

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION,
Petitioner,

v.

D3D TECHNOLOGIES, INC.,
Patent Owner.

IPR2021-00703
Patent 9,473,766 B2

Before JAMESON LEE, BARBARA A. PARVIS, and SCOTT RAEVSKY,
Administrative Patent Judges.

LEE, *Administrative Patent Judge.*

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We instituted an *inter partes* review of claims 1–4, 6–10, 12–16, and 18 of U.S. Patent No. 9,473,766 B2 (Ex. 1001, “the ’766 patent”) owned by D3D Technologies, Inc. (“Patent Owner”). Paper 10 (“Decision to Institute” or “Inst. Dec.”). We have authority to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We determine that Microsoft Corporation (“Petitioner”) has proved by a preponderance of the evidence that claims 1–4, 6–10, 12–16, and 18 of the ’766 patent are unpatentable.

A. Background

Petitioner filed a Petition (Paper 2 (“Pet.”)) requesting *inter partes* review of claims 1–4, 6–10, 12–16, and 18 of the ’766 patent. The filing is accompanied by a Declaration of Henry Fuchs, Ph.D. (Ex. 1003). Patent Owner filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply (Paper 8) to Patent Owner’s Preliminary Response and Patent Owner filed a Preliminary Sur-reply (Paper 9).

The Decision to Institute was entered on October 12, 2021. Inst. Dec. 1. Thereafter, Patent Owner filed a Patent Owner Response.¹ Paper 14 (“PO Resp.”). Petitioner filed a Reply (Paper 18 (“Reply”)). Patent Owner waived the filing of a Sur-reply. Paper 19. Oral hearing was held on July 11, 2022. Patent Owner elected not to participate in the oral hearing. Ex. 3002. A copy of the hearing transcript has been entered into the record as Paper 24 (“Tr.”).

¹ Patent Owner has not filed a declaration of any technical witness in support of its positions in this proceeding.

B. Real Parties-in-Interest

Petitioner identifies only itself as real party-in-interest. Pet. 96.
Patent Owner identifies only itself as real party-in-interest. Paper 6, 2.

C. Related Matters

Petitioner and Patent Owner both identify *D3D Technologies, Inc. v. Microsoft Corporation*, No. 6:20-cv-1699 (M.D. Fla.) as litigation involving the '766 patent. Pet. 96; Paper 4, 2–3. Patent Owner identifies IPR2021-00647 as an *inter partes* review of related U.S. Patent No. 8,384,771 B1, and IPR2021-00648 as an *inter partes* review of related U.S. Patent No. 9,349,183 B1. Paper 4, 2. Petitioner also has filed two petitions for *inter partes* review of related U.S. Patent No. 9,980,691 B2 (IPR2021-00877 and IPR2021-00878) and a petition for *inter partes* review of related U.S. Patent No. 10,795,457 B2 (IPR2021-01325). We instituted and issued Final Written Decisions in each of IPR2021-00647 and IPR2021-00648. We instituted *inter partes* review in IPR2021-00878 and IPR2021-01325 and those proceedings are pending. On December 2, 2021, we denied institution in IPR2021-00877.

D. The '766 Patent

The '766 patent is directed to three dimensional viewing of images, and its disclosure is summarized in its Abstract of Invention as follows:

A method and apparatus for three dimensional viewing of images is presented. Left eye viewing point (LEVP) imagery is passed through a left eye filter to obtain a filtered LEVP imagery. Right eye viewing point (REVP) imagery is passed through a right eye filter to obtain a filtered REVP imagery. The filtered LEVP imagery is projected on a display and the filtered REVP imagery is projected on the display. A user wearing polarized glasses is able to view the filtered LEVP imagery and the filtered REVP

imagery as three-dimensional imagery on the display. The three dimensional imagery can be augmented.

Ex. 1001, code (57). Figure 14, reproduced below, shows such a viewing environment:

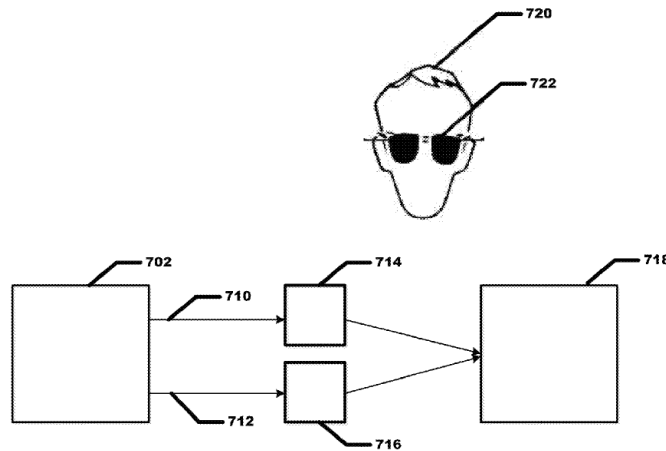


FIGURE 14

Figure 14 is a block diagram of an environment for providing three dimensional viewing of images according to the embodiments of the '766 patent. Image 710 is generated for the left eye; image 712 is generated for the right eye; and the two are superimposed and projected onto display screen 718 through polarization filters 714 and 716. *Id.* at 17:4–9. Medical personnel 720 viewing the imagery would wear glasses 722 corresponding to the techniques used to display the images. *Id.* at 17:9–11. “For example, if the images from the LEVP and REVP [are] linearly polarized and displayed orthogonally, then linearly polarized glasses would be worn by the medical personnel and the desired 3D effect achieved.” *Id.* at 17:11–15.

The '766 patent states that the techniques used to generate the images sent to the display include but are not limited to using linear polarization filters, circular polarization filters, anaglyph color filters, and interleaving LEVP and REVP images. *Id.* at 17:16–20. It further states that interleaving the LEVP and REVP images would be coupled with a user's wearing of

active shutter glasses. *Id.* at 17:20–22. Additionally, it states: “The intent of this patent is to cover instances wherein imagery is filtered or interleaved and projected onto a display unit where medical [personnel] equipped and wearing glasses of comparable technology could view the volumetric data and gain a 3D perspective.” *Id.* at 17:26–29.

Of the challenged claims, claims 1, 7, and 13 are independent and are reproduced below, with bracketed headings added to correspond to claim element headings used by Petitioner (*see* Pet. v–x):

1. [1pre] A method of three-dimensional viewing of images by a user comprising:

[1a] passing left eye viewing point (LEVP) imagery through a left eye filter having a first orientation to obtain a filtered LEVP imagery;

[1b] passing right eye viewing point (REVP) imagery through a right eye filter having a second orientation, said second orientation different than said first orientation to obtain a filtered REVP imagery,

[1c-1] wherein said different orientation of said right eye filter with said left eye filter comprises one of the group consisting of:

said left eye filter is ninety degrees apart from said right eye filter when said left eye filter and said right eye filter are linear polarization filters;

[1c-2] said left eye filter is an opposite handedness with respect to said right eye filter when said left eye filter and said right eye filter are circular polarization filters; and

[1c-3] said left eye filter is a chromatically opposite color than said right eye filter when said left eye filter and said right eye filter are anaglyph color filters;

[1d] projecting said filtered LEVP imagery on a display; projecting said filtered REVP imagery on said display

wherein said filtered REVP imagery is superimposed over said filtered LEVP imagery; and

[1e] wherein a user wearing polarized glasses is able to view said filtered LEVP imagery and said filtered REVP imagery as three dimensional imagery on said display,

[1f] wherein a left lens of said polarized glasses is oriented in a similar manner as said left eye filter and wherein a right lens of said polarized glasses is oriented in a similar manner as said right eye filter.

Ex. 1001, 21:47–22:11.

7. [7pre] A non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images, the medium including instructions in which a computer system performs operations comprising:

[7a] passing left eye viewing point (LEVP) imagery through a left eye filter having a first orientation to obtain a filtered LEVP imagery;

[7b] passing right eye viewing point (REVP) imagery through a right eye filter having a second orientation, said second orientation different than said first orientation to obtain a filtered REVP imagery,

[7c-1] wherein said different orientation of said right eye filter with said left eye filter comprises one of the group consisting of:

said left eye filter is ninety degrees apart from said right eye filter when said left eye filter and said right eye filter are linear polarization filters;

[7c-2] said left eye filter is an opposite handedness with respect to said right eye filter when said left eye filter and said right eye filter are circular polarization filters; and

[7c-3] said left eye filter is a chromatically opposite color than said right eye filter when said left eye filter and said right eye filter are anaglyph color filters;

- [7d] projecting said filtered LEVP imagery on a display; projecting said filtered REVP imagery on said display when said filtered REVP imagery is superimposed over said filtered LEVP imagery; and
- [7e] wherein a user wearing polarized glasses is able to view said filtered LEVP imagery and said filtered REVP imagery as three dimensional imagery on said display,
- [7f] wherein a left lens of said polarized glasses is oriented in a similar manner as said left eye filter and wherein a right lens of said polarized glasses is oriented in a similar manner as said right eye filter.

Id. at 22:28–61.

- 13. [13pre] A computer system comprising:
 - [13a] a memory;
 - [13b] a processor;
 - [13c] a communications interface;
 - [13d] an interconnection mechanism coupling the memory, the processor and the communications interface; and
 - [13e] wherein the memory is encoded with an application providing three dimensional viewing of images, that when performed on the processor, provides a process for processing information, the process causing the computer system to perform, the operations of:
 - [13f] passing left eye viewing point (LEVP) imagery through a left eye filter having a first orientation to obtain a filtered LEVP imagery;
 - [13g] passing right eye viewing point (REVP) imagery through a right eye filter having a second orientation, said second orientation different than said first orientation to obtain a filtered REVP imagery
 - [13h-1] wherein said different orientation of said right eye filter with said left eye filter comprises one of the group consisting of:

said left eye filter is ninety degrees apart from said right eye filter when said left eye filter and said right eye filter are linear polarization filters;

[13h-2] said left eye filter is an opposite handedness with respect to said right eye filter when said left eye filter and said right eye filter are circular polarization filters; and

[13h-3] said left eye filter is a chromatically opposite color than said right eye filter when said left eye filter and said right eye filter are anaglyph color filters;

[13i] projecting said filtered LEVP imagery on a display; projecting said filtered REVP imagery on said display wherein said filtered REVP imagery is superimposed over said filtered LEVP imagery; and

[13j] wherein a user wearing polarized glasses is able to view said filtered LEVP imagery and said filtered REVP imagery as three dimensional imagery on said display,

[13k] wherein a left lens of said polarized glasses is oriented in a similar manner as said left eye filter and wherein a right lens of said polarized glasses is oriented in a similar manner as said right eye filter.

Ex. 1001, 23:13–24:16.

E. Evidence Relied on by Petitioner

Petitioner relies on the following evidence:²

² The '766 patent issued from Application 14/313,398, filed June 24, 2014, which is a continuation-in-part of Application 12/176,569, filed July 21, 2008, now abandoned, which is a continuation-in-part of Application 11/941,578, filed November 16, 2007, now U.S. Patent No. 8,384,771 B1. Ex. 1001, codes (21), (22), (63). The '766 patent also claims priority to Provisional Application 60/877,931, filed December 28, 2006. *Id.* at code (60).

References		Date	Exhibit
Rosencwaig	WO 95/00872	Published Jan. 5, 1995	Ex. 1010
Dean	U.S. Pat. 5,402,191	Issued Mar. 28, 1995	Ex. 1006
Doneus	Doneus, M and Hanke, K., 1999. Anaglyph images - still a good way to look at 3D-objects? In: <i>Proceedings of the 17th CIPA Colloquium: Mapping and Preservation for the New Millenium.</i>	October 3–6, 1999	Ex. 1005
Ito	U.S. Pat. 5,734,416	Issued Mar. 31, 1998	Ex. 1007
Faris	U.S. Pat. 6,449,005 B1	Issued Sep. 10, 2002	Ex. 1011
Getty	WO 2009/076303 A2	Published June 18, 2009	Ex. 1008

Petitioner also relies on the Declaration of Henry Fuchs, Ph.D.
(Ex. 1003).

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ³	Basis
1–3	103	Doneus, Dean

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284, 287–88 (2011), revised 35 U.S.C. §§ 102 and 103 effective March 16, 2013. Because the effective filing date of the ’766 patent appears to be subsequent to March 16, 2013 (Ex. 1001, codes (22), (63)), we refer to

Claim(s) Challenged	35 U.S.C. §³	Basis
4	103	Doneus, Dean, Ito
6	103	Doneus, Dean, Getty
7–9, 13, 14, 16	103	Doneus, Dean, Faris
10, 15	103	Doneus, Dean, Faris, Ito
12, 18	103	Doneus, Dean, Faris, Getty
1–4	102(a)(1)	Rosencwaig
4	103	Rosencwaig, Ito
6	103	Rosencwaig, Getty
7–10, 13–16	103	Rosencwaig, Faris
10, 15	103	Rosencwaig, Faris, Ito
12, 18	103	Rosencwaig, Faris, Getty

II. ANALYSIS

A. Legal Standards

To prevail in its challenge to Patent Owner’s claims, Petitioner must demonstrate that the claims are unpatentable and that burden never shifts to the patentee. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010); *Net MoneyIN, Inc. v. VeriSign, Inc.*,

the post-AIA versions of §§ 102, 103. *See* Pet. 3. Our analysis would not change under the pre-AIA versions of §§ 102, 103.

545 F.3d 1359, 1369 (Fed. Cir. 2008). The applied reference “need not satisfy an *ipsissimis verbis* test.” *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009); *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990). Even in a non-obviousness setting, it is proper to take into account not only the literal and specific teachings of the reference, but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). For anticipation, the dispositive question is whether one skilled in the art would reasonably understand or infer from a prior art reference that every claim element is disclosed in that reference. *Eli Lilly v. Los Angeles Biomedical Res. Inst.*, 849 F.3d 1073, 1074–75 (Fed. Cir. 2017).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the claimed invention, as a whole, would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which said claimed invention pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁴ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). There must be some articulated reasoning with rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

⁴ Patent Owner has not presented objective evidence of nonobviousness in this proceeding.

