

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GIESECKE+DEVRIENT GMBH,
GIESECKE+DEVRIENT CURRENCY TECHNOLOGY GMBH, and
PAPIERFABRIK LOUISENTHAL GMBH,
Petitioners,

v.

LUMENCO, LLC,
Patent Owner.

IPR2024-00837
Patent 10,317,691 B2

Before MEREDITH C. PETRAVICK, BENJAMIN D. M. WOOD, and
NABEEL U. KHAN, *Administrative Patent Judges*.

WOOD, *Administrative Patent Judge*.

DECISION
Denying Petitioner's Request for Rehearing of
Decision Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.71(d)

I. INTRODUCTION

Giesecke+Devrient GmbH, Giesecke+Devrient Currency Technology GmbH, and Papierfabrik Louisenenthal GmbH (collectively, “Petitioner”) requests rehearing of our Decision Denying Institution of *Inter Partes* Review (Paper 8, “Decision” or “Dec.”). Paper 9 (“Rehearing Request” or “Reh’g Req.”). In the Decision, we determined that Petitioner did not demonstrate a reasonable likelihood of prevailing in showing that any of claims 1, 3–7, and 9–13 of U.S. Pat. No. 10,317,691 (Ex. 1001, “the ’691 patent”) is unpatentable. For the reasons set forth below, we deny the Rehearing Request.

II. STANDARD OF REVIEW

“A party dissatisfied with a decision may file a single request for rehearing without prior authorization from the Board.” 37 C.F.R. § 42.71(d). The request must “specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, a reply, or a sur-reply.” *Id.* “When rehearing a decision on petition, a panel will review the decision for an abuse of discretion.” 37 C.F.R. § 42.71(c).

III. ANALYSIS

Petitioner requests rehearing of the Board’s construction of limitation [1d] of claim 1,¹ which reads in pertinent part “wherein each of the sets of

¹ As we did in the Decision (Dec. 18), and as Petitioner does in the Rehearing Request (Reh’g Req. 1), we treat claim 1 as representative of

the micro mirrors providing the pixels for each of the differing ones of the images has a differing cone angle offset.” Reh’g Req. 1. We interpreted this language to mean that “*each set* of micro mirrors has a differing cone angle offset,” i.e., “a set of micro mirrors producing a pixel for a first image must have a cone angle offset that is different from the other sets of micromirrors producing pixels for that image, and also different from the sets of micromirrors producing pixels for any other image.” Dec. 16, 17. Petitioner contends that our construction “is unsupported by the plain meaning and intrinsic record.” Reh’g Req. 1.

Petitioner acknowledges that its Rehearing Request “provides additional responsive arguments and citations to the ’691 Patent (Ex. 1001) and Hesselink Declaration (Ex. 1003) that, while in the record, were not explicitly raised in the Petition in connection with the disputed limitation.” Reh’g Req. 3–4.² Petitioner contends that “[t]his practice is permissible in a Request for Rehearing because, as here, Petitioners could not have reasonably anticipated the arguments in the Petition.” *Id.* at 4 (citing *Momentum Dynamics Corp. v. Witricity Corp.*, IPR2021-01165, Paper 9 at 2 (PTAB Mar. 16, 2022)). According to Petitioner, “Petitioners could not have reasonably anticipated PO’s misrepresentations in its Preliminary Response because they have no basis in the ’691 Patent, or any other document available to Petitioners at the time of the filing of the Petition.”

independent claims 6 and 12, and limitation [1d] as representative of limitations [6d] and [12d].

² The Petition did not offer a construction for limitation [1d] or any other claim term. *See* Pet. 15 (“[N]o claim terms require express construction to resolve the challenges here.”).

Id. at 4–5. Petitioner further notes that “neither Patent Owner nor the Board provide a single citation to the ’691 Patent, or any other document, in supporting its interpretation that each set of micromirrors for an image must have different cone angle offsets.” *Id.* at 5 (citing Dec. 12–18; Prelim. Resp. 10–12).

We disagree that Petitioner could not have reasonably anticipated the interpretation that Patent Owner proposed and our Decision adopted because, as discussed below, that interpretation is evident from the plain language of limitation [1d]. Nonetheless, we address Petitioner’s arguments.

