NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

INFERNAL TECHNOLOGY, LLC, TERMINAL REALITY, INC.,
Plaintiffs-Appellants

v.

SONY INTERACTIVE ENTERTAINMENT LLC,
Defendant-Cross-Appellant

2022-1647, 2022-1739

Appeals from the United States District Court for the Eastern District of Texas in No. 2:19-cv-00248-JRG, Chief Judge J. Rodney Gilstrap.

Decided: February 2, 2024

ERIC WILLIAM BUETHER, Buether Joe & Counselors, LLC, Dallas, TX, argued for plaintiffs-appellants. Also represented by CHRISTOPHER MICHAEL JOE, KENNETH PAUL KULA.

ABRAN J. KEAN, Erise IP, P.A., Greenwood Village, CO, argued for defendant-cross-appellant. Also represented by ERIC ALLAN BURESH, Overland Park, KS.

Before MOORE, *Chief Judge*, CLEVENGER and STARK, *Circuit Judges*.

CLEVENGER, *Circuit Judge*.

Infernal Technology, LLC, and Terminal Reality, Inc., (collectively, "Infernal" for the remainder of this opinion) appeal the decision from the United States District Court for the Eastern District of Texas denying Infernal's motion for a new trial following a jury verdict that certain products belonging to Sony Interactive Entertainment LLC ("Sony") did not infringe U.S. Patent No. 6,362,822 ("'822 patent") and U.S. Patent No. 7,061,488 ("'488 patent") (collectively, the "Asserted Patents"). Sony, on a conditional cross-appeal, challenges the district court's finding that the claims of the Asserted Patents are not ineligible for patent protection under 35 U.S.C. § 101.

BACKGROUND

A. The Asserted Patents

The Asserted Patents are directed to "improved methods and arrangements for use in rendering lighting and shadows in computer graphic simulations, such as, for example, interactive computer graphics simulations of multi-dimensional objects." '822 patent, col. 1, ll. 7–10. These patents share a common specification, and the '488 Patent is a continuation of the '822 patent.[1]

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[1] Infernal alleges that Sony infringed claim 1 of the '822 patent and claims 1, 27, and 50 of the '488 patent (collectively, the "Asserted Claims"). All citations to the Asserted Claims in this opinion are to claim 1 of the '822 patent, which is representative of all claims, including those in the '488 patent.

The Asserted Patents describe difficulties prior art methods faced in portraying 3D worlds and objects in computer gaming, which "typically require[d] that millions of calculations be conducted between frames (i.e., in 'real time')." '822 patent, col. 1, ll. 25–47. These computing challenges meant that compromises often occurred in accurately portraying virtual 3D worlds. '822 patent, col. 1, ll. 47–50. Such a compromise was in the rendering of shadows cast by lighted 3D objects. '822 patent, col. 1, ll. 57–59. One such prior art method, discussed in the Asserted Patents, involved two steps: in the first step, converting data for a 3D object from model world coordinates to a light source's coordinates to determine which portions of the object are visible to the light source and thus illuminated by it. '822 patent, col. 2, ll. 4–15. The resulting data is then transformed back to the modeling world coordinates to create viewpoint-independent data. '822 patent, col. 2, ll. 18–24. In the second step, the data is "converted from the modeled world space to a corresponding screen (or camera) viewpoint" and an algorithm determines which portions of the objects of the scene are visible with respect to the camera. '822 patent, col. 2, ll. 25–34. This two-step method resulted in unrealistic shadows in scenes with multiple light sources since the portions of the objects in the scene would be repeatedly darkened for each light source that did not hit that portion. '822 patent, col. 2, ll. 35–56. The process was also overly burdensome from a computational standpoint. '822 patent, col. 2, ll. 57–63.

