United States Court of Appeals for the Federal Circuit

LG ELECTRONICS INC.,
Appellant

v.

IMMERVISION, INC.,
Appellee

2021-2037, 2021-2038

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2020-00179, IPR2020-00195.

Decided: July 11, 2022

JULIE S. GOLDEMBERG, Morgan, Lewis & Bockius LLP, Philadelphia, PA, argued for appellant. Also represented by DION MICHAEL BREGMAN, ALEXANDER STEIN, Palo Alto, CA; ANDREW V. DEVKAR, Los Angeles, CA; WILLIAM R. PETERSON, Houston, TX.

JOHN DAVID SIMMONS, Panitch Schwarze Belisario & Nadel, LLP, Wilmington, DE, argued for appellee. Also represented by DENNIS JAMES BUTLER; KEITH AARON JONES, STEPHEN EMERSON MURRAY, Philadelphia, PA.

Before NEWMAN, STOLL, and CUNNINGHAM, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* STOLL.

Opinion dissenting in part filed by *Circuit Judge* NEWMAN.

STOLL, *Circuit Judge*.

This appeal requires us to consider how to treat a prior art reference in which the alleged teaching of a claim element would be understood by a skilled artisan not to be an actual teaching, but rather to be an obvious error of a typographical or similar nature. LG Electronics Inc. appeals from the United States Patent Trial and Appeal Board's final written decisions in a pair of inter partes review proceedings challenging claims 5 and 21 of U.S. Patent No. 6,844,990. In both proceedings, the Board found that LG had not shown the challenged claims were unpatentable. Because substantial evidence supports the Board's finding that prior art disclosure critical to both of LG's petitions for inter partes review was an apparent error that would have been disregarded or corrected by a person of ordinary skill in the art, we affirm.

BACKGROUND

I

The '990 patent relates to capturing and displaying digital panoramic images. Panoramic (e.g., super-wide angle) objective lenses typically have linear image point distribution functions. This means there is a linear relationship between the distance of an image point from the image's center and the corresponding relative angle of the object point to the image's center. While this linearity allows digital panoramic images to be easily rotated, shifted, and enlarged or shrunk, it also limits image quality to "the resolution of the image sensor used when taking the initial image." '990 patent col. 3 ll. 1–9. This limitation on image

quality is most noticeable when enlarging sectors of the image. The '990 patent purports to improve the resolution of particular sectors of a digital panoramic image "without the need to increase the number of pixels per unit of area of an image sensor or to provide an overlooking optical enlargement system." *Id.* at col. 3 ll. 35–42.

Specifically, the '990 patent specification describes capturing an initial digital panoramic image using an objective lens having a non-linear image point distribution function that "expands certain zones of the image and compresses other zones of the image." *Id.* at col. 3 l. 62–col. 4 l. 38. The "non-linearity of the initial image" can then be corrected to produce a final panoramic image for display. *Id.* at col. 4 ll. 47–53. "[T]he expanded zones of the image cover" a higher "number of pixels of the image sensor" than they would with a lens having linear image point distribution. *Id.* at col. 3 l. 62–col. 4 l. 10.

The challenged claims specify that the lens "compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image." *Id.* at col. 19 ll. 48–51. Dependent claim 5, which depends from cancelled claim 1, is representative:

> 1. (Cancelled) A method for capturing a digital panoramic image, by projecting a panorama onto an image sensor by means of a panoramic objective lens, the panoramic objective lens having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that the panoramic image obtained has at least one substantially expanded zone and at least one substantially compressed zone.
>
> . . .

> 5. The method according to claim 1, wherein the objective lens *compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image.*

Id. at col. 19 ll. 26–51 (claim 5) (emphasis added); *see also id.* at col. 20 l. 51–col. 21 l. 11 (claim 21).[1]

II

On November 27, 2019, LG filed two petitions for inter partes review, each challenging a dependent claim of the '990 patent. J.A. 322–66 (IPR2020-00179 challenging claim 5); J.A. 3338–87 (IPR2020-00195 challenging claim 21). Fundamental to LG's obviousness arguments is U.S. Patent No. 5,861,999 ("Tada"), directed to a "Super Wide Angle Lens System Using an Aspherical Lens."[2] Tada describes four embodiments that share a general system structure and differ in aspects such as lens element thickness, separation distance, and lens shape. Each embodiment satisfies a set of eight conditions relating to the aspheric characteristics of various lens elements. Tada col. 2 ll. 7–67. The embodiment relevant to this appeal, Embodiment 3, is depicted in Figure 11 and described by a prescription—or set of optical parameters—set forth in Table 5. *Id.* Fig. 11, Tbl. 5.