B. Level of Ordinary Skill in the Art

Petitioner asserts that one of ordinary skill in the art at the pertinent time of the '766 patent “would have had at least a Bachelor’s degree in an academic area emphasizing electrical engineering, computer science, or a similar discipline, and at least two years of experience in the field working with, teaching, or researching stereoscopic and/or virtual/augmented reality (VR/AR) display technologies.” Pet. 6. Patent Owner has not separately made its own assertion of the level of ordinary skill. PO Resp. 12–13. Petitioner’s assertion appears generally consistent with what is reflected by the content of the applied prior art references. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1354–55 (Fed. Cir. 2001) (the applied prior art may reflect an appropriate level of skill).

In the Decision to Institute, we adopted Petitioner’s articulation of the level of ordinary skill, but deleted the qualifier “at least” for the level of education and for the amount of experience, to keep the level from being vague and overbroad and extending into the level of an expert. Paper 10, 16. During trial, Patent Owner agreed with that determination (PO Resp. 12–13) and Petitioner did not argue against that determination.

Accordingly, we maintain our determination, in the Decision to Institute, of the level of ordinary skill in the art.

C. Claim Construction

We use the same claim construction standard that would be used to construe a claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b)

(2020). The claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) is applicable.

Claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315. The following guidance from *Phillips* is instructive:

It is a “bedrock principle” of patent law that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Innova*, 381 F.3d at 1115; *see also Vitronics*, 90 F.3d at 1582 (“we look to the words of the claims themselves . . . to define the scope of the patented invention”); *Markman*, 52 F.3d at 980 (“The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of claims.”). That principle has been recognized since at least 1936, when Congress first required that the specification include a portion in which the inventor “shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery.” Act of July 4, 1836, ch. 357, § 6, 5 Stat. 117, 119. In the following years, the Supreme Court made clear that the claims are “of primary importance, in the effort to ascertain precisely what it is that is patented.” *Merrill v. Yeomans*, 94 U.S. 568, 570, 24 L.Ed. 235 (1876). Because the patentee is required to “define precisely what his invention is,” the Court explained, it is “unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms.” *White v. Dunbar*, 119 U.S. 47, 52, 7 S.Ct. 72, 30 L.Ed. 303 (1886); *see also Cont’l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 419, 28 S.Ct. 748, 52 L.Ed. 1122 (1908) (“the claims measure the invention”); *McCarty v. Lehigh Valley R.R. Co.*, 160 U.S. 110, 116, 16 S.Ct. 240, 40 L.Ed. 358 (1895) (“if

we once begin to include elements not mentioned in the claim, in order to limit such claim . . . , we should never know where to stop”); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339, 81 S.Ct. 599, 5 L.Ed.2d 592 (1961) (“the claims made in the patent are the sole measure of the grant”).

Phillips, 415 F.3d at 1312.

In patent law, “the name of the game is the claim.” *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998). As the Federal Circuit further explained:

Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.

Superguide Corp. v. DirectTV Enterprises, Inc., 358 F.3d 870, 875 (Fed. Cir. 2004). *See also Hill–Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014) (“While we read claims in view of the specification, of which they are a part, we do not read limitations from the embodiments in the specification into the claims.”).

It is improper to add to a claim an “extraneous” limitation appearing in the specification, and “extraneous” means a limitation read into a claim from the specification wholly apart from any need to do so. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988)); *see also Hoganas AB v. Dresser Indus., Inc.*, 9 F.3d 948, 950 (Fed. Cir. 1993).

The specification may reveal a special definition given to a claim term by the patentee, or the specification or prosecution history may reveal an intentional disclaimer or disavowal of claim scope by the inventor. *Phillips*, 415 F.3d at 1316. If an inventor acts as his or her own lexicographer, the

definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). The disavowal, if any, can be effectuated by language in the specification or the prosecution history. *Poly-America, L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016).

Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

1. “projecting”

In its Petition, Petitioner did not propose a specific construction for any claim term. Neither did Patent Owner in its Preliminary Response. In the Decision to Institute, we construed the term “projecting,” which appears in each independent claim. Inst. Dec. 18–19. Specifically, we determined that “projecting,” in the context of claims 1, 7, and 13, is not limited to front projection but covers rear projection or projecting from the rear, where the viewer is on the opposite side of the display relative to the light projecting source. *Id.*

Petitioner does not disagree with our construction of “projecting,” and does not seek a change in our construction in any way. Reply 13; Tr. 8:13–23. Patent Owner in its Response does not address or dispute our construction of “projecting,” for example, by stating that our construction is incorrect or by explaining why our reasoning in support of the construction is erroneous.

For reasons explained in the Decision to Institute, which we reiterate below, we maintain the construction of “projecting” as “not limited to front projection but covers rear projection or projecting from the rear, where the viewer is on the opposite side of the display relative to the light projecting source.”

First, each claim recites “projecting,” not “front projecting” or “projecting from the front.” On their face the claims do not limit “projecting” to front projection where the viewer is on the same side as the light projecting source relative to the display. Second, the Specification of the ’766 patent does not specifically describe any embodiment that implements front projection or projecting from the front where the viewer is on the same side as the light projecting source relative to the display. For example, the ’766 patent, with respect to Figure 14, does not describe the location of the viewer with respect to display 718. Ex. 1001, 17:4–15. Third, the Specification specifically discloses embodiments that implement rear projection or projecting from the rear where the viewer is on the opposite side of the light projecting source relative to the display. For instance, the ’766 patent describes head display unit 22 worn by user 24, which displays image 18 to the right eye and image 20 to the left eye. Ex. 1001, 6:1–2, 6:11–17. The ’766 patent also describes a head display unit, worn by a viewer, in which the left and right eye images are superimposed or interleaved on a typical flat screen computer display. *Id.* at 16:46–52.

For these reasons, we determine that “projecting,” in the context of claims 1, 7, and 13, is not limited to front projection but covers rear projection or projecting from the rear, where the viewer is on the opposite side of the display relative to the light projecting source.

2. “LEVP imagery” / “REVP imagery”

Patent Owner proposes a construction for the terms “LEVP imagery” and “REVP imagery,” which appear in independent claims 1, 7, and 13.

PO Resp. 13–15. Patent Owner asserts that the terms “LEVP/REVP imagery” should be construed as:

A two-dimensional left eye / right eye representation of a three-dimensional volume as seen from a user-specified viewing angle and a separately determined left eye / right eye representation made up of a number of pixels, each of which has properties according to properties of voxels of the volume included in respective theta-alpha cones through the volume from the left eye / right eye viewing perspective.

PO Resp. 13. Patent Owner argues:

The ’766 patent explains that the images 710 and 712 (see Fig. 14) that are presented to a viewer are images “*generated by the process described above* for [a] left eye viewing point (LEVP) and [a] right eye viewing point (REVP)” Ex. 1001 at 7:4-6. The process being referred to is one that includes combining slices produced by imaging devices to create a volume of interest, and selecting separate and distinct viewpoints for a viewer’s left and right eyes, based on a selected viewing angle of the slices, the left eye and right eye viewpoints, and the volume of interest. *Id.* at 9:4-8 (selecting a volume of interest), 15-21 (arranging slices that make up the volume of interest), 31-34 (selecting an initial viewing angle and rotating the volume of interest to align therewith), 39-45 (selecting left eye and right eye viewpoints); 10:3-11 (displaying left eye and right eye images based on the initial viewing angle, viewpoints, and the volume of interest). Further, a coordinate system for the imagery is established, converted to voxels (that is, volume-based units), and the LEVP and REVP are established. For each voxel, viewing angles are calculated and the viewing angles translated to respective display coordinates. *Id.* at 15:43-51. Accordingly, a person of ordinary skill in the art would understand that the *imagery* referred to in the claims is a two-dimensional representation of a three-dimensional volume as seen from a user-specified viewing angle and a separately determined

viewing perspective. The person of ordinary skill in the art would further recognize and understand that this two-dimensional representation is made up of a number of pixels, each of which has properties according to properties of voxels of a volume included in respective theta-alpha cones through the volume from the viewing perspective. Because this is the plain and ordinary meaning of the recited LEVP/REVP imagery as would be understood by a person of ordinary skill in the art, it is the proper construction to accord these terms as they appear in the claims. *Phillips*, 415 F.3d at 1313.

Id. at 14–15.

For two reasons, we do not agree with Patent Owner’s proposed construction. First, it effectively reads in from the Specification specific implementation details which are not necessary to make sense of what is claimed. Second, Patent Owner does not assert that the inventors of the ’766 patent acted as their own lexicographers and provided a special definition for the terms “LEVP imagery” and “REVP imagery.” “LEVP” and “REVP” simply are acronyms for left eye viewing point or left eye viewing perspective (LEVP), and right eye viewing point or right eye viewing perspective (REVP), respectively. Ex. 1001, code (57), 6:54–67. Further, Patent Owner’s proposed construction is not supported by testimony of any technical expert with regard to how one with ordinary skill in the art would have read the terms “LEVP imagery” and “REVP imagery” in the context of the ’766 patent.

Unless there is a persuasive reason to restrict the meaning of these terms to include various implementation details of specific embodiments described in the Specification, these terms have their plain and ordinary meaning, which is, for “LEVP imagery,” *imagery as seen from the left eye viewing point or left eye viewing perspective*, and, for “REVP imagery,” *imagery as seen from the right eye viewing point or right eye viewing*

perspective. Patent Owner presents no persuasive reason why these two terms should be limited to include numerous features, which are implementation details for a specific embodiment, from the Specification.

The various implementation details are extraneous because they are not necessary to understand and make sense of the claims, and thus reading them into a claim is improper. *In re Paulsen*, 30 F.3d at 1480 (citing *E.I. du Pont de Nemours & Co.*, 849 F.2d at 1433); *see also Hogan AB*, 9 F.3d at 950. The above-quoted assertions of Patent Owner establish only that the Specification of the '766 patent describes the specific implementation details of a particular embodiment of "LEVP imagery" and "REVP imagery," not that those implementation details are required to meet the terms "LEVP imagery" and "REVP imagery."

Patent Owner also asserts that the '766 patent distinguishes "images from imagery," citing column 8, lines 20–21 of the '766 patent, which states: "These type images [multiple MRI slices] may be viewed in true 3D stereoscopic imagery as well." PO Resp. 24. We do not see such alleged distinction based on the cited text. The cited language simply means MRI slices may be viewed in 3D, and does not convey any meaningful difference between the term "image" and the term "imagery." Even assuming that "image" is different from "imagery," that still does not justify reading into the claim terms "LEVP imagery" and "REVP imagery" all of the implementation details described in the Specification for a disclosed embodiment of "LEVP imagery" and "REVP imagery."

For the foregoing reasons, Patent Owner's proposed construction of "LEVP imagery" and "REVP imagery" is incorrect. Rather, we construe "LEVP imagery" as meaning *imagery as seen from the left eye viewing point or left eye viewing perspective*. We construe "REVP imagery" as meaning

imagery as seen from the right eye viewing point or right eye viewing perspective.

*D. Alleged Obviousness of
Claims 1–3 over Doneus and Dean*

1. Overview of Doneus

Doneus is titled: “ANAGLYPH IMAGES - STILL A GOOD WAY TO LOOK AT 3D-OBJECT?” Ex. 1005, 1. Doneus explains:

Besides maps and plans, the modern [computer] systems provide the user also with 3D-models. At the same time, the WWW allows to offer these models to a world-wide audience.

There are several techniques available, to publish 3D-models in a way, that the reader can view them also in 3D. However, most of them require special devices, as stereoscopes, polarizing glasses etc. One of the cheapest methods is the anaglyph image which can be viewed with a red and a green transparency in front of the reader[']s eyes.

In this paper, we want to show cheap ways of producing black and white as well as coloured and animated anaglyph images.

Id.

At the outset, Doneus describes stereoscopic vision as resulting from two different perspectives as seen from two eyes, i.e., that “[t]he two perspectives result in a special imagination depending on the integration ability of the human viewing system.” *Id.* “Basic for any stereoscopic vision is the evaluation of these differences of perspectives. The physiological value for perception of depth is the disparity, which photogrammetrists call the stereoscopic parallax (Ning Qian, 1997).” *Id.* Further, as described by Doneus, to achieve stereoscopic viewing, the left eye has to view the left eye image and the right eye has to view the right eye image. *Id.* at 2.

Specifically, Doneus groups stereoscopic 3D viewing systems into two types: (1) those based on use of a stereoscope, and (2) those based on a mixed image. *Id.* In the case of a stereoscope, the light rays coming from both images are made parallel by the lenses of the stereoscope, and thus the eyes can have a parallel viewing direction. *Id.* Doneus states: “The advantage of this method is, that the images are easy to publish. Additionally, colour images can be viewed. The disadvantage lies in the fact that every viewer needs a stereoscope.” *Id.* In the case of a mixed image, “both pictures of the stereo pair are put together into a single image.” *Id.*

According to Doneus, systems based on a mixed image are further divided into three types. *Id.* First, a polarization method is used in which both images of the stereoscopic pair are projected using polarizing filters, where filters of opposite polarity are placed in front of left and right projectors, and in which the viewers wear a pair of glasses with corresponding filters. *Id.* Second, a stereo-image alternator is used, in which the two images of the stereopair are shown alternatingly on a screen, and a viewer wears glasses with liquid crystal lenses that respond to an infrared emitter to shutter to switch in synchronization with the alternating left and right-eye images on the screen. *Id.* Thus, each eye sees only the image intended for that eye. *Id.* Doneus states: “The disadvantage of this system [second type] again lies in the required medium and devices (software and liquid crystal glasses with infrared emitter).” *Id.* Third, Doneus describes: “Another possibility is the anaglyph system.” *Id.*

For the anaglyph system, Doneus describes:

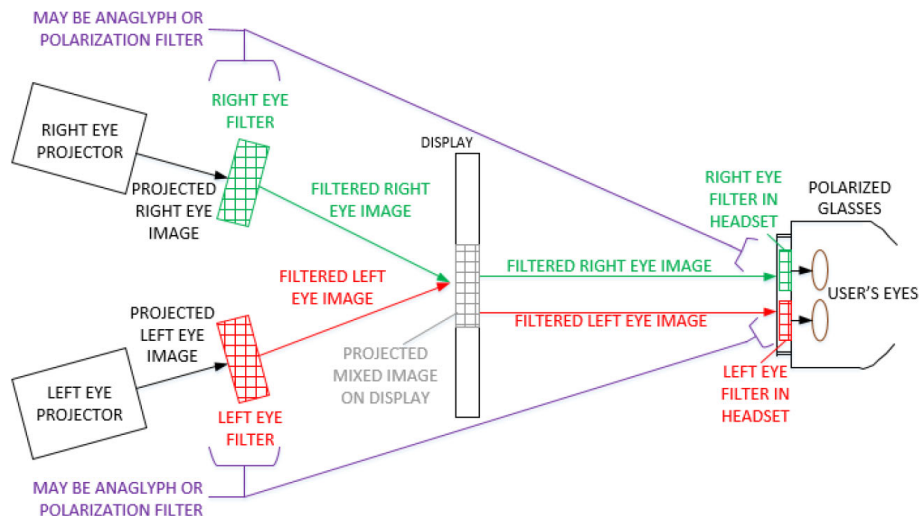
Here, the left image is drawn in red and the right in cyan (or green) colour or projected using a red and cyan (or green) filter. If the viewer then looks at the mixed image through a cyan-filter in front of his right and a red-filter in front of his left eye, each

complementary coloured image is filtered away. This results in a stereoscopic view, where each part of the stereopair is viewed only by the corresponding eye.