To address the issues with the prior art methods, the Asserted Patents claim an improved method and arrangement for rendering shadows that (1) provides observer and light data for the simulated scene (the "providing" step); (2) compares light data and observer data to determine which points in the scene are illuminated by each light source and storing the light image data for those illuminated points in a "light accumulation buffer" (the "comparing" and "storing" step); and (3) combines the data stored in the light

accumulation buffer with the observer data for the scene (the "combining" step) and then (4) "display[s] the resulting image data to a computer screen." '822 patent, col. 3, ll. 18–62; *id.* col. 12, ll. 4–20. Essentially, the Asserted Patents represent improvements over the prior art because they teach storing data for the portions of the objects in the scene that are illuminated, rather than the portions that are shaded, to avoid repeated shadowing in scenes with multiple light sources; and they teach converting 3D to 2D data for the method steps to reduce the intensity of the computing in the process. Claim 1 of the Asserted Patents is representative:

> 1. A shadow rendering method for use in a computer system, the method comprising the steps of:
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> providing observer data of a simulated multi-dimensional scene;
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> providing lighting data associated with a plurality of simulated light sources arranged to illuminate said scene, said lighting data including light image data;
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> for each of said plurality of light sources, comparing at least a portion of said observer data with at least a portion of said lighting data to determine if a modeled point within said scene is illuminated by said light source and storing at least a portion of said light image data associated with said point and said light source in a light accumulation buffer; and then
>
> combining at least a portion of said light accumulation buffer with said observer data and
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> displaying resulting image data to a computer screen.

'822 patent, col. 12, ll. 4–20.

B. The District Court Proceedings

a. Pre-Trial

Infernal sued Sony in the Eastern District of Texas for infringing the Asserted Claims with certain video games and video game consoles ("Accused Products"). Sony denied infringement and raised the invalidity of the Asserted Claims under § 101 as an affirmative defense. Am. Answer at 8, *Infernal v. Sony*, No. 2:19-cv-00248-JRG (E.D. Tex. 2020) (No. 200). The district court adopted the parties' joint proposed claim constructions for several claim terms, including, as is most relevant to this appeal, the terms and constructions reproduced in following chart.

Proposed Claim Term	Patent Claims	Proposed Construction
light image data	'822 Patent, Claim 1 '488 Patent, Claims 1, 11, 27, 50	"for each of the plurality of light sources, 2D data representing the light emitted by the light source to illuminate the scene as viewed from the light source's perspective"
light accumulation buffer	'822 Patent, Claim 1 '488 Patent, Claims 1, 11, 27	"memory for storing the light image data for cumulative light falling on a region in the observer image corresponding to the modeled point"
[order of the comparing, storing, and combining steps]	'822 Patent, Claim 1 '488 Patent, Claims 1, 11, 27, 50	The comparing and storing steps are completed before beginning the combining step

J.A. 1673 (Joint Claim Construction Chart).

b. Trial

A jury trial began on October 4, 2021. The jury was provided with the claim construction chart in their juror notebooks at the start of trial. J.A. 585, ll. 13–22.

In its opening statement, Infernal explained how the Asserted Patents improved the prior art before making

bare allegations that the Accused Products met the limitations of the Asserted Claims without any specific reference to how the Accused Products infringed. J.A. 592–611. Sony responded by drawing a distinction between the Asserted Patents and the Accused Products based on the "key question" of what the light accumulation buffer stores: arguing that based on the settled claim construction, the Asserted Patents teach the accumulation of data "from the light source's perspective," taking into account the observer's perspective only at the end in the "combining" step, whereas the Accused Products take the observer's perspective "into account one light source at a time for the whole process." J.A. 627, ll. 4–17. Sony's counsel explicitly distinguished light falling on an object—what the Asserted Patents store—from the light reflected off that object that hits the camera—the light that the Accused Products store. J.A. 627, l. 22–J.A. 628, ll. 1–25.

In Infernal's case-in-chief, it focused primarily on the improvements that the Asserted Patents made over the prior art. The first discussion of infringement came with its second witness, the inventor Mark Randel, who stated that he initially suspected infringement when he "read a paper on how lighting was done in one of [Sony's games] . . . and [] thought . . . this sounds a little bit familiar to me." J.A. 678, ll. 18–21. Infernal then developed its infringement theory through the testimony of its expert Dr. Hart, who compared selected scenes and the source code from the Accused Products to the Asserted Patents, alleging that the source code demonstrated that each element of the Asserted Claims was practiced by the Accused Products. J.A. 922–1008. In describing the "light falling [from a light source] on a region [in the scene]" that is accumulated by the "light accumulation buffer" as included in the agreed construction, Dr. Hart explained his opinion that reflected light satisfies the "light falling on a region" portion of the claim construction of "light accumulation buffer." J.A. 951–953.

In Sony's case-in-chief, it supported its non-infringement theory with three witnesses: Al Hastings, John Hobson, and Dr. Lastra.

