UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BUNGIE, INC., Petitioner,

v.

WORLDS INC., Patent Owner.

Case IPR2015-01319 Patent 8,082,501 B2

Before KARL D. EASTHOM, KERRY BEGLEY, and JASON J. CHUNG, *Administrative Patent Judges*.

CHUNG, Administrative Patent Judge.

FINAL WRITTEN DECISION Inter Partes Review 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Petitioner, Bungie, Inc., filed a Petition to institute an *inter partes* review of claims 1–8, 10, 12, and 14–16 of U.S. Patent No. 8,082,501 B2 ("the '501 patent"). Paper 3 ("Pet."). Patent Owner, Worlds Inc., filed a Preliminary Response pursuant to 35 U.S.C. § 313. Paper 12 ("Prelim. Resp."). Upon consideration of the Petition and Preliminary Response, on November 30, 2015, we instituted an *inter partes* review of claims 1–8, 10, 12, and 14–16 ("instituted claims"), pursuant to 35 U.S.C. § 314. Paper 14 ("Dec.").

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 20 ("PO Resp.")) and a Supplement to the Response (Paper 22 ("Supp. Resp.")). Petitioner filed a Reply to Patent Owner's Response. Paper 31 ("Reply"). Patent Owner filed a Motion to Exclude (Paper 33 ("Mot.") and Petitioner filed an Opposition to the Motion to Exclude (Paper 36 ("Opp.")), to which Patent Owner filed a Reply (Paper 38 ("Mot. Reply")). An oral hearing was held on August 17, 2016, and a transcript of the hearing is included in the record. Paper 41("Tr.").

We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, Petitioner has shown by a preponderance of the evidence that claims 1–8, 10, 12, and 14–16 of the '501 patent are unpatentable. *See* 35 U.S.C. § 316(e).

A. Related Matters

The '501 patent is involved in a district court proceeding, *Worlds Inc. v. Activision Blizzard, Inc.*, Case No. 1:12-cv-10576 (D. Mass.) ("District Court Case"). Paper 5. In addition, the '501 patent is related to the patents

at issue in IPR2015-01264, IPR2015-01268, IPR2015-01269, IPR2015-01321, and IPR2015-01325. *Id.*

B. The Asserted Grounds

We instituted *inter partes* review on the following grounds of unpatentability asserted by Petitioner:

Reference(s)	Basis	Instituted Claim(s)
Funkhouser (Ex. 1005) ¹ and Sitrick	§ 103(a) ³	1–6, 12, 14, and 15
$\frac{(Ex. 1013)^{2}}{Funkhouser, Sitrick,}$ and Wexelblat $\frac{(Ex. 1020)^{4}}{Fx}$	§ 103(a)	7 and 16
Funkhouser, Sitrick, and Funkhouser '93 $(Ex. 1017)^5$	§ 103(a)	8 and 10
Durward (Ex. 1008) ⁶	§ 102(a)	1–6, 12, 14, and 15
Durward and Wexelblat	§ 103(a)	7 and 16

¹ Thomas A. Funkhouser, *RING: A Client-Server System for Multi-User Virtual Environments, in* 1995 SYMPOSIUM ON INTERACTIVE 3D GRAPHICS (1995).

² U.S. Patent No. 4,521,014, issued June 4, 1985.

³ The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, revised 35 U.S.C. § 103 and the relevant sections took effect on March 16, 2013. Because the application from which the '501 patent issued was filed before that date, our citations to Title 35 are to its pre-AIA version.

⁴ U.S. Patent No. 5,021,976, issued June 4, 1991.

⁵ Thomas A. Funkhouser & Carlo H. Séquin, *Adaptive Display Algorithm* for Interactive Frame Rates During Visualization of Complex Virtual Environments, in COMPUTER GRAPHICS PROCEEDINGS: ANNUAL CONFERENCE SERIES (1993).

⁶ U.S. Patent No. 5,659,691, filed Sept. 23, 1993, issued Aug. 19, 1997.

Reference (s)	Basis	Instituted Claim(s)
Durward and Schneider (Ex. 1019) ⁷	§ 103(a)	8 and 10

C. The '501 Patent

The '501 patent discloses a "client-server architecture" for a "graphical, multi-user, interactive virtual world system." Ex. 1001, [57], 3:6–8. In the preferred embodiment, each user chooses an avatar to "represent the user in the virtual world," *id.* at 3:25–27, and "interacts with a client system," which "is networked to a virtual world server," *id.* at 3:14–15. "[E]ach client . . . sends its current location, or changes in its current location, to the server." *Id.* at 3:40–44; *see id.* at 2:44–47. The server, in turn, sends each client "updated position information" for neighbors of the client's user. *Id.* at [57], 2:44–49, 3:40–44, 14:28–32.

The client executes a process to render a "view" of the virtual world "from the perspective of the avatar for that . . . user." *Id.* at [57], 2:40–42, 3:30–35, 4:54–56, 7:55–57. This view shows "avatars representing the other users who are neighbors of the user." *Id.* at [57], 2:42–44.

D. The Instituted Claims

Of the instituted claims 1–8, 10, 12, and 14–16, claims 1, 12, and 14 are independent claims. *Id.* at 19:20–20:65. Claim 1 is illustrative and reproduced below:

1. A method for enabling a first user to interact with other users in a virtual space, each user of the first user and the other users

⁷ U.S. Patent No. 5,777,621, filed June 7, 1995, issued July 7, 1998.

being associated with a three dimensional avatar representing said each user in the virtual space, the method comprising the steps of:

- customizing, using a processor of a client device, an avatar in response to input by the first user;
- receiving, by the client device, position information associated with fewer than all of the other user avatars in an interaction room of the virtual space, from a server process, wherein the client device does not receive position information of at least some avatars that fail to satisfy a participant condition imposed on avatars displayable on a client device display of the client device;
- determining, by the client device, a displayable set of the other user avatars associated with the client device display; and
- displaying, on the client device display, the displayable set of the other user avatars associated with the client device display.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

We begin our analysis by addressing the level of ordinary skill in the art. Petitioner argues, and Dr. Zyda opines, that a person of ordinary skill in the art relevant to the '501 patent would have had "through education or practical experience, the equivalent of a bachelor's degree in computer science or a related field and at least an additional two years of work experience developing or implementing networked virtual environments." Pet. 7; Ex. 1002 ¶ 55. Mr. Pesce similarly testifies that a person of ordinary skill in the art would have had "at least a bachelor's degree or equivalent in computer science, with two or more years of experience in coding related to both virtual environments and computer networking." Ex. 2017 ¶ 33.

The parties' proposals for the level of ordinary skill in the art have slight differences in wording, yet we do not find them to have meaningful distinctions (e.g., "at least" two years versus "two or more years," "networked virtual environments" versus "virtual environments and computer networking"). Neither party asserts that there is any such distinction. Based on the testimony of the parties' experts as well as our review of the '501 patent, the types of problems and solutions described therein, and the prior art involved in this proceeding, we adopt the following as the level of ordinary skill in the art: the equivalent, through education or practical experience, of a bachelor's degree in computer science or a related field, and at least two years of experience developing, coding, or implementing networked virtual environments, or virtual environments and computer networking.

B. Mr. Pesce's Qualifications as an Expert

Petitioner argues the testimony of Mr. Pesce, Patent Owner's declarant, should be given no weight because it "often is inconsistent, lacks objective support, and/or was incapable of being substantiated during . . . cross examination," providing examples of these alleged deficiencies in Mr. Pesce's testimony regarding claim construction and the timing of the invention of the '501 patent. Reply 1–3. Petitioner further argues that "[i]t is not clear how Mr. Pesce qualifies as an expert in this field," citing Mr. Pesce's deposition testimony regarding the amount of experience he had in 1995⁸ and his lack of an educational degree beyond high school. Reply 3

⁸ The '501 patent claims priority to provisional application no. 60/020,296 ("296 provisional"), filed on November 13, 1995. Ex. 1001, [60].

(citing Ex. 1046, 18:12–19:2, 21:8–15, 40:10–20; Ex. 2017 ¶ 35). Petitioner also asserts that "Mr. Pesce was unwilling to address his documented . . . use of psychedelic drugs during the 1990s (Ex. 1041) and whether that drug use affected his recollection of events during the period relevant to the ['501] patent[]. *See also*, Ex. 1046 at 46:11–47:21, 50:25–53." Reply 3.

Here, Petitioner has not moved to exclude Mr. Pesce's testimony. Nor has Petitioner taken an express and affirmative position that Mr. Pesce is not qualified as an expert. *See id.* ("It is *not clear* how Mr. Pesce qualifies as an expert in this field.") (emphasis added). To the extent Petitioner is suggesting as much, we disagree.

Federal Rule of Evidence ("Rule") 702 provides that a "witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion if (a) the expert's knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based upon sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the

Petitioner uses the provisional filing date in its analysis in its briefing and Dr. Zyda's declaration (*see, e.g.*, Pet. 4–11; Reply 2–5; Ex. 1002 ¶¶ 53–55), and represented at the hearing that it does not contest, for purposes of this proceeding, priority to the provisional (Tr. 195:1–7). Patent Owner also takes the position that the '501 patent is entitled to priority to the provisional and represented at the hearing that its specification is nearly identical to that of the '501 patent. *See, e.g., id.* at 90:5–91:3, 92:10–15; Ex. 2017 ¶ 34. Based on our review of the '296 provisional, we agree with Patent Owner's representation that its specification is nearly identical to the '501 patent specification, and we accept the parties' agreement that the '501 patent is entitled to priority to the '296 provisional. *See* Ex. 2020. None of our determinations in this Decision would change if the '501 patent were not entitled to this priority date.

witness has applied the principles and methods reliably to the facts of the case." Fed. R. Evid. 702. Under this standard, testimony on the issue of unpatentability proffered by a witness who is not "qualified in the pertinent art" generally is not admissible. *Sundance Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008). Rule 702, however, does not "require[] a witness to possess something more than ordinary skill in the art to testify as an expert" and a "witness possessing merely ordinary skill will often be qualified to present expert testimony." *Id.* at 1363. Nor does the Rule require a perfect match or complete overlap between the witness's technical qualifications and the field of the invention. *See SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1372–73 (Fed. Cir. 2010).

In his declaration and curriculum vitae, Mr. Pesce details his relevant work experience from 1984 to the present as well as his teaching experience and numerous technical publications and presentations. *See* Ex. 2017 ¶¶ 3–19, 35–42, pp. 67–82; *see also* Ex. 1046, 19:8–21:16, 39:11–40:20. Having reviewed this experience and Mr. Pesce's technical testimony, we find his knowledge, skill, and experience in the relevant field of networked virtual environments, as well as computer networking and virtual reality more generally, sufficient to render him qualified to offer expert testimony in this proceeding under Rule 702.

We do not find the evidence to which Petitioner points persuasive on this issue. First, Petitioner refers to Mr. Pesce's declaration testimony that "as of 1995, [he] possessed more than 5 years of experience in the computer graphics industry with an emphasis on virtual reality" and his admission during his deposition that he was working in the field "from 1991" so "five years" is accurate, rather than "more than five years" as he stated in his

declaration. Ex. 2017 ¶ 33; Ex. 1046, 39:13–40:20; see Reply 3. We do not find this admitted minor misstatement of Mr. Pesce's experience to undermine his qualifications, or credibility, as an expert. Mr. Pesce worked on virtual reality environments beginning in 1991 and continuing through the relevant time of invention of the '501 patent, and for many years thereafter. See, e.g., Ex. 2017 ¶¶ 5–19, 35–42, pp. 67–82; Ex. 1046, 39:13– 40:20. Second, as to Mr. Pesce's lack of an educational degree beyond high school, Petitioner and Dr. Zyda, as well as Mr. Pesce, agree that experience can overcome a lack of a formal technical education in satisfying the standard for a person of ordinary skill in the art, and we have so determined in our finding in § II.A regarding the level of ordinary skill in the art. Pet. 11 (proffering definition of one of ordinary skill in the art as "someone who had, through education or practical experience, the equivalent of a bachelor's degree in computer science or a related field") (emphasis added); Ex. 1002 ¶ 55 (same); Ex. 2017 ¶ 33; see id. ¶¶ 3, 35; Reply 3; Opp. 7. We note that Mr. Pesce did attend the Massachusetts Institute of Technology ("MIT") for four semesters. Ex. 2017 ¶ 3; Ex. 1046, 19:8–14; see id. at 19:15–21:16. As we explain above, we find Mr. Pesce's experience, skill, and knowledge in the relevant field sufficient to render him qualified to offer expert testimony in this proceeding.

