); a power source (*e.g.*, battery pack 181); a storage device; and a network connection. (EX-1006, 11:1-14:10, Fig. 1; EX-1003, ¶158.) These components introduce various complexities, including how to allocate these components among various programs executing via the processor 182. (EX-1003, ¶158.)

The POSITA would have understood that managing the above components of Mann '526's computer system, such as by allocating components and resources of the computer system among processes of processor 182, is a task best suited to an operating system. (EX-1003, ¶159.) Indeed, this is a primary purpose of operating systems. (EX-1019, 5 (“the job of the operating system is to provide for an orderly and controlled allocation of the processors, memories, and I/O devices among the various programs competing for them”); EX-1003, ¶159.)

Moreover, by 2013, operating systems were a relatively mature and well understood type of software, such that the POSITA would be familiar with their usage, and would be able to incorporate an operating system into a computer system like that of Mann '526 with a reasonable expectation of success and without undue experimentation. (EX-1003, ¶160.)

(ii) Optical/Perceptual Parameter Based Operating System

Mann '526 in view of Vaissie further teaches that the operating system is an optical/perceptual parameter based operating system. (EX-1003, ¶161.) Mann '526 teaches that its operating system is based on optical parameters and perceptual parameters. (EX-1003, ¶161.) For example, Mann '526 discloses that head tracking and eye tracking can be used to interact with the viewfinder and the graphical user interface, such that “the viewfinder is the mouse/cursor: the wearer’s head is the mouse, and the center of the viewfinder is the cursor.” (EX-1006, 14:32-65; EX-1003, ¶161.) Fig. 1D illustrates an example motion of a cursor and viewfinder reticle 192, controlled by head tracking and eye tracking:

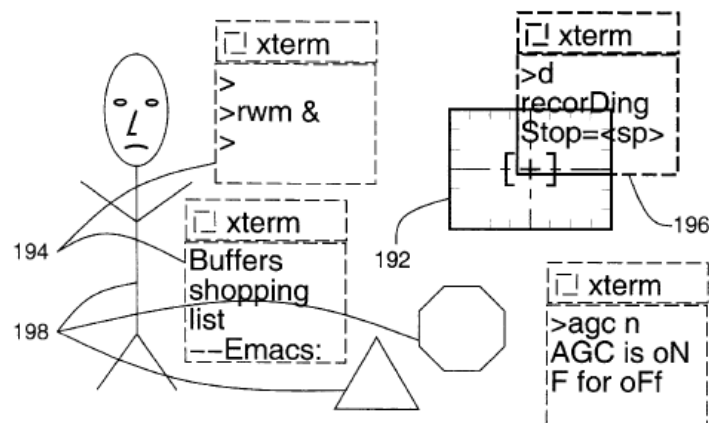


FIG. 1D

(EX-1006, 26:10-19, Figs. 1C, 1D; EX-1003, ¶161.)

As described above with respect to element 1[C], the eye tracker in Mann '526 in view of Vaissie utilizes optical parameter measurements, at least because,

as described above, the eye tracker uses *pupil measurements* and *corneal measurements* to determine the direction of eye gaze. (EX-1003, ¶162.) The operating system uses these optical parameter measurements to determine the coordinates of the cursor, which is in turn used to select and activate terminal windows for controlling processes of the eyewear. (EX-1006, 14:32-65; EX-1003, ¶162.) Handling input (*e.g.*, line-of-sight information for the user’s eye) and controlling processor actions are core operating system functions, so the POSITA would have understood them to be performed by the processor’s operating system. (EX-1019, 269 (“One of the main functions of an operating system is to control all the computer’s I/O (Input/Output) devices”), 5 (“the job of the operating system is to provide for an orderly and controlled allocation of the processors, memories, and I/O devices among the various programs competing for them”); EX-1003, ¶162.) The Mann ’526 operating system is *optical parameter based* at least in that it utilizes the optical parameter measurements to execute these core operating system functions. (EX-1003, ¶162.)

Similarly, as disclosed by Mann ’526, the cursor and terminal window activation is also controlled by head tracking. (EX-1006, 14:32-65; EX-1003, ¶163.) For example, a user “makes [a] window active by head movement up and to the right.” (EX-1006, 14:45-50; EX-1003, ¶163.) As Mann ’526 discloses, the head tracker is based on camera output, utilizing at least *video* parameters of the

camera to “orient[] the head (and hence the camera) that the cursor may be positioned.” (EX-1006, 14:45-50; EX-1003, ¶164.)