The first witness, Al Hastings, who worked on designing one of the Accused Products, testified that the Accused Products only store light hitting the camera—never from the light sources' perspectives—and that the observer data needs to be recorded at the first step of the Accused Products' process to determine how the light will hit the camera. J.A. 1113–1116; J.A. 1120; J.A. 1122–1124. He also testified that the Accused Products use the observer perspective data for "[e]very light over and over again," going one light at a time to compute the interaction of the light with the material it falls on to determine what reflects to hit the camera before accumulating that light. J.A. 1120.

This testimony was largely echoed by Sony's second witness, John Hobson, who wrote the code for the lighting process in a different one of the Accused Products. J.A. 1173, ll. 9–23. He asserted that the Accused Products perform calculations on the interaction between the light and the surface it hits to determine how that light then hits the camera, and then store only the light hitting the camera. J.A. 1177–78; J.A. 1191–92; J.A. 1218. He distinguished this process from the Asserted Patents' claimed process, which he testified "accumulates the light in a perspective that's other than the camera, [and is] . . . only using that information to render that image from the camera's perspective but not actually the light hitting the camera." J.A. 1217, ll. 10–13.

Finally, Sony called its expert witness, Dr. Lastra, who described the method in the Asserted Patents as accumulating the light falling on a region in the scene from the perspective of the light source in a "light accumulation buffer," and then, "only after all the light falling on the region is stored," combining the data in the accumulation

buffer with the observer data. J.A. 1242, ll. 12–25–J.A. 1243, l. 1. He also explained that the court's construction of "light accumulation buffer" states that "light image data is being stored," and that the court construed "light image data" as "light emitted as viewed from the perspective of the light source"; and thus, light falling on the region from the perspective of the light source is what is being stored in the "light accumulation buffer" in the Asserted Patents. J.A. 1245, ll. 1–13, 18–23. Dr. Lastra specifically drew the jury's attention to these constructions in their juror notebooks and reminded the jury that the "constructions place [a] boundary on what the claims mean." J.A. 1246 ll. 9–24.

Dr. Lastra also testified that the order of steps in the Asserted Claims, as required by the patent and the court's claim construction, had to be that the "comparing" and "storing" steps are completed for each individual light before beginning the "combining" step. J.A. 1247, ll. 20–25; J.A. 1249, ll. 10–11; J.A. 1262, ll. 19–24. Thus, Dr. Lastra summarized, to infringe the Asserted Patents, a product would have to accumulate light falling on a region from the perspective of the light source and can only combine that data with the observer perspective data at the end of the process. J.A. 1263, ll. 8–18. He concluded that the Accused Products did not perform this infringing process; rather, they accumulated the light hitting the camera "light-source-by-light source . . . using observer data right away." J.A. 1264, ll. 23–25; J.A. 1265, ll. 1–3; J.A. 1266, ll. 12–16; J.A. 1270, ll.23–25; J.A. 1271, ll. 1–3. He testified that this process is repeated for any additional light sources in the scene. *See* J.A. 1278, ll. 10–12 ("[T]he accumulators are combined with observer data from the very first light and then every subsequent light you process is combining new observer data into accumulators.")

On cross-examination, Infernal's counsel questioned Dr. Lastra about his use of the word "all" in his statement that the claim construction for the order of steps required

that the "combining" step could not occur until "*all* comparing and storing steps are completed." J.A. 1297–1302 (emphasis added). Infernal's counsel asked Dr. Lastra whether it would be infringement if at any point in the game the Accused Products performed the steps in the claimed order, and then at a different point in the game performed the steps again in a different, non-infringing order. J.A. 1306, ll. 5–24; J.A. 1307, ll. 8–18. In response, Dr. Lastra agreed that in this hypothetical situation— "if [the Accused Products] had done the steps in the right order"—there would be infringement. J.A. 1307, ll. 24–25.