Third, we turn to Petitioner's citation and reference to Exhibit 1041,⁹ an excerpt from a 1999 interview of Mr. Pesce at the AllChemical Arts conference in which he discusses how his use of psychedelic drugs,

⁹ Exhibit 1041 is a subject of Patent Owner's motion to exclude, which we address below in § II.M. We consider Exhibit 1041 here only for the limited purpose for which we find it relevant and admissible in § II.M.

beginning in college, has impacted and facilitated his career and work, and Mr. Pesce's related deposition testimony in which he states he does not recall the interview and the specific contents thereof. Reply 3 (citing Ex. 1041; Ex. 1046, "46:11-47:21, 50:25-53"); Ex. 1041; Ex. 1046, 46:11-47:21, 50:25–57:10. We have considered Exhibit 1041 in assessing Mr. Pesce's capacity to perceive and recall developments and details from the relevant art in the 1990s about which he testifies, as well as the reliability of his perception and recollection. See infra § II.M; see, e.g., Ex. 2017 ¶¶ 36–44, 49.a.iv, 59; Ex. 1046, 85:4–21, 89:10–90:7, 204:12–205:20, 222:1–223:6. We do not find Exhibit 1041, which lacks detailed information regarding the extent and regularity of any drug use, to undermine Mr. Pesce's capacity to perceive and recall such events or the reliability of his relevant testimony. Nor do we find his inability to remember the specifics of this one particular interview given nearly twenty years ago to undermine his credibility, reliability, or qualifications as a witness. Having carefully reviewed his testimony in this proceeding, we find his technical testimony, and particularly his testimony on issues related to the development of the art in the early to mid-1990s, cogent. We consider Mr. Pesce's testimony throughout our analysis below and where we discount or disagree with his testimony, it is for reasons other than the contents of Exhibit 1041 and his deposition testimony regarding this exhibit.

Petitioner's remaining arguments regarding specific alleged deficiencies in Mr. Pesce's testimony on claim construction go to the weight to be accorded to Mr. Pesce's testimony on these particular substantive issues. *See* Reply 1–3. We have considered these alleged deficiencies and

address them, as appropriate, in our analysis below of the issues to which they pertain.

C. Claim Construction

In our Institution Decision, we raised the issue of the impending expiration of the '501 patent and its potential impact on the applicable claim construction standard, given that the Board construes unexpired patents under the broadest reasonable interpretation standard but expired patents under the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). See Inst. Dec. 4 n.1; 37 C.F.R. § 42.100(b) (2012)¹⁰; Cuozzo Speed Techs., LLC v. Lee, 136 S. Ct. 2131, 2144–46 (2016) (holding that 37 C.F.R. § 42.100(b), under which the Board applies the broadest reasonable interpretation standard to unexpired patents, "represents a reasonable exercise of the rulemaking authority that Congress delegated to the . . . Office"); Black & Decker, Inc. v. Positec USA, Inc., 646 Fed. App'x 1019, 1024 (Fed. Cir. 2016) (holding that in an *inter partes* review, "[c]laims of an expired patent are given their ordinary and customary meaning in accordance with our opinion in Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005) (en banc)"). Because neither party had addressed this issue, we stated that we "expect the parties to address, with particularity, in their future briefing the expiration date of the '501 patent claims on which we institute *inter partes* review." Inst. Dec. 4 n.1.

¹⁰ The Office amended rule 37 C.F.R. § 42.100(b) after the Institution Decision in this proceeding. The amended rule does not apply to this proceeding, because it applies only to petitions filed on or after May 2, 2016. *See* Amendments to the Rules of Practice for Trials Before the Patent Trial and Appeal Board, 81 Fed. Reg. 18,750, 18,766 (Apr. 1, 2016).

In its Response, Patent Owner represented that the '501 patent expires on November 12, 2016, with an explanation supporting the calculation of this expiration date. *See* PO Resp. 7–12. In its Supplement to the Response, Patent Owner reiterated the expiration date of the '501 patent to be November 12, 2016. *See* Supp. Resp. At the oral hearing, Patent Owner confirmed this expiration date and Petitioner indicated that it agrees with and does not challenge this date. *See* Tr. 14:1–16, 88:8–89:7. Based on the parties' agreement and our review of the record, we agree that the '501 patent expired on November 12, 2016. *See, e.g.*, Ex. 1001, [22], [60], [63]; Ex. 1004, 322, 339.

The '501 patent is now expired.¹¹ In an *inter partes* review, the proper claim construction standard in an expired patent is set forth in *Phillips*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See In re Rambus Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012) ("[T]he Board's review of the claims of an expired patent is similar to that of a district court's review."). Under the *Phillips* standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire patent disclosure. *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012).

¹¹ Although we apply the *Phillips* standard in this Decision, our claim interpretation would not differ under the broadest reasonable interpretation standard, applicable to unexpired patents. Rather, having considered the issue, we would reach the same claim interpretation under the broadest reasonable interpretation standard.

1. Determining

In the Petition, Petitioner argues the scope of the "determining" step of claims 1 and 14 and the "determine" limitation of claim 12 (collectively, the "determining limitations") "at least includes executing a client process to determine, from user positions received from the server, other users' avatar(s) located within a point of view or perspective (e.g., field of view) of the first user." Pet. 10 (citing Ex. 1002 \P 61).

In response, Patent Owner advances several arguments as to why Petitioner's proposed claim scope is incorrect (*see* PO Resp. 12–17), but ultimately "submits that no construction is necessary for the full 'determining' steps of claims 1, 12, and 14" (*id.* at 17).

In reply, Petitioner recognizes that Patent Owner argues the determining limitations need no construction and points out that Patent Owner "does not contest disclosure of this element in the prior art" (Reply 4), but Petitioner still provides several arguments as to why its proffered scope of the determining limitations is correct. *Id.* at 4–6.

The parties' arguments regarding the instituted grounds, however, do not hinge on the Board resolving the proper interpretation of the determining limitations of claims 1, 12, and 14, and in particular, the issue of claim scope raised by Petitioner. *See, e.g.*, Resp. 20–36; Reply 4 ("[Patent Owner] does not contest disclosure of this element in the prior art."). Accordingly, based on our review of the arguments and evidence of record, we need not address Petitioner's proposed scope of the determining limitations or otherwise construe these limitations to resolve the issues presented in this case. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir.

1999) (holding that only claim terms that "are in controversy" need to be construed and "only to the extent necessary to resolve the controversy").

2. Avatar

Independent claims 1, 12, and 14 of the '501 patent recite "avatar" in several contexts. For instance, claims 1 and 14 recite in their preambles "each user of the first user and the other users being associated with *a three dimensional avatar*" (emphasis added), and claim 12 includes a similar recitation in its preamble. Ex. 1001, 19:20–23, 20:15–16, 20:34–36. As another example, claims 1 and 14 recite in their bodies "customizing, using a processor of a client device, *an avatar* in response to input by the first user" (emphasis added), and the body of claim 12 features a similar limitation. *Id.* at 19:25, 20:20, 20:38. In addition, claims 1, 12, and 14 recite "the other user avatars." *Id.* at 19:28, 19:35, 19:38, 20:23, 20:26, 20:41, 20:47–48, 20:51. Claims 1, 12, and 14 additionally recite in their bodies "avatars," by itself, without "the other user" modifier. *Id.* at 19:31–32, 20:27, 20:44–45. Claim 12 also recites in its body "the other users' avatars." *Id.* at 20:28.

The parties only dispute whether "avatar" must be "three-dimensional," as Patent Owner urges. *See* Pet. 10; PO Resp. 17–19; Reply 7–9; Tr. 127:6–11. Specifically, Petitioner proposes "avatar" is "a graphical representation of a user" (*see* Pet. 10; Reply 7–9), whereas Patent Owner proposes "avatar" is "a three-dimensional graphical representation of a user" (*see* PO Resp. 17–19).

To resolve the parties' dispute, we consider whether the phrases "each user of the first user and the other users being associated with a three dimensional avatar" recited in the preamble of claims 1 and 14 and "each

user being associated with a three dimensional avatar" recited in the preamble of claim 12 are limiting. Petitioner assumes but does not concede that the preamble is limiting. Pet. 40; *see also* Pet. 15.

In response, although Patent Owner does not argue affirmatively whether the preamble is limiting (*see generally* PO Resp.), Patent Owner states "[i]ndeed, to remove all doubt, the preambles of claims 1, 12, and 14 expressly recite that the claims 'avatar' is three-dimensional" (*id.* at 18). Moreover, during the oral hearing, Patent Owner acknowledged that "three dimensional" as recited in claims 1, 12, and 14 of the preamble of the '501 patent rendered superfluous the additional "three-dimensional" requirement of its proposed construction of "avatar." Tr. 129:22–130:12 (Patent Owner responding to question regarding whether its proposed construction, when "plugged" into claims of the '501 patent and other patent claims requiring a "three-dimensional" avatar would render "three-dimensional" superfluous with "I think it has to, Your Honor."); *see also* Ex. 1046, 100:1–19, 104:13–105:4.

The determination of whether a preamble limits a claim is made on a case-by-case basis in light of the facts in each case; there is no litmus test defining when a preamble limits the scope of a claim. *Catalina Mktg. Int'l v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). "Preamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006). However, "[w]hen limitations in the body of the claim rely upon and derive antecedent basis from the preamble, then the preamble may act as a necessary component of the claimed invention." *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332,

1339 (Fed. Cir. 2003) (citing *e.g., Electro Sci. Indus. v. Dynamic Details, Inc.*, 307 F.3d 1343, 1348 (Fed. Cir. 2002)). Also, "a claim preamble has the import that the claim as a whole suggests for it. In other words, when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects." *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995).

Here, the body of claims 1, 12, and 14 recite "the first user" and "the *other* user avatars." Ex. 1001, 19:26, 20:21–22, 20:39, 19:28, 19:35, 19:38, 20:23, 20:26, 20:41, 20:47–48, 20:51. The phrases "the first user" and "the *other* user avatars" have antecedence, by implication, to "each user of the first user and the other users being associated with a *three dimensional avatar*" (emphasis added) recited in the preamble of claims 1 and 14 and similarly recited in the preamble of claim 12. *Compare e.g., id.* at 19:21–22, *with id.* at 19:26, 19:28, 19:34–35, 19:38. Moreover, the phrases "the first user" and "the *other* user avatars" have antecedence, by implication, to "each user being associated with a *three dimensional avatar*" (emphasis added) recited in the *preamble of claim 12. Compare e.g., id.* at 20:15–16, *with id.* at 20:20–21, 20:23, 20:26. In addition, the body of claim 12 recites "the other users" avatars" that, by implication, has antecedence to "each user being associated with a three dimensional avatar" as recited in the preamble of claim 12. *Compare id.* at 20:28, *with id.* at 20:15–16.

Although the antecedent from the body of the claim is not a verbatim recitation of the preamble in every instance, antecedent basis can be present by implication. *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1116 (Fed. Cir. 1987). In this case, we determine the antecedent basis for

"the first user" and "the *other* user avatars" recited in the body of claims 1, 12, and 14 of the '501 patent refers to, by implication, "each user of the first user and the other users being associated with a *three dimensional avatar*" (emphasis added) as recited in the preamble of claims 1 and 14 and as similarly recited in the preamble of claim 12. *Compare, e.g.*, Ex. 1001, 19:21–22, with id. at 19:26, 19:28, 19:34–35, 19:38. Moreover, we determine the antecedent basis for the phrases "the first user" and "the other user avatars" recited in the body of claim 12 refers to, by implication, "each user being associated with a *three dimensional avatar*" (emphasis added) recited in the preamble of claim 12. Compare, e.g., id. at 20:15–16, with id. at 20:20–21, 20:23, 20:26. We also determine the antecedent basis for "the other users' avatars" recited in the body of claim 12 refers to, by implication, "each user being associated with a three dimensional avatar" as recited in the preamble of claim 12. Compare id. at 20:28, with id. at 20:15-16. Accordingly, the phrases "each user of the first user and the other users being associated with a three dimensional avatar" recited in the preamble of claims 1 and 14 and "each user being associated with a three dimensional avatar" recited in the preamble of claim 12 are limiting.

