

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROOFR, INC.,
Petitioner

v.

PICTOMETRY INTERNATIONAL CORP.,
Patent Owner

Case IPR2023-00436
U.S. Patent No. 9,183,538

PATENT OWNER'S SUR-REPLY

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I. INTRODUCTION

The '538 patent provides novel and nonobvious claims for using aerial images to quickly and efficiently make roof measurement estimations. Presumably appreciating this fact and recognizing the shortcomings in its Petition, Petitioner's Reply presents a desperate and unsuccessful attempt to rehabilitate—often impermissibly—a fatally-flawed Petition. The Petition is supported by an expert declaration filled with conclusory statements from an alleged expert confused by the most basic roofing measurement concepts. The Petition and Petitioner Reply repeat the same fundamental error of attempting to fill gaps in the art with unsubstantiated expert opinions that are often at odds with statements within the art.

For example, a primary dispute in this case centers on the “predominant pitch” limitations recited in the independent claims. Petitioner concedes that none of the Petition's prior art discloses estimating roofing area based on a “predominant pitch.” Reply, 5. Petitioner attempts to fill this gaping hole by relying on the conclusory testimony of its expert, asserting that doing so “allows for a more streamlined, yet accurate, estimation.” Reply, 5. But Petitioner ignores the express teachings of its own prior art, Bailey, which contradicts Petitioner's expert and counsels not to use a “predominant pitch” to estimate roofing area.

Petitioner's approach flies in the face of case law and precedent. Namely,

the Federal Circuit and the Board have repeatedly found unsupported expert testimony insufficient to fill gaps in the prior art and supply a missing claim limitation. *See DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367, 1374-1377 (Fed. Cir. 2018) (reliance “on ordinary creativity as a wholesale substitute for reasoned analysis and evidentiary support” “when dealing with a limitation missing from the prior art references specified” is “not sufficient”); *Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00984, Paper 9 at 22-23 (P.T.A.B. Nov. 19, 2021) (“Petitioner improperly fills a gap in its mapping to a claim limitation based on this attorney argument and unsupported testimony”); *Alcon Inc. v. AMO Development, LLC*, IPR2021-00862, Paper 49 at 26 (P.T.A.B. Dec. 12, 2022) (finding expert testimony insufficient to supply a missing limitation “absent some evidentiary support beyond [the experts’] bare opinions”). The result should be the same here.

Petitioner has also not met its burden to demonstrate that either Pershing-789 or Kennedy teaches determining the footprint of a roof and estimating roofing area based on that footprint, as required by the independent claims. Under its own interpretation of “footprint,” Petitioner fails to show that the prior art teaches these limitations, while impermissibly introducing new arguments in its Reply that contradict arguments in its Petition.

For dependent claims 11 and 18, it’s more of the same. Petitioner does not

dispute that none of the prior art presented in the Petition teaches determining a “predominant pitch” by taking a weighted average of individual pitch values or pitch factors, as the claims require. Again, the sum total of Petitioner’s evidence to fill gaps in the art is the bare testimony of its expert opining that “a POSITA would have been familiar with the use of weighted averages generally to determine an average representative of a range of values.” Reply, 15. That a POSITA would have been generally familiar with the mathematical concept of a weighted average is not sufficient to establish obviousness of claims 11 and 18.

All of the impermissible gap filling by Petitioner’s expert is exacerbated by his lack of relevant experience, and numerous, significant shortcomings including repeatedly confusing basic roofing concepts imperative to the technology at issue. As noted in the Patent Owner Response, the Board should accord little to no weight to Mr. Cummings’s testimony.

II. PETITIONER FAILS TO SHOW THAT BAILEY, IN COMBINATION WITH EITHER PERSHING-789 OR KENNEDY, RENDERS OBVIOUS THE CLAIMED “PREDOMINANT PITCH” LIMITATIONS.

A. Independent Claims 1, 13, and 14: None of the art applied in the Petition discloses or suggests the “predominant pitch” limitations.

Petitioner attempts to cull together disparate teachings of the prior art to fit the ’538 patent claims. But, as explained in the POR, Petitioner’s proffered theories and motivations ignore the express teachings found in Bailey—

Petitioner’s own prior art. POR, 9-10. Although Bailey discloses a “predominant slope” for purposes of data collection, Bailey teaches that the predominant slope is not used for determining “an estimated roofing area of the roof,” as the claims require—regardless of whether a roof has one or multiple sections. Additionally, none of the theories presented in the Petition demonstrate that the prior art teaches determining a predominant pitch or slope “by analyzing one or more image[s] showing the roof.” The Board should therefore find the independent claims patentable.

