

Filed: December 24, 2024

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
U.S. Patent No. 10,317,691

**PETITIONERS' REQUEST FOR REHEARING
UNDER 37 C.F.R. § 42.71(d)**

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I. INTRODUCTION

The Board's Decision denying institution (Paper No. 8) ("Decision") misapprehended claims of U.S. Patent No. 10,317,691 ("'691 Patent") and specifically the meaning of the term "differing ones of the images" has a differing cone angle offset" in the claims,¹ which led to denial of institution. Decision, 12-18. Petitioners respectfully disagree with the Board's adoption of the Patent Owner ("PO") proposed interpretation, which is unsupported by the plain meaning and intrinsic record, and therefore requests rehearing on this narrow issue.

Specifically, the claim plainly requires that each image has "sets" (plural) of micro mirrors associated with it, and "each of the sets"² (plural) of providing pixels "for each of the differing ones of the images has a differing cone angle offset." Petition, 34. Accordingly, correctly interpreted, the claim only requires differing cone angle offsets for the differing ones of the images, with each image having sets (plural) of micro mirrors associated with it.

¹ The Decision did not identify any other claim element as not satisfied by the Petition. See Decision at 12-18. The Decision's analysis focuses on limitation [1d] of claim 1 and notes that claims 6 and 12 have "substantially the same" limitation. Decision, 18. This Request likewise refers to claim 1 for the same reason.

² Not to be misread as, each set (singular) of the sets (plural).

The Decision also overlooks and misapprehends the intrinsic record, and the Petition's citations to it, supporting the correct claim interpretation. *See, supra*, Section III.A.2-4. By contrast, PO did not provide *a single citation* to the intrinsic record for its erroneous interpretation, and the Board adopted this erroneous interpretation without any citation as well. Decision, 12-18; POPR, 10-12. The intrinsic record (including an explicit statement during prosecution) consistently describes the sets (plural) of micromirrors for an image as having *the same* cone angle offset and other images having *differing cone angle offsets*. *See* Section III.A.2.

Further, the Decision overlooked important context established by other claim language, including that “one of the images is observable at a time by a viewer,” thus requiring *the same* cone angle offset for an image and other images having *differing cone angle offsets*. Petition, 43-45 (element [1f]). Specifically, the Decision's interpretation requiring each pixel in an image to be visible from a *different* viewing angle renders element [1f] impossible to satisfy. Instead of displaying an observable image, this incorrect interpretation results in the display of random pixels while other pixels are dark (*i.e.*, not observable). Decision, 16-17. In other words, the Board's interpretation, invited by PO's erroneous arguments, creates an inherent contradiction in the claim by *requiring* that every pixel within an image have *a different viewing angle*, such an image would never be observable. Rather, each *image* (consisting of a plurality of pixels) needs to have a different cone angle offset from

another image (consisting of another plurality of pixels), so that each image is independently observable by a viewer, as the claims require. Each pixel for an image must be seen with the same offset angle to present the full image to the viewer.

Respectfully, for these and further reasons addressed below, these clear errors require rehearing. Upon rehearing, the Board should institute trial.

II. APPLICABLE LEGAL STANDARDS

This Request is authorized under 37 C.F.R. § 42.71(d). It has been filed within 30 days of the November 25, 2024 entry of a decision not to institute a trial. When rehearing a decision on whether to institute a trial, the Board reviews the decision for an abuse of discretion. 37 C.F.R. § 42.71(c).

An abuse of discretion occurs when a “decision was based on an erroneous conclusion of law or clearly erroneous factual findings, or... a clear error of judgment.” *PPG Indus. Inc. v. Celanese Polymer Specialties Co.*, 840 F.2d 1565, 1567 (Fed. Cir. 1988). The party requesting rehearing “must specifically identify all matters [it] believes the Board misapprehended or overlooked, and the place where each matter was previously addressed.” 37 C.F.R. § 42.71(d).