In the '501 patent, by using antecedent basis as determined above, the inventors chose to "use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects." *See Bell*, 55 F.3d at 620. The '501 patent describes a "three dimensional figure chosen by the user" as a preferred embodiment. Ex. 1001, 3:25–27. In contrast, in related cases involving patents related to the '501 patent, the Board determined the inventors sought broader protection for a more generic avatar not limited to

three dimensions. *See infra* note 12; *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999); *Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333 (Fed. Cir. 2003). Here, however, the existence of antecedent basis from the body of the '501 patent claims for the phrase "each user of the first user and the other users being associated with a *three dimensional avatar*" (emphasis added) (Ex. 1001, 19:21–22, 20:34–36) recited in the preamble of claims 1 and 14 and similarly recited in claim 12, and defining the invention in terms of the preamble and body of the claim, also shows that the preamble is necessary to give life, meaning, and vitality into the claims.

Therefore, because the phrases "each user of the first user and the other users being associated with a *three dimensional avatar*" (emphasis added) (*id.* at 19:21–22, 20:34–36) recited in the preamble of claims 1 and 14 and "each user being associated with a *three dimensional avatar*" (emphasis added) (*id.* at 20:15–16) recited in the preamble of claim 12 are limiting, the terms "an avatar" (*id.* at 19:25, 20:20, 20:38), "the other user avatars" (*id.* at19:28, 19:35, 19:38, 20:23, 20:26, 20:41, 20:47–48, 20:51), "avatars" (*id.* at 19:31–32, 20:27, 20:44–45), and "the other users' avatars" (*id.* at 20:28) must be three-dimensional.¹²

¹² If the phrases "each user of the first user and the other users being associated with a *three dimensional avatar*" (emphasis added) (Ex. 1001, 19:21–22, 20:34–36) recited in the preamble of claims 1 and 14 and "each user being associated with a *three dimensional avatar*" (emphasis added) (Ex. 1001, 20:15–16) recited in the preamble of claim 12 were not limiting, then we would agree with Petitioner that an "avatar" is "a graphical representation of a user" without a three-dimensional requirement, as the Board has determined in related cases involving related patents. *See* IPR2015-01264, slip op. at 40–56 (PTAB Nov. 10, 2016) (Paper 42);

E. Obviousness of Claims 1–6, 12, 14, and 15 in View of Funkhouser and Sitrick

1. Funkhouser (Ex. 1005)

Petitioner argues Funkhouser constitutes a "printed publication" under § 102(a) and was published "no later than April 12, 1995." Pet. 6, 13. Patent Owner does not contest, and appears to accept, Petitioner's position. *See* IPR2015-01264, Paper 20, 44–47 (referring to April 12, 1995 as "the effective publication date of Funkhouser"); *see generally id*.

In determining whether a reference is a "printed publication," "the key inquiry is whether or not [the] reference has been made 'publicly accessible." *In re Klopfenstein*, 380 F.3d 1345, 1348 (Fed. Cir. 2004). A reference is "publicly accessible" if the reference "has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter . . . exercising reasonable diligence, can locate it and recognize and comprehend therefrom the essentials of the claimed invention without need of further research or experimentation." *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378 (Fed. Cir. 2006)

(internal citations omitted).

Funkhouser (Ex. 1005) is an article that appears in a collection of articles, titled 1995 SYMPOSIUM ON INTERACTIVE 3D GRAPHICS (Ex. 1006) ("1995 Symposium Book"). Ex. 1005; Ex. 1006, cover, 1–3, 85; Ex. 1002 ¶ 40. The 1995 Symposium Book was compiled for a symposium sponsored

IPR2015-01268, slip op. at 37–54 (PTAB Nov. 30, 2016) (Paper 44); IPR2015-01269, slip op. at 37–53 (PTAB Nov. 28, 2016) (Paper 42); IPR2015-01321, slip op. at 13–30 (PTAB Nov. 28, 2016) (Paper 42); IPR2015-01325, slip op. at 13–30 (PTAB Nov. 28, 2016) (Paper 42). by the Association for Computing Machinery ("ACM"), held on April 9–12, 1995 ("1995 Symposium"). Ex. 1006, cover, 1–3, 85; Ex. 1002 ¶¶ 40–41. The 1995 Symposium Book indicates that Funkhouser was scheduled to be presented on April 11, 1995. Ex. 1006, 2. Dr. Zyda-who was the chairperson of the 1995 Symposium—testifies that Funkhouser's author, Thomas Funkhouser, "was a well-known researcher" at the time and that the symposium gathered "many of the top researchers in the fields of virtual reality systems, computer graphics, and real-time interactive 3D." Ex. 1002 ¶¶ 44–45; Ex. 1006, cover. According to Dr. Zyda, "[o]ver 250 participants attended the 1995 [S]ymposium and each was provided with a copy of the 1995 [Symposium Book]." Ex. 1002 ¶ 45. In addition, Dr. Zyda testifies that copies of the book were available from the ACM. Id.; see Ex. 1006, copyright page ("A limited number of copies are available at the ACM member discount."); see also id. at 4. The 1995 Symposium Book and Funkhouser feature a 1995 copyright date and permit copying, generally without a fee and with "a fee and/or specific permission" if for "direct commercial advantage." Ex. 1006, copyright page, 85; Ex. 1005, 85.

In light of this evidence of Funkhouser's distribution and accessibility, Petitioner has demonstrated that an interested ordinarily skilled artisan, "exercising reasonable diligence," could have obtained Funkhouser "no later than April 12, 1995"—the last day of the 1995 Symposium. *See, e.g., Mass. Inst. of Tech. v. Ab Fortia*, 774 F.2d 1104, 1109 (Fed. Cir. 1985) (holding a paper to be a prior art printed publication where the paper was "disseminated without restriction to at least six persons" and "between 50 and 500" ordinary artisans were "informed of its contents by [an] oral presentation" before the critical date). Accordingly, Petitioner has submitted evidence

sufficient to show that Funkhouser was a printed publication no later than April 12, 1995. Patent Owner does not dispute the publication date of Funkhouser. *See generally* PO Resp.; Tr. Based on the record before us, Petitioner has shown by a preponderance of the evidence that Funkhouser qualifies as prior art under 35 U.S.C. § 102(a).

Funkhouser describes providing a three-dimensional virtual environment between entities representing users. Ex. 1005, 85. In addition, Funkhouser discusses when an entity changes state, sending update messages to workstations with entities that can "potentially perceive" the change. *Id.* Figure 12 is reproduced below.



Figure 12 illustrates user A can see both users B and E and user B is closer to user A than user E is. *Id.* at 91. Because the cell in which user A is located is potentially visible to the cells in which users B and E are located, user A receives updates regarding users B and E. *See id.* at 87. Moreover, updates regarding user B "could be sent to A at a finer resolution" because user B "may be more important" than user E to user A. *Id.* at 91.

2. Sitrick (Ex. 1013)

We first assess Sitrick's prior art status. Petitioner argues Sitrick is prior art under 35 U.S.C. § 102(b), and Patent Owner has not disputed

Petitioner's position. Pet. 13; *see generally* PO Resp.; Tr. We agree with Petitioner that Sitrick, a U.S. patent that issued on June 4, 1985, more than one year before the earliest possible effective filing date of the '501 patent, constitutes § 102(b) prior art. *See* 35 U.S.C. § 102(b); Ex. 1001, [60], [63]; Ex. 1013, [22], [45].

Sitrick describes providing a multi-player gaming system on a network. Ex. 1013, Abs., 1:4–5, 3:56–57, 4:48–51. In addition, Sitrick discusses a user selecting a distinguishable visual image as her or his avatar. *Id.* at Abs., 1:4–5, 3:56–57, 4:48–51. The user selection includes the color, size, shape, or a digitized image of the user's face. *Id.* at Abs.

3. Discussion

Petitioner asserts that the subject matter of claims 1–6, 12, 14, and 15 would have been obvious in view of Funkhouser and Sitrick under 35 U.S.C. § 103(a). Pet. 15–36. Petitioner provides a limitation by limitation analysis as to how the combination of Funkhouser and Sitrick allegedly teaches or suggests the subject matter of claims 1–6, 12, 14, and 15. *Id.* Patent Owner contests Petitioner's obviousness assertions. PO Resp. 13–31.

a. The Combination of Funkhouser and Sitrick Teaches a Custom Avatar

The parties disagree as to whether the combination of Funkhouser and Sitrick teaches or suggests the limitation "customizing . . . an avatar," as recited in claim 1 and similarly recited in claims 12 and 14. PO Resp. 20– 22; Reply 9–10. Because Petitioner has the burden of proof (*see* 35 U.S.C. § 316(e), 37 C.F.R. § 42.20(c)), we begin with Petitioner's arguments.

Petitioner argues the combination of Funkhouser's avatars having a geometric description and behavior and Sitrick's selection of a distinguishable visual image representation by which a user is identified teaches the claimed "customizing." Pet. 16–18, 26.

In response, Patent Owner argues Petitioner acknowledges that Funkhouser fails to teach "customizing . . . an avatar in response to input by the first user" and relies on Sitrick to remedy this shortcoming. *Id.* at 21 (citing Pet. 17). According to Patent Owner, Sitrick fails to teach "avatar" as properly construed (i.e., Sitrick's avatar is not three-dimensional). *Id.*

Patent Owner also highlights that Sitrick was first filed on September 30, 1982. *Id.* (citing Ex. 1013, 1). Patent Owner argues Sitrick teaches a user selecting a distinguishable image representation to identify themselves as a two-dimensional image and, therefore, does not teach the three-dimensional "custom avatar." *Id.* According to Patent Owner, the '501 patent describes "N two-dimensional panels," which the combination of Sitrick and Funkhouser fails to teach or suggest. *Id.* Patent Owner argues the combination of Funkhouser and Sitrick fails to reconcile the differences between selecting a two-dimensional representation and "customizing" a three-dimensional avatar as properly construed. *Id.* Patent Owner concludes its argument by explaining the combination of Funkhouser and Sitrick fails to teach or suggest "avatar," "customizing," or creating a "custom avatar" as properly construed. *Id.* at 21–22.

In reply, Petitioner argues Patent Owner's argument attacks Sitrick individually for its failure to teach customization of a *three-dimensional* avatar. Reply 9. Petitioner argues Patent Owner focuses too narrowly on

whether Sitrick *alone* teaches customizable avatar while failing to address the teaching of the *combination* of Funkhouser and Sitrick. *Id.* at 9–10.

Petitioner argues even if we applied Patent Owner's proposed construction, Sitrick teaches a customizable user "representation" and Funkhouser teaches three-dimensional avatars. *Id.* at 10 (citing Ex. 1013, Abstract, 11:41–45; Ex. 1005, 85, Plates I and II). According to Petitioner, Dr. Zyda explains that a person having ordinary skill in the art would have understood Sitrick to teach multiple avatar customizing methods, and that the combination of Funkhouser and Sitrick teaches "custom avatar." *Id.* (citing Ex. 1002 ¶¶ 83–85).

Petitioner also argues aside from asserting that Sitrick teaches customizable two-dimensional avatars rather than three-dimensional avatars, Patent Owner does not identify why these differences would have rendered claims 1, 12, and 14 non-obvious in view of the *combination* of Funkhouser and Sitrick. *Id.* Petitioner concludes its argument by asserting Patent Owner fails to rebut the obviousness challenge in the Petition. *Id.*

We find persuasive Petitioner's argument and evidence that the combination of Funkhouser and Sitrick teaches or suggests customization of an "avatar," and are not persuaded by Patent Owner's arguments disputing Petitioner's showing on this issue. As explained *supra* in Part II.C.2, we agree with Patent Owner that an "avatar" is "three-dimensional," yet we agree with Petitioner's showing that Funkhouser's virtual environment displayed on a client workstation from the perspective of one or more entities and depicting entities as a three-dimensional graphical representation teaches three-dimensional "avatars." Ex. 1005, 85, Plates I and II. Moreover, we note that Patent Owner, during the oral hearing, explicitly

stated that it does not dispute that Funkhouser teaches an "avatar" even under its proposed narrower construction, which includes a "three-dimensional" requirement. Tr. 67:12–68:2. Dr. Zyda explains that a person having ordinary skill in the art would have understood Sitrick to teach multiple avatar customizing methods, and that the combination of Funkhouser and Sitrick teaches "custom avatar." *Id.* (citing Ex. 1002 ¶¶ 83– 85). The portions of Sitrick cited by Petitioner teach a customizable user "representation." Ex. 1013, Abs., 11:41–45.