1. Bailey instructs not to use the “predominant slope” for estimating roofing area.

Petitioner concedes that Bailey does not literally “teach that its predominant slope is used to calculate the area of a roof.” Reply, 5. Nevertheless, Petitioner faults PO for “fail[ing] to credit the creativity of [a] POSITA and common sense.” Reply, 5-6. Bailey’s express teachings underscore that Petitioner’s proposed combinations are conclusory and based on impermissible hindsight: Despite its disclosure of a “predominant slope” for purposes of data collection, Bailey expressly teaches *not* to use that predominant slope to estimate roofing area. EX1010, 17, 22. Petitioner’s reliance on “creativity of a POSITA and common sense,” Reply, 5, does not fill the gaps in the prior art. *See DSS*, 885 F.3d at 1374-1377; CTPG, 36 (“expert testimony cannot take the place of disclosure from patents or printed publications.”).

Specifically, Petitioner points to Bailey’s “predominant slope of the roof section” to meet the claimed “predominant pitch,” Pet., 31 (citing EX1010, 17), which appears as part of Bailey’s “Roof Section Identification Worksheet,” EX1010, 12, 15. Bailey explains, however, that its “predominant slope,” EX1010, 17, is *not* used for “determin[ing] an estimated roofing area of the roof,” as the claims require. Rather, as explained in the POR, Bailey’s predominant slope is simply part of standard “data collection,” and its purpose is to “simplif[y] the task of collecting the inventory data for a roof section and ensure[] uniformity in reporting terminology.” EX1010, 11-12; POR, 14. None of the prior art provides any teaching or suggestion to use a predominant slope to estimate roofing area.

To be sure, Bailey’s “Roof Section Identification Worksheet” also includes a roof section “area”:

ROOF SECTION IDENTIFICATION WORKSHEET			AGENCY/INST.: <i>Example</i>	
DATE: <i>Jul/ 1999</i>	BLDG. NO.: <i>1253</i>	SECTION ID: <i>A</i>	AREA: <i>2813</i>	SF
OCCUPANCY:	YEAR ORIG. CONST.: _____		YEAR LAST REPLACED: _____	

EX1010, 14 (excerpt, annotated).

Importantly, Bailey explains that this “roof section area” is calculated using the procedure outlined in Appendix B—not by using the predominant slope:

The *roof section area* used in the condition rating procedure is *the actual exposed area* — not the projected horizontal area. The latter area can be determined from a roof section plan having horizontal

dimensions and then can be *converted to the actual area by adjusting for roof slope (see Appendix B)*.

EX1010, 22 (emphasis added).

There is no dispute that the roof estimation procedure outlined in Bailey’s Appendix B does *not* use a predominant slope to estimate roofing area. POR, 12-16. Petitioner’s own expert, Mr. Cummings, confirms that the procedure in Bailey’s Appendix B “does not use predominant slope as part of [its] calculation.” EX2032, 63:19-64:14. And despite relying specifically on Bailey’s Appendix B in its Petition, Pet., 34 (citing EX1010, 134-36), Petitioner agrees, arguing that the procedure outlined in Bailey’s Appendix B is “an alternative” to “the use of predominant slope.” Reply, 7; *see also* Reply, 14 (“Appendix B [of Bailey] is not instructive as to how Bailey’s predominant slope would be determined.”).

Petitioner does not explain why a POSITA would have ignored Bailey’s express teaching to use the procedure outlined in Appendix B for calculation of “roof section area.” EX1010, 22. Indeed, both Petitioner and Mr. Cummings state with respect to Bailey that “[a] POSITA would have been highly motivated to consider the teachings of such a well-respected guide.” Pet., 24; EX1003, ¶46. Yet, Petitioner contends that a POSITA would have ignored those teachings in favor of a procedure found only in the ’538 patent claims. Such a conclusion is not rooted in the prior art or any supporting evidence—it is improperly derived from the

language of the '538 patent claims. *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011) (“Care must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references”); *Cheese Sys., Inc. v. Tetra Pak Cheese & Powder Sys., Inc.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013) (“Obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention.”) (quotation omitted).