The Petition and cited exhibits fully addressed the matters that the Board misapprehended or overlooked. Pet., 34-41. However, to more fully respond to PO's misrepresentations in its Preliminary Response and the Decision's adoption of them, Petitioners provide 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. This practice is permissible in a Request for Rehearing because, as here, Petitioners could not have reasonably anticipated the arguments in the Petition. *Momentum Dynamics Corp., v. Witricity Corp.*, IPR2021-01165, Paper 9 at 2 (P.T.A.B. Mar. 16, 2022) (allowing in Request for Rehearing citations to record and explanation “not specifically refer[ed] to in the Petition” because “Petitioner reasonably might not have expected the Patent Owner or the Board to question” the disputed issue).³

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

³ Petitioners do not seek to introduce “new evidence” in this Request, and therefore do not argue for “good cause” to do so. *See* PTAB Consolidated Trial Practice Guide, 84 Fed. Reg. 64,280 (Nov. 21, 2019), p. 90. To the extent the Board considers the responsive arguments and citations not explicitly raised in the Petition in connection with the disputed limitation to be “new evidence,” there is “good cause” to introduce because Patent Owner's arguments could not have been reasonably anticipated. *Juniper Networks, Inc. v. Chrimar Sys.*, IPR2016-01389, Paper 69 at 101 (P.T.A.B. Jan. 23, 2018) (citation to new extrinsic evidence proper on reply to rebut new claim construction arguments).

document available to Petitioners at the time of the filing of the Petition. In fact, neither PO 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. Decision, 12-18; POPR, 10-12. As will be discussed below, the intrinsic record directly contradicts this interpretation. In fact, PO represented to the Patent Office during prosecution that the claim is satisfied by images with a single cone angle offset. Petitioners could not have reasonably anticipated that PO would represent to the Board that the claim should be interpreted in the opposite way it previously told the Patent Office it should be interpreted. Accordingly, Petitioners' additional record citations are permissible because there was no reasonable basis for Petitioners to believe that it needed to preemptively rebut PO's mischaracterizations in the Petition. *Momentum Dynamics*, Paper 9 at 2.

III. THE DECISION IS AN ABUSE OF DISCRETION

The Decision improperly imparted a non-existent requirement on the claims which is directly contrary to the intrinsic record. This constitutes legal error, which is an abuse of discretion. *PPG Indus.*, 840 F.2d at 1567; *see also Apple Inc. v. Corephotonics, Ltd.*, IPR2020-00487, Paper 13 at 3-5 (P.T.A.B. Nov. 5, 2020) (granting Petitioner's Request for Rehearing based on unreasonable claim interpretation in institution denial); *Askeladden, L.L.C. v. OHVA, Inc.*, IPR2023-00921, Paper 15 at 5-8 (P.T.A.B. Mar. 15, 2024) (same).

**A. No Support for the Decision's Claim Interpretation
Requiring the Cone Angle Offset be Different for Pixels in
the Same Image**

The issue is whether “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” means that each set of micromirrors forming a pixel must have differing cone angle offsets amongst differing images, or amongst both differing images *and within the same image*. Decision, 15-17. Without support, the Board adopted the latter interpretation. *Id.* This is clear error.

**1. The Board Misapprehended or Overlooked the
Claims By Requiring Differing Cone Angle
Offsets For All Pixels Within the Same Image**

The Decision incorrectly concludes that “a set of micromirrors 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*.” Decision, p. 17 (emphasis added). The clear error of this interpretation is apparent from the plain meaning of the claim.