As for Patent Owner's argument that Sitrick was filed on September 30, 1982, to the extent that Patent Owner is suggesting a 1982 filing date proves Sitrick cannot teach customization of a graphical representation of a user, we disagree with Patent Owner. Patent Owner acknowledges that Sitrick teaches a user selecting a distinguishable image representation to identify themselves as a two-dimensional image (PO Resp. 21); therefore, Sitrick teaches customizing a graphical representation of a user. Moreover, as we note above, Funkhouser teaches three-dimensional avatars, and Petitioner's obviousness arguments are based on a combination of Funkhouser and Sitrick. *See* Pet. 16–18, 26; Ex. 1005, Plates I & II; Tr. 67:12–68:2.

Accordingly, for the reasons given, Petitioner has shown persuasively that the combination of Funkhouser and Sitrick teaches "customizing . . . an avatar in response to input by the first user," as recited in claim 1 of the '501 patent and the corresponding limitations of claims 12 and 14.

b. Undisputed Limitations of Claims 1–6, 12, 14, and 15

We have reviewed the arguments and evidence presented in the Petition regarding how the combination of Funkhouser and Sitrick teaches or suggests the remaining limitations of claim 1–6, 12, 14, and 15. Pet. 13–31. Patent Owner does not contest that the combination of Funkhouser and Sitrick teaches or suggests these limitations. *See* PO Resp. 20–36; *see also* Reply 9–14. Based on our review of the Petition and the supporting evidence, we find persuasive Petitioner's arguments and evidence, including citations to the references and Dr. Zyda's testimony, and we adopt them as the basis for our determination that the combination of Funkhouser and Sitrick teaches or suggests these limitations of claims 1–6, 12, 14, and 15, thereby rendering these claims unpatentable for obviousness. Pet. 13–31.

c. Conclusion

In conclusion, for the reasons given above and based on our review of the arguments and evidence of record, Petitioner has shown by a preponderance of the evidence that the subject matter of claims 1–6, 12, 14, and 15 of the '501 patent would have been obvious over Funkhouser and Sitrick.

F. Obviousness of Claims 8 and 10 in View of Funkhouser, Sitrick, and Funkhouser '93

1. Funkhouser '93 (Ex. 1017)

Petitioner argues Funkhouser constitutes a "printed publication" under § 102(a) and was published "no later than April 12, 1995." Pet. 6, 9. Patent Owner does not contest, and appears to accept, Petitioner's position. *See*

IPR2015-01264, Paper 20, 44–47 (referring to April 12, 1995 as "the effective publication date of Funkhouser"); *see generally id*.

Petitioner has submitted evidence to show that Funkhouser '93 was a printed publication by August 6, 1993 and, thus, constitutes prior art to the '501 patent under § 102(b). Pet. 6. Funkhouser '93 is an article included in a collection of presentation materials (Ex. 1018, "1993 Conference Book"), compiled for a conference sponsored by the ACM held on August 1–6, 1993. Ex. 1018, cover, 1–8, 247; Ex. 1002 ¶ 51. Dr. Zyda testifies that all participants in the conference, including Dr. Zyda, received a copy of the 1993 Conference Book. Ex. 1002 ¶ 51. The 1993 Conference Book and Funkhouser '93 feature a 1993 copyright date and permit copying, generally without a fee and with "a fee and/or specific permission" if for "direct commercial advantage." Ex. 1018, 2, 247; Ex. 1017, 247. The 1993 Conference Book also provides information for ACM and non-ACM members to order the 1993 Conference Book. Ex. 1018, 2. Accordingly, Petitioner has submitted evidence sufficient to show that Funkhouser '93 was a printed publication by August 6, 1993—the last day of the conference. See Mass. Inst. of Tech., 774 F.2d at 1109. Patent Owner does not dispute the publication date of Funkhouser '93. See generally PO Resp.; Tr. Based on the record before us, Petitioner has shown by a preponderance of the evidence that Funkhouser '93 qualifies as prior art under 35 U.S.C. § 102(b).

Funkhouser '93 discusses an adaptive display algorithm that allows users to set target frame rates. Ex. 1017, 247. In addition, Funkhouser '93 discusses workstations rendering image quality at less than full detail in exchange for faster target frame rates when rendering complex images. *Id.*

Funkhouser '93 also describes the omission of books in bookshelves when applying the faster target frame rate. *Id.* at 253–54, Fig. 11.

2. Discussion

Petitioner asserts that the subject matter of claims 8 and 10 would have been obvious in view of Funkhouser, Sitrick, and Funkhouser '93 under 35 U.S.C. § 103(a). Pet. 33–39. Petitioner provides a limitation by limitation analysis as to how the combination of Funkhouser, Sitrick, and Funkhouser '93 allegedly teaches or suggests the subject matter of claims 8 and 10. *Id.* Patent Owner contests Petitioner's obviousness assertions. PO Resp. 24–28.

a. Funkhouser '93 Teaches Omitting Objects

The parties disagree over whether the combination of Funkhouser '93's omitting objects and Funkhouser's avatars teaches or suggests "filtering the other user avatars," as recited in claims 8 and 10. PO Resp. 24–28; Reply 14–15. We begin with Petitioner's arguments.

Petitioner argues Funkhouser '93's teaching of "levels of detail representing 'no polygons at all'" teaches omitting objects. *See* Pet. 34 (citing Ex. 1017, 249). Petitioner also argues Funkhouser teaches other user avatars. Pet. 16–23.

In response, Patent Owner argues Funkhouser '93 teaches "omission of books on bookshelves and texture on doors" rather than omitting objects or avatars. PO Resp. 24–25. Patent Owner refers to Dr. Zyda's testimony to support its argument that Funkhouser '93 does not teach avatars. *Id.* at 25– 27 (citing Ex. 2016, 259:16–260:13, 260:17–261:8). According to Patent Owner, in Funkhouser '93, the bookshelf in Figure 11 is the object and the

books reflect a texture that can be adjusted to reach a uniform frame rate. *Id.* at 26.

In reply, Petitioner argues that the issue we should focus on is whether the *combination* of Funkhouser and Funkhouser '93 teaches the limitations of claims 8 and 10, not whether Funkhouser '93 *alone* teaches claims 8 and 10. Reply 14 (citing PO Resp. 25–26). Petitioner argues that Funkhouser '93 distinguishes between textures and omitted books, which teaches both omission of books on bookshelves and omission of texture. Reply 14–15 (citing Ex. 1017, 253). Petitioner also argues Funkhouser '93's disclosure of "levels of detail representing 'no polygons at all'" expressly refers to omitting entire objects, and a "'no polygons at all' detail level . . . will result in [objects] being omitted from the display once the maximum number of objects displayable within the 'maximum cost' is exceeded." Reply 16 (quoting Ex. 1017, 249, 251).

We find persuasive Petitioner's showing that the combination of Funkhouser and Funkhouser '93 teaches or suggests "filtering the other user avatars," as recited in claims 8 and 10. We are not persuaded by Patent Owner's argument that Funkhouser '93 fails to teach omitting objects or avatars because one cannot show nonobviousness "by attacking references individually" where the challenge is based on a combination of references. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 426 (CCPA 1981)). In this case, Petitioner has shown that Funkhouser teaches the claimed "other user avatars," which as we explain above in § II.C.2 must be three-dimensional in light of the limiting preamble language of independent claim 1, from which claims 8 and 10 depend. For example, Funkhouser explains that "[c]lients execute the

programs necessary to generate behavior for their entities" and "[t]hey may . . . include viewing capabilities in which the virtual environment is displayed on the client workstation screen from the point of view of one or more of its entities" and depicts its entities as three-dimensional graphical representations. Ex. 1005, 85, 209 (Plate II). In addition, Patent Owner, during the oral hearing, explicitly stated that it does not dispute that Funkhouser teaches an "avatar" even under its proposed narrower construction of the term, which includes a "three-dimensional" requirement. Tr. 67:12–68:2.

We agree with Petitioner's showing that Funkhouser '93 teaches omitting objects from the display under certain circumstances. As Petitioner points out, Funkhouser '93 makes clear the possibility that the "target frame time [may] not [be] long enough to render all potentially visible objects even at the lowest level of detail" and explains that its approach can handle such a situation "if levels of detail representing 'no polygons at all' are allowed," such that "only the most 'valuable' objects are rendered." Ex. 1017, 249; *see id.* at 253, Fig. 11. Even Patent Owner acknowledged at the oral hearing that Funkhouser '93's reference to "levels of detail representing 'no polygons at all" means "no object" or, in other words, "exclud[ing]" objects. Tr. 69:11–20, 71:8–22, 74:22–25; *see id.* at 189:3–5. These disclosures demonstrate that Funkhouser '93 teaches that objects that cannot be rendered within the target frame rate, even at the lowest detail or accuracy level, may be excluded or omitted from the display. *See* Reply 16; Tr. 55:1–7, 191:14–192:12.

In addition, in discussing Figure 11, Funkhouser '93 distinguishes between textures and omitted books, i.e., "omission of *texture* on the

bookshelves in Figure 11b1 . . . and omission of *books* on bookshelves and *texture* on doors in Figure 11 c1." Reply 15 (citing Ex. 1017, 253). We find these disclosures regarding Figure 11 and the figure itself to support Funkhouser '93 teaching or at least suggesting filtering objects where they cannot be rendered at the target frame rate.

For the reasons given, we agree with Petitioner's showing that the combination of Funkhouser and Funkhouser '93 teaches or suggests "filtering the other user avatars" as recited in claims 8 and 10.

b. Funkhouser '93 Teaches a Limit of Other User Objects Displayed

Regarding the next dispute, the parties contest whether Funkhouser '93 teaches a "filtering the other user" objects "displayed on the client device display," as recited in claim 10. PO Resp. 27–28; Reply 14– 15.

Petitioner relies on pages 249 and 251 of Funkhouser '93, which, according to Petitioner, teaches that objects can be assigned a "no polygons at all" detail level that results in objects being omitted from the display once the maximum number of objects displayable within the "maximum cost" is exceeded. Pet. 6, 34 (citing Ex. 1017, 249, 251).

In response, Patent Owner argues that Funkhouser '93 does not feature a limit of the other user avatars that are displayed. PO Resp. 27. Rather, according to Patent Owner, Funkhouser '93 teaches a selection of objects in descending order of value until a maximum cost is reached. *Id.* Patent Owner argues Funkhouser '93 does not teach excluding a number of objects after the maximum cost is claimed; rather, according to Patent Owner, Funkhouser '93 teaches an algorithm for each potentially visible

object based on value, but does not teach omitting objects/avatars having lower value once the maximum cumulative benefit is reached. *Id.* at 27–28 (citing Ex. 1017, 251; Ex. 2017 ¶ 53). According to Patent Owner, this may result in objects having a lower value (i.e., a bookshelf with reduced texture and a lower accuracy level), which results in books being omitted, which is not the same as filtering objects based on computing resources or user selection. *Id.* at 28.

In reply, Petitioner argues that Funkhouser '93 teaches that objects can be assigned a "no polygons at all" detail level that results in objects being omitted from the display once the maximum number of objects displayable within the "maximum cost" is exceeded. Reply 15 (citing Ex. 1017, 249, 251).

We agree with Petitioner's showing that Funkhouser '93 teaches "filtering the other user" objects "displayed on the client device display," as recited in claim 10. We are not persuaded by Patent Owner's argument that Funkhouser '93 fails to teach or suggest a limit of other user objects displayed because, as explained above, Funkhouser '93 teaches a level of detail representing "no polygons" and refers to using such a detail level "where the target frame time is not long enough to render all potentially visible objects even at the lowest level of detail," such that "only the most 'valuable' objects are rendered." Ex. 1017, 249. And Patent Owner acknowledged at the hearing that this disclosure refers to the possibility of omitting objects. Tr. 69:11–20, 71:8–22, 74:22–25; *see id.* at 189:3–5. Moreover, Funkhouser '93 teaches that its optimization algorithm results in books on a bookshelf being omitted (i.e., limit of the other user objects) as a result of "a selection made by the local user" (i.e., user selection) and the

"optimization algorithm" (i.e., based on computing resources or user selection). Pet. 34, 36, 38 (citing Ex. 1017, 247); Reply 15 (citing Ex. 1017, 253).