For example, “video outputs from cameras 110 and 120 pass through wiring harness 180 into vision analysis processor 183,” which uses this video data for head tracking. (EX-1006, 13:43-46; EX-1003, ¶164.) The head tracking determines the orientation of the head “based on the visual location of objects in the field of view of camera 110.” (EX-1006, 13:46-49; EX-1003, ¶164.) That is, the orientation of the head is based on the video output from the camera. (EX-1003, ¶164.)

The video parameters used by the head tracking are perceptual parameters at least because the ’113 Patent identifies “video” as a specific example of perceptual parameters. (EX-1001, 14:8-11; EX-1003, ¶165.) The head tracking utilizes other perceptual parameters as well. (EX-1003, ¶165.) For example, the camera output on which the head tracking is based captures *environmental* parameters (*e.g.*, from the environment of the user, as captured by the camera); and the head tracking is based further on *spatial* parameters describing spatial relationships between the “objects in the field of view.” (EX-1006, 13:46-49; EX-1003, ¶165.) Further, the head tracking output, which indicates the “yaw, pitch, and roll” of the head, and which is utilized by the operating system, can itself be described as a *spatial* parameter, at least because yaw, pitch, and roll describe the spatial orientation of

the head. (EX-1006, 13:46-49; EX-1003, ¶165.)

The Mann '526 operating system is thus *perceptual parameter based* at least in that it utilizes the perceptual parameters of the camera-based head tracking system to execute operating system functions, as described above. (EX-1003, ¶166.)

f. Element [E]

Mann '526 in view of Vaissie meets this element at least as described for element 1[D]. (EX-1003, ¶167.) For example, the eyewear is controlled by the optical/perceptual parameter based operating system at least in that the optical/perceptual parameter based operating system is used to control process execution (*e.g.*, starting and stopping a camera of the eyewear), such as via GUI terminal windows that may be activated via eye tracking and head tracking. (EX-1006, 14:32-35, 14:55-15:13; EX-1003, ¶167.)

As an example, as shown in Fig. 1D below, a user can use a terminal window of the operating system to enter a command, such as to instruct a camera process to start or stop recording. (EX-1006, 14:55-15:13; EX-1003, ¶168.) For instance, in Fig. 1D, the “recorDing Stop” command is executed by the operating system to pause the camera from recording. (EX-1006, 14:55-15:36; EX-1003, ¶168.) The POSITA would have understood this to include providing a command

(e.g., “Stop”) to a process executing on processor 182 and controlling a camera of the wearable optics device. (EX-1006, 14:66-15:36; EX-1003, ¶168.)

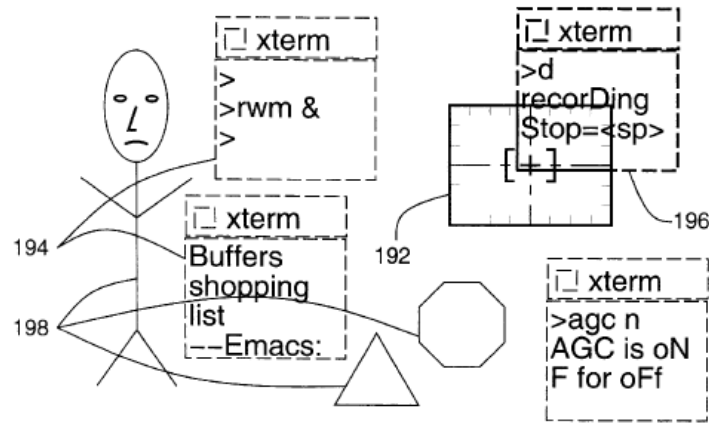


FIG. 1D

(EX-1006, Fig. 1D; EX-1003, ¶168.)

4. Claim 2

Mann '526 in view of Vaissie meets each limitation of claim 2, as described below. (EX-1003, ¶169.)

a. Element [Pre]

Mann '526 in view of Vaissie meets the wearable optics system of claim 1 as described for claim 1[Pre]. (EX-1003, ¶170.)

b. Element [A]

Mann '526 in view of Vaissie meets this element as described for claim 1[E]. (EX-1003, ¶171.)