First, 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.” Petition, 34. (emphasis added). It does not recite “*each* pixel for *each* image” has a differing cone angle offset, as the Decision suggests. Decision, p. 17. Accordingly, the claim

plainly requires differing cone angle offsets for sets of the micro mirrors of differing images (as the Decision states, “*for any other image*”), not for sets of the micro mirrors within the same image (as the Decision states, “*for that image*”). Petition, 34-37, 41. It was clear error to require differing cone angle offsets for sets of micromirrors in the same (i.e., non-differing) image.⁴

Second, the Decision consistently re-writes the limitation as “require[ing] that *each set* of [the sets of] micro mirrors has a differing cone angle offset.” Decision, p. 16, 17 (“for *each* set of micro mirrors providing the pixels...”)(emphasis in original). To the contrary, the claim plainly does not recite “each set,” it instead refers to “each of the sets [plural] of the micro mirrors.” It is the collection of *sets* of micromirrors, which form an image, that has a differing cone angle offset from another collection of *sets*, which form another image.

Specifically, element [1b] requires that that “each of the images comprises a plurality of pixels” and element [1c] requires that each pixel has “a set of micro

⁴ The Decision cites authority concluding that “each” means “all” (see Decision, p. 16), which is not in dispute. Petitioners agree with this interpretation: an image generated by “all” sets of micromirrors providing pixels for the image has a differing cone angle offset than another image generated by another “all” sets of micromirrors for that image.

mirrors” to reflect light towards it. Put together, an image has a plurality of pixels, and light for a given pixel of an image is generated by a set of micro mirrors. Accordingly, each **image** has “sets” (plural) of micro mirrors because each image comprises a plurality of pixels. Critically, element [1d] recites “each of the [micro mirror] sets” (plural) “provid[e] the pixels” (plural) “for each of the differing ones of the images,” meaning that each differing image has sets (plural) of micro mirrors. Each of those “sets” (plural) for “differing ones of the images” has “a differing cone angle offset.” Element [1f] confirms this interpretation by making clear that cone angle offsets are selected such that an image (*i.e.*, sets of micromirrors) is observable at a time by a viewer, not by a pixel-by-pixel basis (*i.e.*, each pixel having a set of micromirrors). *See, infra*, III.A.3.

2. The Board Misapprehended or Overlooked the Specification, Cited by the Petition and Dr. Hesselink, in Support of the Proper Interpretation

The Decision’s interpretation that the sets of micromirrors within the same image must have differing cone angle offsets is directly contrary to the intrinsic evidence, which the Decision overlooks entirely. In fact, neither PO nor the Decision provide a single citation to the ’691 Patent, file history, or any other document, in supporting its interpretation that each set of micromirrors for the same image must have different cone angle offsets. Decision, 12-18; POPR, 10-12. By contrast, Petitioner has fully supported the correct interpretation.

As an initial matter, the physics of the cone angle offsets are to provide a distinct viewing angle for each **image**, such that one image is viewable at a time (depending on the angle of the viewer). *See* Pet. at 37-38, 44-45; *see also* element [1f]. The Decision overlooks the Petition's explanation of these physics that the cone angle offsets are satisfied by the prior art having viewing angles which "produc[e] two images that are visible at different viewing angles." *See* Pet. at 37-41. In fact, the Decision states that "Petitioner has not made us aware of anything in the Specification that suggests otherwise" (Dec., 17), but overlooks that the Petition cites to 22:34-60 of the '691 Patent, which states the following:

FIGS. 16A and 16B illustrate schematically side and top views, respectively, of a security element or visual display assembly 1600 during its use to **display a single voxel 1640**, such as a pixel from a particular image/frame that is configured to be **visible at a particular height/level, H_{Voxel} , and associated with a particular offset value (defining a relative offset angle and direction relative to an orthogonal or "0" offset of the cone axis 1650 such as with the DX, DY, and DZ values)**... and rays 1633 that continue on past the voxel 1640 would be **directed to a viewer's eyes within a cone having the cone angle, β_{Cone} , and with a cone axis 1650** (that passes through the voxel 1640 and also through the center point of the cone base 1630). **To create an image, numerous voxels are defined for each image/frame that are offset in the X direction from the voxel 1640 but with a like height, H_{voxel}** (which may be positive or negative to display an image

above/in front of or below/behind the mirror plane) and offset value.