As for the "avatar" limitation, as stated *supra* in Part II.C.2, a "three dimensional avatar" recited in the preamble of independent claim 1, from which claim 10 depends, is limiting. As stated *supra* in Part II.E.3.a, we agree with Petitioner's showing that Funkhouser's virtual environment displayed on a client workstation from the perspective of one or more entity and depicting entities as a three-dimensional graphical representation teaches "avatars." In addition, Patent Owner explicitly stated that it does not dispute that Funkhouser teaches an "avatar" even under its proposed narrower construction, which features a "three-dimensional" requirement. Tr. 67:12–68:2.

Accordingly, Petitioner has shown that the combination of Funkhouser, Sitrick, and Funkhouser '93 teaches or suggests "limit of the other user avatars displayed on the client device display," as recited in claim 10. We disagree with Patent Owner's arguments disputing this showing.

c. Undisputed Limitations of Claims 8 and 10

We have reviewed the arguments and evidence presented in the Petition regarding how the combination of Funkhouser, Sitrick, and Funkhouser '93 teaches or suggests the remaining limitations of claim 8 and 10. Pet. 33–39. Patent Owner does not contest that the combination of Funkhouser, Sitrick, and Funkhouser '93 teaches or suggests these limitations. *See* PO Resp. 24–28; *see also* Reply 14–15. Based on our

review of the Petition and the supporting evidence, we find persuasive Petitioner's arguments and evidence, including citations to the references and Dr. Zyda's testimony, and we adopt them as the basis for our determination that the combination of Funkhouser, Sitrick, and Funkhouser '93 teaches or suggests these limitations of claims 8 and 10, thereby rendering them unpatentable for obviousness. Pet. 33–39.

d. Conclusion

In conclusion, for the reasons given above and based on our review of the arguments and evidence of record, Petitioner has shown by a preponderance of the evidence that the subject matter of claims 8 and 10 of the '501 patent would have been obvious over Funkhouser, Sitrick, and Funkhouser '93.

G. Obviousness of Claims 7 and 16 in View of Funkhouser, Sitrick, and Wexelblat

1. Wexelblat (Ex. 1020)

We first assess Wexelblat's prior art status. Petitioner argues Wexelblat is prior art under 35 U.S.C. § 102(b), and Patent Owner has not disputed Petitioner's position. Pet. 32; *see generally* PO Resp.; Tr. We agree with Petitioner that Wexelblat, a U.S. patent that issued on June 4, 1991, more than one year before the earliest possible effective filing date of the '501 patent, constitutes § 102(b) prior art. *See* 35 U.S.C. § 102(b); Ex. 1001, [60], [63]; Ex. 1020, [22], [45].

Wexelblat discusses an artificial reality with interacting users. Ex. 1020, 6:61–7:10. In addition, Wexelblat discusses a user teleporting from a current location to another location. *Id*.

2. Discussion

Petitioner asserts that the subject matter of claims 7 and 16 would have been obvious in view of Funkhouser, Sitrick, and Wexelblat under 35 U.S.C. § 103(a). Pet. 33–39. Petitioner provides a limitation by limitation analysis as to how the combination of Funkhouser, Sitrick, and Wexelblat allegedly teaches or suggests the subject matter of claims 8 and 10. *Id.* Patent Owner contests Petitioner's obviousness assertions. PO Resp. 24–28.

a. Funkhouser Is Compatible with Wexelblat

The parties dispute whether Funkhouser and Wexelblat are compatible. Pet. 32–33; PO Resp. 31–34; Reply 10–11.

Petitioner argues it would have been obvious to combine Wexelblat's navigating from room to room in a virtual environment with Funkhouser's system in order to provide entities within a virtual environment with a method to return quickly to a location of interest after an initial visit. Pet. 32–33 (citing Ex. 1020, 6:67–7:5; Ex. 1002 ¶ 138).

In response, Patent Owner argues Funkhouser's background "discusses the problem caused by distributing every entity's state change to every workstation participating in the virtual environment." PO Resp. 31. Patent Owner further argues Funkhouser states that "it is necessary to develop a system design and communication protocol that does not require sending update messages to all participating hosts for every entity state change." *Id.* (quoting Ex. 1005, 86). Patent Owner further argues that Funkhouser's intended purpose is to limit sending messages to only a small subset of clients to which the update is relevant. *Id.* at 32. Patent Owner

additionally argues this "means that entities do not receive real-time update messages for other entities that are not visible, and therefore cannot display the virtual environment from another entity's perspective." *Id*.

Patent Owner also argues Dr. Zyda acknowledged that incorporating Wexelblat's teleportation feature into Funkhouser's message culling system would detract from, rather than enhance, the user's virtual world experience. *Id.* at 33 (citing Ex. 2016, 164:1–166:15). Patent Owner argues Dr. Zyda's testimony illustrates that Wexelblat's teleportation, within a virtual world, has the effect of making all of the other avatars "potentially visible" in the next couple of frames. *Id.* (quoting Ex. 2017 ¶ 108). In particular, according to Patent Owner, Dr. Zyda testified that Funkhouser provides more messages about other user avatars than what a client can see. *Id.* at 34 (citing Ex. 2016, 43:2–15, 57:2–6, 162:9–12). Patent Owner argues that because Funkhouser only sends messages of other avatars that are potentially visible or audible, incorporating Wexelblat's teleportation into Funkhouser requires the server to provide each client with updates from all other entities since they are potentially visible. *Id.* (citing Ex. 2017 ¶ 108).

In reply, Petitioner argues Patent Owner's argument that Wexelblat's teleportation would have expanded the potentially visible area to the entire virtual environment, thus requiring the server to send positional updates for all users in the entire virtual environment and negating Funkhouser's message culling, is mutually exclusive from Patent Owner's argument that adding Wexelblat's teleportation feature to Funkhouser would have created an unacceptable delay while the information for the new perspective is sent from the server to the client. Reply 11. According to Petitioner, Patent Owner's two arguments are mutually exclusive because "[i]f the server

sends updates for the entire virtual space there would be no possibility of additional lag as it downloads updates for a specific location after a teleportation" and "[c]onversely, if the server sends updates for only a limited portion of the environment potentially visible to a user avatar based on its location (as Funkhouser discloses) there would be no need to send updates for the entire space as the potentially visible region could be recalculated after a perspective switch." *Id.* Petitioner further argues Patent Owner's argument that Wexelblat's teleportation would have expanded the potentially visible area to the entire virtual environment, thus, requiring the server to send positional updates for all users in the entire virtual environment and negating Funkhouser's message culling, can be dismissed easily. *Id.* According to Petitioner, Patent Owner's argument "depends on eliminating server-side message culling," which runs contrary to both Funkhouser's teaching and Petitioner's ground of unpatentability that was instituted by the Board. *Id.*

We agree with Petitioner that Patent Owner's argument "depends on eliminating server-side message culling," which runs contrary to both Funkhouser's server-side message culling and Petitioner's asserted ground of unpatentability. We disagree with Patent Owner's argument that Wexelblat's teleportation would expand the potentially visible area of Funkhouser's clients to the entire virtual environment, thus requiring the server to send positional updates for all users in the entire virtual environment and negating Funkhouser's message culling. In addition, the cited portions of Dr. Zyda's testimony relied upon by Petitioner demonstrate that Wexelblat's teleportation would not affect Funkhouser's server-based message culling because the combination of Funkhouser and Wexelblat

would provide entities within a virtual environment with a method to return quickly to a location of interest after an initial visit. Pet. 31-32 (citing Ex. 1002 ¶¶ 134–141).

Moreover, we agree with Petitioner that Funkhouser's statement that "it is necessary to develop a system design and communication protocol that does not require sending update messages to all participating hosts for every entity state change" (Ex. 1005, 86) does not imply that Funkhouser is incompatible with Wexelblat because this implication focuses too narrowly on Funkhouser. Rather, a broad approach should be taken. Indeed, the Supreme Court provided guidance in determining the applicability of a reference's teachings in an obviousness inquiry. In *KSR International Co. v. Teleflex Inc.*, the Court explained that if a feature has been used to improve one device, and a person of ordinary skill in the art would have recognized that it would improve a similar device in that field or another, implementing that feature on the similar device is likely obvious. 550 U.S. at 417.

Accordingly, we find persuasive Petitioner's showing and Dr. Zyda's supporting testimony that combining Funkhouser and Wexelblat would represent combining familiar elements according to known methods that yield the predictable results of navigating from room to room. Pet. 31–32 (citing Ex. 1002 ¶¶ 134–141). We, therefore, agree with Petitioner's showing on this issue and disagree with Patent Owner's argument that Funkhouser and Wexelblat are incompatible.

b. Combining Wexelblat's Teleportation Feature with Funkhouser's Message Culling System Would Not Create an Unacceptable Delay

The parties also contest whether adding Wexelblat's teleportation feature to Funkhouser's system would create an unacceptable delay while the information for the new perspective is sent from the server to the client. PO Resp. 34–36; Reply 11–14, 13–14.

As stated *supra* in Part II.G.2.a, Petitioner argues that it would have been obvious to combine Wexelblat's navigating from room to room in a virtual environment with Funkhouser's system in order to provide entities within a virtual environment with a method to return quickly to a location of interest after an initial visit.

In response, Patent Owner argues that combining Wexelblat's teleportation feature and Funkhouser's system results in an unacceptable delay. PO Resp. 34–36. In support of its argument, Patent Owner refers to Dr. Zyda's testimony that users would think a teleport delay is sluggish, which causes users to "get pretty unhappy," and argues that this contradicts Dr. Zyda's declaration. PO Resp. 31–32 (quoting Ex. 2016, 164:8–19, 165:2–14, 166:13–16, 163:8–12, 163:22–23). Patent Owner further argues Funkhouser discusses the need for "near real-time' updates 'since large variances or delays in updates can result in visually perceptible jerky or latent motion, and thus may be disturbing to users" and Funkhouser's solution for limiting messages has some built-in latency. PO Resp. 33 (quoting Ex. 1005, 85). Patent Owner also argues Funkhouser states that the "disadvantage of the RING system design is that extra latency is introduced when messages are routed through servers,' and '[c]omputations are performed in the servers before messages are propagated further adding to

latency." PO Resp. 33 (quoting Ex. 1005, 88). According to Patent Owner, adding latency that is undesirable to users or disturbing runs contrary to Funkhouser. PO Resp. 33 (citing Ex. 2017 ¶ 104). According to Patent Owner, Petitioner and Dr. Zyda failed to recognize and reconcile the inconsistency between Funkhouser and Durward. *Id.* at 36 (citing 2017 ¶ 120).

In reply, Petitioner argues Patent Owner's argument that adding a teleportation feature results in an unacceptable delay is not supported by the record. Reply 11–12. Petitioner further argues Patent Owner mischaracterizes Dr. Zyda's testimony, exaggerating both the amount of delay and the effect of this delay on a user's experience. *Id.* at 12. According to Petitioner, although Dr. Zyda acknowledged "that a teleport feature could result in a system stalling from one frame to four frames while the information" is being loaded, Dr. Zyda explained that "'[i]t may not be noticeable." Id. (quoting Ex. 2016, 164:8–165:17). According to Petitioner, even at the largest delay Dr. Zyda identified, four frames, and the lowest framerate the NPS system on which Dr. Zyda worked in the early 1990s, three frames per second, the largest delay would have been 1.33 seconds. *Id.* (citing Ex. 2016, 166:4–12). In addition, Petitioner argues Mr. Pesce acknowledged that a one or two second delay would not have been irritating to a user and would have been below the threshold of acceptability. Id. (citing Ex. 1046, 260:18–261:19). Petitioner also argues the alleged unacceptable lag to a user is "undermined by the fact that [Patent Owner's] patents themselves provide no solution to this alleged problem" and "would also have been an issue in the system described in [Patent

Owner's] patents," which similarly perform computations "in the servers before messages are propagated." Reply 13–14.