5. Claim 3

Mann '526 in view of Vaissie meets each limitation of claim 3, as described below. (EX-1003, ¶172.)

a. Element [Pre]

Mann '526 in view of Vaissie meets the wearable optics system of claim 1 as described for claim 1. (EX-1003, ¶173.)

b. Element [A]

Mann '526 in view of Vaissie meets this element as described for claim 1[D]. (EX-1003, ¶174.) For example, as described above, Mann '526 discloses that sensors (*e.g.*, cameras) of the eyeglasses can be controlled by using a terminal window of a window manager application (*e.g.*, X-windows) to provide a command to a sensor (*e.g.*, to command the camera to start or stop recording). (EX-1006, 4:55-15:13; EX-1003, ¶174.) Mann '526 thus teaches that applications are utilized to control *sensors* of the wearable optics device. (EX-1003, ¶174.) In addition, as Mann '526 discloses, camera recordings are transmitted by transmitter 186. (EX-1006, 15:31-36; EX-1003, ¶174.) Mann '526 thus also teaches that applications are utilized to control *communication* of the wearable optics device, at least by using a terminal window to control the camera (and thus the transmission of camera recordings) as described above. (EX-1003, ¶174.)

6. Claim 12

Mann '526 in view of Vaissie meets each limitation of claim 12, as described below. (EX-1003, ¶175.)

a. Element [Pre]

The preamble is taught by Mann '526 in view of Vaissie as described for claim 1[Pre]. (EX-1003, ¶176.)

b. Element [A]

Mann '526 in view of Vaissie meets this element as described for claim 1[A]. (EX-1003, ¶177.)

c. Element [B]

Mann '526 in view of Vaissie meets this element as described for claim 1[B]. (EX-1003, ¶178.)

d. Element [C]

Mann '526 in view of Vaissie meets this element as described for claim 1[C]. (EX-1003, ¶179.)

e. Element [D]

Mann '526 in view of Vaissie meets this element as described for claim 1[D]. (EX-1003, ¶180.)

f. Element [E]

Mann '526 in view of Vaissie meets this element. (EX-1003, ¶181.) For

example, Mann '526 discloses that one or more beamsplitters, such as described with respect to claim 1, can be “embedded in one or both glass lenses of the eyeglasses.” (EX-1006, 20:22-24; EX-1003, ¶181.) The beamsplitters “may be integrated into the lenses in such a manner to have the appearance of ordinary lenses in ordinary bifocal eyeglasses.” (EX-1006, 20:29-31; EX-1003, ¶181.) In addition, beamsplitters can be “implemented as a metallisation within a lens of the eyeglasses.” (EX-1006, 22:55-61; EX-1003, ¶181; *see also* N. Keng, *Fabricating and Characterizing Thin Film Materials*, <https://www.thermofisher.com/blog/materials/metallization-fabricating-and-characterizing-thin-metal-films/> (“Metallization is the process of adhering a thin metallic film to a surface.”).) Further, beamsplitters and diverging lens 250 “may be embedded within the eyeglass lens ... so that the embedded elements may appear to be a feature of bifocal eyeglasses.” (EX-1006, 22:55-61; EX-1003, ¶181.) Mann '526 thus teaches that *the lens includes a plurality of layers (e.g., a metallization layer of the lens, a layer of the lens that does not include the metallization layer, and/or a layer comprising one or more beamsplitters embedded within the lens).* (EX-1003, ¶181.)

7. Claim 13

Mann '526 in view of Vaissie meets each limitation of claim 13, as described below. (EX-1003, ¶182.)

a. Element [Pre]

Mann '526 in view of Vaissie meets the wearable optics system of claim 12 as described for claim 12. (EX-1003, ¶183.)

b. Element [A]

Mann '526 in view of Vaissie meets this element as described for claim 2[A]. (EX-1003, ¶184.)

8. Claim 14

Mann '526 in view of Vaissie meets each limitation of claim 14, as described below. (EX-1003, ¶185.)

a. Element [Pre]

Mann '526 in view of Vaissie meets the wearable optics system of claim 12 as described for claim 12. (EX-1003, ¶186.)

b. Element [A]

Mann '526 in view of Vaissie meets this element as described for claim 3[A]. (EX-1003, ¶187.)

VII. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE AND IMPROPER IN VIEW OF BINDING AGENCY GUIDANCE

A. District Court Litigation

The Board should not deny institution under § 314 on the basis of the litigation pending in the United States District Court for the District of Delaware.

The *Fintiv* factors on balance favor institution here, but moreover, discretionary

denial under *Fintiv* would be contrary to the Interim Guidance dated June 21, 2022. For example, the Interim Guidance directs that “the PTAB will not deny institution based on *Fintiv* if there is compelling evidence of unpatentability.” (Interim Guidance at 5.) Such compelling evidence exists here: this Petition presents two independent grounds, demonstrating the unpatentability of claims 1-3 and 12-14 for the reasons set forth above. Either of these grounds, let alone both of them, plainly leads to a conclusion that the claims are unpatentable.