Tada claims priority from Japanese Patent Application No. 09-201903, which was published as JP H10-115778 ("Japanese Priority Application"). Tada "expressly

---

[1] Independent claims 1 and 17 were cancelled in ex parte reexamination. The claims at issue here were not subject to reexamination.

[2] Tada was published with the title "Super Wide Angel Lens System Using an Aspherical Lens"; a Certificate of Correction dated December 28, 1999, updated the title to its present form.

incorporated" these priority applications "by reference in their entireties." *Id.* at col. 3 ll. 9–13.

LG argued that Tada discloses, as recited in the challenged claims, a panoramic objective lens having a non-linear image point distribution that compresses the center and edges of an image and expands an intermediate zone of the image between the center and the edges of the image. Tada, however, does not explicitly discuss the image point distribution functions of its lenses. Instead, LG relied on its expert Dr. Russell Chipman's declaration for the proposition that Tada's third embodiment has a distribution function producing "a compressed center and edges of the image and an expanded intermediate zone of the image between the center and the edges of the image" as recited in challenged claims 5 and 21.

Dr. Chipman "reconstruct[ed] the lens of Figure 11 [of Tada] using the information in Table 5 of Tada" by inputting certain "information from Table 5 [as published] . . . into an optical design program." J.A. 1486–87 (Chipman Decl. ¶ 46). Dr. Chipman then plotted the image point distribution function for the lens system at six wavelengths and testified that the "function is not linear" in any of them. J.A. 1490–93 (Chipman Decl. ¶¶ 52–53). More specifically, Dr. Chipman explained that this embodiment of Tada's lens system "compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image." J.A. 1503 (Chipman Decl. ¶ 68). LG relied exclusively on Dr. Chipman's calculations and plots using the prescription in Table 5 to show that Tada's third embodiment meets the compression and expansion zone limitation of the challenged claims. LG did not rely on any other prior art reference or any other portion of Tada's disclosure for this limitation.

The Board instituted inter partes review in both proceedings. The parties engaged in expert discovery, with

ImmerVision deposing Dr. Chipman and LG deposing ImmerVision's expert, Mr. David Aikens. In its patent owner response, ImmerVision, relying on Mr. Aikens' declaration, argued that Tada's Table 5 includes a readily apparent error that cannot form the basis of any obviousness ground.

Mr. Aikens, who was specifically tasked with verifying Dr. Chipman's work, began by following Dr. Chipman's process, creating a lens model from the prescription, including the aspheric coefficients—values defining the surface shape of an aspherical lens—in Tada's Table 5 using an optical design program. J.A. 3031–32 (Aikens Decl. ¶ 58). From the outset, Mr. Aikens noticed that something was wrong: the physical surface of his lens model based on Tada's Table 5 and the example lens depicted in Tada's Figure 11 did not match. J.A. 3031–32 (Aikens Decl. ¶¶ 57–59). Because of this discrepancy, Mr. Aikens compared the sag table—a table of heights of a lens surface with respect to the optical axis—generated for his lens model with the sag table provided in Tada's Table 6 corresponding to Embodiment 3. J.A. 3032–33 (Aikens Decl. ¶ 60) ("[T]he sag table can be used as a check to make sure the equation and its coefficients are correctly understood . . . this is so commonly required that a sag table is a standard output of optical design codes."). They also did not match. J.A. 3034–35 (Aikens Decl. ¶¶ 61–62). Next, Mr. Aikens reviewed the image plane for his lens model to evaluate the magnitude of the error and discovered that the output image was distorted with "precisely the kind of uncorrected field curvature that Tada was explicitly trying to prevent." J.A. 3035–36 (Aikens Decl. ¶¶ 63–64); *see also* J.A. 2423 (Aikens Dep. 132:1–10) (explaining that the model "couldn't make a usable image . . . it was so clearly wrong, there was no point in spending more time on it").

Having established that the image was severely distorted, Mr. Aikens began comparing other aspects of his lens model with the "diagrams of the aberrations, astigmatism, and distortion" provided in Tada for its third

embodiment using "standard output features" of optical design code. J.A. 3036–38 (Aikens Decl. ¶¶ 65–66). For example, Mr. Aikens compared the comatic aberration plot generated for his lens model to Tada's Figures 15A–D (comatic aberration plots for the model lens system using Table 5 data). J.A. 3036–38 (Aikens Decl. ¶¶ 65–67). These, too, did not match. Mr. Aikens explained that "at this point, [a person of ordinary skill in the art] would be convinced that there was an error in [the] model and that the error was significant." J.A. 3039 (Aikens Decl. ¶ 68); *see also* J.A. 2423 (Aikens Dep. 132:18–21) ("I recognized that there had to be something wrong with the aspheric coefficients. This is almost always where problems occur.").