Id. Doneus states that the advantage of the anaglyph system is that anaglyphs can be produced easily on all kinds of media and that the viewing devices are very cheap and can be produced by anybody. *Id.*

Doneus concludes: “[W]e think that the anaglyph – although often underrated – is still a good way to look at 3D objects even today.” *Id.* at 3.

Doneus does not include any figure to illustrate its three dimensional viewing system or method. Petitioner, based on the description provided in Doneus, prepared the following pictorial illustration, appearing on page 9 of the Petition, of Doneus’s described systems and methods:



The illustration is Petitioner’s rendition of the systems and methods described in Doneus. Pet. 9–10. Based on our reading of Doneus, as discussed above, the illustration is an accurate depiction of the disclosures of Doneus. Patent Owner has not asserted that any portion of this depiction is inaccurate. Hereinafter, we refer to this illustration as Petitioner’s Pictorial Rendition of Doneus (“PRD”) and treat the PRD effectively as disclosure of Doneus.

2. *Overview of Dean*

Dean's disclosure relates to stereoscopic displays. Ex. 1006, 1:6–8.

In its Background of the Invention section, Dean explains:

Stereoscopic 3-D imaging requires the presentation of two slightly different sets of images to a viewer; one set corresponds to a left eye viewpoint and the other corresponds to a right eye viewpoint. When the sets of images are presented so that only the left eye of a viewer can see the left eye set of images and the right eye can see only the right eye set of images, the viewer will be able to perceive a 3-D image.

Id. at 1:11–18. Also in its Background of the Invention section, Dean describes that there are known ways for separating left and right eye images including, for instance, the use of mutually extinguishing polarizing filters.

Id. at 1:28–29. In that regard, Dean states:

The filters are placed in front of left and right eye projectors with their polarizing axes at 90 degrees to each other. Viewers wear eyeglasses with polarizing filters arranged in the same orientation as the filters on the projectors. The left and right eye images appear on the screen at the same time, but only the left eye polarized light is transmitted through the left eye lens of the eyeglasses and only the right eye polarized light is transmitted through the right eye lens. This method is inexpensive and allows full colour 3-D images. However, it has limitations in that a substantial amount of unwanted transmission can occur and can result in the formation of objectionable ghost images.

Id. at 1:29–42. Figure 1a illustrates the linear polarization method and is reproduced below:

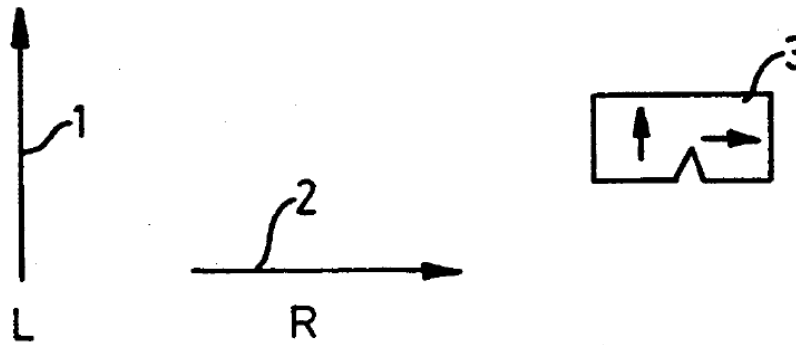


FIG. 1a

Figure 1a illustrates the pre-existing linear polarization method of left and right eye image separation. *Id.* at 4:40–41, 4:52–54. Dean describes:

Linear polarizing axis 1 is vertical and corresponds to left eye images and linear polarizing axis 2 is horizontal and corresponds to right eye images. Eyeglasses 3, have left and right eye lenses made of polarizing filters with identical orientations to those in front of the projection lenses.

Id. at 4:54–59. Dean further describes another previously known polarization method of left and right eye image separation, which makes use of not linear polarizers but “circular polarizers which separate light into clockwise and counterclockwise polarized light.” *Id.* at 10:28–30.

3. *Independent Claim 1⁵*

a) *The Preamble*

Claim 1 in its preamble [1pre] recites “[a] method of three-dimensional viewing of images by a user comprising.”

Petitioner explains that in Doneus, images for the left and right eye are separated by polarization filters of opposite polarity and are viewable by

⁵ We use captions [1pre] through [1f] added by Petitioner to refer to individual recitations within claim 1, for convenience and for having consistency with Petitioner’s labeling. *See* Pet. v-vi.

a user wearing glasses with corresponding polarization filters. Pet. 16 (citing Ex. 1005, 2). Petitioner asserts that the stereo pair of images can be viewed “in 3D” by a user. *Id.* (citing Ex. 1003 ¶ 135). Petitioner also references the illustration shown in the PRD. *Id.* Petitioner’s assertions are supported by the cited disclosures of Doneus and by the cited testimony of Dr. Fuchs. Patent Owner presents no argument regarding the preamble. We are persuaded that Doneus discloses preamble [1pre] of claim 1.⁶

b) Limitations [1a] and [1b]

Claim 1 further recites in limitation [1a] “passing left eye viewing point (LEVP) imagery through the left eye filter having a first orientation to obtain a filtered LEVP imagery.” Claim 1 further recites in limitation [1b] “passing right eye viewing point (REVP) imagery through a right eye filter having a second orientation, said second orientation different than said first orientation to obtain a filtered REVP imagery.” Petitioner explains: “Doneus teaches passing a left eye image (LEVP imagery) and a right eye image (REVP imagery) through a pair of polarization filters of opposite polarity, respectively, to obtain stereoscopic left eye filtered image (filtered LEVP imagery) and right eye filtered image (filtered REVP imagery).” Pet. 17 (citing Ex. 1005, 2). Notwithstanding Patent Owner’s argument, discussed below, we are persuaded that Doneus discloses steps [1a] and [1b].

Patent Owner argues: “Doneus advocates the use of anaglyph images, ‘which can be viewed with a red and a green transparency in front of the reader’s eyes,’ as a ‘good way to look at 3D objects even today.’ Ex. 1005, 3.” PO Resp. 18. Patent Owner cites to the following in Doneus:

⁶ We need not decide whether the preamble recitation is limiting because whether or not it is limiting, we find that Doneus discloses it.

Here, the left image is drawn in red and the right in cyan (or green) colour or projected using a red and cyan (or green) filter. If the viewer then looks at the mixed image through a cyan-filter in front of his right and a red-filter in front of his left eye, each complementary coloured image is filtered away. This results in a stereoscopic view, where each part of the stereopair is viewed only by the corresponding eye. The advantage of this method is, that anaglyphs can be produced easily on all kind of media. Additionally, the viewing devices are very cheap and can be produced by anybody. The disadvantage lies in the limited possibility of viewing coloured 3D-models and in a considerable light loss.

Id. at 18–19 (citing Ex. 1005, 2). Patent Owner then explains:

In so endorsing the use of simple anaglyph systems, *Doneus notes that alternative systems for viewing stereoscopic images*, especially those that rely on alternating viewing of stereopairs of images (that is first viewing the left eye image and then viewing the right eye image in alternating sequence) [such as that disclosed in Dean] *are not favored* because they require the use of expensive equipment to produce the images and also to view them. *Id.* (criticizing the [use] of mixed images produced by polarization methods or that require stereo-image alternators to view because of the need for specialized mediums and devices to display and view the images).

Id. at 19 (emphasis added). With respect to Dean, Patent Owner asserts:

The stereopairs of images that Dean refers to are those “displayed in a repeating on/off cycle which is the same for both series of images” *Id.* at 3:56–60. That is, “the left and right images are alternately projected using projectors provided with polarizing filters arranged with their axes at 90 degrees to each other. Corresponding polarizing filters are provided on eye-glasses worn by the viewer and substantially extinguish transmission of unwanted image information to the viewer’s eyes.” *Id.* at 3:27–33.

Dean further advocates the addition of scattering shutters for the eye-glasses worn by the viewer to reduce ghosting of images being retained on the left eye display when the right eye is receiving and vice versa, This use of scattering shutters

significantly increases the extinction ratio or the ratio of the brightness of the correct or wanted image to the brightness of the incorrect or unwanted image. *Id.* at 3:7–17. Additionally, Dean modifies the timing of the image displays by expanding the display time of the correct or wanted image to overlap with display time of the unwanted image. This overlap increases the brightness of the wanted image and works in concert with the scattering shutters to suppress the ghosting. *Id.* at 3:18–21.

Id. at 19–20.

Patent Owner’s argument about Doneus supposedly not favoring non-anaglyph type polarization systems and methods is unavailing in the context of recitation [1pre] and limitations [1a] and [1b]. Petitioner asserts that Doneus specifically teaches recitation [1pre] and limitations [1a] and [1b], not that anything in Doneus has to be modified to arrive at those recited features. For features that are expressly described in a prior art reference, such as recitation [1pre] and limitations [1a] and [1b], whether there are advantages and/or disadvantages for implementing them plays no role in determining that the reference teaches them. Doneus expressly discloses 3-D viewing by imposing non-anaglyph type opposite polarization on images for the left and right eye, as discussed above. The fact that such systems and methods are more expensive than the anaglyph and do not produce images that can be printed does not negate or undermine that disclosure.

Further, Doneus also describes disadvantages for the anaglyph. Doneus states: “The disadvantage lies in the limited possibility of viewing coloured 3D-models and in a considerable light loss.” Ex. 1005, 2. Thus, according to Doneus, the two types of systems, anaglyph and non-anaglyph, each have advantages and disadvantages. Doneus does not “favor” one type over the other, in an absolute sense. And even if it does, it still teaches both.

Doneus describes different ways for providing three dimensional viewing of images and notes their disadvantages relative to each other. Ex. 1005 § 3. In case of stereoscopes, Doneus states: “The advantage of this method is, that the images are easy to publish. Additionally, colour images can be viewed. The disadvantage lies in the fact, that every viewer needs a stereoscope.” *Id.* In case of the stereo-image alternator, Doneus states: “The disadvantage of this system again lies in the required medium and devices (software and liquid crystal glasses with infrared emitter).” *Id.* In case of using non-anaglyph type polarization filters, Doneus states: “Although viewing of polarized 3D-models is very comfortable the main disadvantage lies in the fact, that they cannot be printed. Additionally, special expensive equipment is needed (projectors or hard- and software, glasses with polarizing filters).” *Id.* In case of anaglyphs, Doneus states: “The advantage of this method is, that anaglyphs can be produced easily on all kind of media. Additionally, the viewing devices are very cheap and can be produced by anybody. The disadvantage lies in the limited possibility of viewing coloured 3D-models and in a considerable light loss.” *Id.* Doneus thus describes different alternatives, all viable, for enabling the viewing of three dimensional images. They are different and all have advantages and disadvantages relative to each other.

To the extent Patent Owner is arguing that Doneus teaches away from non-anaglyph solutions, we disagree. Regarding teaching away, the Federal Circuit has stated: “[T]he prior art’s mere disclosure of more than one alternative does not constitute a teaching away . . . because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed.” *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). As is evident from the above-quoted text from *Fulton*, the criticism, discrediting, and

disparagement, if any, must rise above and beyond the level of merely assessing the advantages and disadvantages among viable alternatives. The central part of the sentence, which gives meaning to “criticize, discredit, and discourage,” is “the prior art’s mere disclosure of more than one alternative does not constitute a teaching away.” *Fulton* does not stand for the proposition that any criticism, discrediting, or disparagement of a feature constitutes a teaching away from adoption of that feature. Indeed, in *Fulton* the Federal Circuit explained that “[c]hoosing one alternative necessarily means rejecting the other,” and that “[t]his interpretation of our case law [treating the choosing of one alternative as a teaching away from the other alternative] fails.” *Fulton*, 391 F.3d at 1201. In any event, in the case here, Doneus describes reasons to choose any of the disclosed alternatives. Ex. 1005 § 3.

Patent Owner further argues that “the combination of Doneus and Dean does not teach or suggest the LEVP/REVP imagery recited in the challenged claims.” PO Resp. 21. The argument is without merit because it is based on Patent Owner’s proposed construction of “LEVP imagery” and “REVP imagery,” which we have, in Section II.C.2 above, discussed and determined as improper. Instead, we have construed “LEVP imagery” as meaning *imagery as seen from the left eye viewing point or left eye viewing perspective*, and “REVP imagery” as meaning *imagery as seen from the right eye viewing point or right eye viewing perspective*. Petitioner persuasively explains (Pet. 17) that Doneus discloses such passing “LEVP imagery” and “REVP imagery” through opposite filters. Patent Owner also acknowledges that “Dean describes the presentation of images from different left eye and right eye viewpoints.” PO Resp. 22.