We agree with Petitioner's showing that adding Wexelblat's teleportation feature to Funkhouser would have not created an unacceptable delay while the information for the new location is sent from the server to the client. We disagree with Patent Owner's argument that adding Wexelblat's teleportation feature to Funkhouser's system would have created such an unacceptable delay, thereby allegedly undermining Petitioner's proposed combination of Funkhouser and Wexelblat. Regarding Dr. Zyda's testimony, Patent Owner takes his testimony out of context. Although Dr. Zyda testified that a one to four frame delay may occur and users may be unhappy, Dr. Zyda explained that "[i]t may not be noticeable." Ex. 2016, 164:8–165:17. That is, as Petitioner points out, the largest delay Dr. Zyda identified was four frames and the lowest framerate his NPS system displayed was three frames per second, which translates to the largest delay being 1.33 seconds. Ex. 2016, 166:4–12; see Reply 12. In addition, Mr. Pesce acknowledged that a one or two second delay would not have been irritating to a user and would be below the threshold of acceptability. Ex. 1046, 260:18–261:19. In addition, the alleged unacceptable lag to a user is undermined by the fact that the '501 patent fails to provide a solution to this alleged lag, which also would have been an issue in the system described in the '501 patent that similarly performs computations "in the servers before messages are propagated." Reply 13–14; see, e.g., Ex. 1001, 12:42-59.

As for Patent Owner's argument that adding latency that is undesirable to users or disturbing runs contrary to Funkhouser, this does not

imply that Funkhouser is incompatible with Wexelblat. In *KSR*, the Court explained that if a feature has been used to improve one device, and a person of ordinary skill in the art would have recognized that it would improve a similar device in that field or another, implementing that feature on the similar device is likely obvious. 550 U.S. at 417.

Here, the cited portions of Dr. Zyda's testimony relied upon by Petitioner explain that it would have been obvious to a person having ordinary skill in the art to combine Wexelblat's navigating from room to room in a virtual environment with Funkhouser's system in order to provide entities within a virtual environment with a method to return quickly to a location of interest after an initial visit. Pet. 32 (citing Ex. 1002 ¶ 138). Accordingly, we are persuaded by Petitioner's showing and Dr. Zyda's supporting testimony that combining Funkhouser and Wexelblat would represent combining familiar elements according to known methods that yield the predictable results of providing entities within a virtual environment with a method to return quickly to a location of interest after an initial visit. *Id.* at 31-32 (citing Ex. 1002 ¶ 138).

For the reasons given, we agree with Petitioner that its proposed combination of Funkhouser and Wexelblat would not have created an unacceptable delay.

c. Any Delay from the Addition of Wexelblat's Teleportation Feature to Funkhouser's System Would Not Have Been Detrimental to a User's Experience

The parties' next dispute focuses on whether the speed of networks in 1995 was sufficiently slow that the delay caused by adding Wexelblat's perspective-switching feature to Funkhouser's system would have been

detrimental to a user's experience and would have undermined Funkhouser's teaching of providing a real virtual world experience, as Patent Owner argues. PO Resp. 35–36; Reply 12–14.

As stated *supra* in Part II.G.2.a, Petitioner argues it would have been obvious to combine Wexelblat's navigating from room to room in a virtual environment with Funkhouser's system in order to provide entities within a virtual environment with a method to return quickly to a location of interest after an initial visit.

In response, Patent Owner argues the limitations of network speeds and hardware in 1995 could result in a delay of several seconds to as much as a few minutes. PO Resp. 35–36 (citing Ex. 2017 ¶ 100; Ex. 2016, 166:13–15). Furthermore, Mr. Pesce's declaration states "[i]n the 1995 time period, the speed of network connections were sufficiently slow that this lag would have been detrimental to a user's virtual world experience – anywhere from several seconds to as much as a few minutes – and would have undermined [Funkhouser's] purpose of providing a more real virtual world experience." Ex. 2017 ¶ 100.

In reply, Petitioner argues Mr. Pesce acknowledged he only considered network transmissions over a 14.4 kilobits per second modem or possibly a 9600 bits per second modem (i.e., the slowest type of network mentioned in Patent Owner's patents) because "'all of [Patent Owner's] patents talk about using dial-up systems, not using Ethernet.'" Reply 13 (quoting Ex 1046, 256:20–257:10, 264:17–265:14; Ex. 2017 ¶ 101). Petitioner further argues the challenged claims of the '501 patent are not limited to a slow dial-up modem and neither is Funkhouser. Reply 13. In support of its argument, Petitioner refers to Mr. Pesce's testimony, in which

Mr. Pesce acknowledged that Funkhouser teaches faster network transmissions. *Id.* (citing Ex. 1046, 266:6–15; Ex. 1005, 89). Petitioner also refers to Mr. Pesce's acknowledgement that he failed to analyze if adding a perspective-switching feature would have been feasible in a system with higher transmission speeds, which, according to Petitioner, illustrates that Patent Owner's "argument that the proposed combination would result in unacceptable system lag is based on Mr. Pesce's misconception the system must utilize a dial-up network, rather than the faster networks actually in use at the time and disclosed in the prior art." *Id.* at 13 (citing Ex. 1046, 266:16–23).

As above, we find persuasive Petitioner's evidence and reasoning supporting its proposed combination of Wexelblat's perspective-switching feature with Funkhouser's system. We disagree with Patent Owner's argument that the network speed was sufficiently slow that any delay caused by this addition would have been detrimental to a user's experience and would have undermined Funkhouser's teaching of providing a real virtual world experience. Mr. Pesce acknowledges he only considered network transmissions over a 14.4 kilobits per second modem or possibly a 9600 bits per second modem (i.e., the slowest type of network mentioned in Patent Owner's patents), because "all of [Patent Owner's] patents talk about using dial-up systems, not using Ethernet." Ex 1046, 256:20–257:10, 264:17–265:14; Ex. 2017 ¶ 101.

The instituted claims of the '501 patent, however, are not limited to a slow dial-up modem and neither is Funkhouser. Reply 13. In particular, Mr. Pesce acknowledges that Funkhouser teaches faster network transmissions compared to a dial-up modem. Ex. 1046, 266:6–15; Ex. 1005,

5. Mr. Pesce also acknowledges that he failed to analyze if adding a perspective-switching feature would have been feasible in a system with higher transmission speeds, which illustrates that Patent Owner's argument that the combination of Funkhouser and Wexelblat would have resulted in unacceptable system delay is based on Mr. Pesce's flawed premise that the system must utilize a slower dial-up network, rather than the faster networks in use at the time and taught in Funkhouser. Ex. 1046, 266:16–23. Accordingly, we disagree with Mr. Pesce's testimony on this point.

We, therefore, agree with Petitioner's showing that the speed of the networks in 1995 would not have created an unacceptable system delay that would have prevented or undermined Petitioner's proposed combination.

d. Undisputed Limitations of Claims 7 and 16

We have reviewed the arguments and evidence presented in the Petition regarding how the combination of Funkhouser, Sitrick, and Wexelblat teaches or suggests the remaining limitations of claims 7 and 16. Pet. 32–33. Patent Owner does not contest that the combination of Funkhouser, Sitrick and Wexelblat teaches or suggests these limitations. *See* PO Resp. 31–36; *see also* Reply 10–14. Based on our review of the Petition and the supporting evidence, we find persuasive Petitioner's arguments and evidence, including citations to the references and Dr. Zyda's testimony, and we adopt them as the basis for our determination that the combination of Funkhouser, Sitrick, and Wexelblat teaches or suggests these limitations, thereby rendering claims 7 and 16 unpatentable for obviousness. Pet. 32–33.

e. Conclusion

In conclusion, for the reasons given above and based on our review of the arguments and evidence of record, Petitioner has shown by a preponderance of the evidence that the subject matter of claims 7 and 16 of the '501 patent would have been obvious over Funkhouser and Wexelblat.

H. Anticipation by Durward of Claims 1–6, 12, 14, and 15

1. Durward (Ex. 1008)

We turn to the instituted ground of anticipation by Durward and first assess Durward's prior art status. Petitioner argues Durward is prior art under 35 U.S.C. § 102(e), and Patent Owner has not disputed Petitioner's position. Pet. 39; *see generally* PO Resp. We agree with Petitioner that Durward, a U.S. patent that was filed on September 23, 1993, more than one year before the earliest possible effective filing date of the '501 patent, constitutes § 102(e) prior art. *See* 35 U.S.C. § 102(e); Ex. 1001, [60], [63]; Ex. 1008, [22], [45].

Durward describes a virtual reality system with a database defining three-dimensional virtual spaces. Ex. 1008, Abs. Figure 5 is reproduced below.



Durward's Figure 5 illustrates assigning visual relevant spaces 200 and 204 to virtual beings 182 and 184, respectively. *Id.* at 4:59–63. Durward describes only communicating to a user the position, orientation, and/or movement of elements within the visual relevant space of a virtual being defining the user and those elements outside of the visual relevant space may or may not be visible to the user. *Id.* at 5:5–20.

2. Discussion

Petitioner asserts that the subject matter of claims 1–6, 12, 14, and 15 are anticipated under 35 U.S.C. § 102(e). Pet. 39–52. Petitioner provides a limitation by limitation analysis as to how the combination of Durward allegedly discloses the subject matter of claims 1–6, 12, 14, and 15. *Id.* Patent Owner contests Petitioner's obviousness assertions. PO Resp. 22–23.

a. Durward Fails to Disclose "three dimensional avatar" as Recited in Claims 1, 12, and 14

The parties dispute whether Funkhouser discloses a "three dimensional avatar" as recited in claims 1, 12, and 14. PO Resp. 22–23; Reply 10–11; Pet. 32–33.

Petitioner argues Durward discloses virtual beings representing users in a virtual space and the virtual beings interacting with other virtual beings in a virtual reality world. Pet. 40–41 (citing Ex. 1008, 1:7–11, 1:59–64, 2:1– 3, 2:51–52). Petitioner also refers to Durward's disclosure that the virtual beings may take the form of a human being, an animal, etc. that is visible within the virtual space. *Id.* at 41 (citing Ex. 1008, 3:30–32, 1:52–54, 7:29– 34). According to Petitioner, Durward's avatars are three-dimensional. *Id.* at 41 (citing Ex. 1008, 1:52–54, 7:29–34, Ex. 1002 ¶ 167). In response, Patent Owner argues that although Durward discloses "three-dimensional virtual spaces," Durward does not disclose the virtual entities are three-dimensional nor use the term "avatar." PO Resp. 22. Patent Owner further argues that at the time of Durward's filing in 1993, a person having ordinary skill in the art would have understood Durward's virtual entities to be two-dimensional, given the software limitations that precluded a three-dimensional rendering of an entity during the 1993 time period. *Id.* (citing Ex. 2017 ¶ 59).

Moreover, Patent Owner argues Petitioner refers to Durward as disclosing three-dimensional virtual entities based on Durward's disclosures in column 1, lines 52–54, column 7, lines 29–34, and paragraph 167 of Dr. Zyda's declaration. Id. According to Patent Owner, neither of the two cited portions of Durward disclose "avatars," or three-dimensional graphical representations, as the term is construed properly by Patent Owner. Id. at 22–23 (citing Ex. 2017 ¶ 59). Specifically, Patent Owner argues column 1, lines 52–54 of Durward discloses "three-dimensional virtual spaces," and column 7, lines 29–34 discloses "data designating flexure and position of the user's legs, arms, fingers, etc. may be assigned to the virtual being's legs, arms, fingers etc. so that the virtual being may emulate the gestures of the user for running, kicking, catching virtual balls, painting, writing, etc." Id. (quoting Ex. 1008, 1:52–54, 7:29–34). Patent Owner further argues that paragraph 167 of Dr. Zyda's declaration is conclusory and entitled little to no weight under 37 C.F.R. § 42.65(a) because it is devoid of any factual underpinning and is contradicted by Mr. Pesce, who confirms that Durward neither teaches nor suggests a three-dimensional virtual entity. Id. at 23 (citing Ex. 2017 ¶ 59). Moreover, Patent Owner

argues even with local area networks and high end computers, the best virtual worlds in 1993 implemented merely two-dimensional virtual entities. *Id.*

In reply, Petitioner argues Durward discloses three-dimensional avatars. Reply 16. In particular, Petitioner argues Durward discloses a user representation in a three-dimensional virtual space in which a "virtual being within the virtual space" represents a user. *Id.* (citing Ex. 1008, 1:52–64). Petitioner argues Durward discloses the virtual being within the three-dimensional space matches the user's three-dimensional movements in the real world closely. *Id.* (citing Ex. 1008, 7:29–34). Petitioner also argues "Patent Owner attempts to trivialize the virtual beings disclosed in Durward but does not explain how the complex correlation between a user's three dimensional-movement in the real world and a virtual being in a three-dimensional virtual world would be restricted to two-dimensions." *Id.* Petitioner argues Durward does not disclose such a restriction and Patent Owner's arguments do not comport with Durward's disclosure of a three-dimensional virtual reality system. *Id.*

Petitioner further argues Patent Owner relies on "Mr. Pesce's unsubstantiated and incredible testimony regarding the art—that the state of computer graphics advanced so dramatically in two years that a person of skill in 1995 would necessarily understand that an avatar <u>must</u> be three-dimensional." *Id.* at 17 (citing PO Resp. 22; Ex. 2017 ¶ 59). Petitioner concludes its argument by arguing it is unreasonable to conclude that a person having ordinary skill in the art would have understood Durward's three-dimensional virtual world beings to be limited to two-dimensional objects. *Id.*

We disagree with Petitioner's showing that Durward discloses a "three dimensional avatar" as recited in independent claims 1, 12, and 14 as well as dependent claims 2–6 and 15, which depend from claims 1 and 14. Petitioner's argument relies on Durward as allegedly disclosing the claimed "three dimensional avatar" recited in claims 1, 12, and 14. *See* Pet. 31–32, 34.