After Sony rested its case, Infernal presented its rebuttal case through its expert witness, Dr. Hart. J.A. 1318; J.A. 1320–31. Throughout Dr. Hart's testimony, he disagreed with Sony's position—which relied on the district court's construction of "light image data"—that the Asserted Claims require that the light accumulation buffer store light image data "from the light source's perspective." J.A. 1320, ll. 19–24; J.A. 1321, ll. 22–25–J.A. 1322, l. 1; J.A. 1323, ll. 24–25–1324, ll. 1–2; J.A. 1326, ll. 7–12; J.A.1327, ll. 2–6. Each time that Infernal attempted to elicit testimony from Dr. Hart to contradict the position that the Asserted Claims require the storage of light image data in the light accumulation buffer from the light source's perspective, the district court—in the presence of the jury— sustained Sony's objections to the testimony on the ground that it was contrary to the settled claim construction of "light image data," which expressly requires the data be "viewed from the light source's perspective." *See* J.A.1321 ll.19–25, J.A. 1322–1324; J.A. 1326, ll. 17–21; J.A. 1327, ll. 2–21 ("The jury has the [c]ourt's claim construction for observer data, light image data, light accumulation buffer, and all other terms that the court has construed previously. The jury is obligated to apply those definitions to the claim language when comparing the claim language to the [A]ccused [P]roducts to determine in an ultimate sense whether or not those products or methods infringe the

[A]sserted [C]laims. And we are not going to reopen and we are not going to reargue and we are not going to contradict the court's plain claim construction."). After Dr. Hart's testimony, Infernal rested its case. J.A. 1333.

The jury was charged with determining whether Infernal had "proven, by a preponderance of the evidence, that [Sony] has infringed any of the following [Asserted Claims]" and answered in the negative for each of the Asserted Claims. J.A. 1696–97.

c. Post-Trial

Following the jury verdict on non-infringement, Infernal filed a motion for a new trial, contending that Sony failed to offer legally sufficient evidence to support the verdict. *Infernal Tech., LLC v. Sony Interactive Ent. LLC*, 2022 WL 822110, at *1–2 (E.D. Tex. Mar. 17, 2022) ("Decision"). Specifically, Infernal argued in its motion that (1) requiring that the "light image data" stored in the "light accumulation buffer" in the "storing" step be "viewed from the light source's perspective" is a legal error; and (2) it was legal error for Sony to argue that, in order for the Accused Products to infringe, the "sequence of steps" in the Asserted Claims required that the Accused Products complete the "comparing" and "storing" steps for *all* light sources in a the scene before beginning any "combining" step. *Id.* at *2.

d. District Court's Ruling on Motion for New Trial

The district court determined that Infernal's first argument—that it was legal error to require that the "light image data" stored in the "light accumulation buffer" be "viewed from the light source's perspective" ("the 'storing' step argument")—was incompatible with the agreed-upon

claim constructions for "light accumulation buffer" and "light image data." *Decision*, 2022 WL 822110, at *3. The district court emphasized that both parties agreed during claim construction that "light accumulation buffer" means "memory for storing the light image data for cumulative light falling on a region in the observer image corresponding to the modeled point" and "light image data" means "for each of the plurality of light sources, 2D data representing the light emitted by the light source to illuminate the scene as viewed from the light source's perspective." *Id.* The district court then reasoned that, "[i]f the construction of 'light image data' is superimposed within the construction for 'light accumulation buffer,' the resulting construction is: 'memory for storing 2D data representing the light emitted by the light source to illuminate the scene *as viewed from the light source's perspective* for cumulative light falling on a region in the observer image corresponding to the modeled point.'" *Id.* (emphasis in original).

Thus, the district court found the merits of Infernal's argument to be unpersuasive "under the plain language of the [c]ourt's constructions."[2] *Id.* The district court further explained that Infernal's reliance on the phrase "in the observer image" in the construction of "light accumulation buffer" was misguided because:

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[2] While the district court indicated that it viewed Infernal's argument as an attempt to impermissibly re-argue claim construction—which Infernal maintains on appeal is a mischaracterization of its argument—the court nevertheless rejected Infernal's "storing step" argument on the merits. *See Decision*, 2022 WL 822110, at *3 ("[Infernal] implicitly acknowledge[s] that if the [c]ourt rejects [Infernal's] new claim construction arguments (which it does so herein), the jury's verdict is supported by the evidence presented at trial.").

> The storing of "light falling on a region *in the observer image*" [] does not mean that such data must be from the *perspective of the observer* or camera, nor does it displace the requirement that the data stored must be "2D data representing light emitted by the light source to illuminate the scene as viewed from the light source's perspective."