For the foregoing reasons, Petitioner has shown that Doneus discloses limitations [1a] and [1b].

c) *Limitations [1c-1], [1c-2], [1c-3]*

Claim 1 further recites in limitations [1c-1], [1c-2], and [1c-3] the following:

[1c-1] wherein said different orientation of said right eye filter with said left eye filter comprises one of the group consisting of:

said left eye filter is ninety degrees apart from said right eye filter when said left eye filter and said right eye filter are linear polarization filters;

[1c-2] said left eye filter is an opposite handedness with respect to said right eye filter when said left eye filter and said right eye filter are circular polarization filters; and

[1c-3] said left eye filter is a chromatically opposite color than said right eye filter when said left eye filter and said right eye filter are anaglyph color filters;

For the above recitation, only one of [1c-1], [1c-2], and [1c-3] needs to be met. For limitation [1c -3], Petitioner relies on the disclosure of Doneus. Pet. 21–22. Petitioner explains:

Doneus discloses that, in anaglyph stereoscopic systems, a right eye image is projected through a cyan/green filter (“**right eye filter**”) and a left eye image is projected through a red filter (“**left eye filter**”). MSFT-1005, 2. *See supra* Sections III.A.1, III.A.3.[1a]&[1b]; *see also* MSFT-1006, 1:19–25. The left and right eye images are seen through a user’s glasses with corresponding filters. MSFT-1005, 2. Red is a chromatically opposite color from cyan, green, or blue. MSFT-1003, ¶¶[146]–[147].

Id. For limitations [1c-1] and [1c-2], Petitioner relies on the combined teachings of Doneus and Dean. *Id.* at 19–21.

Petitioner explains as follows:

Doneus describes using filters of opposite polarity to obtain these images, but does not explicitly describe the specific types of filters used to provide the opposite polarity. MS-1005, 2. Dean explains that such filters can be orthogonal polarizers or circular polarizers (e.g., polarizing light clockwise and counter-clockwise). MS-1006, 1:11–19, 1:28–39, 4:52–59, 7:8–46, 10:27–50, FIGS. 1a, 3a(i)-3b(ii).

It would have been obvious for a [person of ordinary skill in the art (POSITA)] to combine Dean's disclosure of the different types of polarization filters (linear and circular polarization filters) with Doneus to cure Doneus's lack of explicit disclosure of the type of polarizers being used and enable a POSITA to implement polarized left and right images for 3D viewing. MS-1003, ¶¶[89]-[90]. This Doneus-Dean combination would merely involve combining prior art elements (polarizer types) according to known methods (Dean and Doneus's stereoscopic display methods) to yield predictable results (3D viewing of stereopairs). MS-1003, ¶[90].

Combining Doneus and Dean would not have modified Doneus's teachings but merely would have incorporated a well-known technique (e.g., how to polarize light using linear or circular polarizers) into Doneus. Moreover, Doneus's polarizing filters would operate in the same way before and after the incorporation of Dean's teachings, to polarize projected light, thereby making the combination even more predictable and foreseeable. MS-1003, ¶[91].

Pet. 13–14. On that basis, with respect to a system according to Doneus and Dean in combination, Petitioner states that when linear polarization is used, “right eye linear polarizing filters are used as the right eye filters and left eye linear polarizing filters are used as the left eye filters,” and that “[t]he orientation of the right eye linear polarizing filters is orthogonal to the orientation of the left eye linear polarizing filters.” *Id.* at 15. Also on that basis, Petitioner states that when circular polarization is used in the combination, “right eye circular polarizing filters are used as the right eye

polarizing filters and left eye circular polarizing filters are used as the left eye filters,” and that “[t]he orientation of the right eye circular polarizing filters is in the opposite direction (opposite handedness, e.g., clockwise) compared to the left eye [circular] polarizing filters (e.g., counterclockwise).” *Id.*

Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning. Doneus lacks the implementation details of how the left and right eye images are linearly oppositely polarized, as compared to each other, and of how the left and right eye images are oppositely circularly polarized, relative to each other, and Dean supplies such detail. Ex. 1006, 1:28–33, 4:52–59, 10:25–40, Figs. 1a, 3a(i)-3(b)(ii). Notwithstanding Patent Owner’s arguments, discussed below, we are sufficiently persuaded that limitations [1c-1] and [1c-2] are met by the combined teachings of Doneus and Dean, and limitation [1c-3] is met by Doneus without need for any teaching from Dean. Furthermore, only one of limitations [1c-1], [1c-2], and [1c-3] needs to be met, because claim 1 recites that the different orientation of the right eye filter as compared to the left eye filter is one of the three. Ex. 1001, 21:55–66.

Patent Owner argues that one with ordinary skill in the art would not have combined the teachings of Doneus and Dean “because Doneus advocates the use of anaglyphic systems over complex shutter systems of the kind described by Dean.” PO Resp. 21. The argument is misplaced for several reasons. First, as already discussed above in the context of limitations [1a] and [1b], Doneus does not categorically favor anaglyphic systems over non-anaglyphic systems, and anaglyphic and non-anaglyphic systems are all viable alternatives. Second, Petitioner has not proposed to use the shutter system of the kind described by Dean. Third, the disclosure

of Dean as relied on by Petitioner does not tie the 90 degrees offset between opposite polarization filters to concurrent use of complex shutters. For instance, Dean describes:

Another method of image separation involves the use of mutually extinguishing polarizing filters. The filters are placed in front of left and right eye projectors with their polarizing axes at 90 degrees to each other. Viewers wear eyeglasses with polarizing filters arranged in the same orientation as the filters on the projectors. *The left and right eye images appear on the screen at the same time*, but only the left eye polarized light is transmitted through the left eye lens of the eyeglasses and only the right eye polarized light is transmitted through the right eye lens. This method is inexpensive and allows full colour 3-D images.

Ex. 1006, 1:28–39 (emphasis added). Further, Figures 3a(i) and 3a(ii) of Dean illustrate the use of linear opposite filters without application of the complex scattering shutters disclosed by Dean. *Id.* at 7:8–46. Similarly, we do not find that Dean’s reference to circular polarization filters for the left and right eyes limits their use to applications also employing Dean’s alternating scattering shutters.

That Dean discloses a complex system involving the use of alternating displays and eye glasses with scattering shutters does not detract or take away from Dean’s teaching of what polarization techniques to use for polarization filters that enable viewing of a three dimensional image. Petitioner has not proposed to modify Doneus to use alternating displays. Nor has Petitioner proposed to use eye glasses with alternatingly scattering shutters. The stated motivation to combine simply relies on ascertaining what specific polarization techniques may be used to provide polarization filters. Pet. 13–14. A prior art reference must be considered for everything it teaches by way of technology and is not limited to the particular

innovation it is describing. *See EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985).

For the foregoing reasons, Petitioner has shown that a proper combination of Doneus and Dean teaches limitations [1c-1], [1c-2], and [1c-3]. Note also that claim 1 requires satisfaction of only one of limitations [1c-1], [1c-2], and [1c-3].

d) Limitation [1d]

Claim 1 further recites in step [1d]: “projecting said filtered LEVP imagery on a display; projecting said filtered REVP imagery on said display wherein said filtered REVP imagery is superimposed over said filtered LEVP imagery.” Referring to the PRD and associated disclosure of Doneus, Petitioner explains how step [1d] is met by the combined teachings of Doneus and Dean. Pet. 22–25. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning. Patent Owner does not make additional arguments with respect to limitation [1d]. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

Petitioner has shown that a proper combination of Doneus and Dean teaches limitation [1d].

e) Limitation [1e]

Claim 1 further recites in limitation [1e]: “wherein a user wearing polarized glasses is able to view said filtered LEVP imagery and said filtered REVP imagery as three dimensional imagery on said display.” Referring to the PRD and associated disclosure of Doneus, Petitioner explains how limitation [1e] is met by the combined teachings of Doneus and Dean.

Pet. 25–26. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning. Patent Owner does not make additional arguments with respect to limitation [1e]. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

Petitioner has shown that a proper combination of Doneus and Dean teaches limitation [1e].

f) Limitation [1f]

Claim 1 further recites in limitation [1f]: “wherein a left lens of said polarized glasses is oriented in a similar manner as said left eye filter and wherein a right lens of said polarized glasses is oriented in a similar manner as said right eye filter.” Referring to the PRD and associated disclosure of Doneus, Petitioner explains how limitation [1f] is met by the combined teachings of Doneus and Dean. Pet. 26–27. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Patent Owner does not make additional arguments with respect to limitation [1f]. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

Petitioner has shown that a proper combination of Doneus and Dean teaches limitation [1f].

g) Summary

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claim 1 would have been obvious over Doneus and Dean.

4. *Dependent Claims 2 and 3*

Claim 2 depends from claim 1 and further recites: “wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses.” Ex. 1001, 22:11–14. Petitioner explains how Dean discloses orthogonal linear polarization for viewing three dimensional images, and why one with ordinary skill in the art would have known to apply such orthogonal linear polarization in Doneus. Pet. 13–15, 28–30. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Claim 3 depends from claim 1 and further recites: “wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses.” Ex. 1001, 22:15–18. Petitioner explains how Dean discloses circular polarization for viewing three dimensional images, and explains why one with ordinary skill in the art would have known to apply such circular polarization in Doneus. Pet. 13–15, 30–31. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Patent Owner does not make additional arguments with respect to claims 2 and 3. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claims 2 and 3 would have been obvious over Doneus and Dean.

*E. Alleged Obviousness of
Claim 4 over Doneus, Dean, and Ito*

1. Overview of Ito

Ito discloses a stereoscopic picture display unit. Ex. 1007, 2:5–8. Ito describes, for three dimensional viewing of images, the use of circular polarizing filters in the form of “circular polarizing plates of opposite rotary directions for the right and left eyes.” *Id.* at 10:49–56. Ito specifically states: “The circular polarizing plates themselves are easy to obtain since they can be formed by combining linear polarizing plates with *quarter wave plates* and are commercially available as single components.” *Id.* at 10:57–60 (emphasis added).

2. Claim 4

Claim 4 depends from claim 3 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” Ex. 1001, 22:19–20. Petitioner explains how Ito discloses the use of quarter wave plate to implement circular polarization filters and why one with ordinary skill in the art, in light of Ito, would have known to use a quarter wave plate in the circular polarization filters according to the combined teachings of Doneus and Dean. Pet. 31–32. Petitioner’s assertions are supported by the cited evidence and its reasoning has a rational underpinning.

Patent Owner does not make additional arguments with respect to claim 4. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claim 4 would have been obvious over Doneus, Dean, and Ito.

*F. Alleged Obviousness of
Claim 6 over Doneus, Dean, and Getty*

1. Overview of Getty

Getty discloses a method for marking stereo pairs of images.

Ex. 1008 ¶ 4. Specifically, Getty describes:

The stereoscopic pair of projection of projection images is displayed such that the stereoscopic pair of projection images, when viewed through a viewing apparatus, forms a perceived three dimensional image. An input device or software application can then be used to position a marker within the stereoscopic pair of projection images to identify a location within the perceived three dimensional images.

Id.

2. Claim 6

Claim 6 depends from claim 1 and further recites a step of: “further comprising augmenting said three dimensional imagery.” Petitioner explains how Getty discloses augmenting three dimensional imagery and why one with ordinary skill in the art, in light of Getty, would have known to add a step of augmenting three dimensional imagery to the method according to the combined teachings of Doneus and Dean as discussed in the context of claim 1. Pet. 33–37. Petitioner’s assertions are supported by the cited evidence and its reasoning has a rational underpinning. Specifically, Getty discloses marking stereo pairs of images. Ex. 1008 ¶¶ 4, 54–56, 62. Marking, in the context of the ’766 patent, is a form of augmenting images, because the ’766 patent describes a user annotating an image, such as

placing a sphere or arrow on an image, and inserting a place marker or highlighting, as providing an augmented reality. Ex. 1001, 18:44–19:22.

Patent Owner does not make additional arguments with respect to claim 6. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claim 6 would have been obvious over Doneus, Dean, and Getty.

*G. Alleged Obviousness of Claims 7–9
13, 14, and 16 over Doneus, Dean, and Faris*

1. Overview of Faris

Faris pertains to a method and apparatus for producing stereo images of 3-D objects and scenery, specifically a method and system for producing and displaying spectrally-multiplexed color images of 3-D scenery for use in stereoscopic viewing thereof. Ex. 1011, 4:14–22. Faris additionally pertains to a method of producing spectrally-multiplexed color images of 3-D scenery, “from a diverse array of devices, including computer systems, camera systems, laser-disc playback units, video-tape recording and playback units, color image scanners, television signal receivers and the like.” *Id.* at 4:41–46.

In pertinent part, Faris describes:

As illustrated in FIG. 3, the SMC computer system (e.g. workstation) 5 of the illustrative embodiment comprises a number of integrated system components, namely: one or more central processing units 6 (e.g. microprocessor); *program memory storage 7 for storing an operating system program, application programs, and various image processing routines of*

the present invention; random access data storage memory (e.g. VRAM) 8 for storing left and right color perspective images of a 3-D object or scene, upon which spectral multiplexing is to be performed; a mass-type data storage memory 9 for storing produced pairs of spectrally-multiplexed color images {ISMCI(1,k), ISMCI(2,k)}; a visual display unit 10 having a visual display screen or surface; a keyboard or other text input device 11; a pointing and selecting device (e.g. mouse or track-ball) 12; and one or more video output devices 13, such as CD-ROM or stereo-video camera. As illustrated, each of these system components is operably associated with processor 6 by way of one or more system buses 14 in a manner known in the art. In the preferred embodiment, the operating system may be Unix® X-Windows, allowing the processor to support at least two input/output windows, pointing and selecting device 12, and multi-media input and output devices 13. It is understood, however, that other suitable operating system programs can be used with acceptable results. In applications where images of 3-D scenery or objects are generated using computer programming techniques, conventional computer algorithms can be used to generate left and right color perspective images with the computer system. *Presently suitable graphics software is commercially available for creating high resolution 3-D color models, renderings and animations, as well as performing perspective image generation functions upon Intel 386/486 microprocessor based personal computer systems. Exemplary software is available from Autodesk, Inc. of Sausalito, Calif. under the trademark "Autodesk 3D Studio," Release 2.*

Ex. 1011, 9:53–10:21 (emphasis added).