As explained *supra* in Part II.C.2, we determined that the "three dimensional avatar" recited in the preamble of claims 1, 12, and 14 is limiting.¹³ In an attempt to carry its burden of proving unpatentability, Petitioner relies on column 1, lines 52–54 of Durward, but this disclosure falls short of disclosing a "three dimensional avatar" because column 1, lines 52–54 merely discloses "three-dimensional virtual spaces." Pet. 41, 48–49; Ex. 1008, 1:52–54. Moreover, Petitioner refers to column 1, lines 7–11 of Durward, which merely discloses multiple users at remote locations participating in a virtual reality network experience; this disclosure, however, fails to disclose a "three dimensional avatar" as recited in claims 1, 12, and 14. Pet. 40, 48–49; Ex. 1008, 1:7–11. Petitioner additionally points to column 1, lines 59–64 of Durward, which discloses correlating a position, orientation, and/or movements of a virtual being to the received data; again, this excerpt fails to disclose a "three dimensional avatar" as recited in claims 1, 12 and 14. Pet. 40–41, 48–49; Ex. 1008, 1:59–64. Petitioner also

¹³ In the event that the "three dimensional avatar" recited in the preamble is not limiting, then Durward's disclosure of "data designating flexure and position of the user's legs, arms, fingers, etc. may be assigned to the virtual being's legs, arms, fingers etc. so that the virtual being may emulate the gestures of the user for running, kicking, catching virtual balls, painting, writing, etc." discloses "avatar" as recited in claims 1, 12, and 14.

refers to column 2, lines 1–3 of Durward, which merely discloses defining other virtual beings within a database in response to position, orientation, and/or movement, and again, fails to disclose a "three dimensional avatar" as recited in claims 1, 12, and 14. Pet. 41, 48–49; Ex. 1008, 2:1–3. In addition, Petitioner cites column 2, lines 51–52 of Durward, which merely discloses a network including a central control unit that communicates with users. Pet. 41, 48–49; Ex. 1008, 2:51–52. Yet, this disclosure also fails to disclose a "three dimensional avatar" as required by claims 1, 12, and 14. Petitioner also relies on Durward's Figure 1, which illustrates users represented by stick figures; these stick figures, however, are two-dimensional. Pet. 41, 48– 49; Ex. 1008, Fig. 1.

Moreover, Petitioner refers to column 3, lines 30–32 of Durward, which merely discloses a user may take the form of a human being, animal, object, etc. and be visible within a virtual space. Pet. 41, 48–49; Ex. 1008, 3:30–32. This disclosure also does not disclose "three dimensional avatar" as required by claims 1, 12, and 14. Having considered the cited disclosures of Durward and Petitioner's arguments regarding these disclosures, Petitioner has not demonstrated that these disclosures disclose a "three dimensional avatar," as claims 1, 12, and 14 require.

Furthermore, we do not find Dr. Zyda's opinion on this issue persuasive. *See* Pet. 32, 34 (citing Ex. 1002 ¶¶ 165–168). The cited portions of Dr. Zyda's declaration relied upon by Petitioner to teach "three dimensional avatar" merely parrot the cited portions of Durward relied upon by Petitioner and are devoid of any explanation as to how Durward discloses a "three dimensional avatar." *See* Ex. 1002 ¶¶ 165–168.

Nor do we find Petitioner's reliance on Durward's teachings recited in column 7, lines 29–34 persuasive. Reply 6–7 (citing Ex. 1008, 7:29–34); see also Tr. 166:5–171:21. Column 7, lines 29–34 of Durward states "data designating flexure and position of the user's legs, arms, fingers, etc. may be assigned to the virtual being's legs, arms, fingers etc. so that the virtual being may emulate the gestures of the user for running, kicking, catching virtual balls, painting, writing, etc." Although Durward teaches assigning "data designating flexure and position of the user's legs, arms, fingers, etc." "to the virtual being's legs, arms, fingers etc.," Petitioner does not demonstrate sufficiently that such movement teaches or suggests three-dimensional virtual beings or avatars. Rather, such movement could be performed by two-dimensional entities. Indeed, Figures 1 and 4 of Durward illustrate movement of two-dimensional stick figures. Ex. 1008, Figs. 1 and 4. On this point, we find persuasive Mr. Pesce's opinion that Durward's disclosures do not disclose three-dimensional virtual entities and are "entirely consistent with two-dimensional" entities. Ex. 2017 ¶ 59. We likewise find persuasive Patent Owner's argument and Mr. Pesce's testimony that there can be virtual beings in less than three-dimensions within a three-dimensional environment. See, e.g., Tr. 134:8–135:6 (arguing that despite Durward's disclosure of a "three-dimensional virtual space," its virtual entities would have been understood to be two-dimensional); see also, e.g., Ex. 2017 ¶¶ 40, 59 (opining the same); Ex. 1046, 204:12–205:20; PO Resp. 22–23.

Accordingly, based on the arguments and evidence in the record before us, Petitioner has not shown that the cited portions of Durward

disclose a "three dimensional avatar" as required by claims 1, 12, and 14 and dependent claims 2–6, and 15, which depend from claims 1 and 14.

b. Conclusion

Petitioner has not shown that Durward discloses the subject matter of claims 1–6, 12, 14, and 15 of the '501 patent and, thus, has not shown that Durward anticipates these claims.

I. Obviousness of Claims 7 and 16 in View of Durward and Wexelblat

The parties' argue whether the combination of Durward and Wexelblat teaches the limitations recited in claims 7 and 16. PO Resp. 31– 36; Reply 17. Claims 7 and 16 directly depend from claims 1 and 14, respectively. Claims 1 and 14 recite "three dimensional avatar." Ex. 1001, 19:22, 20:17. Similar to the anticipation ground relying on Durward discussed *supra* in Part II.H.2.a, Petitioner relies on Dr. Zyda's opinion and Durward to teach or suggest a "three dimensional avatar." We are unpersuaded by Petitioner's argument and evidence that Durward teaches or suggests a "three dimensional avatar" for the same reasons we find unpersuasive Petitioner's showing that Durward discloses this limitation. Accordingly, for at least the reasons stated *supra* in Part II.H.2.a, Petitioner has not shown that the combination of Durward and Wexelblat teaches or suggests each limitation recited in claims 7 and 16.

J. Obviousness of Claims 8 and 10 in View of Durward and Schneider

The parties' argue whether the combination of Durward and Wexelblat teaches the limitations recited in claims 7 and 16. PO Resp. 21– 31; Reply 17–19. Claims 8 and 10 directly depend from claim 1. Claim 1

recites "three dimensional avatar." Ex. 1001, 19:22. Similar to the anticipation ground based on Durward discussed *supra* in Part II.H.2.a, Petitioner relies on Dr. Zyda's opinion and Durward to teach or suggest a "three dimensional avatar." We are unpersuaded by Petitioner's argument and evidence that Durward teaches or suggests a "three dimensional avatar" for the same reasons we find unpersuasive Petitioner's showing that Durward discloses this limitation. Accordingly, for at least the reasons stated *supra* in Part II.H.2.a, Petitioner has not shown that the combination of Durward and Schneider teaches or suggests each limitation recited in claims 8 and 10.

K. Real Parties-in-Interest

Patent Owner argues Activision Publishing, Inc. ("Activision") is an unnamed real party in interest, who was served with a complaint in the District Court Case more than one year before the Petition was filed. PO Resp. 39–45. Thus, according to Patent Owner, the Petition fails to comply with 35 U.S.C. § 312(a)(2) and 37 C.F.R. § 42.8, and institution of review was barred under 35 U.S.C. § 315(b). PO Resp. 36–42. Patent Owner argues the Board erred in denying its Motion for Routine or Additional Discovery related to this issue (Paper 9) and in instituting review despite Patent Owner's assertions of Activision's status as a real party in interest. PO Resp. 36–42.

The Response repeats largely the same arguments Patent Owner raised in its discovery motion and Preliminary Response, for example, relying on the same provisions of the Software Publishing and Development Agreement between Activision and Petitioner to support its assertion that

Activision had the opportunity to control and is funding this *inter partes* review. *See, e.g., id.*; Prelim. Resp. 39–48; Reply 20. We addressed Patent Owner's arguments and evidence in detail in our pre-institution order denying Patent Owner's Motion for Routine or Additional Discovery and the Institution Decision. *See* Inst. Dec. 31–37 (§ II.I); Paper 14. We note that Patent Owner did not seek rehearing of the Institution Decision or permission for a renewed request for discovery after institution. Nonetheless, having reconsidered the issue in light of Patent Owner's arguments in the Response, we remain unpersuaded that there is sufficient evidence that Activision is an unnamed real party in interest for the reasons given in the Institution Decision. Inst. Dec. 31–37 (§ II.I).

L. Alleged Unconstitutionality

Patent Owner argues that an unpatentability ruling in this *inter partes* review proceeding constitutes an impermissible taking of a private right without Article III oversight. PO Resp. 42–44. Petitioner responds that the U.S. Court of Appeals for the Federal Circuit has addressed such arguments and held that the *inter partes* review process is not unconstitutional. Reply 20. Petitioner is correct that the Federal Circuit has addressed the issue and rejected a challenge to the constitutionality of *inter partes* reviews as violative of Article III. *See MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1289–92 (Fed. Cir. 2015), *cert. denied*, 2016 WL 1724103 (U.S. Oct. 11, 2016). Accordingly, we disagree with Patent Owner's arguments on this issue.

M. Patent Owner's Motion to Exclude

In its Motion to Exclude, Patent Owner seeks to exclude five exhibits, specifically Exhibits 1033, 1034, 1037, 1041, and 1042. *See generally* Mot. We have not relied on four of these exhibits—Exhibits 1033, 1034, 1037, and 1042—in reaching our decision and, therefore, Patent Owner's arguments as to these exhibits are moot. For Exhibit 1042, in particular, we note that Petitioner does not cite this exhibit in its Petition or its Reply and, thus, has not proffered any argument relying on this exhibit. *See id.* at 9; Opp. 11; *see generally* Pet.; Reply. Accordingly, Patent Owner's Motion to Exclude is *dismissed* as moot as to Exhibits 1033, 1034, 1037, and 1042.

The remaining exhibit, Exhibit 1041, is an excerpt from an interview of Mr. Pesce at the 1999 AllChemical Arts conference in which Mr. Pesce discusses his use of psychedelic drugs beginning in college and how this usage has affected and facilitated his work and career. Ex. 1041. Patent Owner objects to its admissibility under Rules 402, 403, 404, 405, and 608. Mot. 7. Specifically, Patent Owner argues Petitioner uses the exhibit "to attack Mr. Pesce through irrelevant and improper evidence directed to general character and specific instances of conduct, rather than to his qualifications to testify on the knowledge and understanding of a person of ordinary skill in the art. See Fed. R. Evid. 402, 404, 405, 608." Mot. 8; see Mot. Reply 6. In addition, Patent Owner asserts that even if the Board were to conclude that Exhibit 1041 is "relevant to any issue in this proceeding," the exhibit should be excluded under Rule 403 because "any probative value" is substantially outweighed by the "risk of unfair prejudice," "namely, that Mr. Pesce's entire testimony would be entitled to no weight due to any use of psychedelics." Mot. 8.