Id. at n.4 (emphasis in original). Since Infernal's argument that the verdict was against the great weight of the evidence relied on its "storing" step argument and it did not dispute that the Accused Products accumulate the light hitting the camera, rather than from the light source's perspective, the district court concluded that its rejection of Infernal's interpretation of the Asserted Claims meant that the verdict was supported by the evidence. *Id.* at *3.

The district court also rejected Infernal's argument related to Sony's "sequence of steps" theory of non-infringement, stating that there was "no error in [Sony's theory] . . . [which] is supported by the plain language of the agreed constructions and the claim itself." *Id.* at *4. The district court noted that the parties disputed whether Infernal waived its "storing" step and "sequence of steps" arguments by failing to object to Sony's arguments at trial but did not decide whether these arguments were waived because it rejected them on the merits. *Id.* at n.6.

Infernal appealed the district court's denial of its motion for a new trial to this court, and Sony cross-appealed the district court's holding that the Asserted Claims are not ineligible for patent protection under § 101. This court has jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

On appeal, Infernal makes two main arguments that the district court erred in denying its motion for a new trial:

(1) the district court led the jury to find non-infringement when it misapplied its claim construction by erroneously "transplanting [] the entirety of its construction of language in the 'providing' step [] into the 'storing' limitation"; and (2) Sony's legally flawed alternate non-infringement theory misapplied the district court's claim construction by portraying the Asserted Patents as requiring the completion of "the 'providing' and 'comparing and storing' steps for *all* light falling on a region before beginning the combining step." Appellant's Br. 23–24, 44 (emphasis in original). Infernal contends that these errors led the jury to reach its verdict against the great weight of the evidence. Infernal also argues that, because the jury's verdict on non-infringement was a general verdict with no specific grounds, this Court must order a new trial if it finds that either one of the asserted theories of non-infringement fails. Appellant's Br. 42–43 (citing *Muth v. Ford Motor Co.*, 461 F.3d 557, 564 (5th Cir. 2006)).

This court reviews a district court's ruling on a motion for a new trial under the law of the regional circuit—here, the Fifth Circuit, which reverses a district court's ruling on a new trial "only upon an 'abuse of discretion or a misapprehension of the law' by the district court." *Z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007); *see also Industrias Magromer Cueros y Pieles S.A. v. Bayou Furs Inc.*, 293 F.3d 912, 918 (5th Cir. 2003) ("This standard of review is somewhat narrower when a new trial is denied and somewhat broader when a new trial is granted."). A district court abuses its discretion in ruling on a motion for a new trial only if "there is a complete absence of evidence to support the verdict." *Industrias*, 293 F.3d at 924 (quoting *Sam's Style Shop v. Cosmos Broad.* Corp., 694 F.2d 998, 1006 (5th Cir. 1982)). A plaintiff is only entitled to a new trial if it can demonstrate that the verdict was "against the great weight of the evidence, not merely against the preponderance of the evidence." *Dresser-Rand Co. v. Virtual Automation Inc.*, 361 F.3d 831, 838–39 (5th Cir. 2004).

I

A. The "Storing" Step Argument

The district court correctly rejected Infernal's "storing" step argument because it conflicts with the agreed-upon meaning of "light image data" and with the Asserted Patents' specification and claims.

Sony contends that Infernal is impermissibly attempting to reargue the settled claim construction of "light image data" and "light accumulation buffer." While the district court indicated that Infernal's motion for new trial "seeks to reargue claim construction," it ultimately rejected "[Infernal's] new claim construction arguments" and found that Infernal's theory that "light image data" does not carry a perspective requirement contradicted the settled claim constructions on the merits. *Decision*, 2022 WL 822110, at *3. To the extent that Infernal's arguments can be interpreted as proposing new claim constructions, we reject those new construction arguments as untimely; the time to contest the settled claim constructions was before the case was submitted to the jury, and, most preferably, during the *Markman* process. Thus, we agree with the district court that Infernal's arguments will fail where they contradict the agreed-upon constructions of the terms "light image data" and "light accumulation buffer." *See id.* ("The [c]ourt finds that [Infernal's] argument is contrary to the agreed constructions this [c]ourt entered during *Markman*.").

