

Petitioner's Request for Rehearing of Denial of Institution

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

CELLULAR SOUTH, INC.,
Patent Owner.

Case IPR2025-00877
Patent 11,126,853 B2

**PETITIONER'S REQUEST FOR REHEARING OF
DENIAL OF INSTITUTION (37 CFR § 42.71(d)(2))**

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I. INTRODUCTION

Petitioner Google LLC respectfully requests rehearing of the Decision Denying Institution of *Inter Partes* Review (Paper 11 (“Decision”)). The Decision made several clear legal and factual errors, discussed in more detail below, that individually and collectively warrant rehearing:

First, the Petition and Patent Owner Preliminary Response (“POPR”) put the meaning of the claim term “**fractal**” in controversy. As the Board acknowledged, it is required to construe terms that are in controversy. (Decision at 6 (citing *Realtime, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019)).) The Board therefore should have construed “fractal” and considered the merits of the Petition’s analysis of claim 1[c] based on the Zhao prior art reference alone—it didn’t.

Second, the Board erred in its unduly narrow interpretation of the claim phrase “**based on landmarks**” to require a search for or express identification of landmarks. (Decision at 11.) The Board’s interpretation improperly imports a limitation into the claim and is wrong as a matter of law. *See, e.g., Sorrell Holdings, LLC v. Infinity Headwear & Apparel, LLC*, No. 2022-1964, 2024 WL 413432, at *2 (Fed. Cir. Feb. 5, 2024) (“[W]e have repeatedly held that courts should not read limitations from the specification into the claims”) (citing *Liebel-Flarsheim Company v. Medrad, Inc.*, 358 F. 3d 898, 904 (Fed. Cir. 2004)).

Third, the Board compounded that error by misunderstanding the combined

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disclosures of Zhao and Kouzani described in the Petition. The combination of Zhao and Kouzani renders obvious the claimed “**fractal [that] includes a representation of the object based on landmarks associated with the object**” even under the Board’s incorrect interpretation. This is because Zhao describes identifying facial landmarks in connection with both detecting and recognizing a face in an image, and Kouzani describes using fractals to generate an accurate representation of a detected face. (Petition at 30-31, 37-38, 42.) Under the proposed combination, therefore, fractal generation relies on facial detection using facial feature identification. (Petition at 44 (“The combination would have predictably resulted in *Zhao’s system for facial detection* and recognition in which recognition was performed by processes that compared a *fractal of a detected facial image against a fractal model, and that updated the fractal model with the facial image.*”) (emphasis added).)

II. THE BOARD ERRED AS A MATTER OF LAW WHEN IT DID NOT CONSTRUE THE TERM “FRACTAL” AND DID NOT CONSIDER THE PETITION’S ANALYSIS OF CLAIM ELEMENT 1[C] BASED ON ZHAO ALONE

There was a clear controversy over the meaning of the term “**fractal**” as used in the ’853 patent based on the Petition’s alternative argument that Zhao alone discloses and renders obvious claim element 1[c]. Petitioner offered two alternative interpretations of “fractal”: (1) a shape or polygon, or a shape or polygon used to identify objects or faces; and (2) a fragmented geometric shape that can be subdivided in parts, each of which is a reduced-size copy of the whole (i.e., self-

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similarity repeated indefinitely at different scales). (Petition at 40-41.) The main difference between Petitioner's two interpretations is that the first interpretation does not require subdivided parts that are repeated at different scales. Petitioner argued that Zhao alone disclosed and rendered obvious the claimed "fractal" at least under this first interpretation. (Petition at 39-40 (citing EX1002, ¶131; Zhao, ¶0058 (describing facial features such as "eyes, noses, mouths, ears, chins, etc., of a face in an image, as well as the corners, curves, color, overall shape, etc., associated with each feature").) Petitioner's second interpretation is consistent with the ordinary understanding of "fractal."

Patent Owner, in response, put forth "plain and ordinary meaning" without addressing the merits of Petitioner's Zhao-only mapping. (POPR at 18 n.1.) Patent Owner did not elaborate on what the "plain and ordinary meaning" of "fractal" actually is. But as the Decision acknowledged, Patent Owner had argued previously that a construction of "fractal" involving self-repeating patterns at different scales (e.g., similar to a Sierpinski triangle) "cannot be correct." (Decision at 8 (quoting EX1017 at 007).) In other words, Patent Owner had previously argued that Petitioner's second, ordinary understanding interpretation was wrong. Patent Owner argued that, instead, "[t]he '853 Patent uses the term 'fractal' approximately 58 times, but never in the context of geometric 'repeating patterns'" (EX1017 at 007)—the key difference between Petitioner's alternative interpretations. And notably,

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Patent Owner did *not* argue that its own “plain and ordinary meaning” would exclude Petitioner’s first interpretation—i.e., a shape or polygon, or a shape or polygon used to identify objects or faces. (*See* POPR at 18 n.1.)