Further, the Interim Guidance instructs that “the PTAB will not . . . deny institution of an IPR . . . in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” (Interim Guidance at 7.) *See also Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01054, Paper 12 at 18-19 (P.T.A.B. Dec. 1, 2020). Petitioner so stipulates. Under the Interim Guidance, the Board cannot deny institution based on *Fintiv* for at least these reasons.

B. Prosecution

The Board further should not deny institution under § 325(d) on the basis of the prosecution of the original patent application (U.S. Patent Appl. No. 13/841,141). Section 325(d) is inapplicable to this proceeding because the Petition and accompanying declaration of Dr. LaViola demonstrate that, to the extent

substantially the same art or arguments presented herein were previously presented to the Office (the first part of the *Advanced Bionics* framework), the Office erred in a material manner with respect to the patentability of the challenged claims (the second part). *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (Feb. 13, 2020) (precedential).

“[T]he *Becton, Dickinson* factors provide useful insight into how to apply the framework under 35 U.S.C. § 325(d).” *Advanced Bionics* at 9 (footnote omitted). As relevant to the second part of the *Advanced Bionics* framework (previous Office error), the *Becton, Dickinson* factors include:

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; ...

(e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Belsungen AG, IPR2017-01586, Paper 8 at 17 (PTAB Dec. 15, 2017) (precedential).

1. Ground 1

With respect to Ground 1 (Osterhout), Osterhout was considered by the Examiner for earlier versions of the challenged claims in a Nov. 25, 2013 Final Office Action. However, the Examiner did not consider Osterhout in the light in

which it is now presented: while the challenged claims were rejected for anticipation by Osterhout under § 102, EX-1002, 93-95, the Petition presents obviousness grounds under § 103 that the Examiner had not considered. (Although other claims were rejected under § 103 in view of Osterhout and a second reference, EX-1002, 96-98, those claims are not challenged here.)

While the Examiner’s reasons for allowance incorporated comments from the applicant’s own Office Action response—which asserted without citation that “there is simply no teaching of the optical parameter measurements utilized in conjunction with the dynamic eye tracking mechanism,” EX-1002 at 27, 78-79—a simple reference to a patent applicant’s own self-serving statements is no substitute for the evaluation of a reference’s full teachings under § 103. This is particularly so where, as here, the reference in question (Osterhout) spans over 100 pages and describes numerous embodiments. In contrast to what the Examiner evaluated, the Petition and accompanying declaration provide the Board with a roadmap of how the teachings of Osterhout render the claims obvious. *Becton, Dickinson* factor (c) thus weighs against discretionary denial. (See *Safran Cabin Inc. v. B/E Aerospace, Inc.*, IPR2022-00749, Paper 10 at 11 (PTAB Oct. 21, 2022) (“the fact that [the prior art] was not a basis for an obviousness rejection during the relevant prosecution weighs against exercising discretion to deny institution under § 325(d).”))

Regardless of whether factor (c) is met, the Board should determine that discretionary denial is not warranted based on factors (e) and (f). (*See Intex Recreation Corp. et al., v. Team Worldwide Corp.*, IPR2018-00875, Paper 14 at 16 (PTAB Sept. 14, 2018) (declining to exercise discretionary denial even though factor (c) “weighs in favor of us exercising our discretion under 325(d)”)). During prosecution of the application that became the ’113 Patent, the patent examiner rejected the claims as being anticipated by Osterhout, but the applicant overcame the rejection by amending the claims to recite *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*; and the claims were allowed on the basis of that amendment. (EX-1002, 25-28, 72-80, 91-100.)

However, this entire amendment is plainly taught by Osterhout. In Section V. above, the Petition sets forth out in detail where these limitations are found in Osterhout, including the specific disclosures of Osterhout that were overlooked by the Examiner and not correctly applied to the challenged claims. For example, as described above in Section V, paragraph [0301] of Osterhout specifically identifies that “an *eye tracking facility* may use the *corneal reflection* and the *center of the pupil* as features to track over time.” (EX-1005, [0301] (emphasis added).) As the

Petition explains, this disclosure of Osterhout unambiguously teaches the same “optical parameter measurements utilized in conjunction with the dynamic eye tracking mechanism” that the Examiner believed rendered the claims novel over the art. (EX-1002, 27, 78-79; EX-1003, ¶43.) The Petition thus demonstrates that the Examiner erred in a material manner, meeting *Becton, Dickinson* factor (e). (See *Halliburton Energy Servs. v. U.S. Well Servs., LLC*, IPR2021-01034, Paper 13 at 17-18 (PTAB Jan. 18, 2022)(“Petitioner demonstrates that the Examiner erred in a manner material to the patentability of the challenged claims [by] overlooking and not applying this disclosure to the claims during prosecution”).)