Infernal argues that the verdict was against the great weight of the evidence because the district court misapplied the settled claim constructions by improperly importing the portion of its claim construction of "light image data" that required the data to be "viewed from the light source's perspective" to instances of "light image data" used in the "storing step"—both in the express claim language of that step and in the district court's claim construction of

"light accumulation buffer." Thus, Infernal contends, the evidence that the Accused Products store only data from the observer's perspective in the "light accumulation buffer" is insufficient to support a verdict of non-infringement, since the Asserted Claims do not limit the data stored in the "light accumulation buffer" to data "as viewed from the light source's perspective."

Infernal contends that the district court's error was including the entire construction of "light image data" whenever it is used in the claim, and that for the "storing" step, "light image data" should not mean "2D data representing the light emitted by the light source to illuminate the scene *as viewed from the light source's perspective*" but instead merely "2D data representing the light emitted by the light source to illuminate the scene." J.A. 1673 (Joint Claim Construction Chart) (emphasis added). This argument directly contradicts the settled claim constructions and fails to overcome the presumption that "claim terms are normally used consistently throughout the patent." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005); *see also, Phonometrics v. Northern Telecom Inc.*, 133 F.3d 1459, 1465 (Fed. Cir. 1998); *In re Varma*, 816 F.3d 1352, 1363 (Fed. Cir. 2016).

According to Infernal, the district court should not have applied "the *entirety* of its construction of language" across every step in representative claim 1. Appellant's Br. 24 (emphasis added). However, Infernal agreed to the *entire* claim construction of "light image data," at no point arguing that the proper construction of that term should not include perspective language, or that it should differ based on the step in the claims in which it appeared. Additionally, there is no indication that the entire agreed-upon construction of "light image data" should apply only in the "providing" step in the claim. In fact, the construction of "light image data" in the parties' agreed-upon claim construction chart explicitly applies to the '822 patent, claim

1, and the '488 patent, claims 1, 11, and 27—not just to the "providing" step in claim 1. J.A. 1673. Thus, we find the argument that the district court erred by imputing the entire, agreed-upon construction of a term to each instance of that term's appearance in the claim unpersuasive.[3]

The cases that Infernal references for support for the proposition that claim terms can have inconsistent meanings across a patent are inapposite to the case at hand. As Infernal itself identified, this court has explicitly stated that "[a] word or phrase used consistently throughout a claim should be interpreted consistently." *Phonometrics*, 133 F.3d at 1465. While it is true that this court, in *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, indicated that the use of an antecedent such as "said" before a claim term is not sufficient on its own to create a rule that the same claim terms are required to carry the same meaning regardless of context, in that case, the court found that there would be an "apparent nonsensical reading under a uniform construction" of the term. 520 F.3d 1367, 1376 (Fed. Cir. 2008). Similarly, Infernal's reliance on *In re Jublia*, an unpublished case from the District of New Jersey, was misguided because the claim term at issue in that case, "bottom," took on different meanings throughout the claim only because it was used in the clearly different contexts of describing physically distinct components of the

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[3] Infernal's attempt to draw a distinction between the "type" of data and the "perspective" of that data is similarly unpersuasive. Infernal argues that while the "type" of "light image data" remains consistent throughout the Asserted Claims, the "perspective" varies based on the step in which the term "light image data" is used. This argument is unsupported by the agreed-upon claim construction of "light image data," which expressly included the requirement that the data be "viewed from the light source's perspective."

patented device. 2021 WL 100267, at *7 (D.N.J. Jan. 11, 2021).

In the present case, "light image data" is used in a consistent context: the claim describes providing the "lighting data including light image data," comparing a "portion of said lighting data" and then "storing at least a portion of said light image data" in the "light accumulation buffer." '822 Patent, col. 12, ll. 8–18. The use of "said" suggests consistent usage. Additionally, the claim references "portions" of the same data and there is no other "light image data" to which the claim could be referring, making it clear that the term is used consistently across the claim. It is not "nonsensical" to assume that the "light image data" referenced throughout the claim carries a consistent meaning, as nothing contradicts that interpretation. Similarly, "light image data" is not being used to qualify different components of the invention like "bottom" was in *Jublia*.

Further, Infernal's reliance on words surrounding "light image data" when it is used in the claim and in the claim construction of "light accumulation buffer" falls short of overcoming the presumption that claim terms typically carry their construed meaning throughout the patent because its arguments are contradicted by the patent itself.