Pet. at 37 (emphases added).

As emphasized above, the '691 Patent states unambiguously that "[t]o create an image," each "pixel"/"voxel" within that image has "**a like height, H_{voxel} ... and [a cone angle] offset value**" (singular). This important disclosure makes clear that there is an "offset value" for an image, so that all pixels/voxels in given image are "directed to a viewer's eyes." *Id.* Element [1f] claims this feature and recites that "the cone angle offsets are selected... **whereby *only one of the images is observable at a time by a viewer.***" Petition, 43-45. 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 PO'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.

Other citations to the specification for this limitation that the Board overlooked include 24:63-25:2 (Fig. 20), 22:39-42 (Figs. 16A-16B), and 23:57-62 (Fig.

17), which were all cited to explain how the cone angle offset was defined in the specification. Pet., 41. These sections all disclose single cone angle offsets assigned to images (*i.e.*, pixels of the same image have the same cone angle offset), and none disclose different cone angle offsets for each pixel within the same image.

For example, the cited Fig. 17 description (23:57-62) explicitly states that “voxel-providing micro mirrors” of image 1721 have “a first cone angle offset (such as with a ‘0’ offset)” (*i.e.*, a single cone angle offset for all pixels/voxels in the same image):

FIG. 17 illustrates a top view (as may be seen by a viewer) of a security element 1700 as it is reflecting light. The security element 1700 is configured such that **each cone angle offset can be seen at one time by the viewer**. Particularly, the security element 1700 includes a substrate 1710 upon which an array of micro mirrors 1712 is formed/mounted (as discussed above in more detail). **A first number of sets of voxel-providing micro mirrors are configured** (e.g., via their positions in the array and tilt angles) **to focus on voxels of a first frame/image 1721**, and the rays from these micro mirrors are configured with a first cone angle offset (such as with a “0” offset). When a viewer views the security element 1700 straight down or orthogonally, the image 1721 is visible via the reflected light from the micro mirror array 1712.

Ex. 1001 ('691 Patent), 23:51-65 (emphases added). The description of *a single cone angle offset* (*i.e.*, “a first cone angle offset (such as with a ‘0’ offset)”) *for all* pixels/voxels in the same image (image 1721) contradicts the Decision's

interpretation that there must be distinct cone angle offsets for all pixels in the same image. In this example, image 1721 has a “0” offset – meaning that “image 1721 is visible” “[w]hen a viewer views the security element 1700 straight down.” Ex. 1001 ('691 Patent), 23:57-65; Pet., 41; *see also* element [1f] (“wherein the cone angle offsets are selected... whereby only one of the images is observable at a time by a viewer”). However, the Decision’s interpretation paradoxically requires that only a single *pixel* of image 1721 would be visible when a viewer looks “straight down” (*i.e.*, at a “0” offset), meaning that image 1721 could never be “observable at a time by a viewer,” as required by element [1f].

3. The Board Misapprehended or Overlooked Explicit Statements in the File History in Support of the Proper Interpretation

PO 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):

Kaule fails to show “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” (again see Applicant’s Figure 21 illustrating *pixel sets with nine differing cone angle offsets each associated with one of nine differing images*).

Ex. 1003 (Hesselink Dec.), ¶62 (citing Ex. 1002, p. 100) (emphasis added). Figure 21 illustrates the nine differing cone angle offsets (one for each *image*):

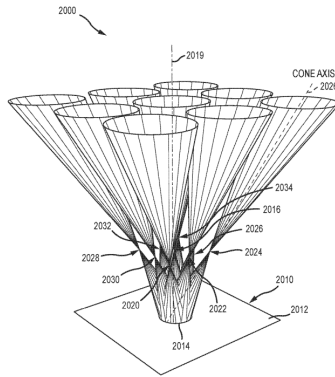


FIG. 21

Id., ¶¶59, 62. PO's express interpretation of the claim during prosecution to overcome the prior art is the same interpretation provided by Petitioner, and expressly contradicts the construction adopted in the Decision. The Decision erred in overlooking PO's own interpretation of the claim during prosecution. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc) ("the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention").