Mr. Aikens then noticed that, as depicted in the reproduced tables below, the aspheric coefficients from Table 3, which corresponds to Tada's Embodiment 2, "were exactly the same as in Table 5," which corresponds to Embodiment 3. J.A. 2425 (Aikens Dep. 134:16–21).

TABLE 3-continued

FNO = 1:1.3
f = 1.00
W = 58.4
fB = 2.75 (=0.432/1.51633 + 2.467)

Surface No.	R	D	Nd	vd
11	2.479	1.691	1.77250	49.6
12	−10.343	0.000	—	—
13	∞	0.432	1.51633	64.1
14	∞	2.467	—	—
15	∞	—	—	—

*designates an aspherical surface with rotation symmetry around the optical axis.

Aspherical Data:

No.3: K = 0.00, A4 = 0.30330×10^{-1}, A6 = -0.43125×10^{-2}, A8 = 0.46329×10^{-3}, A10 = -0.24092×10^{-4}

No.4: K = 0.00, A4 = 0.50708×10^{-1}, A6 = -0.52255×10^{-2}, A8 = 0.34087×10^{-2}, A10 = -0.73846×10^{-3}

Tada Tbl. 3 (annotated).

TABLE 5

FNO = 1:1.3
f = 1.00
W = 58.5
fB = 2.79 (=0.437/1.51633 + 2.501)

Surface No.	R	D	Nd	vd
1	11.660	0.364	1.77250	49.6
2	3.274	1.637	—	—
3*	−8.060	2.485	1.49176	57.4
4*	3.032	3.046	—	—
5	−11.339	0.655	1.84666	23.8
6	−3.881	0.546	—	—
diaphragm	∞	2.417	—	—
7	28.148	0.327	1.84666	23.8
8	3.022	1.455	1.51633	64.1
9	−4.790	0.036	—	—
10	4.000	0.327	1.84666	23.8
11	2.425	1.637	1.77250	49.6
12	−11.318	0.000	—	—
13	∞	0.437	1.51633	64.1
14	∞	2.501	—	—
15	∞	—	—	—

*designates an aspherical surface with rotation symmetry around the optical axis.
Aspherical Data:
No.3: K = 0.00, A4 = 0.30330 × 10^{-1}, A6 = −0.43125 × 10^{-2}, A8 = 0.46329 × 10^{-3}, A10 = −0.24092 × 10^{-4}
No.4: K = 0.00, A4 = 0.50708 × 10^{-1}, A6 = −0.52255 × 10^{-2}, A8 = 0.34087 × 10^{-2}, A10 = −0.73846 × 10^{-3}

Id. Tbl. 5 (annotated).

Mr. Aikens turned next to Tada's Table 9, which provides ratios of the radius of curvature and aspherical factors of Tada's aspherical lens element to the focal length of the entire lens system. J.A. 3039–40 (Aikens Decl. ¶ 69); Tada Tbl. 9. Because the focal length of the entire lens system was defined as 1 for each embodiment, the values for conditions (2), (3), and (4) in Table 9 should have matched the aspheric coefficients A4, A6, and A8 in Table 5. But, as depicted below, they did not match:

14	∞	2.501	—	—
15	∞	—	—	—

*designates an aspherical surface with rotation symmetry around the optical axis.

Aspherical Data:

No.3: K = 0.00, A4 = 0.30330×10^{-1}, A6 = -0.43125×10^{-2}, A8 = 0.46329×10^{-3}, A10 = -0.24092×10^{-4}

No.4: K = 0.00, A4 = 0.50708×10^{-1}, A6 = -0.52255×10^{-2}, A8 = 0.34087×10^{-2}, A10 = -0.73846×10^{-3}

Tada Tbl. 5 (annotated).

TABLE 9-continued

	Embodiment 3	Embodiment 4
Condition (1)	−8.060	−10.108
Condition (2)	2.0485×10^{-2}	8.8810×10^{-2}
Condition (3)	-2.5925×10^{-3}	-2.7110×10^{-2}
Condition (4)	2.4634×10^{-4}	7.9690×10^{-3}
Condition (5)	3.022	2.691
Condition (6)	2.425	2.512
Condition (7)	27.255	25.229
Condition (8)	4.229	4.543

Id. Tbl. 9 (annotated).

Finally, Mr. Aikens reviewed Tada's Japanese Priority Application and saw that the aspheric coefficients in its Table 5—which corresponded to the same lens embodiment as Tada's Table 5—differed from those in Tada's Table 5. J.A. 3041–42 (Aikens Decl. ¶¶ 72–75). The relevant portions of these tables are reproduced below.

14	∞	2.501	—	—
15	∞	—	—	—

*designates an aspherical surface with rotation symmetry around the optical axis.