Infernal's attempt to argue that the phrase "modeled point within said scene," which appears in the "storing" step, indicates that the "light image data" as used in that step is from the observer's perspective rather than the light source's perspective is flawed because nothing in the patent indicates that a "modeled point within said scene" must be viewed from the observer's perspective. The agreed-upon claim construction of "a modeled point within said scene" is "a point on a modeled object within said scene," which—unlike other constructions, including that of "light image data"—does not include perspective language. J.A. 1673. The word "scene" is described in the

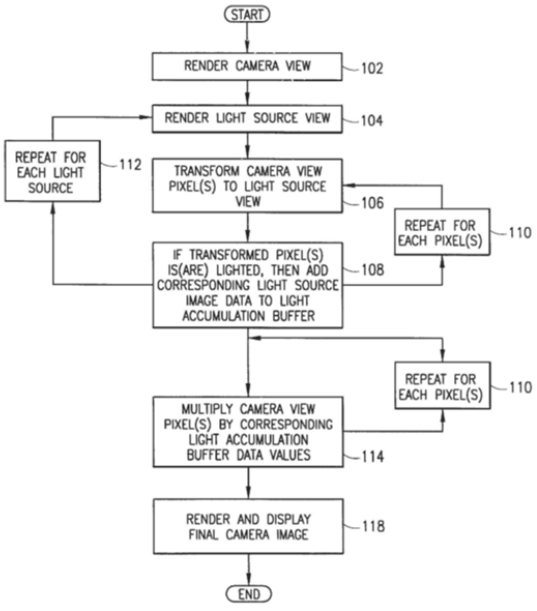
patent specification as being rendered from either the camera perspective or the light perspective, therefore, the inclusion of "a modeled point within said scene" alone says nothing about the perspective of the data associated with that point. '822 patent, col. 7, ll. 4–43.

For the same reason, Infernal's argument that applying the full construction of "light image data" in the "storage" step would contradict the use of "associated with said point" in that step fails, since this phrase can best be understood as identifying the location within the scene where the light is falling, rather than the perspective from which the light is being viewed. As mentioned above, "said point" refers to the "modeled point within said scene," which does not on its own indicate a perspective.

Infernal's objection to the district court's application of the entire construction of "light image data" to that term's use within the construction of "light accumulation buffer" also fails. The district court, adopting the proposed construction that Infernal and Sony agreed to, determined that "light accumulation buffer" means "memory for storing the light image data for cumulative light falling on a region in the observer image corresponding to the modeled point." J.A. 1673. Infernal's argument that "in the observer image" necessitates the observer perspective, and therefore prevents the "light image data for cumulative light falling on a region" to be from the light source's perspective, is misguided and ignores the perspective language explicitly included in the construction of "light image data." Infernal points to no evidence that "observer image" is the same as "observer data" from "the observer's perspective"—even though in other instances of claim construction where the district court intended the terms to be from the observer's perspective, it explicitly said so. *See* J.A. 1672 ("observer data of a simulated multi-dimensional scene" means "data representing at least the color of objects in a simulated multi-dimensional scene *as viewed from an*

observer's perspective" (emphasis added)); J.A. 1673 ("observer data associated with a simulated multi-dimensional scene" means "data representing at least the color of objects in a simulated multi-dimensional scene *as viewed from the observer's perspective*" (emphasis added)).

Additionally, the order of the steps outlined in the Asserted Claims further supports that "in the observer image" is a reference point and not a description of the perspective of the data stored in the "light accumulation buffer." Figure 4 of the Asserted Patents, pictured below, demonstrates that the camera view pixels are transformed to the light source view before they are stored in the light accumulation buffer, and that the camera view pictures are compared to the "light image data" from the "light accumulation buffer" *after* the data is stored in the buffer.



'822 patent, Fig. 4.

The specification explains this in further detail, stating that "in step 106, a pixel [] in camera image [] is transformed or otherwise used to determine a corresponding pixel [] in light [] image" and "[i]n step 108 [(the storage of the data in the light accumulation buffer)], if the *transformed* pixel identified in step 106 is illuminated by the light source, then the corresponding pixel data value in the light image is added to the light accumulation buffer." '822 patent, col. 8, ll. 45–48, 57–60 (emphasis added). Therefore, the "observer image" referenced in the district court's construction is a reference point to the corresponding location of the data in the scene of objects to be digitally represented and is not a reference to the perspective of the data that is being stored. Thus, interpreting "light image data" to be from "the light source's perspective" does not read "in the observer image" out of the district court's construction of "light accumulation buffer."