Petitioner contends Exhibit 1041 is relevant and admissible because it "bears on the credibility of Patent Owner's expert and the reliability of his testimony in this proceeding, including his ability to accurately recall details from the relevant time period." Opp. 6–7; *see id.* at 10. In other words, according to Petitioner, Exhibit 1041 is relevant to Mr. Pesce's "capacity to remember details" and "recall events" from the 1990s, including "virtual reality technology," as well as "the quality of any such recollections." *Id.* at 7–9. Petitioner contends Exhibit 1041 "is not submitted to attack Mr. Pesce's character" and "thus, Patent Owner's citations to [Rules] 404, 405, and 608 are misplaced." *Id.* at 7 & n.1. Petitioner also asserts Patent Owner's argument regarding Rule 403 "should . . . be denied," because the only unfair prejudice Patent Owner alleges is that the Board will give Mr. Pesce's testimony little or no weight but this would be "the correct outcome" for the reasons identified in its Reply. *Id.* at 10.

Patent Owner responds that Petitioner has "no basis to argue that the contents of Exhibit 1041 weigh on Mr. Pesce's memory of events in the mid-1990s." Mot. Reply 5. As support, Patent Owner argues that even Petitioner's counsel acknowledged in referring to events in April 1993 that it is "hard to remember" events from such a "long time ago." *Id.* at 5–6 (quoting Ex. 1046, 28:8–13).

We first address Exhibit 1041's admissibility as to Mr. Pesce's capacity to recall events from the 1990s as well as the reliability of such recollections. As part of his testimony regarding claim construction and unpatentability in this proceeding, Mr. Pesce offers testimony, both in his declaration and at his deposition, regarding developments in virtual reality from approximately 1991 through 1996 and the status of the art at various

points of that time period. See, e.g., Ex. 2017 ¶¶ 36–44, 49.a.iv, 59; Ex. 1046, 85:4–21, 89:10–90:7, 204:12–205:20, 222:1–223:6. Therefore, Exhibit 1041, featuring excerpts of an interview of Mr. Pesce from 1999 documenting his drug use beginning in college¹⁴ and how this usage facilitated and impacted his work, is relevant to his capacity to perceive and recall these details and events on which he testifies, and the reliability of such perceptions and recollections. See, e.g., Jarrett v. United States, 822 F.2d 1438, 1445–46 (7th Cir. 1987) (holding that a "witness's use of drugs" is "relevant" to, and may be used to attack, the witness's "ability to perceive the underlying events"); United States v. Apperson, 441 F.3d 1162, 1195–96 (10th Cir. 2006) (quoting Jarrett, 822 F.2d at 1446); United States v. Robinson, 583 F.3d 1265, 1272 (10th Cir. 2009) (recognizing that drug use bears on a witness's "capacity," which is significant "at the time of the event," and that "[a] witness's credibility may always be attacked by showing that his or her capacity to observe, remember, or narrate is impaired") (internal citations and quotations omitted); United States v. Dixon, 38 Fed. App'x 543, 548 (10th Cir. 2002) (unpublished) ("Evidence of a witness's drug use may be admitted to show the effect of the drug use on the witness's memory or recollection of events."); United States v. Smith, 156 F.3d 1046, 1055 (10th Cir. 1998) (upholding allowance of witness questioning regarding drug use twenty years earlier as relevant to her "ability to remember the [relevant] events" or her "recall and recollection").

When offered for this purpose, Rules 404, 405, and 608 do not prohibit Exhibit 1041's admissibility. Rule 404, and related Rule 405, do

 $^{^{14}}$ According to his declaration, Mr. Pesce left MIT in 1982. Ex. 2017 \P 3.

not bar admission of Exhibit 1041 for this purpose because it is not being offered as character evidence to "show that on a particular occasion [Mr. Pesce] acted in accordance with" a particular "character" or "trait." Fed. R. Evid. 404(a)(1), (b)(1); see Fed. R. Evid. 405 (providing for allowable methods of proving a person's character when such evidence is admissible); see also United States v. Skelton, 514 F.3d 433, 441 (5th Cir. 2008) (concluding that "Rule 404(b) does not bar the evidence at issue because it is not being offered as character evidence to show action in conformity therewith"). Nor does Rule 608(b) apply. Rule 608(b) provides, in pertinent part, that "[e]xcept for a criminal conviction under Rule 609, extrinsic evidence is not admissible to prove specific instances of a witness's conduct in order to attack or support the witness's *character for* truthfulness." Fed. R. Evid. 608(b) (emphasis added). Therefore, by its express terms, "[t]he application of Rule 608(b) to exclude extrinsic evidence of a witness's conduct is limited to instances where the evidence is introduced to show a witness's general character for truthfulness." Skelton, 514 F.3d at 441–42; see United States v. Taylor, 426 Fed. App'x 702, 705– 06 (11th Cir. 2011) (unpublished). In other words, the Rule acts as an "absolute prohibition on extrinsic evidence . . . only when the *sole* reason for proffering that evidence is to attack or support the witness' character for truthfulness" or "veracity." United States v. Epstein, 426 F.3d 431, 439 n.4 (1st Cir. 2005); Fed. R. Evid. 608(b) advisory committee's note to 2003 amendments (emphasis added). Accordingly, Rule 608(b) does not bar the admissibility of Exhibit 1041 because it is being offered as evidence of Mr. Pesce's capacity and reliability in perceiving and recalling events from the 1990s.

Given that Exhibit 1041 is relevant for this purpose and its admission is not barred by Rules 404, 405, and 608, we turn to Rule 403 to consider whether it should nonetheless be excluded because its "probative value is substantially outweighed by a danger of ... unfair prejudice." Fed. R. Evid. 403.¹⁵ Here, the probative value of Exhibit 1041 as to Mr. Pesce's ability to perceive and recall events and details from the art in the early to mid-1990s is limited as, for example, it lacks specific details regarding the extent and regularity of his drug use. Yet, on the other hand, the risk of unfair prejudice is minimal. To begin with, an unfair prejudice analysis is not well suited to a bench trial, such as this. See, e.g., Schultz v. Butcher, 24 F.3d 626, 632 (4th Cir. 1994) ("[I]n the context of a bench trial, evidence should not be excluded under 403 on the ground that it is unfairly prejudicial."); Gulf States Utilities Co. v. Ecodyne Corp., 635 F.2d 517, 519 (5th Cir. 1981) (holding that "exclusion of evidence under Rule 403's weighing of probative value against prejudice was improper" and was a "useless procedure" because "[t]his portion of Rule 403 has no logical application to bench trials"). Moreover, the only "unfair prejudice" that Patent Owner alleges is that all of Mr. Pesce's testimony will be given little to no weight—which is not accurate, as we are considering the admissibility of Exhibit 1041 only for its relevance to his capacity and reliability in perceiving and recalling events and other details from the early to mid-1990s, on which he offers testimony. See Mot. 8. Although we are cognizant of the sensitive nature of evidence of drug use, there is minimal

¹⁵ Rule 403 lists other considerations but Patent Owner does not argue that any of these apply, and we conclude that they do not. *See id.*; Mot. 7–8.

risk of any unfair prejudice from considering Exhibit 1041 for this limited purpose. In sum, the probative value of Exhibit 1041 for this limited purpose is not "substantially outweighed" by any danger of unfair prejudice and, thus, exclusion under Rule 403 is not warranted.

We turn to the alleged relevance and admissibility of Exhibit 1041 regarding "Mr. Pesce's credibility" generally. Opp. 7; *see id.* at 6, 10. Petitioner, in addition to specifying that Exhibit 1041 is relevant to Mr. Pesce's "capacity" and "ability to accurately recall details from the relevant time period" and "the quality of any such recollections," makes more general references to the exhibit's alleged relevance to his "credibility." *Id.* at 6–10. To the extent Petitioner is suggesting that we consider Exhibit 1041 to assess Mr. Pesce's truthfulness, Rule 608(b) bars the admissibility of extrinsic evidence to attack a "witness's character for truthfulness," as explained above. Fed. R. Evid. 608(b). Also, evidence of drug use generally is not considered relevant to or probative of truthfulness. *See United States v. Tanksley*, No. 93-6346, 2016 WL 502659, at *3 (6th Cir. 1997) (unpublished) ("Evidence of prior drug use generally is not relevant to the issue of truthfulness....").

We recognize a witness's credibility may involve aspects beyond truthfulness. For example, "Rule 608(b) was amended by substituting 'character for truthfulness' in place of 'credibility," *Epstein*, 426 F.3d at 439 n.4, because, as the advisory committee explains, "*use of the overbroad term 'credibility*' had been read 'to bar extrinsic evidence for bias, competency and contradiction impeachment since they too deal with credibility," Fed. R. Evid. 608(b) advisory committee's note to 2003 amendments (emphasis added); *see also Skelton*, 514 F.3d at 441–42;

Taylor, 426 Fed. App'x at 705. Petitioner, however, in discussing Exhibit 1041 in its Reply and in opposing Patent Owner's Motion to Exclude, does not articulate any relevance of Exhibit 1041 as to Mr. Pesce's credibility that is distinct from his truthfulness, for which its admission is barred under Rule 608(b), and his capacity and reliability in recalling events in the art in the 1990s, for which we have determined above the evidence is relevant and admissible. See Reply 3; Opp. 6–10. Nor do we see any such relevance. In addition, courts have often held that evidence of a witness's drug use, though relevant to the witness's capacity to perceive and recall relevant events, cannot be used to attack the witness's "general credibility." E,g., Jarrett, 822 F.2d at 1446 ("A witness's use of drugs may not be used to attack his or her general credibility but only his or her ability to perceive the underlying events and testify lucidly at trial."); Apperson, 441 F.3d at 1195– 96 (quoting Jarrett, 822 F.2d at 1446) (holding that "the district court correctly concluded that evidence of [the witness's] alleged prior drug use could not be used to attack [his] general credibility"); see also, e.g., United States v. Cousins, 842 F.2d 1245, 1249 (11th Cir. 1988) ("[A]lthough extrinsic evidence of prior drug use could not properly be used just to attack [defendant]'s credibility, such evidence could be used to refute the specifics to which [defendant] had previously testified.").

Accordingly, we admit Exhibit 1041 and consider it for the limited purpose of assessing Mr. Pesce's capacity to perceive and recall events and details from the relevant art from the 1990s about which he testifies, as well as the reliability of such perceptions and recollections. We do not, however, consider Exhibit 1041 for Mr. Pesce's credibility more generally and particularly, his truthfulness. Thus, Patent Owner's Motion to Exclude is

denied as to Exhibit 1041.

III. CONCLUSION

In conclusion, Petitioner has shown by a preponderance of the evidence that: claims 1–6, 12, 14, and 15 of the '501 patent are unpatentable under 35 U.S.C. § 103(a) in view of Funkhouser and Sitrick; claims 7 and 16 are unpatentable under 35 U.S.C. § 103(a) in view of Funkhouser, Sitrick, and Wexelblat; and claims 8 and 10 are unpatentable under 35 U.S.C. § 103(a) in view of Funkhouser, Sitrick, and Funkhouser '93.

Petitioner, however, has not shown by a preponderance of the evidence that: claims 1–6, 12, 14, and 15 are anticipated by Durward under 35 U.S.C. § 102(e); claims 7 and 16 are unpatentable under 35 U.S.C. § 103(a) in view of Durward and Wexelblat; and claims 8 and 10 are unpatentable under 35 U.S.C. § 103(a) in view of Durward and Schneider.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–8, 10, 12, and 14–16 of the '501 patent are unpatentable;

FURTHER ORDERED that Patent Owner's motion to exclude (Paper 33) is *dismissed* as to Exhibits 1033, 1034, 1037, and 1042 and *denied* as to Exhibit 1041; and

FURTHER ORDERED that, because this is a Final Written Decision, the 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.

PETITIONER:

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