Petitioner further argues that “PO does not provide any analysis under the relevant law, and fails to identify any ‘clear discouragement’ in Bailey from using a predominant slope to estimate roofing area.” Reply, 7. The law does not require “clear discouragement,” as Petitioner suggests. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, . . . would be led in a direction divergent from the path that was taken by the applicant.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018). That is the case here. Petitioner’s own expert opined that “[a] POSITA would have been highly motivated to consider the teachings of such a well-respected guide” like Bailey. EX1003, ¶46. Thus, by Petitioner’s expert’s own admission, a POSITA would have been led to follow Bailey’s outlined procedure, which does not involve use of a “predominant pitch” to estimate roofing area. POR, 12-16.

This conclusion is not altered by Petitioner’s contention that “Bailey’s

predominant slope simplifies the calculation of roof estimates, and allows for a more streamlined, yet accurate, estimation.” Reply, 5. Neither Petitioner nor its expert explain how use of Bailey’s “predominant slope” would simplify calculations or increase accuracy compared with Bailey’s already-disclosed estimation procedure in Appendix B. *See* Pet., 20-22¹; EX1003, ¶¶43-44.

Petitioner, in fact, confirms that use of a predominant slope would *not* simplify Bailey’s procedure outlined in Appendix B: “[M]easuring individual slopes is necessary even if the predominant pitch is used to estimate the roof area because the predominant pitch is determined from the individual slopes of different portions of the roof.” Reply, 7-8 (emphasis added). Thus, Petitioner provides no logical reason why use of Bailey’s “predominant slope” would “streamline[]” the procedure outlined in Bailey’s Appendix B—both techniques still require measurement of individual roof slopes. Reply, 7-8.

Accordingly, Petitioner’s unsupported and conclusory contentions do not establish that a POSITA would have strayed from Bailey’s outlined procedure for estimating roofing area. *Fanduel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1341 (Fed. Cir. 2020) (“[T]he burden of proving invalidity in an IPR remains on

¹ Of note, the Petition does not even cite its expert for support of this contention. Pet., 20-22.

the petitioner throughout the proceeding.”); *Finnigan Corp. v. Int’l Trade Comm’n*, 180 F.3d 1354, 1366 (Fed. Cir. 1999) (“The law has long looked with disfavor upon invalidating patents on the basis of mere testimonial evidence absent other evidence that corroborates that testimony.”).

2. That Bailey discloses an example roof with a single section does not indicate that a POSITA would have used Bailey’s “predominant slope” to estimate roofing area.

Petitioner argues that “Bailey expressly teaches a ‘roof section’ may comprise the entire roof.” Reply, 3 (citing EX1010, 10). Petitioner misses the point. As explained above, despite its disclosure of a “predominant slope” for purposes of data collection, Bailey expressly teaches *not* to use that predominant slope to estimate roofing area. EX1010, 17, 22. Instead, Bailey instructs to use the procedure outlined in Appendix B for determining “roof section area.” *Id.*; POR, 15-16. That Bailey discloses an example roof with a single section does not indicate that a POSITA would have used Bailey’s predominant slope to estimate roofing area in lieu of the procedure outlined in Appendix B. POR, 12-17.

3. Petitioner fails to demonstrate that Bailey, alone or in combination with Pershing-789 or Kennedy, renders obvious determining a predominant pitch by analyzing one or more images showing the roof.

Petitioner argues that “Bailey need not separately disclose determining the predominant pitch by analyzing an image of a roof” because “the Petition relies on Pershing-789 (in Grounds 1-2) and Kennedy (in Grounds 3-4) for their remote

measurement systems that determine roof measurements (including pitch) from aerial images of roofs.” Reply, 10. Petitioner further argues, for the first time, “[a]pplying Bailey’s teachings, *the slope information determined from the aerial images would be used—instead of slope information from a roof plan—to compute the predominant pitch.*” Reply, 12 (emphasis added). Petitioner never makes this argument in its Petition.

Particularly, the Petition alleges that “Pershing-789 broadly discloses a calculation of pitch.” Pet., 30; *see also* Pet., 65 (“Kennedy discloses that the measuring tool can be used to determine the pitch of a roof.”). The Petition then solely relies on Bailey for *both* its disclosure and calculation of a “predominant slope”—without reference to any pitch values determined by Pershing-789 or Kennedy. Pet., 31-34, 66. But, as explained in the POR and conceded by Petitioner’s expert, Bailey provides no guidance on how to determine its “predominant slope.” POR, 17-19; EX2032, 54:17-55:4, 57:12-58:5.