A. Claim Language

Petitioner first argues that “the claim plainly recites ‘each of the sets’ of micro mirrors ‘for each of the differing ones of the images has a differing cone angle offset.’” Reh’g Req. 6 (citing Pet. 34). According to Petitioner, the claim “does not recite ‘*each* pixel for *each* image’ has a differing cone angle offset, as the Decision suggests,” and therefore “the claim plainly requires differing cone angle offsets for sets of the micro mirrors of differing images . . . , not for sets of the micro mirrors within the same image.” *Id.* (citing Dec. 17).³

Petitioner also takes issue with our characterization of limitation [1d] as requiring that “each set of micro mirrors ha[ve] a different angle offset.” Reh’g Req. 7 (citing Dec. 16, 17). Petitioner contends that, “[t]o the

³ Petitioner bases its argument that limitation [1d] “does not recite ‘each pixel for each image’ has a differing cone angle offset” on an incomplete reproduction of the claim language that omits the word “pixels.” See Ex. 1001, 28:29–31 (“each of the sets of the micro mirrors *providing the pixels* for each of the differing ones of the images has a differing cone angle offset”) (emphasizing claim language omitted at Reh’g Req. 6).

contrary, the claim plainly does not recite ‘each set,’ it instead refers to ‘each of the sets [plural] of the micro mirrors.’ *Id.* (quoting claim 1) (second alteration in original). Thus, according to Petitioner, “[i]t is the collection of *sets* of micro mirrors, which form an image, that has a differing cone angle offset from another collection of *sets*, which form another image.” *Id.*

Petitioner misreads limitation [1d], and in particular fails to accord proper meaning to the word “each” in this limitation. “A claim must be read in accordance with the precepts of English grammar.” *In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983). Importantly, “[e]ach is treated as singular . . . when it comes before a singular noun (e.g., *each house*): *Each group is responsible for its own quality control*—A. Francis, 1986;” and “when it is followed by *of* and a plural noun (e.g. *each of the houses*): *each of the three parties has a right to a confidential briefing* (not *have*).” Fowler’s Dictionary of Modern English Usage 242 (J. Butterfield ed., 4th ed. 2015). Thus, *each* refers to each *singular* (i.e., individual) *set* of micro mirrors, even though it is followed by “*of the sets*.” The plain language of limitation [1d] confirms that “each of the sets” is singular by using the singular verb tense “has” rather than the plural tense “have.” Ex. 1001, 28:31. Accordingly, as we held in the Decision (Dec. 17), limitation [1d] requires that *each individual set of micro mirrors has a differing cone angle offset*.

The rest of the limitation’s subject language—“providing the pixels for each of the differing ones of the images”—does not change this result. “[P]roviding the pixels” identifies the relevant “each of the sets of the micro mirrors,” and “for each of the differing ones of the images” identifies the relevant “pixels.” In combination, “providing the pixels for each of the differing ones of the images” clarifies that “each of the sets of the micro

mirrors” has, as an antecedent basis, the *set* (singular) of micro mirrors recited in limitation [1c]. This limitation reads: “the array of micro mirrors includes, for each of the pixels of each of the images, *a set* of the micro mirrors each having a reflective surface oriented to reflect the ambient light toward a point on the plane corresponding to one of the pixels.” Ex. 1001, 28:24–28 (emphasis added). Thus, each individual set of micro mirrors must have a different cone angle offset from that of the other sets of micro mirrors, whether or not they provide pixels for the same or different images. Petitioner’s interpretation of this language as not requiring differing cone angle offset for sets of micro mirrors forming pixels within the same image (Reh’g Req. 7) is therefore incorrect.