Aspherical Data:

No.3: K = 0.00, A4 = 0.30330 × 10^{-1}, A6 = −0.43125 × 10^{-2}, A8 = 0.46329 × 10^{-3}, A10 = −0.24092 × 10^{-4}

No.4: K = 0.00, A4 = 0.50708 × 10^{-1}, A6 = −0.52255 × 10^{-2}, A8 = 0.34087 × 10^{-2}, A10 = −0.73846 × 10^{-3}

Tada Tbl. 5 (annotated).

14	∞	2.501	-	-
15	∞	-	-	-

＊は回転対称非球面

非球面データ：

No.3; K=0.00 A4= 0.20485×10^{-1} A6=-0.25925×10^{-2}
A8=0.24634×10^{-3} A10=-0.11117 ×10^{-4}

No.4; K=0.00 A4= 0.44252×10^{-1} A6=-0.58852×10^{-2}
A8= 0.39420 ×10^{-2} A10=-0.79700 ×10^{-3}

Japanese Priority Application ¶ [0032] (Tbl. 5) (annotated).

It became clear to Mr. Aikens that, after "chang[ing] the aspheric coefficients [of his model] to match" those of the Japanese Priority Application, the aspheric coefficients in the Japanese Priority Application were the correct ones and that they yielded a lens surface that was "a perfect match to the surface described in Table 6." J.A. 3042 (Aikens Decl. ¶¶ 74–75). In other words, there was a transcription, or copy-and-paste, error in Tada. The disclosures in Tada's Table 5, which were intended to correspond to its Embodiment 3, were actually identical to those in Table 3, which corresponded to Embodiment 2.

In its final written decisions, the Board found that the "disclosure of aspheric[] coefficients in Table 5 of Tada is an obvious error" that a person of ordinary skill in the art would have recognized and corrected. *LG Elecs. Inc. v. ImmerVision, Inc.*, No. IPR2020-00179, 2021 WL 1904645, at *11 (P.T.A.B. 2021) (*Final Written Decision*). [3] Continuing, the Board found that because the correct aspheric coefficients in Table 5 of the Japanese Priority Application do not satisfy the language of the challenged claims, LG had not met its burden to prove the challenged claims unpatentable as obvious. *Id.* Although LG was free to rely on the rest of the reference, it had not done so. The Board concluded that LG did not meet its burden to prove the challenged claims would have been obvious by a preponderance of evidence. *Id.*

LG appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

Obviousness is a legal question based on underlying findings of fact. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021). We review the Board's ultimate obviousness determination de novo and underlying factual findings, including whether a prior art reference includes an obvious typographical or similar error that would be apparent to persons of ordinary skill, for substantial evidence. "The substantial evidence standard asks 'whether a reasonable fact finder could have arrived at the agency's decision.'" *OSI Pharms., LLC v. Apotex*

---

[3] The Board issued a nearly identical decision in the proceeding concerning claim 21. *LG Elecs. v. ImmerVision, Inc.*, No. IPR2020-00195, 2021 WL 2486694, (P.T.A.B. 2021). For brevity, we cite only the decision in IPR2020-00179, the proceeding concerning claim 5.

Inc., 939 F.3d 1375, 1381–82 (Fed. Cir. 2019) (quoting *In re Gartside*, 203 F.3d 1305, 1312 (Fed. Cir. 2000)).

It is undisputed that the aspheric coefficients in Tada's Table 5 were erroneous. Appellant's Br. 15; *see also* J.A. 2903–04 (Chipman Dep. 49:2–50:24); J.A. 3039–40 (Aiken Decl. ¶¶ 68–69). And "[t]here is no dispute that if a lens were constructed using the (correct) aspherical data from Tada's Japanese priority application, the lens would not satisfy the [compression and expansion zone] limitation of claims 5 and 21." Appellant's Br. 15. Therefore, the primary question before us is whether substantial evidence supports the Board's fact finding that the error would have been apparent to a person of ordinary skill in the art such that the person would have disregarded the disclosure or corrected the error.

I

We begin with the legal standard. Over fifty years ago, our predecessor court reversed the decision of the Board of Patent Appeals and Interferences[4] affirming the rejection of certain claims directed to a specific compound of inhalation anesthetic—$CF_3CF_2CHClBr$—as obvious. *In re Yale*, 434 F.2d 666 (C.C.P.A. 1970). The obviousness rejection relied on the errant disclosure of this compound in an article published a few years prior. *Id.* at 667. That article included $CF_3CF_2CHClBr$ as one of nine compounds plotted on a graph with other inhalant anesthetic compounds. *Id.* This was the only instance of $CF_3CF_2CHClBr$ within the reference; the compound $CF_3CHClBr$ appeared throughout the rest of the article. *Id.* At the time, $CF_3CF_2CHClBr$ was not a known compound. *Id.* Our predecessor court set forth the standard for evaluating these types of apparent or "obvious typographical error[s]." *Id.* at 669.