Therefore, the district court did not abuse its discretion in rejecting Infernal's argument that it was a misapplication of the claim construction of "light image data" to conclude that that data is "viewed from the light source's perspective" wherever the term "light image data" is used in the Asserted Claims. Thus, the jury's non-infringement verdict was supported by the evidence that the Accused Products only stored "light image data" from the observer's perspective in the "light accumulation buffer."

B. The "Sequence of Steps" Argument

Infernal does not dispute the "sequence of steps" construction that requires the "comparing" and "storing" steps be completed before beginning the "combining" step. However, Infernal argues that the district court erred by requiring this sequence for all light sources in the scene rather than for a specific plurality of light sources, and that Sony failed to identify a plurality of light sources that did not

perform the claimed sequence of steps. Both arguments fail.

The district court did not err in its application of its "sequence of steps" claim construction. Infernal's position, as explained by the district court, is that all steps for a particular light source in a scene must be completed before the steps begin on the next light source; on the other hand, Sony contends that because the claims state "*for each* of said plurality of light sources, comparing . . . and storing . . . ; and then combining" must occur, the data from *each* light source illuminating the scene must be compared and stored before the combining step can occur for any light source. *Decision*, 2022 WL 822110, at *4. Given each party's proposed application of the claim construction, the district court agreed with Sony that the "plain language of the [c]ourt's construction along with the claim language itself show that 'for each of said plurality of light sources' the comparing and storing steps are to be completed before the combining step." *Id.*

The district court's construction of the sequence of steps is not limited to any specific plurality of light sources. Thus, Infernal's contention that Sony failed to identify a plurality of light sources that did not perform the sequence of steps in the claimed order is not relevant, and Sony's evidence that the Accused Products never perform the sequence of steps in the claimed order for *any* of the light sources in the scene is sufficient to show non-infringement. *Id.* at *4. Since Sony provided sufficient evidence at trial to show that the Accused Products did not perform the claimed sequence of steps for any light source, the hypothetical situation that Infernal's counsel posed at trial and continues to use as support on appeal is irrelevant. Appellant's Br. 46. The district court's application of the settled claim construction, therefore, is not legal error.

Since the district court did not abuse its discretion in accepting both of Sony's non-infringement theories, whether this court would have had to order a new trial if one of the non-infringement theories was legally erroneous is not at issue and need not be addressed.

II

In addition to its non-infringement arguments, Sony asserted as an affirmative defense that the Asserted Claims are invalid under 35 U.S.C. § 101 pursuant to *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014). In particular, Sony argued that the Asserted Claims are drawn to an ineligible abstract idea under *Alice* step one and involve only technologies and activities that were well-known to a person of ordinary skill before the Asserted Patent applications were filed, and thus are ineligible under *Alice* step two for lacking an "inventive concept." *Id.* at 217. The district court submitted the *Alice* step two question to the jury, which found that the Asserted Claims failed to satisfy the step two test for patentability. After separate, post-trial briefing, the district court held as a matter of law that the Asserted Patents are not drawn to an abstract idea, and thus satisfy the eligibility test of § 101. *Infernal Tech., LLC v. Sony Interactive Ent. LLC*, 2021 WL 5804262, at *3–5 (E.D. Tex. Dec. 7, 2021).

Sony's cross-appeal challenges the district court's holding that the Asserted Claims are not drawn to ineligible subject matter, but conditions its presentation of this challenge on reversal by this court of the denial of Infernal's motion for a new trial. At oral argument, Sony expressly stated that its cross-appeal is conditional, and verbally agreed to withdraw its cross-appeal if the court rules in its

favor on Infernal's appeal.[4] Because we hold in Sony's favor on Infernal's appeal, Sony's cross-appeal is deemed withdrawn.

CONCLUSION

Accordingly, and for the above reasons, we affirm the district court's denial of Infernal's motion for a new trial.

AFFIRMED

COSTS

Costs against appellant in Appeal No. 2022-1647. Each side to bear its own costs in Appeal No. 2022-1739.

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[4] Oral Arg. at 24:38–24:50, https://oralarguments.cafc.uscourts.gov/default.aspx?fl=22-1647_12072023.mp3.