Therefore, at a minimum, there was a claim construction dispute regarding the plain and ordinary meaning of “fractal” that the Board was required to resolve with an actual construction. *See O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008) (“[When] the ‘ordinary’ meaning of a term does not resolve the parties’ dispute, [] claim construction requires the court to determine what claim scope is appropriate in the context of the patents-in-suit.”).) But instead, the Board concluded only that “we do not construe ‘fractal’ to mean ‘one or more shapes’ in the absence of a reasoned analysis supporting such a position.” (Decision at 9; *see also id.* at 6 (“We do not need to construe any claim terms to reach a decision in this proceeding.”).) Simply concluding what “fractal” *might not* mean was legal error. For one thing, Petitioner *did* provide analysis for that construction—Patent Owner’s own. (Petition at 40 (citing EX10107 at 007).) In any event, “[w]hen the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.” *O2 Micro*, 521 F.3d at 1362. The Board’s negative, partial construction did not. The Board should have provided an actual construction specifying the scope of “fractal” in order to resolve the parties’ dispute and to properly evaluate whether Zhao’s disclosure of an object model comprising facial

features such as “eyes, noses, mouths, ears, chins, etc., of a face in an image, as well as the corners, curves, color, overall shape, etc., associated with each feature” discloses a “fractal.” (*See* Petition at 39-40 (citing EX1002, ¶131; Zhao, ¶0058).)

III. THE BOARD'S CONSTRUCTION OF THE CLAIMED FRACTAL THAT “INCLUDES A REPRESENTATION OF THE OBJECT BASED ON LANDMARKS ASSOCIATED WITH THE OBJECT” IS WRONG AS A MATTER OF LAW

Turning to the combination with Kouzani, the Decision correctly observed that “claim 1 is not broadly claiming any fractal, but rather one that is ‘based on landmarks.’” (Decision at 11.) But the Decision erred as a matter of law by interpreting the phrase “*based on* landmarks” too narrowly, describing it in connection with “looking for particular landmarks in the image.” (Decision at 11.) There is nothing about the phrase “based on” that requires a search for, or express identification or recognition of, landmarks. Claim 1 could have been drafted to include that sort of requirement, but it wasn't. The phrase “based on” more broadly means, for example, taking into consideration or dependent on. *See, e.g., IAP Intermodal, LLC v. Northwest Airlines Corp.*, C.A. No. 2:04-cv-65, 2005 WL 6217423, at *10 (E.D. Tex. Sept. 7, 2005) (construing “based on” as “taking into consideration”); *Varentec, Inc. v. GridCo, Inc.*, C.A. No. 16-217-RGA, 2017 WL 3731243, at *9 (D. Del. Aug. 30, 2017) (construing “based on” as “dependent on”). Thus, if landmarks are present in the image, then they can be taken into consideration without having to expressly identify them. For instance, because the eyes, nose,

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mouth and so on are distinguishing features of a face, any model, whether fractal or not, that attempts to accurately represent a particular face would be based on (i.e., dependent on) those features by virtue of their presence in an image. The '853 patent itself in fact repeatedly uses the phrase "based on" consistent with that broader ordinary understanding, for example:

- "[T]he demultiplexer nodes can generate a confidence score *based on* a comparison of the image and the fractal." ('853, 1:63-65.)
- "The method can include generating a content-rich video *based on* the video and the metadata." ('853, 2:28-30.)
- "[D]eriving topics from the audio file *based on* natural language processing..." ('853, 3:10-11.)
- "The machine learning can include ensemble learning *based on* the concatenation of several classifiers, i.e. cascade classifiers." ('853, 8:48-51.)
- "Recognition can be improved *based on* near-frame proximity." ('853, 21:35-36.)

The Decision cites the '853 patent at 13:53-57, which ambiguously describes "utiliz[ing] facial recognition algorithms to identify facial fractals by extracting landmarks from an image of the subject's face." (Decision at 11 (citing '853, 13:53-57).) The passage does not describe identifying landmarks; even if it did, it does not require an identification apart from a prerequisite identification related to face detection. In any event, even if the passage both clearly required express identification of landmarks and clearly related to claim element 1[c] (and neither is

clear), it would be improper to use it to read a narrow limitation into the claim’s broad “based on” plain language. *See, e.g., Sorrell Holdings*, 2024 WL 413432, at *2 (“[W]e have repeatedly held that courts should not read limitations from the specification into the claims”) (citing *Liebel-Flarsheim*, 358 F. 3d at 904).