---

[4] The Board of Patent Appeals and Interferences is the predecessor of the Patent Trial and Appeal Board.

The *Yale* court explained that "any number" of several pieces of evidence "individually or cumulatively would . . . alert one of ordinary skill in the art to the existence" of the error. *Yale*, 434 F.2d at 669. First, the court noted the inconsistency between the reference's figures: "$CF_3CF_2CHClBr$ in Fig. 3 is the only compound listed in any figure which is not also listed in Fig. 1." *Id.* at 667. Second, "[a]ll eight [compounds listed in Clements] have the identical [chemical property value] in Fig. 3 that was listed for them in Fig. 1," with the exception of the $CF_3CF_2CHClBr$ compound, which "has the [chemical property value] which was assigned in Fig. 1 to $CF_3CHClBr$." *Id.* at 669. Because $CF_3CF_2CHClBr$ and $CF_3CHClBr$ are two different compounds, the court explained that it would not be "likely to have the same [chemical property value]." *Id.* at 667. Finally, in response to a letter from a reader, one of the authors of the article stated that the reference to $CF_3CF_2CHClBr$ was "of course, an error as [the reader] suppose[d,] and $CF_3CF_2CHClBr$ should read $CF_3CHClBr$." *Id.* Although the court gave less probative weight to this last piece of evidence because it "had not been sworn to," the court found it supported the conclusion that the disclosure of $CF_3CF_2CHClBr$ was in error. *Id.* at 669.

The court in *Yale* held that where a prior art reference includes an obvious error of a typographical or similar nature that would be apparent to one of ordinary skill in the art who would mentally disregard the errant information as a misprint or mentally substitute it for the correct information, the errant information cannot be said to disclose subject matter. *Id.* at 669. The remainder of the reference would remain pertinent prior art disclosure. This standard for reviewing errors in disclosures has been undisturbed for half a century and we are bound to apply it. *Deckers Corp. v. United States*, 752 F.3d 949, 955–56 (Fed. Cir. 2014) (discussing *stare decisis*). Moreover, we view *Yale*'s standard as sound law, ensuring that an obviously errant disclosure of a typographical or similar nature would not

prevent a true inventor of the claimed subject matter from later obtaining patent protection.

II

We now address the Board's fact finding in this case. Based on the record before it, the Board found that the aspheric coefficients in Tada's Table 5 were an obvious error of a typographical or similar nature that would have been apparent to a skilled artisan. *Final Written Decision*, 2021 WL 1904645, at *11. As explained below, we conclude that the Board's finding is supported by substantial evidence.

The Board correctly identified several aspects of the disclosure in Table 5 that would alert the ordinarily skilled artisan that the disclosure was an obvious error of a typographical or similar nature. First, Table 5 in Tada's Japanese Priority Application has different values for the aspheric coefficients than Table 5 in Tada. J.A. 3041–42 (Aikens Decl. ¶¶ 72–75). Citing Mr. Aiken's declaration, the Board found that the discrepancy between the coefficients in Tada's Table 5 and the Japanese Priority Application's Table 5 was "grounded [in] a transcription error in the values for A4, A6, and A8 in Tada's Table 5, namely, inadvertent duplication of the values for the aspherical data in Table 3." *Final Written Decision*, 2021 WL 1904645, at *9. Indeed, Mr. Aikens identified the "obvious typographical error in Table 5" as an error in which the "aspheric coefficients listed in Table 5 were inadvertently copied over from Table 3, which describes Embodiment 2 of Tada." J.A. 3030 (Aikens Decl. ¶ 56). The Board explained that the "correspondence of the Tables 1, 3, 7, and 9 between the [Japanese Priority Application] and Tada itself is apparent, even prior to translation, as is the inconsistency as to the aspherical data for Table 5." *Final Written Decision*, 2021 WL 1904645, at *9.