Moreover, with respect to factor (f), the Petition is supported by the declaration of Dr. LaViola (EX-1003). Dr. LaViola’s analysis identifies in detail how the limitations of the challenged claims are taught by Osterhout, providing additional evidence and facts that the Examiner did not have the benefit of considering. (EX-1003.)

2. Ground 2

With respect to Ground 2 (Mann ’526 in view of Vaissie), the Mann ’526 reference was presented to the Office by the applicant, concurrently with a Dec. 23, 2013 Office Action response. (EX-1002, 81.) While the examiner initialed the Mann ’526 reference, the Examiner made no other acknowledgement of Mann

'526. (EX-1002, 35.) Instead, the Examiner quickly moved the application to allowance on Feb. 6, 2014, without distinguishing Mann '526 in his reasons for allowance, or citing any portion of Mann '526's disclosure. (EX-1002, 24-28.) In a different application, for the '929 Patent, the Examiner used Mann '526 to reject that application's claims. However, the Examiner did not have the opportunity to consider Mann '526 for the challenged (and different) claims of the '113 Patent, in the light in which it is presented in the Petition. For example, the Examiner did not consider whether the challenged claims of the '113 Patent were obvious in view of Mann '526 in combination with Vaissie, a reference that was not presented to the Office at all for the '113 Patent. (EX-1002; *See Halliburton* at 17 (“we determine that the first part of the *Advanced Bionics* framework is not satisfied because the Petition includes grounds based on combinations of prior art not previously presented to the office”).)

Nor did the Examiner have the benefit of Dr. LaViola's declaration, which describes in detail how the claim limitations are taught by this combination of references. (EX-1003, ¶118.) To the extent the art and arguments of Ground 2 were previously presented, the Office erred with respect to the challenged claims for the reasons set forth in this Petition, which details in Section VI. how all claim limitations are taught by Mann '526 in view of Vaissie; and in the accompanying declaration, which provides additional evidence and facts that the Examiner did not

have the benefit of considering. (EX-1003.)

For all the foregoing reasons, the Board should decline to exercise discretionary denial of the Petition under § 325(d).

VIII. NOTICES AND STATEMENTS

Pursuant to 37 C.F.R. § 42.8(b)(1), Magic Leap, Inc. is the real party-in-interest for Petitioner.

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the following related matters. The ’113 Patent is asserted in the following litigation matter: *Percept Technologies Inc. v. Magic Leap, Inc.*, Case No. 1:22-cv-0025-RGA (D. Del.). The complaint in the litigation matter was served on Petitioner on January 21, 2022. (EX-1012.) In addition to the ’113 Patent, the complaint also asserts the ’929 Patent. Petitioner is concurrently requesting *inter partes* review of the ’929 Patent (IPR2023-00494).

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner identifies the following counsel (and a power of attorney accompanies this Petition).

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Pursuant to 37 C.F.R. § 42.8(b)(4), service information for lead and back-up counsel is provided above. Petitioner consents to electronic service by email to MagicLeap-Percept-IPR@mofo.com.

Pursuant to 37 C.F.R. § 42.104(a), Petitioners certify that the '113 Patent is available for *inter partes* review and that Petitioners are not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

IX. CONCLUSION

Petitioner requests that the Board initiate *inter partes* review and cancel all challenged claims of the '113 Patent.

The USPTO is authorized to charge any required fees, including the fee as set forth in 37 C.F.R. § 42.15(a) and any excess claim fees, to Deposit Account No. **03-1952** referencing Docket No. **72800-00000.15**.

Dated: January 20, 2023

Respectfully submitted,

By /Mehran Arjomand/
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Certification of Word Count (37 C.F.R. § 42.24)

I hereby certify that this Petition for *Inter Partes* Review has 13,898 words (as counted by the “Word Count” feature of the Microsoft Word™ word-processing system), exclusive of “a table of contents, a table of authorities, mandatory notices under § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing.”

Dated: January 20, 2023

By /Mehran Arjomand/
Mehran Arjomand, Reg. No.: 48,231

Certificate of Service (37 C.F.R. § 42.6(e)(4) and 42.205(a))

I hereby certify that the attached Petition for *Inter Partes* Review and supporting materials were served as of the below date by U.S. Express Mail, on the Patent Owner at the correspondence address indicated for U.S. Patent No. 8,696,113.

Los Altos Law
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Dated: January 20, 2023

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