2. *Independent Claim 7*

Claim 7 is the same as claim 1, except for the preamble. Rather than reciting a method of three dimensional viewing of images by a user comprising," claim 7's preamble recites: "A non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images, the medium including instructions in which a computer system performs operations comprising." Ex. 1001, 22:28–32.

Thus, all of the limitations of claim 1 are in claim 7 as operations performed by a computer system according to instructions in computer readable code stored on a non-transitory computer readable storage medium.

To account for claim 7, Petitioner relies on the same evidence and arguments it relies on for claim 1, plus Faris. Regarding the addition of Faris, Petitioner explains:

Here, Faris, like Doneus and Dean, discloses a computer-implemented method that executes software for displaying stereoscopic images. MS-1005, 2; MS-1006, 1:11–19, 7:8–46, 11:8–13; MS-1011, FIGS. 3, 14A, 14B, 9:53–10:21, 28:21–67. Faris teaches that such a method can be implemented in a computer system that executes computer readable code/instructions for providing three dimensional viewing of images to a user and through a non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images. MS-1011, FIGS. 3, 14A, 14B, 9:53–10:21, 28:21–67. A POSITA would have encoded the instructions for implementing Doneus and Dean’s method for viewing 3D images into a computer-readable medium to be stored and executed in Faris’s computer system, which could predictably be performed by a POSITA. MS-1003, ¶¶[108]–[109]. And since Doneus teaches using a computer screen and software, such a combination would have been foreseeable. Encoding the instructions for implementing Doneus and Dean’s method for viewing 3D images to a computer-readable storage medium, as disclosed by Faris, would have been advantageous because doing so would allow the method to be performed by various computer systems that are capable of executing the instructions. *Id.*

Pet. 42–43. Petitioner further asserts that “[c]ombining the teachings of Doneus, Dean, and Faris would merely involve combining prior art elements according to known methods to yield predictable results. MS-1003, ¶¶[107]–[109].” *Id.* at 42. Petitioner’s assertions are supported by the cited testimony of Dr. Fuchs and have a reasonable underpinning.

Patent Owner does not, with regard to Petitioner's alleged teachings of Faris and proposed reasons for and manner of combining the teachings of Doneus, Dean, and Faris, present contrary arguments. Instead, Patent Owner presents the same arguments it presents for claim 1. We have already discussed and rejected above, in the context of claim 1, Patent Owner's argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach "LEVP imagery" or "REVP imagery."

Accordingly, Petitioner has proved by a preponderance of the evidence obviousness of claim 7 over Doneus, Dean, and Faris.

3. *Dependent Claims 8 and 9*

Claim 8 depends from claim 7 and further recites: "wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses." Ex. 1001, 22:62–64. Petitioner explains how Dean discloses orthogonal linear polarization for viewing three dimensional images, and why one with ordinary skill in the art would have known to apply such orthogonal linear polarization in computer instructions according to the combined teachings of Doneus and Faris. Pet. 10–16, 38–44. Petitioner's reasoning is supported by the cited evidence and has a rational underpinning.

Claim 9 depends from claim 7 and further recites: "wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses." Ex. 1001, 22:66–23:2. Petitioner explains how Dean discloses use of circular polarization filters and corresponding circular polarization glasses for viewing three dimensional images, and why one with ordinary skill in the art would have known to include such circular polarization in computer

instructions according to the combined teachings of Doneus and Faris. Pet. 10–16, 38–43, 45. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Patent Owner does not make additional arguments with respect to claims 8 and 9. We have already discussed and rejected above Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

Accordingly, Petitioner has proved by a preponderance of the evidence obviousness of claims 8 and 9 over Doneus, Dean, and Faris.

4. *Independent Claim 13*⁷

Claim 13 is the same as claim 1, except for the preamble and the recitation of several additional elements. Rather than reciting a “method of three-dimensional viewing of images by a user comprising,” claim 13’s preamble recites: “A computer system comprising.” Ex. 1001, 23:13. Claim 13 additionally recites, compared to claim 1:

[13a] a memory;

[13b] a processor;

[13c] a communications interface;

[13d] an interconnection mechanism coupling the memory, the processor and the communications interface; and

[13e] wherein the memory is encoded with an application providing three dimensional viewing of images, that when performed on the processor, provide a process for processing information, the process causing the computer system to perform the operations of:

⁷ We use captions [13pre] through [13k] added by Petitioner to refer to individual recitations within claim 13, for convenience and for having consistency with Petitioner’s labeling. *See* Pet. viii-ix.

Id. at 23:14–23.

Thus, all of the limitations of claim 1 are in claim 13 as operations performed by a computer system including a memory, processor, communications interface, and interconnection mechanism coupling the memory, the processor, and the communications interface, according to an application in memory that provides three dimensional viewing of images by processing information.

To account for claim 13, Petitioner relies on the same evidence and arguments it relies on for claim 1, plus Faris. Regarding the addition of Faris, Petitioner explains:

Here, Faris, like Doneus and Dean, discloses a computer-implemented method that executes software for displaying stereoscopic images. MS-1005, 2; MS-1006, 1:11–19, 7:8–46, 11:8–13; MS-1011, FIGS. 3, 14A, 14B, 9:53–10:21, 28:21–67. Faris teaches that such a method can be implemented in a computer system that executes computer readable code/instructions for providing three dimensional viewing of images to a user and through a non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images. MS-1011, FIGS. 3, 14A, 14B, 9:53–10:21, 28:21–67. *A POSITA would have encoded the instructions for implementing Doneus and Dean's method for viewing 3D images into a computer-readable medium to be stored and executed in Faris's computer system, which could predictably be performed by a POSITA.* MS-1003, ¶¶[108]–[109]. And since Doneus teaches using a computer screen and software, such a combination would have been foreseeable. Encoding the instructions for implementing Doneus and Dean's method for viewing 3D images to a computer-readable storage medium, as disclosed by Faris, would have been advantageous because doing so would allow the method to be performed by various computer systems that are capable of executing the instructions. *Id.*

Pet. 42–43 (emphasis added). Petitioner further asserts that “[c]ombining the teachings of Doneus, Dean, and Faris would merely involve combining prior art elements according to known methods to yield predictable results. MS-1003, ¶¶[107]–[109].” *Id.* at 42. Petitioner’s assertions are supported by the cited testimony of Dr. Fuchs and have a reasonable underpinning.

Patent Owner does not, with regard to Petitioner’s alleged teachings of Faris and proposed reasons for and manner of combining the teachings of Doneus, Dean, and Faris, present contrary arguments. Instead, Patent Owner presents the same arguments it presents for claim 1. We have already discussed and rejected above, in the context of claim 1, Patent Owner’s argument that Doneus favors anaglyphs, that there is no motivation to combine the teachings of Doneus and Dean, and that Doneus and Dean do not teach “LEVP imagery” or “REVP imagery.”

For the preamble of claim 13, which recites a computer system, Petitioner asserts that Faris describes a computer system. Specifically, Petitioner asserts that Faris discloses a computer-implemented method that executes software for displaying stereoscopic images. Pet. 42 (citing Ex. 1011, 9:53–10:21, 28:21–67). Dr. Fuchs also testifies that Faris describes a computer system used to execute 3D stereoscopic viewing. Ex. 1003 ¶ 106. Patent Owner does not present contrary argument. Petitioner’s assertion is supported by the cited evidence. We determine that Faris describes a computer system.

For limitation [13a], a memory, Petitioner asserts: “Faris’s computer system includes a memory such as ‘hard-disc data storage device 142 for storing an operating system program, application programs, and optionally various image processing routines of the present invention.’ MS-1011, 9:53–67, 28:21–67; MS-1003, ¶[223].” Pet. 45. The assertion is supported

by the cited evidence and not disputed by Patent Owner. We determine that Faris's computer system includes a memory.

For limitation [13b], a processor, Petitioner asserts: "Faris's computer system includes a processor such as any one or more of 'one or more central processing units 141 (e.g. microprocessor),' controller 151, and driver 149 shown in Faris's FIG. 14B. MS-1011, 9:53–67, 28:21–67; MS-1003, ¶[224]." Pet. 46. The assertion is supported by the cited evidence and not disputed by Patent Owner. We determine that Faris's computer system includes a processor.

For limitation [13c], a communications interface, Petitioner asserts: "Faris's computer system includes one or more input/output devices 147 (a communications interface) e.g., CD-ROM, a stereo-image producing computer, or camera), as shown in FIG. 14B. MS-1011, 9:53–10:2, 28:21–67; MS-1003, ¶[225]." Pet. 47. The assertion is supported by the cited evidence and not disputed by Patent Owner. We determine that Faris's computer system includes a communications interface.

For limitation [13d], an interconnection mechanism coupling the memory, the processor, and the communications interface, Petitioner asserts: "Faris's computer system includes **an interconnection mechanism such as one or more buses 152 that couple the memory** (hard-disc data storage device 142), **the processor** (processing units 141, driver 149, and/or controller 151), **and the communications interface** (one or more input/output devices 147), as shown in FIG. 14B below. MS-1011, 28:21–67; MS-1003, ¶[226]." Pet. 48. The assertion is supported by the cited evidence and not disputed by Patent Owner. We determine that Faris's computer system includes such an interconnection mechanism.

For limitation [13e], “wherein the memory is encoded with an application providing three dimensional viewing of images, that when performed on the processor, provide a process for processing information, the process causing the computer system to perform the operations of,” Petitioner accounts for it by the discussion of how the teachings of Doneus, Dean, and Faris are combined. Pet. 41–43. Specifically, Petitioner asserts that “[a] POSITA would have encoded the instructions for implementing Doneus and Dean’s method for viewing 3D images into a computer-readable medium to be stored and executed in Faris’s computer system, which could predictably be performed by a POSITA. MS-1003, ¶¶[108]-[109].” *Id.* at 43. The discussion is supported by the cited evidence. Patent Owner does not present argument additional to those it presents for claim 1, which we have already addressed and rejected above. We determine that limitation [13e] is met by the combined teachings of Doneus, Dean, and Faris.

Limitations [13f], [13g], [13h-1], [13h-2], [13h-3], [13i], [13j], and [13k] read the same as limitations [1a], [1b], [1c-1], [1c-2], [1c-3], [1d], [1e], and [1f], respectively. Petitioner’s arguments and evidence in support thereof are the same and have been discussed above in the context of claim 1. Patent Owner does not present argument additional to those it presents in the context of claim 1, and we have addressed and rejected those arguments when discussing claim 1. We determine that limitations [13f], [13g], [13h-1], [13h-2], [13h-3], [13i], [13j], and [13k] are met by the combined teachings of Doneus and Dean.

Accordingly, Petitioner has proved by a preponderance of the evidence obviousness of claim 13 over Doneus, Dean, and Faris.

5. *Dependent Claims 14 and 16*

Claim 14 depends from claim 13 and further recites: “wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses.” Ex. 1001, 24:17–20. Petitioner explains how Dean discloses orthogonal linear polarization for viewing three dimensional images, and why one with ordinary skill in the art would have known to apply such orthogonal linear polarization in computer instructions according to the combined teachings of Doneus and Faris. Pet. 10–16, 38–44, 50. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Claim 16 depends from claim 13 and further recites: “wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses.” Ex. 1001, 24:24–27. Petitioner explains how Dean discloses use of circular polarization filters and corresponding circular polarization glasses for viewing three dimensional images, and why one with ordinary skill in the art would have known to include such circular polarization in computer instructions according to the combined teachings of Doneus and Faris. Pet. 10–16, 38–44, 50. Petitioner’s reasoning is supported by the cited evidence and has a rational underpinning.

Patent Owner does not make any additional argument for claims 14 and 16 relative to what it has argued for claim 13. We have already discussed and rejected Patent Owner’s arguments in the context of claim 13.

Petitioner has proved by a preponderance of the evidence obviousness of claims 14 and 16 over Doneus, Dean, and Faris.

*H. Alleged Obviousness of Claims 10 and 15
over Doneus, Dean, Faris, and Ito*

Claim 10 depends from claim 7 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” Ex. 1001, 23:3–5. Claim 15 depends from claim 14 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” *Id.* at 24:21–23. Petitioner explains how Ito discloses the use of quarter wave plate to implement circular polarization filters and why one with ordinary skill in the art, in light of Ito, would have known to use a quarter wave plate in the circular polarization filters according to the combined teachings of Doneus and Dean. Pet. 31–32, 51. Petitioner’s assertions are supported by the cited evidence and its reasoning has a rational underpinning.

Patent Owner does not make any additional argument beyond those it has made for independent claims 7 and 13, which we already have addressed and rejected above. Petitioner has proved by a preponderance of the evidence obviousness of claims 10 and 15 over Doneus, Dean, Faris, and Ito.

*I. Alleged Obviousness of Claims 12 and 18
over Doneus, Dean, Faris, and Getty*

Claim 12 depends from claim 7 and further recites: “further comprising augmenting said three dimensional imagery.” Ex. 1001, 23:10–12. Claim 18 depends from claim 13 and further recites: “further comprising augmenting said three dimensional imagery.” *Id.* at 24:32–33. Petitioner explains how Getty discloses augmenting three dimensional imagery and why one with ordinary skill in the art, in light of Getty, would have known to add a step of augmenting three dimensional imagery to the method according to the combined teachings of Doneus and Dean as

discussed in the context of claim 1. Pet. 33–37. Petitioner’s assertions are supported by the cited evidence and its reasoning has a rational underpinning. Specifically, Getty discloses a method for marking stereo pairs of images. Ex. 1008 ¶ 4. Marking, in the context of the ’766 patent, is a form of augmenting images, because the ’766 patent describes a user annotating an image, such as placing a sphere or arrow on an image, and inserting a place marker or highlighting, as providing an augmented reality. Ex. 1001, 18:44–19:22.

Patent Owner does not make any additional argument beyond those it has made for independent claims 7 and 13, which we already have addressed and rejected above. Petitioner has proved by a preponderance of the evidence obviousness of claims 12 and 18 over Doneus, Dean, Faris, and Getty.