Second, the Board found that an inconsistency between Tada's Tables 5 and 9 "ma[de] it apparent that there is an

error in Table 5's recitation of the aspheric[] coefficients." *Id.* at *8. It was undisputed that Tada's Tables 5 and 9 are inconsistent: the aspheric coefficients A4, A6, and A8 in Tada's Table 5 should match the values for conditions (2)–(4) in Table 9 but do not. *Id*. at *7–8; *see Yale*, 434 F.2d at 667 (describing the internal inconsistency within a reference as a signal that a person of ordinary skill "would readily recognize" as portending error). As Mr. Aikens explained, and Dr. Chipman agreed, because the focal length for the entire lens system is set to 1 in each of the embodiments, "Table 9 rather conveniently gives you the aspheric coefficients for each of the four embodiments, and it matches correctly for [Embodiments] 1, 2[,] and 4 and is totally wrong for [Embodiment] 3." J.A. 2427 (Aikens Dep. 136:11–15); J.A. 3039–40 (Aikens Decl. ¶ 69) (The "values [in Table 9] do not match the values in Table 5 because Table 5 is in error."); *see also* J.A. 2902–04 (Chipman Dep. 48:9–50:24) (conceding that the aspheric coefficients in Table 5 match the values in Table 9 for each of the embodiments except for Embodiment 3).

Third, the Board found that having identical aspheric coefficients in Tada's Tables 3 and 5 "is incongruous with the differences in the values of other data for the lens systems." *Final Written Decision*, 2021 WL 1904645, at *8. In other words, given the other significant differences between the embodiments, it was unusual for Tables 3 and 5 to list the same aspheric coefficients. *Id.*; J.A. 2425 (Aikens Dep. 134:4–21) ("I noticed that when I was typing in Embodiment 2 from Table 3, the aspheric coefficients were exactly the same as in Table 5, and that's never true. That could not be right."); *see also Yale*, 434 F.2d at 667 (noting the improbability of two different compounds having the same chemical property value).

Considering all the evidence before it, the Board reasonably found that Tada's Table 5 includes an obvious error of a typographical or similar nature that would have been apparent to one of ordinary skill in the art, who would have

substituted it with the correct information and, thus, that Table 5 cannot be said to disclose a lens that compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image. *Final Written Decision*, 2021 WL 1904645, at *11.

III

LG presents two additional arguments. First, LG contends that *Yale* sets forth an "Immediately Disregard or Correct" standard that imposes a temporal urgency on the discovery of the error before the error can be considered "obvious" to a skilled artisan. *See, e.g.*, Appellant's Br. 4–5, 15, 23, 25, 28. Applying this reading of *Yale*, LG argues that Mr. Aikens' "convoluted process" that took "ten to twelve hours" to complete clearly weighed against the obviousness of the error. *Id.* at 27–28. LG reasons that because Tada has remained uncorrected in the public domain for over 20 years, LG should have been able to rely on the aspheric coefficients in Tada's Table 5 as published.

LG's suggestion that *Yale* requires a person of ordinary skill in the art to *immediately* recognize the apparent error is incorrect. As the Board correctly explained, the length of time and the "particular manner" in which the error was actually discovered "does not diminish that there is an obvious error in Tada within the meaning of *Yale*." *Final Written Decision*, 2021 WL 1904645, at *10. Contrary to LG's assertions, *Yale* does not impose a temporal requirement. Nor does LG cite any other authority requiring that the error be discovered within a specified amount of time. Certainly, the amount of time it takes a skilled artisan to detect an error may be relevant to whether an error is, in fact, an apparent error under *Yale*. But this is just one factor for the fact finder to consider as part of the overall analysis. Here, the Board considered the totality of circumstances and found that Tada's disclosure of aspheric coefficients in Table 5 is an obvious error of a typographical

or similar nature, notwithstanding the amount of time that preceded detection of the obvious error. For the reasons explained above, this finding is supported by substantial evidence.

Second, LG suggests that *Yale* is limited to instances in which the error is a typographical error. Appellant's Br. 22–23. For example, LG argues that *Yale* should be narrowly limited to errors such as the spelling mistake in Tada's title upon original publication ("Super Wide *Angel* Lens"), which was corrected soon after ("Super Wide *Angle* Lens"), or in Tada's cancelled claim 1 ("arranged in this order *form* an object side"), which was also corrected ("arranged in this order *from* an object side"). Appellant's Br. 30. According to LG, any other interpretation of the *Yale* standard would "grant[] a monopoly over a resource that was previously freely available to all, destabilizing the patent system." *Id.* at 24. We disagree.

While our predecessor court described the error in *Yale* as typographical, the error at issue here is not so far afield as to warrant a different outcome. As the Board found and Mr. Aikens, testified, the error in Tada's Table 5 was "a transcription error . . . namely, inadvertent duplication of the values for the aspherical data in Table 3." *Final Written Decision*, 2021 WL 1904645, at *9; *see also* J.A. 3030 (Aikens Decl. ¶ 56). The distinction between the typographical error in *Yale* and the copy-and-paste error here is a distinction without a difference.

CONCLUSION

We have considered the parties' remaining arguments and find them unpersuasive. For the foregoing reasons, we affirm the Board's final written decisions.

AFFIRMED

United States Court of Appeals for the Federal Circuit

LG ELECTRONICS INC.,
Appellant

v.