4. Other Parts of the Intrinsic Record Support Petitioners' Correct Interpretation

All other disclosures of a "cone angle offset" in the '691 Patent specification contradict the Decision's interpretation that there must be distinct cone angle offsets for each set of micromirrors in the same image, including:

- **Figure 17:** showing nine images having nine cone angle offsets, including the center image 1721 with "a first cone angle offset (such as with a '0' offset)," and "an additional eight frames/images" "at eight different cone angle offsets." *See* Ex. 1001 ('691 Patent), 23:51-24:13.

- **Figure 18:** showing nine images with “nine different cone angle offsets.” *See* Ex. 1001 ('691 Patent), 24:14-28.
- **Figure 19:** showing 16 images “at sixteen different cone angle offsets.” *See* Ex. 1001 ('691 Patent), 24:44-60.
- **Figures 21/22:** “Each of the voxels/ pixels 2016, 2020, 2022, 2024, 2026, 2028, 2030, 2032, and 2034 is from a different frame or image, and each of the nine frames or images is given or assigned a different/unique ‘offset’ value.” *See* Ex. 1001 ('691 Patent), 25:33-26:5.
- **Figures 23/24:** “FIGS. 23 and 24 show rings (or cones) 2050 to indicate generally where each of the nine images/frames is viewable due to their differing cone angle offsets.” *See* Ex. 1001 ('691 Patent), 26:6-37.

Ex. 1003 (Hesselink Dec.), ¶59. As discussed above, a single pixel/voxel is shown in FIGs. 16A-B along with an explanation that “to create the image” numerous pixels/voxels with the same “like height... and offset value.” *See, supra*, 8-10. The '691 Patent likewise explains that voxels/pixels 2016, 2020... 2034 (shown in FIGs. 20-24) are shown for each image “for ease of explanation, but it will be understood that each image/frame is displayed with numerous (100s to 1000s) of voxels/pixels of the image **with like cone angle offsets.**” Ex. 1001 ('691 Patent), 25:10-32; Petition, 39 (explaining that the '691 Patent and prior art figures represent images with one pixel instead of the many pixels for “ease of explanation”) (emphasis added).

In sum, the Board overlooked the numerous teachings in the '691 Patent disclosing cone angle offsets, including those explicitly cited in the Petition, describing

single cone angle offsets assigned to images (*i.e.*, pixels of the same image have the same cone angle offset). On the other hand, there is no disclosure in the '691 Patent requiring each set of micromirrors in the same image having different cone angle offsets. The Decision erred in overlooking the specification because “claims must be read in view of the specification, of which they are a part.” *Phillips*, 415 F.3d at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995) (en banc) (quotation marks omitted); *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004) (“In most cases, the best source for discerning the proper context of claim terms is the patent specification wherein the patent applicant describes the invention.”)).

B. The Petition Demonstrated The Disputed Limitation

The Decision acknowledges that Petitioners have a reasonable likelihood of prevailing were the claims are not misinterpreted. *See* Decision, 17 at lines 15-24. Indeed, the Petition explains the teachings of Fuhse262 satisfy the disputed claim language by “producing two images that are visible at different viewing angles” by “omitting mirrors” with certain normal values for each image. Petition, 37-38. This results in “each image ha[ving] a distinct range of normal values.” Petition, 41.

IV. CONCLUSION

For the reasons above, Petitioners respectfully requests that the Board grant this request for rehearing and institute trial.

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CERTIFICATE OF SERVICE

The undersigned certifies that on December 24, 2024 a true and correct copy of the foregoing **PETITIONERS' REQUEST FOR REHEARING UNDER 37 C.F.R. § 42.71(d)** was served by electronic mail on Patent Owner's counsel of record listed below, pursuant to its Mandatory Notices.

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