B. Written Description

Petitioner further argues that “[t]he Decision’s interpretation that the sets of micro mirrors within the same image must have differing cone angle offsets is directly contrary to the intrinsic evidence, which the Decision overlooks entirely.” Reh’g Req. 8. Petitioner specifically asserts that we overlooked the Petition’s citations to the ’691 patent that establish, in Petitioner’s view, “that there is an ‘offset value’ for an image, so that all pixels/voxels in [a] given image are ‘directed to a viewer’s eyes.’” *Id.* at 9–10 (citing Ex. 1001, 22:34–60); *see also id.* at 10–11 (asserting that the Board additionally overlooked 24:63–25:2 (Fig. 20), 22:39–42 (Figs. 16A–16B), and 23:57–62 (Fig. 17), “which were all cited [Pet. 41] to explain how the cone angle offset was defined in the specification.”). According to Petitioner:

If each pixel within the same image were required to have different cone angle offsets, as the Decision requires, the claim

would be impossible to satisfy because it would not be possible for “one of the images” to be “observable at a time by a viewer.” *See* element [1f]. Rather, only certain pixels would be viewable at a time and other pixels of the image would be dark. This contradicts the claim and defeats the purpose of the differing cone angle offsets for the images. In other words, the Board’s interpretation, invited by [Patent Owner]’s erroneous arguments, renders the claim non-sensical by *requiring* that every pixel within an image have a *different viewing angle*, such an image would never be observable.

Id. at 10.

This argument suffers from a number of flaws. First, although the Petition does cite to 22:34–60, 24:63–25:2, 22:39–42, and 23:57–62 of the ’691 patent, the purpose of these citations had nothing to do with the construction of limitation [1d], much less Petitioner’s current argument that all sets of micro mirrors for a given image must have the same cone angle offset. *See, e.g.*, Pet. 37 (citing Ex. 22:34–60 and Figures 16A and 16B to support Petitioner’s assertion that “the cone axis 1650 ‘passes through voxel 1640 and also through the center point of the cone base 1630’”); *id.* at 41 (citing 24:63–25:2, 22:39–42, and 23:57–62 to support the assertion that “[d]efining the cone angle offset based upon a relative position of a cone axis to the orthogonal is taught by the ’691 patent”). Thus, we did not “overlook” these citations, we considered them in light of the limited contentions for which they were then offered as support.

Second, the excerpts from the Specification that Petitioner alleges we overlooked do not describe the invention as a whole, but only specific embodiments of the invention. *See* Ex. 1001, 22:34–60 (describing the embodiment depicted in Figures 16A and 16B); *id.* at 24:63–25:2 (describing the embodiment depicted in Figure 20); *id.* at 23:57–62

(describing the embodiment depicted in Figure 17). Although claims must be interpreted in light of the Specification, it is impermissible to import limitations from the Specification. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1370 (Fed. Cir. 2003). Thus, the patentee's description of specific embodiments is not enough for us to deviate from the claim language. *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1368 (Fed. Cir. 2012).

Moreover, the Specification indicates that independent claims 1, 6, and 12 are not intended to cover the embodiments discussed in the above excerpts. The Specification distinguishes the embodiments depicted in Figures 1–15B from those depicted in, e.g., Figures 16A–16B, 17, and 20, the descriptions of which Petitioner now contends supports its construction of limitation [1d]. For the Figure 1–15B embodiments, the Specification describes the micro mirrors as configured to create “pixels.” Ex. 1001, 21:14–20. For the embodiments depicted in Figures 16A–16B, 17, and 20, however, the Specification refers to the light points created by the micro mirrors as “voxels:”

As will be appreciated from the above description and FIGS. 1-15B, the arrays of micro mirrors can be effectively configured to display images in one, two, or more planes. . . . In other embodiments it may be desirable to select and configure sets of mirrors in the array of micro mirrors for pixel (or “voxel”) creation so as to provide animation and 3D effects at different heights (e.g., in differing image planes or levels relative to the surface(s) containing the array of micro mirrors) and with infinite axes activation.

In order to create 3D images that appear to float in the air relative to the visual display assembly or security element, light is directed by sets of the micro mirrors to focus at selected points/locations above a plane containing the micro mirrors.

Within each set of micro mirrors, the micro mirrors are aimed or tilted so that when incident light within a range of angles is reflected off the micro mirrors the reflected light comes to a focus at the selected point, *which is called a pixel of an image in the discussion above and is called a voxel in the following discussion.*

Id. at 21:14–36 (emphasis added).