IMMERVISION, INC.,
Appellee

2021-2037, 2021-2038

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2020-00179, IPR2020-00195.

NEWMAN, *Circuit Judge*, dissenting in part.

The court today finds an "error of a typographical or similar nature" in the specification of the Tada reference and rules that because the error is "obvious" the erroneous portion of the Tada reference[1] is eliminated as prior art. Maj. Op. at 16–17. I cannot agree that this error is typographical or similar in nature, for its existence was not discovered until an expert witness conducted a dozen hours of experimentation and calculation. Appx2428 (*LG Elecs. Inc.*

---

[1] U.S. Patent No. 5,861,999 ("Tada" or "the '999 Patent").

v. ImmerVision, Inc., No. IPR2020-00179, (P.T.A.B. Oct. 1, 2020), Aikens Dep. 137:3–138:3, Ex. 1018).

The appearance of a few of the same numbers in two different tables in the Tada reference provides no information as to which numbers and tables are correct and which may be in error. In contrast, a typographical or similar error is apparent to the reader and may conveniently be ignored without impeaching the content of the information. The error in the Tada reference cannot properly be deemed typographical or similar.

The events that preceded the expert's discovery of the error in the Tada reference cannot be ignored. The possibly erroneous numbers in the Tada tables were not noticed by any of the patent attorneys throughout the prosecution of Tada's U. S. application. The now "obvious" error was not noticed by the patent examiner during a complex prosecution in which claims were amended and prior art distinguished.

The purportedly "typographical or similar" error was not included in the Certificate of Correction that was obtained for typographical errors in the issued Tada patent. This error was not noticed by two distinct Patent Trial and Appeal Boards in instituting these two inter partes review ("IPR") petitions, despite the technological expertise of the Board.

The error in Tada Table 5 was not corrected anywhere, even after 20 years of publication. Not until an expert witness conducted experiments and compared the U. S. application with the Japanese Priority document[2] did anyone discover the possibly erroneous numbers in Table 5. Appx2422–2430; Appx3030–3042.

---

[2] JP H10-115778 (July 28, 1998).

The specifics of what led the expert, Mr. Aikens, to discover the erroneous values in Table 5 also cast doubt on whether the error may be deemed "obvious and apparent." Mr. Aikens testified that he had fully modeled Tada's Embodiment 3—relying on data from Table 5—without noticing the error. Appx2421–22 (Aikens Dep. 130:8–22). It was only after his model was completed that he noticed the lens created a distorted image, leading him to presume there was perhaps some error in Tada. Appx2422 (Aikens Dep. 131:3–7). At this point in his experimentation, he did not know what the error was, and certainly did not know how to correct the error; he only suspected that an error existed somewhere. Appx2423 (Aikens Dep. 132:2–10).

Upon realizing there was likely an error, Mr. Aikens undertook to discover it. *Id.* at 132:7–10 ("I wanted to understand how this lens could be so wrong and be in the patent. It just didn't make sense to me."). Mr. Aikens testified that he required several additional hours to figure out if there actually was an error in the reference and what that error was. *Id.* at 132:11–13.

First, Mr. Aikens observed that the physical surface shape of his Embodiment 3 lens model did not match the example lens depicted in Tada's Figure 11. Appx2424 (Aikens Dep. 133:11–14); Appx3042 (*LG Elecs. Inc. v. ImmerVision, Inc.*, No. IPR2020-00179, (P.T.A.B. Aug. 4, 2020), Aikens Decl. ¶ 74, Ex. 2009). This suggested that an error existed, but not where the error was or how to correct it. Mr. Aikens then performed various tasks such as comparing the diagrams of the aberrations, astigmatism, and distortion for Embodiment 3 to his model, and fully modeling two other embodiments—Embodiment 1 and Embodiment 2. Appx2425 (Aikens Dep. 134:12–15). None of these steps showed where the purported "obvious error" was located. Only after modeling the other lens embodiments did Mr. Aikens finally observe that the aspherical values from Table 3, which correspond to Tada's

Embodiment 2, "were exactly the same as in Table 5." *Id*. at 134:18–19.

Mr. Aikens testified that at this point of his experimentation he suspected there was an error in the aspherical values in Table 5, but he had yet to determine what was in error. *Id*. at 134:19–21. To investigate further, Mr. Aikens compared the sag table generated from his lens model with sag Table 6 from the Tada reference. He found they did not match, indicating that an error existed; however, he still did not know what the error was, nor how to correct it. Appx2425–26 (Aikens Dep. 134:22–135:4); Appx3032–35, Appx3042 (Aikens Decl. ¶¶ 60–62, 74). Mr. Aikens then compared the values in Table 9 to Table 5 and noticed that upon performing the required calculations, the aspherical values did not match between these two tables. Appx2426–27 (Aikens Dep. 135:9–136:15). It was here, for the first time, that Mr. Aikens testified that he could confirm there actually was an error in the Tada reference. *Id*. at 136:9–10. At this juncture Mr. Aikens felt confident that Table 5 contained erroneous information, but he *still* did not have the information to correct it. Appx2426–27 (Aikens Dep. 135:21–136:1) ("Unfortunately, Tada didn't include a constraint on his A10 term so that I had to optimize to find.").