J. Alleged Anticipation of Claims 1–4 by Rosencwaig

1. Overview of Rosencwaig⁸

Rosencwaig’s disclosure pertains to generating and displaying stereoscopic images to a human viewer by use of passive stereoscopic filters. Ex. 1010, 3:3–6. Rosencwaig describes:

In accordance with these and other objects, the subject invention relates to a passive stereoscopic vision system for a raster displayed image that includes two sets of passive filters. A first set of passive filters is associated with the display. In the preferred embodiment, the image from alternate rows of pixels are transmitted through oppositely oriented polarizers, such that odd numbered rows are transmitted through polarizers having a first polarity and even numbered rows are transmitted through polarizers having a second polarity. The image intended for each eye is displayed through only a polarizer having either the first

⁸ When citing to Rosencwaig, we use the page numbers at the bottom of Ex. 1010.

or the second polarity but not both. The polarizer filters for the display are formed through photolithographic techniques. Each of the viewer's eyes has an appropriately corresponding polarizing filter positioned between it (but not the other eye) and the screen. In this way only the image that is intended for each eye can reach the appropriate eye.

Id. at 6:29–7:11. Figure 1 illustrates a preferred embodiment and is reproduced below:

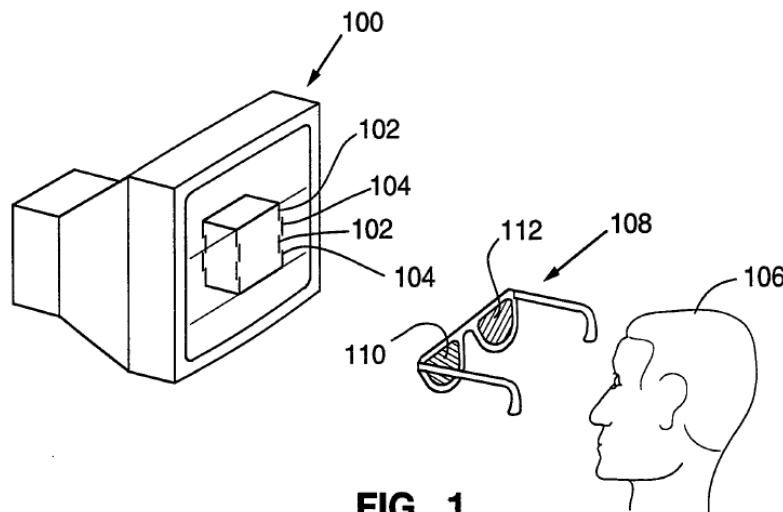


FIG. 1

Figure 1 shows a perspective view of a preferred embodiment. *Id.* at 7:29–30. Raster based display screen 100 presents two images of an object. *Id.* at 7:30–32. Each image is presented from a slightly different perspective, i.e., the perspective of each of the two eyes of a typical viewer. *Id.* at 7:32–34. The two images are interlaced on the display. *Id.* at 8:1. Rosencwaig describes:

The cube is shown as broken portions of two interlaced cubes 102 and 104 shown from two slightly different perspectives. In contrast, in the preferred embodiment, the two images are displayed on alternate rows. By way of example, the image intended for the left eye is displayed on the even rows and the image intended for the right eye is displayed on odd rows. The selection of odd and even rows could just as easily be selected oppositely.

The raster display 100 can be either a CRT, liquid crystal or other type of display. The displays can be treated as a set of pixels arrayed in rows and columns.

A viewer 106 wears a pair of glasses 108, having two oppositely polarized lenses 110 and 112, one for each eye, each of which selectively transmits only the appropriate image from the appropriate alternate rows. In this way, only the image intended for each eye is transmitted to that eye.

Id. at 8:5–22.

Figure 2 shows a close-up view of a portion of display screen 100 of Rosencwaig and is reproduced below:

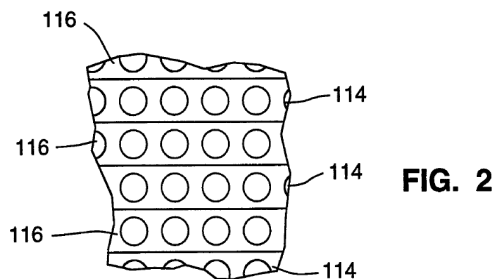


Figure 2 shows a close-up view of a portion of Rosencwaig's display screen 100. *Id.* at 8:27–28. Even rows 114 are provided with polarizers having a first orientation and odd rows 116 are provided with polarizers having a second orientation. *Id.* at 8:28–31.

Figure 4 illustrates the entire viewing environment:

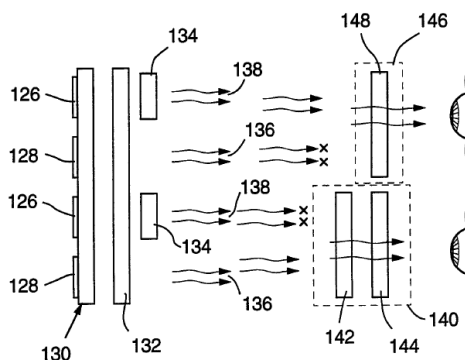


Figure 4 illustrates how image light is transmitted from pixels in a display screen to a viewer's eyes. *Id.* at 9:4–23. Rosencwaig describes:

In Figure 4, a portion of a display screen 130 is shown including 2 pixels 126 and 2 others 128. The light emanating from all the pixels is transmitted through the screen 130 to the display filter which includes a linearizing polarizer 132 and a birefringent retarder [134] in front of alternate pixels 126. The display filter in front of pixels 128 includes only the linear polarizer 132. The retarder [134] is adapted to rotate the polarization of the light from pixels 126 by 90° by means of providing a positive half-wave retardation ($+\lambda/2$).

A pair of glasses is positioned over the view's eyes including two lenses 140 and 146. The first lens 140 consists of a birefringent retarder 142 that rotates the polarization of light striking lens 140 by -90° by means of providing a negative half-wave retardation ($-\lambda/2$). The retarder 142 is followed by a linearizing polarizer 144 oriented at 90° relative to the display polarizer 132. The second lens 146 includes simply a linearizing polarizer 148 that is also oriented at 90° relative to the display polarizer 132.

Id. at 9:4–23.

Rosencwaig sometimes identifies element 100 as the display screen, and sometimes identifies element 130, including pixels 126 and 128, as the display screen. Ex. 1010, 8:27–28, 9:4–5.

2. *Independent Claim 1*

Claim 1 in its preamble [1pre] recites “[a] method of three-dimensional viewing of images by a user comprising.” Petitioner asserts that “Rosencwaig discloses **a method of 3D viewing of images by a user** using a stereoscopic system.” Pet. 60 (citing Ex. 1010, FIGS. 1, 4, 5, 6K, 7F, 4:29–5:11, 5:29–12:14; Ex. 1003 ¶ 154). The assertion is supported by

the cited evidence and not disputed by Patent Owner. We determine that the preamble recitation is met by Rosencwaig.⁹

Claim 1 further recites in step [1a] “passing left eye viewing point (LEVP) imagery through the left eye filter having a first orientation to obtain a filtered LEVP imagery.” Claim 1 further recites in step [1b] “passing right eye viewing point (REVP) imagery through a tight eye filter having a second orientation, said second orientation different than said first orientation to obtain a filtered REVP imagery.”

Petitioner explains:

In the linear polarization implementation shown in FIG. 4 (reproduced below), a first set of pixels 126 and a second set of pixels 128 are arranged in an alternating manner, which as explained above, are used to project REVP imagery and LEVP imagery. MS-1010, 7:4–8:17; *see supra* Section III.G.1. A linearizing polarizer 132 is applied to the light signals projected by all the pixels. *Id.* Birefringent retarders 134/154 are placed “in front of alternate pixels 126” “to rotate the polarization of the light from pixels 126 by 90°.” *Id.* A POSITA would have understood that the combination of **the linearizing polarizer 132 and birefringent retarder 134 corresponds to a “right eye filter,” and the linearizing polarizer 132 corresponds to the “left eye filter”** (or vice-versa) and that these components **filter the REVP and LEVP imagery passing through them to obtain filtered REVP and filtered LEVP imagery, respectively**, as shown in FIG. 4 below. MS-1003, ¶[155]. Furthermore, Rosencwaig’s **combination of the linear polarizer 132 and birefringent retarder 134 (right eye filter) has a second orientation that is different than a first orientation of the linearizing polarizer 132 (left eye filter) by 90°.** *Id.*; MS-1010, 7:4–8:17.

Pet. 60–61.

⁹ We need not determine whether the preamble recitation is limiting.

The assertion is supported by the cited evidence. Patent Owner argues, however, that neither limitation [1a] nor [1b] is met by Rosencwaig. We disagree with Patent Owner. Patent Owner asserts:

[T]he images displayed in the fashion described by Rosencwaig are not indicated to be two-dimensional left eye / right eye representations of a three-dimensional volume as seen from a user-specified viewing angle and separately determined left eye / right eye viewing perspectives, where the two-dimensional left eye / right eye representations are made up of a number of pixels, each of which has properties according to properties of voxels of a volume included in respective theta-alpha cones through the volume from the left eye / right eye viewing perspectives, as required by claim 1.

PO Resp. 29–30. But the argument is misplaced because it is premised on Patent Owner’s incorrect proposed construction of “LEVP imagery” and “REVP imagery.” In Section II.C.2 above, we determined that Patent Owner’s proposed construction is improper and determined, instead, that “LEVP imagery” means *imagery as seen from the left eye viewing point or left eye viewing perspective*, and “REVP imagery” means *imagery as seen from the right eye viewing point or right eye viewing perspective*. Under our construction, Petitioner appropriately regards light from pixels 126 as REVP imagery and light from pixels 128 as LEVP imagery. As noted above, Rosencwaig states: “By way of example, the image intended for the left eye is displayed on the even rows and the image intended for the right eye is displayed on odd rows. The selection of odd and even rows could just as easily have been selected oppositely.” Ex. 1010, 8:9–13.

Petitioner further explains:

In circular polarization implementations, a first set of pixels 126 and a second set of pixels 128 are arranged in an alternating manner, as shown in FIG. 5 below. MS-1010, 9:28–10:4. REVP imagery projected from pixels 126 passes through

a linearizing retarder 132 and a birefringent retarder 154 “to circularly rotate the polarization of the light by means of a quarter-wave retardation ($+\lambda/4$) thereby generating right-hand circularly polarized light.” *Id.* LEVP imagery projected from pixels 128 passes through a linearizing retarder 132 and a birefringent retarder 156 to “circularly rotate the polarization of the light by means of a negative quarter-wave retardation ($-\lambda/4$) thereby generating left-hand circularly polarized light.” *Id.*; MS-1003, ¶[156].

[Figure 5 omitted]

A POSITA would have understood that **the combination of the linearizing polarizer 132 and birefringent retarder 154 that provides the positive quarter-wave retardation ($+\lambda/4$) to obtain right-hand circularly polarized light (“filtered REVP imagery”) corresponds to the “right eye filter,” and the combination of the linearizing polarizer 132 and birefringent retarder 156 that provides the negative quarter-wave retardation ($-\lambda/4$) to obtain left-hand circularly polarized light (“filtered LEVP imagery”) corresponds to “left eye filter.”** MS-1003, ¶[157]. Rosencwaig’s birefringent retarder 156 has a first orientation (i.e., ($-\lambda/4$)) that is different than a second orientation of the birefringent retarder 154 (i.e., ($+\lambda/4$)). *Id.*

Pet. 63–64.

The assertion is supported by the cited evidence and not disputed by Patent Owner.

For the foregoing reasons, we determine that limitations [1a] and [1b] are described by Rosencwaig, in both the linear polarization embodiment and the circular polarization embodiment of Rosencwaig.

Regarding limitations [1c-1], [1c-2], and [1c-3], only one of them need be met. Petitioner’s assertions regarding limitations [1a] and [1b], discussed above, also account for the satisfaction of limitation [1c-1] based on Rosencwaig’s embodiment using linear polarization and satisfaction of limitation [1c-2] based on Rosencwaig’s embodiment using circular

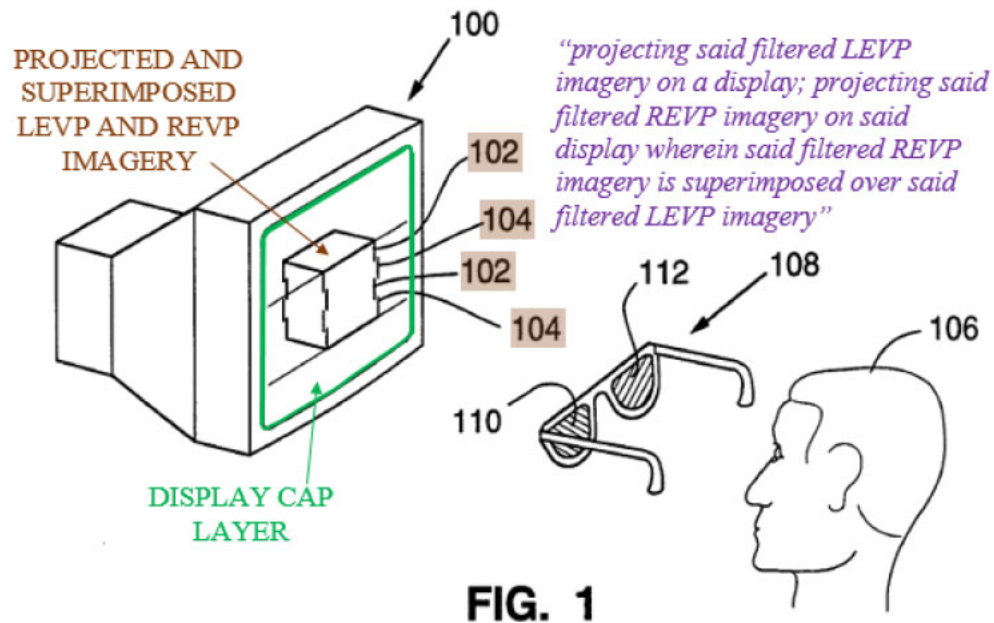
polarization. Patent Owner does not present additional arguments beyond that which we have already addressed and rejected above in the context of the discussion of limitations [1a] and [1b]. We determine that Rosencwaig discloses limitations [1c-1] and [1c-2].