IV. THE BOARD’S CONCLUSION THAT ZHAO AND KOUZANI DO NOT RENDER OBVIOUS A FRACTAL THAT “INCLUDES A REPRESENTATION OF THE OBJECT BASED ON LANDMARKS ASSOCIATED WITH THE OBJECT” WAS CLEARLY ERRONEOUS

The Board’s construction of a fractal “based on landmarks” is wrong, and the Board compounded that error by misunderstanding the combined disclosures of Zhao and Kouzani. Even under the Board’s incorrect construction, Petition showed that the combination of Zhao and Kouzani renders obvious the claimed “**fractal [that] includes a representation of the object based on landmarks associated with the object.**”

As to Zhao, the Petition explained that Zhao describes identifying facial features—i.e., “**landmarks**”—in connection with both face detection and face recognition. For face detection, the Petition cited Zhao’s description that “[o]nce the video has been retrieved, the video undergoes a process of *detection of objects and extraction of object features* from video images (processes 210, 220).” (Petition at 30-31 (emphasis added).) For a face object, “features include eyes, noses, mouths, ears, chins, etc., of a face in an image, as well as the corners, curves, color, overall shape, etc., associated with each feature.” (Petition at 37-38 (quoting Zhao, ¶0058);

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see also id. at 49 (citing Zhao, ¶0066).)

For Kouzani, the Petition noted Kouzani's description that "the input face image is transformed and its fractal model is then compared against a database of fractal models of known faces." (Petition at 42 (quoting Kouzani at 007).) As part of that process, Kouzani (like Zhao) further discloses that those faces are first detected by the system in order to later perform recognition. (Kouzani at 007 ("The input to the face recognition system are centered *face images detected from an input image facial detection system* [7]-[8]. The transformation is carried out once for all the face images in the database.") (emphasis added).) As discussed above, under the combination, the face detection would be performed by Zhao, which identifies facial features. Therefore, as the Petition explained, "[t]he combination would have predictably resulted in *Zhao's system for facial detection* and recognition in which recognition was performed by processes that compared a *fractal of a **detected** facial image against a fractal model, and that updated the fractal model with the facial image.*" (Petition at 44 (emphasis added).) Therefore, Zhao and Kouzani in combination teach fractal generation that relies on facial detection using facial feature identification, thereby rendering the claim obvious even under the Board's unduly narrow interpretation of "based on landmarks."

The Board rejected the combination because, according to the Board, "[t]he block-based system of Kouzani is based on abstract, repeated patterns of pixels,

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without regard to what the pixels represent.” (Decision at 11.) But that misunderstands Kouzani and its role in the proposed combination. Kouzani discloses the claimed fractal “based on landmarks” under a correct claim interpretation because, simply put, Kouzani’s fractal process captures the distinguishing features of a face—i.e., its landmarks. This should be apparent because the goal of Kouzani is effective and efficient facial recognition, which cannot be accomplished without preserving the distinguishing features of the face. (See Petition at 42 (quoting Kouzani at 009).) For this reason, there should be no doubt that facial landmarks are preserved in the fractal. Figure 5 of Kouzani, which shows a reconstructed image of face from a fractal, confirms it:

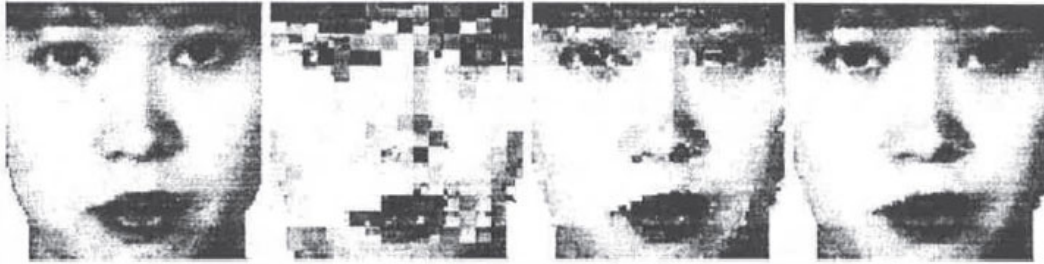


Fig. 5. Fractal decomposition of a sample face image. a) Original image, b) first, c) third, d) fifth iterates of reconstructed image for 8x8 range blocks & 16x16 domain blocks.

(Kouzani at 0011.) Consequently, as the Petition explained, “[u]nder the proposed combination with Kouzani, these geometric features [e.g., eye, nose, chin shapes] would have been embodied in fractal representations.” (Petition at 48.)

And even under the Board’s incorrect claim interpretation, as explained, under the proposed combination, Kouzani’s fractal generation relies on Zhao’s facial detection, which uses facial feature identification and extraction. The combination

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therefore discloses both (1) fractal generation that involves “looking for particular landmarks in the image” (Decision at 11) as well as (2) “utiliz[ing] facial recognition algorithms to identify facial fractals by extracting landmarks from an image of the subject's face” (Decision at 11 (citing '853, 13:53-57)). Claim element 1[c] is therefore obvious even under the Board's incorrect interpretation.

V. CONCLUSION

Petitioner respectfully requests that rehearing be granted and IPR instituted.

Dated: December 17, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. § 42.6(e), that a complete copy of the attached **PETITIONER'S REQUEST FOR REHEARING OF DENIAL OF INSTITUTION (37 CFR § 42.71(d)(2))** was served on December 17, 2025, upon the parties via electronic mail:

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