Mr. Aikens testified that he was finally able to correct and confirm the error when he obtained the Japanese Priority Application. Appx2420 (Aikens Dep. 129:7–11); Appx3042 (Aikens Decl. ¶ 74). The Japanese application had the correct aspherical values in Table 5, as confirmed by a skilled expert in this technology, after many hours of corrective effort that included fully modeling three separate embodiments of the lens. In sum, the error was not of "typographical or similar nature."

The facts of this case readily distinguish it from *In re Yale*, 434 F.2d 666 (CCPA 1970), where our predecessor Court of Customs and Patent Appeals found that the

inclusion of the molecule $CF_3CF_2CHClBr$ in a list of anesthetics was an obvious error. In *Yale* the CCPA explained that $CF_3CF_2CHClBr$ was not a known compound and that the obviously intended compound was $CF_3CHClBr$, a well-known anesthetic. This error was acknowledged by the authors of the article. As the panel majority recounts, "any number" of the pieces of evidence mentioned by the CCPA in *Yale* would "'individually or cumulatively . . . alert one of ordinary skill in the art to the existence' of the error." Maj. Op. at 14 (quoting *Yale*, 434 F.2d at 669). However, the evidence in *Yale* did not require calculations or experimentation. *Yale*, 434 F.2d at 667. The same cannot be said about the error in Tada, for without the Japanese Priority Application, there is no source of the correct information. In Tada, the error in Table 5 is not discoverable unless measurements are conducted, the embodiments are recreated, equations are recalculated, and computations are performed. Without performing these operations, the identity of a few values in both the tables does not establish error. Moreover, the tables do not suggest which table might be incorrect. As Mr. Aikens demonstrated, without modeling Embodiment 3, Table 5 cannot be compared to sag Table 6 or Figs. 11–15.

In contrast, in *Yale* it was obviously an error to replace the known chemical anesthetic compound $CF_3CHClBr$ in Fig. 1 with the unknown chemical compound $CF_3CF_2CHClBr$ in Fig. 3 and list both compounds as having the same property. The CCPA reasoned that a chemist of ordinary skill would deem it extremely unlikely that these two chemicals would have the same $LogP_f$ (partial pressure) value. *Yale*, 434 F.2d at 667.

Although the panel majority finds analogy in the view that it is highly unlikely that the Tada embodiments would have the same aspherical values, Maj. Op. at 16, such that the listing of the same values is an obvious error, there is no intrinsic reason why two different lenses could not have

the same aspherical values. As Mr. Aikens remarked, "[a]nd so I thought, okay, well, maybe there's a typo on the – on the aspherics, or maybe Tada is not very good."). Appx2425 (Aikens Dep. 134:10–12). Even the Tada patent states that "[t]he basic structure of a lens system of the third embodiment is substantially the same as that of the second embodiment. Numerical data regarding the third embodiment is shown in table 5 below." '999 Patent col. 8 ll. 59–64. That Table 3 and Table 5 have some of the same aspherical values does not readily alert a person of ordinary skill that Table 5 contains an obvious error of "typographical or similar nature."

The facts in *Yale* are not readily analogous. An important consideration in *Yale* was that the molecule $CF_3CF_2CHClBr$ was not a known chemical compound at the time. The CCPA explained that the inclusion on a table of known anesthetics of a compound that did not exist would be recognized as an error, as was shown in correspondence. *Yale*, 434 F.2d at 668–69.

I agree with the panel majority that *Yale* establishes the correct standard to determine if an error would be obvious to a person of ordinary skill in the field. However, I do not agree with the majority's application of this standard to the facts herein. An "obvious error" should be apparent on its face and should not require the conduct of experiments or a search for possibly conflicting information to determine whether error exists. When a reference contains an erroneous teaching, its value as prior art must be determined.

The error in the Tada reference is plainly not a "typographical or similar error," for the error is not apparent on its face, and the correct information is not readily evident. It should not be necessary to search for a foreign document in a foreign language to determine whether there is an inconsistency in a United States patent. The foundation of

the "typographical or similar" standard is that the error is readily recognized as an error. I am concerned that we are unsettling long-standing law, and thus I respectfully dissent in part.