Claim 1 further recites limitation [1d]: “projecting said filtered LEVP on a display,” “projecting said filtered REVP imagery on said display,” and “wherein said filtered REVP imagery is superimposed over said filtered LEVP imagery.” Ex. 1001, 21:67–22:3. Petitioner asserts:

The '766 Patent explains that the LEVP and REVP “could be superimposed and projected onto a single flat screen display 718 through the use of techniques such as polarizing filters 714 and 716.” MS-1001, 17:4–9, 17:30–35, 18:33–37 (“the left eye viewing point imagery and right eye viewing point imagery are interleaved and projected onto a typical computer display.”) Likewise, as explained above in Sections III.G.1 and III.G.[1a]&[1b] and shown in Rosencwaig’s FIGS. 1, 4, and 5, alternating pixels are used to project REVP and LEVP imagery which are polarized by a linearizing polarizer 132 and (selectively by) the birefringent retarders 134/154/156 to generate linearly or circularly polarized and filtered LEVP imagery and REVP imagery. MS-1010, 7:4–13, 9:28–10:4, FIGS. 4, 5. MS-1003, ¶¶[162]–[163]. ***The filtered REVP imagery and LEVP imagery are projected and superimposed onto each other such that an interlaced image (e.g., a 3D cube as shown in FIG. 1) appears on the screen of the display device 100.*** MS-1010, 5:29–6:13, FIG. 1. The display devices 100 can be a variety of displays including a CRT, LCD, or plasma display, some of which, as is well-known, have been implemented in a “single flat screen display” or used as a “typical computer display,” similar to the '766 Patent implementations. MS-1010, 4:16–18, 16:25–36, FIGS. 6K, 7F.

Pet. 67–68.

As an illustration, Petitioner includes an annotated Figure 1 of Rosencwaig on page 69 of the Petition, reproduced below:



MS-1010, FIG. 1

The annotated Figure 1 illustrates how, in *Rosencwaig*, filtered LEVP imagery and filtered REVP imagery are superimposed on a display screen for viewing. Pet. 67–69, Figs. 1, 14. We understand Petitioner as having identified display cap layer (shown in light green) as the display screen on which the two imagery are superimposed. *See also* Tr. 35:24–36:2.

Rosencwaig describes that in Figure 1, the image shown on the screen is a cube, actually two interlaced images of the cube. Ex. 1010, 6:1–4.

Rosencwaig describes what Petitioner has referred to as a “display cap layer” as a transparent cap layer of glass or plastic. *Id.* at 14:22–25.

Petitioner’s explanation is supported by the cited evidence. Notwithstanding Patent Owner’s argument to the contrary, discussed below, we determine that *Rosencwaig* discloses limitation [1d].

Patent Owner refers to screen 130 in *Rosencwaig*’s Figures 4 and 5 as the display screen of *Rosencwaig*, and asserts:

For its part, Rosencwaig makes clear that, “The light emanating from all the pixels is transmitted *through* the screen 130 to the display filter which includes a linearizing polarizer 132 and a birefringent retarder 154 in front of alternate pixels 126.” Ex. 1010 at 7:5–9. Because the light from the pixels goes *through* the display screen 130, it does not get projected “on” the display screen as required by claim 1.

PO Resp. 31.

First, as discussed above, we understand Petitioner as having identified the transparent cap layer as the screen on which the images are projected and superimposed, not screen 130. Second, as discussed above in Section II.C.1, “projecting” is not limited to front projecting but covers rear projecting in which case imagery does pass through the screen to be seen by a viewer. That is the preliminary construction we adopted and explained in the Decision to Institute. Inst. Dec. 18–19, 56. In its Patent Owner Response, Patent Owner does not provide any reason why our determination in that regard is incorrect. Accordingly, we determine that Rosencwaig discloses limitation [1d].

Claim 1 further recites limitation [1e]: “wherein a user wearing polarized glasses is able to view said filtered LEVP imagery and said filtered REVP imagery as three dimensional imagery on said display.” Ex. 1001, 22:4–6. Petitioner asserts:

Rosencwaig teaches that a viewer 106 “wears a pair of glasses 108, having two oppositely polarized lenses 110 and 112, one for each eye, each of which selectively transmit only the appropriate image” (e.g., filtered LEVP imagery for the left eye, filtered REVP imagery for the right eye). MS-1010, 6:17–26, FIG. 1 (reproduced below). Only the image intended for each eye is received by the respective eye. *Id.*; MS-1003, ¶[166].

Pet. 70. Petitioner further explains:

In more detail, FIG.4 shows a pair of glasses that include lenses 140 and 146. “The first lens 140 consists of a birefringent retarder 142 that rotates the polarization of light striking lens 140 by -90° by means of providing a negative half-wave retardation ($-\lambda/2$). The retarder 142 is followed by a linearizing polarizer 144 oriented at 90° relative to the display polarizer 132. The second lens 146 includes simply a linearizing polarizer 148 that is also oriented at 90° relative to the display polarizer 132.” MS-1010, 7:14–29, FIG. 4. This configuration allows LEVP imagery to pass through one of the lens., lens 140, and REVP imagery to pass through the other lens, e.g., lens 146. MS-1010, 7:30–9:14, FIG. 4. This is because, one of the lens, e.g., lens 146, blocks out LEVP imagery light, and the other lens, e.g., lens 140, blocks out REVP imagery light. MS-1010, 7:30–9:14, FIG. 4; MS-1003, ¶[167].

Id. at 71–72.

Regarding Figure 5 of Rosencwaig, which illustrates a circular polarization embodiment, Petitioner explains that “[b]ecause lens 156 blocks REVP imagery light, and lens 150 blocks LEVP imagery light, this configuration also allows circularly-polarized LEVP imagery to pass through lens 156, and REVP imagery to pass through lens 150. MS-1010, 10:24–11:16, FIG. 5; MS-1003, ¶¶[168]-[169].” *Id.* at 74.

Based on the foregoing, Petitioner asserts that “[a] POSITA would have understood that Rosencwaig’s stereoscopic display system is used to view the filtered LEVP imagery and filtered REVP imagery as 3D imagery. MS-1003, ¶[170].” *Id.* “Rosencwaig explains that stereoscopic display systems use a stereoscopic pair of left eye and right eye images to display 3D images viewable by a user wearing . . . glasses. MS-1010, 1:8–4:27.” *Id.*

Petitioner’s assertions are supported by the cited evidence. Patent Owner does not present additional arguments beyond that which we have

already addressed and rejected above in the context of the discussion of limitations [1a] and [1b], regarding the meaning of “LEVP imagery” and “REVP imagery.” We determine that Rosencwaig discloses limitation [1e].

Claim 1 further recites limitation [1f]: “wherein a left lens of said polarized glasses is oriented in a similar manner as said left eye filter and wherein a right lens of said polarized glasses is oriented in a similar manner as said right eye filter.” Ex. 1001, 22:7–10. Petitioner’s accounting for limitation [1e] above also accounts for limitation [1f]. Petitioner provides additional explanation on pages 75–79 of the Petition. Petitioner asserts that “Rosencwaig’s glasses include two lens that have polarization filters corresponding to the polarization filters used in the display on the projected images.” Pet. 75 (citation omitted). **“Rosencwaig explains that the left and right eye lens in the viewer’s glasses have a similar orientation at the left and right filters used in the display, respectively. MS-1010, 10:5–23, FIG. 5.”** *Id.* at 77.

Petitioner’s assertions are supported by the cited evidence. Patent Owner does not present additional arguments beyond that which we have already addressed and rejected above in the context of the discussion of limitations [1a] and [1b], regarding the meaning of “LEVP imagery” and “REVP imagery.” We determine that Rosencwaig discloses limitation [1f].

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claim 1 is anticipated by Rosencwaig.

3. *Dependent Claims 2–4*

Claim 2 depends from claim 1 and further recites: “wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses.” Ex. 1001, 22:11–14. Petitioner’s accounting of limitations [1c-1], [1e], and

[1f], discussed above, also accounts for the additional limitation in claim 2. Petitioner's reasoning is supported by the cited evidence. Patent Owner does not make any additional argument for claim 2 relative to what it has argued for claim 1. We have already discussed and rejected Patent Owner's arguments presented in the context of claim 1.

Claim 3 depends from claim 1 and further recites: "wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses." Ex. 1001, 22:15–18. Petitioner's accounting of limitations [1c-2] and [1f], discussed above, also accounts for the additional limitation in claim 3. Petitioner's reasoning is supported by the cited evidence. Patent Owner does not make any additional argument for claim 3 relative to what it has argued for claim 1. We have already discussed and rejected Patent Owner's arguments presented in the context of claim 1.

Claim 4 depends from claim 3 and further recites: "wherein said circular polarization filters each further comprises a quarter wave plate." Ex. 1001, 22:19–20. Petitioner explains:

Rosencwaig teaches that quarter wave ($\lambda/4$) birefringent retarders 154 and 156 are used to implement circular polarizing filters. MS-1010, 9:28–10:4. To implement the quarter wave retarders, Rosencwaig discloses affixing and aligning a retarder polymer sheet 220 "so that its fast axis is $+45^\circ$ [$+\lambda/4$] to the polarization axis of the linearizing polarizer 204," as shown in FIG. 7F below. MS-1010, 14:29–37. A second birefringent retarder layer 228A is subsequently formed to provide the different orientations of the two quarter wave birefringent retarders 154 and 156. MS-1010, 15:1–32; MS-1003, ¶¶[186]–[187].

Pet. 80. Petitioner further explains:

As can be appreciated from Rosencwaig's FIG. 7F, **the circular polarization filters each further comprises a quarter wave plate in the form of a retarder polymer sheet 220 that is aligned to have a $+\lambda/4$ axis.** The retarder polymer sheet 220 is part of both the quarter wave ($\lambda/4$) birefringent retarders 154 and 156 and thus is included in each of the circular polarization filters. MS-1003, ¶[187]. Indeed, FIG. 5 even shows each of the circular polarization filters including a quarter wave retarder 154, 156 in the shape of a plate.

Id. at 80–81.

Petitioner's reasoning is supported by the cited evidence. Patent Owner does not make any additional argument for claim 4 relative to what it has argued for claim 1. We have already discussed and rejected Patent Owner's arguments presented in the context of claim 1.

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that claims 2, 3, and 4 are each anticipated by Rosencwaig.

K. Alleged Obviousness of Claim 4 over Rosencwaig and Ito

Claim 4 depends from claim 3 and further recites: "wherein said circular polarization filters each further comprises a quarter wave plate." Ex. 1001, which depends from claim 1. Ex. 1001, 22:19–20.

Petitioner explains:

Ito, like Rosencwaig, discloses a stereoscopic 3D viewing system that can be implemented in CRT type displays. MS-1007, 1:5–10, 10:40–67, MS-1010, 1:3–6, 4:16–18, 6:14–16, 12:15–33; *see also* Section III.B.1. Ito discloses a similar configuration for implementing circular polarizing filters as Rosencwaig, but explains that circular polarizing filters are implemented using linear polarizing **plates** and quarter wave **plates**. MS-1007, 10:49–65. Combining the teachings of Rosencwaig and Ito would merely involve a simple substitution of one known element for another to obtain predictable results. MS-1003, ¶¶[126], [188]–[190]. Here, **the birefringent retarder polymer sheet 212 and/or other components of the quarter wave birefringent**

retarders 154, 156 could be substituted with Ito's quarter wave plates to realize circular polarizing filters that each include a quarter wave plate. Such a substitution does not modify Rosencwaig's display operations but merely involves implementing a well-known method (as revealed by Ito) for implementing circular polarizing filter into Rosencwaig's display device. *Id.* As such, the combination would have been predictable and foreseeable and would have rendered [4a] obvious. *Id.*

Pet. 81–82.

Petitioner's reasoning is supported by the cited evidence and has a rational underpinning. Patent Owner does not make any additional argument for claim 4 relative to what it has argued for claim 1 as not anticipated by Rosencwaig. We have already discussed and rejected Patent Owner's arguments presented in the context of claim 1. We determine that the added limitation of claim 4 is met by the combine teachings of Rosencwaig and Ito.

Petitioner has proved by a preponderance of the evidence that claim 4 would have been obvious over Rosencwaig and Ito.

L. Alleged Obviousness of Claim 6 over Rosencwaig and Getty

Claim 6 depends from claim 1 and further recites a step of: “further comprising augmenting said three dimensional imagery.” Ex. 1001, 22:26–27. Petitioner explains how Getty discloses augmenting three dimensional imagery and why one with ordinary skill in the art, in light of Getty, would have wanted to add a step of augmenting three dimensional imagery to the method of viewing three dimensional images according to Rosencwaig.

Pet. 33–34, 82–85. Petitioner's assertions are supported by the cited evidence and its reasoning has a rational underpinning. Specifically, Getty discloses marking stereo pairs of images. Ex. 1008 ¶¶ 4, 54–56, 62.

Marking, in the context of the '766 patent, is a form of augmenting images, because the '766 patent describes a user annotating an image, such as

placing a sphere or arrow on an image, and inserting a place marker or highlighting, as providing an augmented reality. Ex. 1001, 18:44–19:22.

Patent Owner does not make any additional argument for claim 6 relative to what it has argued for claim 1 as not anticipated by Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of claim 1. We determine that the added limitation of claim 6 is met by the combine teachings of Rosencwaig and Getty.

Petitioner has proved by a preponderance of the evidence that claim 6 would have been obvious over Rosencwaig and Getty.

*M. Alleged Obviousness of Claims 7–10
and 13–16 over Rosencwaig and Faris*

1. Independent Claim 7

Claim 7 is the same as claim 1, except for the preamble. Rather than reciting “A method of three-dimensional viewing of images by a user comprising,” claim 7’s preamble recites: “A non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images, the medium including instructions in which a computer system performs operations comprising.” Ex. 1001, 22:28–32. Thus, all of the limitations of claim 1 are in claim 7 as operations performed by a computer system according to instructions in computer readable code stored on a non-transitory computer readable storage medium.