The “following discussion” describes, e.g., the embodiments depicted in Figures 16A, 16B, 17, and 20. *See* Ex. 1001, 22:34–25:32 (teaching that the Figure 16A–B embodiment displays single “voxel 1640”); 23:51–60 (teaching that the Figure 17 embodiment comprises micro mirrors configured to “focus on voxels”); 24:63–66 (teaching that Figure 20 depicts “a single voxel 2016 of an image (such as a frame of an animation clip or an image [of] a 3D model”)). Claims 1, 6, and 12, however, recite assemblies that display images comprising a plurality of “pixels.” *Id.* at 28:22–23, 29:11–16, 30:13–14. The patentee’s choice to recite “pixels” rather than “voxels” in claims 1, 6, and 12 indicates the patentee’s intent that these claims cover only the Figure 1–15B embodiments and not the embodiments depicted in, e.g., Figures 16A–16B, 17, and 20. *See Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1026 (Fed. Cir. 2015) (“[W]here the patent describes multiple embodiments, every claim does not need to cover every embodiment.”).

Finally, Petitioner provides no evidence or persuasive technical reasoning to support its contention that all of the sets of micro mirrors for a given image must have the same cone angle offset for the image to be visible to a viewer. *See* Reh’g Req. 10 (“there is an ‘offset value’ for an image, so that all pixels/voxels in [a] given image are ‘directed to a viewer’s eyes.’”). On the contrary, Petitioner appears to acknowledge that multiple pixels, each

produced by a set of micro mirrors having differing cone angle offsets, could nevertheless be visible at the same time. *See id.* (“If each pixel within the same images were required to have different cone angle offsets, . . . only certain pixels would be viewable at the same time”). An image composed of those “certain pixels . . . viewable at the same time” would therefore be visible despite the fact that they are produced by sets of micro mirrors having differing cone angles.⁴

In sum, we are not persuaded that we misapprehended or overlooked the Specification in construing Limitation [1d].

C. Prosecution History

Petitioner also contends that Patent Owner “unambiguously stated during prosecution of the ’691 patent that the disputed limitation should be interpreted as Petitioners explain (i.e., that pixels of an image may have the same shared cone angle offset).” Reh’g Req. 12. In support of this contention, Petitioner relies on the following quotation from Patent Owner’s January 29, 2019 Response to a January 23, 2019 Office Action rejecting then-pending claim 1 as anticipated by Kaule:

Kaule fails to show “each of the sets of the micro mirrors providing the pixels for each of the differing ones of the images

⁴ Figures 4 and 5 of the ’691 patent also appear to depict different pixels for the same image being formed by sets of micro mirrors having differing cone angle offsets. Figure 4 depicts, e.g., two sets of micro mirrors each configured to display one of two pixels 432 of an image in plane 430, each set appearing to have different cone angle offsets. Ex. 1001, 10:26–28, Fig. 4. Likewise, Figure 5 depicts two sets of micro mirrors creating pixels 522 of an image to be displayed on first plane 520. *Id.* at 10:48–59. Here, too, the sets of micro mirrors produce pixels for a single image and yet appear to have different cone angle offsets.

has a differing cone angle offset” (again see Applicant’s Figure 2 [sic, 21] illustrating *pixel sets with nine differing cone angle offsets each associated with one of nine differing images*).

Ex. 1002, 498 (emphasis added by Petitioner at Reh’g Req. 12).⁵ Petitioner characterizes this statement as an “express interpretation of the claim” that is “the same interpretation provided by Petitioner,” and that “expressly contradicts the construction adopted in the Decision.” Reh’g Req. 13.

We disagree that the above statement constitutes an “express interpretation of the claim,” much less one that is at odds with that adopted in the Decision. In the above-quoted excerpt Patent Owner is stating that each of the pixels shown in Figure 21 has a *different* cone angle offset. Ex. 1002, 498. This excerpt is silent regarding whether all other pixels associated with each image must have differing cone angle offsets. In any event, as the Federal Circuit has observed, “because the prosecution history represents an ongoing negotiation between the PTO and the applicant rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc). Thus, we do not view this statement, by itself, as clearly contradicting our interpretation of Limitation [1d].

IV. CONCLUSION

For the foregoing reasons, Petitioner’s Rehearing Request is denied.

⁵ Petitioner incorrectly cites to page 100 of Ex. 1002 (Reh’g Req. 12); the quoted passage is found on page 498 of that exhibit.

V. ORDER

For the reasons given, it is

ORDERED that Petitioner's Rehearing Request is *denied*.

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