To account for claim 7, Petitioner relies on the same evidence and arguments it relies on for claim 1, plus Faris. Regarding the addition of Faris, Petitioner explains:

A POSITA would have combined Rosencwaig’s system and method with Faris’s computer system (that includes a non-transitory computer readable storage medium having computer readable code thereon for 3D viewing of images) for reasons

similar to why a POSITA would have combined Doneus, Dean, and Faris, as explained above in Section III.D.2 (e.g., so that a user/viewer (e.g., an animator, architect, physician, or geological surveyor) would have been able to view 3D images using a diverse array of devices and applications and better perform their jobs). MS-1011, 4L42–47; MS-1003, ¶¶[130]-[131]. Indeed, Rosencwaig explains that its display method can be implemented in “a large variety of displays: CRT’s, LCD’s, plasma, etc.” to allow the viewer to experience 3D viewing of images, but does not explicitly link these displays to a computer system. MS-1010, 4:16–20, 1:8–33. For example, Rosencwaig’s displays could be implemented as Faris’s visual display unit 148/10.

Combining the teachings of Rosencwaig and Faris would have involved combining prior art elements according to known methods to yield predictable results. MS-1003, ¶¶[131]-[132]. Here, Rosencwaig discloses a stereoscopic display method through which a user can view images in 3D in displays like LCDs, CRTs, and plasma displays. MS-1010, 4:16–18. Faris similarly discloses implementing a method of 3D viewing of images in such devices but further reveals the use of a computer system and a non-transitory computer readable storage medium having computer readable code thereon for three dimensional viewing of images. MS-1011, 9:53–67, 28L21–67. To combine the teachings of Rosencwaig and Faris, a POSITA would merely have to encode the instructions for implementing Rosencwaig’s method for viewing 3D images into a computer readable medium and/or a computer system that includes a display like a LCD or CRT. MS-1003, ¶[132]. And since Rosencwaig discloses implementing the 3D stereoscopic viewing in display devices like LCDs in which Faris also implements its computer-readable medium (or which is party of Faris’s computer system), such a combination would have been predictable and foreseeable. *Id.*

Pet. 85–87. Petitioner’s reasoning for combining the teachings of Rosencwaig and Faris is supported by the cited evidence and has a rational underpinning.

Patent Owner does not, with regard to Petitioner’s alleged teachings of Faris and proposed reasons for and manner of combining the teachings of

Rosencwaig and Faris, present contrary arguments. Instead, Patent Owner presents the same arguments it has presented for claim 1, which we already discussed and rejected above in the context of claim 1 and Rosencwaig.

Petitioner has proved by a preponderance of the evidence that claim 7 would have been obvious over Rosencwaig and Faris.

2. *Independent Claim 13*

Claim 13 is the same as claim 1, except for the preamble and the recitation of several additional elements. Rather than reciting a “method of three-dimensional viewing of images by a user comprising,” claim 13’s preamble recites: “A computer system comprising.” Ex. 1001, 23:13.

Claim 13 additionally recites, compared to claim 1:

[13a] a memory;

[13b] a processor;

[13c] a communications interface;

[13d] an interconnection mechanism coupling the memory, the processor and the communications interface; and

[13e] wherein the memory is encoded with an application providing three dimensional viewing of images, that when performed on the processor, provide a process for processing information, the process causing the computer system to perform the operations of:

Id. at 23:14–23.

Thus, all of the limitations of claim 1 are in claim 13 as operations performed by a computer system including a memory, processor, communications interface, and interconnection mechanism coupling the memory, the processor, and the communications interface, according to an application in memory that provides three dimensional viewing of images by processing information.

To account for claim 13, Petitioner relies on the same evidence and arguments it relies on for claim 1, plus Faris. Regarding combining the teachings of Rosencwaig and Faris, Petitioner’s articulated reasoning is the same as that reproduced and discussed above for claim 7. Pet. 85–87. Patent Owner advances no argument against Petitioner’s reasoning for combining the teachings of Rosencwaig and Faris. For the same reasons discussed above in the context of claim 7, we find Petitioner’s articulated reasoning to be supported by the cited evidence and based on a rational underpinning. Specifically, one with ordinary skill in the art would have known to encode the instructions for implementing Rosencwaig’s method for viewing 3D images into a computer system, such as that described in Faris, which includes a display like a LCD or CRT.

For elements [13pre] through [13d], Petitioner explains how Faris’s computer system includes each of the recited elements. Pet. 45–48, 88. The assertions are supported by the cited evidence and not disputed by Patent Owner. We determine that Faris discloses each of these elements of claim 13.

For limitation [13e], Petitioner explains:

As described above in Sections J.1 and III.D.3.[13a], the Rosencwaig-Faris system includes a **memory that includes a storage device 142 that is encoded with application programs performed by one or more of processing units 141, driver 149, and controller 151 for 3D viewing of stereoscopic images (“processing information”).** MS-1011, 28:21–67, FIG. 14B. These application programs implement display system operations that are “essentially the same as described in connection with” a stereoscopic display, e.g, LCD type, that relies on polarizers and user glasses—which a POSITA would have understood is similar to Rosencwaig’s display. MS-1011, 28:21–67, FIGS. 12A, 12B; MS-1003, ¶[241].

Pet. 88–89. The assertions are supported by the cited evidence and not disputed by Patent Owner. We determine that the combined teachings of Rosencwaig and Faris disclose limitation [13e].

Limitations [13f], [13g], [13h-1], [13h-2], [13h-3], [13i], [13j], and [13k] read the same as limitations [1a], [1b], [1c-1], [1c-2], [1c-3], [1d], [1e], and [1f], respectively. Petitioner’s arguments and evidence in support thereof are the same and have been discussed above in the context of claim 1 and Rosencwaig. Patent Owner does not present argument additional to those it presents in the context of claim 1, and we have addressed and rejected those arguments when discussing claim 1. We are sufficiently persuaded that limitations [13f], [13g], [13h-1], [13h-2], [13h-3], [13i], [13j], and [13k] are met by the combined teachings of Rosencwaig and Faris.

Petitioner has proved by a preponderance of the evidence that claim 13 would have been obvious over Rosencwaig and Faris.

3. *Dependent Claims 8–10 and 14–16*

Claim 8 depends from claim 7 and further recites: “wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses.” Ex. 1001, 22:62–64. The added limitation is the same as that added by claim 2 with respect to claim 1. Petitioner relies on its discussion of claim 2 as anticipated by Rosencwaig. Pet. 87. We have determined above that Rosencwaig discloses the added limitation of claim 2. For the same reasons, we determine that the added limitation of claim 8 is disclosed by Rosencwaig.

Patent Owner does not make any additional argument for claim 8 beyond what it has argued for claim 1 and Rosencwaig. We have already

discussed and rejected Patent Owner's arguments presented in the context of claim 1. Petitioner has proved by a preponderance of the evidence that claim 8 would have been obvious over Rosencwaig and Faris.

Claim 9 depends from claim 7 and further recites: "wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses."

Ex. 1001, 22:66–23:2. The added limitation is the same as that added by claim 3 with respect to claim 1. Petitioner relies on its discussion of claim 3 as anticipated by Rosencwaig. Pet. 88. We have determined above that Rosencwaig discloses the added limitation of claim 3. For the same reasons, we determine that the added limitation of claim 9 is disclosed by Rosencwaig.

Patent Owner does not make any additional argument for claim 9 beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner's arguments presented in the context of claim 1. Petitioner has proved by a preponderance of the evidence that claim 9 would have been obvious over Rosencwaig and Faris.

Claim 10 depends from claim 7 and further recites: "wherein said circular polarization filters each further comprises a quarter wave plate." Ex. 1001, 23:3–5. The added limitation is the same as that added by claim 4 with respect to claim 3. Petitioner relies on its discussion of claim 4 as anticipated by Rosencwaig. Pet. 88. We have determined above that Rosencwaig discloses the added limitation of claim 4. For the same reasons, we determine that Rosencwaig discloses the limitation added by claim 10.

Patent Owner does not make any additional argument for claim 10 beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner's arguments presented in the context of

claim 1. Petitioner has proved by a preponderance of the evidence that claim 10 would have been obvious over Rosencwaig and Faris.

Claim 14 depends from claim 13 and further recites: “wherein said left eye filter and said right eye filter comprise orthogonal linear polarization filters, and wherein said polarized glasses comprise linear polarized glasses.” Ex. 1001, 24:18–21. The added limitation is the same as that added by claim 2 with respect to claim 1. Petitioner relies on its discussion of claim 2 as anticipated by Rosencwaig. Pet. 90. We have determined above that Rosencwaig discloses the added limitation of claim 2. For the same reasons, we determine that the added limitation of claim 14 is disclosed by Rosencwaig.

Patent Owner does not make any additional argument for claim 14 beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of claim 1. Petitioner has proved by a preponderance of the evidence that claim 14 would have been obvious over Rosencwaig and Faris.

Claim 15 depends from claim 14 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” Ex. 1001, 24:21–23. The added limitation is the same as that added by claim 4 with respect to claim 3. Petitioner relies on its discussion of claim 4 as anticipated by Rosencwaig. Pet. 90. We have determined above that Rosencwaig discloses the added limitation of claim 4. For the same reasons, we determine that the added limitation of claim 15 is disclosed by Rosencwaig.

Patent Owner does not make any additional argument for claim 15 beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of

claim 1. Petitioner has proved by a preponderance of the evidence that claim 15 would have been obvious over Rosencwaig and Faris.

Claim 16 depends from claim 13 and further recites: “wherein said left eye filter and said right eye filter comprise circular polarization filters, and wherein said polarized glasses comprise circular polarized glasses.” Ex. 1001, 24:24–27. The added limitation is the same as that added by claim 3 with respect to claim 1. Petitioner relies on its discussion of claim 3 as anticipated by Rosencwaig. Pet. 90. We have determined above that Rosencwaig discloses the limitation added by claim 3. For the same reasons, we determine that the added limitation of claim 16 is disclosed by Rosencwaig.

Patent Owner does not make any additional argument for claim 16 beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of claim 1. Petitioner has proved by a preponderance of the evidence that claim 16 would have been obvious over Rosencwaig and Faris.

For the foregoing reasons, Petitioner has proved by a preponderance of the evidence that each of claims 8–10 and 14–16 would have been obvious over Rosencwaig and Faris.

*N. Alleged Obviousness of Claims 10
and 15 over Rosencwaig, Faris, and Ito*

Claim 10 depends from claim 7 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” Ex. 1001, 23:3–5. Claim 15 depends from claim 14 and further recites: “wherein said circular polarization filters each further comprises a quarter wave plate.” *Id.* at 24:21–23. The added recitation is the same as that appearing in claim 4 and discussed above in the context of claim 4.

Petitioner relies on its discussion in the context of alleged anticipation of claim 4 by Rosencwaig and also on its discussion of obviousness of claim 4 over Rosencwaig and Ito. Pet. 90. Petitioner also asserts: “A POSITA would have combined Ito with Rosencwaig and Faris for the same reasons a POSITA would have combined Ito with Rosencwaig. *See supra* Section III.H.1; MS-1003, ¶[133].” *Id.* As discussed above, Petitioner’s assertions are supported by the cited evidence and have a rational underpinning.

Patent Owner does not make any additional argument for claims 10 and 15 on this alleged ground of obviousness beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of claim 1.

We determine that Rosencwaig itself, as well as the combined teachings of Rosencwaig, Faris, and Ito, disclose the added limitation of claims 10 and 15, i.e., “wherein said circular polarization filters each further comprises a quarter wave plate.” Petitioner has proved by a preponderance of the evidence that claims 10 and 15 would have been obvious over Rosencwaig, Faris, and Ito.

*O. Alleged Obviousness of Claims
12 and 18 over Rosencwaig, Faris, and Getty*

Claim 12 depends from claim 7 and further recites: “further comprising augmenting said three dimensional imagery.” Ex. 1001, 23:10–12. Claim 18 depends from claim 13 and further recites: “further comprising augmenting said three dimensional imagery.” *Id.* at 24:32–33. The added recitation is the same as that appearing in claim 6 and discussed above in the context of claim 6.

Petitioner relies on its discussion in the context of alleged obviousness of claim 6 over Rosencwaig and Getty. Pet. 91. Petitioner also asserts: “A

POSITA would have combined Getty with Rosencwaig and Faris for the same reasons a POSITA would have combined Getty with Rosencwaig. *See supra* Section III.I.1; MS-1003, ¶[134].” *Id.* As discussed above, Petitioner’s assertions are supported by the cited evidence and have a rational underpinning.

Patent Owner does not make any additional argument for claims 12 and 18 on this alleged ground of obviousness beyond what it has argued for claim 1 and Rosencwaig. We have already discussed and rejected Patent Owner’s arguments presented in the context of claim 1.

We determine that the combined teachings of Rosencwaig and Getty disclose the added limitation of claims 12 and 18, i.e., “further comprising augmenting said three dimensional imagery.” Petitioner has proved by a preponderance of the evidence that claims 12 and 18 would have been obvious over Rosencwaig, Faris, and Getty.

III. CONCLUSION

Petitioner has proved by a preponderance of the evidence that claims 1–4, 6–10, 12–16, and 18 of the ’766 patent are unpatentable. The outcome for the challenged claims is set forth in the table below.¹⁰ In summary:

¹⁰ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–3	103	Doneus, Dean	1–3	
4	103	Doneus, Dean, Ito	4	
6	103	Doneus, Dean, Getty	6	
7–9, 13, 14, 16	103	Doneus, Dean, Faris	7–9, 13, 14, 16	
10, 15	103	Doneus, Dean, Faris, Ito	10, 15	
12, 18	103	Doneus, Dean, Faris, Getty	12, 18	
1–4	102(a)(1)	Rosencwaig	1–4	
4	103	Rosencwaig, Ito	4	
6	103	Rosencwaig, Getty	6	
7–10, 13–16	103	Rosencwaig, Faris	7–10, 13–16	
10, 15	103	Rosencwaig, Faris, Ito	10, 15	
12, 18	103	Rosencwaig, Faris, Getty	12, 18	
Overall Outcome			1–4, 6–10, 12–16, 18	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–4, 6–10, 12–16, and 18 of the '766 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2021-00703
Patent 9,473,766 B2

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