The POR, therefore, pointed out that Bailey does not disclose or suggest determining a predominant pitch of a roof “by analyzing one or more image[s] showing the roof,” as recited in independent claims 1 and 13. POR, 17-19. It is Petitioner’s burden to prove the theories presented in its Petition, and Petitioner has not shown that Bailey, alone or in combination with Pershing-789 or Kennedy, renders obvious the claimed determination of a predominant pitch of a roof “by

analyzing one or more image[s] showing the roof.” *Fanduel*, 966 F.3d at 1341; *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“[T]he expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute.”).

Nevertheless, even accepting Petitioner’s reply arguments, Petitioner provides no reason to stray from Bailey’s procedure for calculating roofing area, which does not use a predominant slope. As Petitioner contends, “Pershing-789 and Kennedy already determine the slope or pitch for individual portions of a roof by analyzing an image of the roof.” Reply, 11. Petitioner has not explained why use of a predominant slope would “simplif[y]” or “streamline[.]” the determination of estimated roofing area when individual slopes are already determined in Pershing-789’s and Kennedy’s systems. *See* Section II.A.1.

B. Dependent Claims 11 and 18: None of the art applied in the Petition discloses or suggests determining a predominant pitch by taking an average of individual pitch values or pitch factors.

It is undisputed that none of the prior art presented in the Petition teaches determining a “predominant pitch” by taking a weighted average of individual pitch values or pitch factors, as claims 11 and 18 require. Instead, Petitioner seeks to supply these missing elements through the testimony of Mr. Cummings. Reply, 14-17. As explained in the POR, Petitioner’s reliance on Mr. Cummings fails for at least three reasons: (1) A POSITA would not have understood Bailey’s

“predominant slope” to refer to a weighted average of roof pitches, as Petitioner now concedes; (2) Mr. Cummings provides no evidence that it was well known to use a weighted average of roof pitches for calculating roofing area; and (3) Mr. Cummings confirms that Bailey’s pitch factor table is not used to determine Bailey’s “predominant slope.” The Board should, again, reject Petitioner’s hindsight-driven analysis.

1. Bailey does not disclose that its “predominant slope” is a weighted average of roof pitches.

The Petition expressly contends that “a POSITA would understand that Bailey’s disclosure of a single ‘predominant’ or ‘primary’ pitch value *is a weighted average pitch value.*” Pet., 51 (emphasis added); *see also* Pet., 21 (“Bailey expressly teaches finding the ‘predominant slope [*i.e.*, pitch]’—which Mr. Cummings explains *is a weighted average of roof pitches.*”) (emphasis added); EX1003, ¶44 (asserting the same). Petitioner now concedes that it “does not contend that the term ‘predominant pitch’ is a term of art.” Reply, 14. Mr. Cummings similarly conceded in deposition that Bailey does not describe how its predominant slope is determined. EX2032, 54:17-55:4, 56:4-58:11; POR, 18-19, 21. Thus, Petitioner provides no basis to assert that a POSITA would have understood Bailey’s predominant slope to be “a weighted average pitch value.” Pet., 51.

As Patent Owner’s expert, Mr. Kestner, explained, a POSITA would have

understood “predominant pitch” (or “predominant slope” as in Bailey) to simply mean the single pitch that covers the majority of the area of the roof (or roof section in relation to Bailey)—not a weighted average pitch value. EX2031, ¶¶67-69; POR, 24-26. Petitioner does not dispute Mr. Kestner’s testimony. Reply, 15.

2. Mr. Cummings provides no evidence that it was well known to use a weighted average of roof pitches for calculating roofing area.

Petitioner argues that the lack of disclosure in the Petition’s prior art is immaterial because “Mr. Cummings explains that the type of measurement that the ’538 patent refers to as a ‘predominant pitch’ has been used for decades.” Reply, 14. Again, neither Petitioner nor Mr. Cummings provides any evidence to support this assertion.

In his declaration, Mr. Cummings states, with no support, “calculating a predominant pitch, which is merely the computation of a weighted average of pitch values of a roof, has been used in the art *for decades*.” EX1003, ¶46 (emphasis in original). As identified in the POR, if such an assertion were true, Petitioner could have provided corroborating evidence. POR, 45. It did not, and as a result, Mr. Cummings’ testimony adds nothing to the obviousness inquiry. 37 C.F.R.

§ 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”); *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019) (“This court’s opinions

have repeatedly recognized that conclusory expert testimony is inadequate to support an obviousness determination”).

Indeed, Mr. Kestner explains that it was *not* “standard practice in the industry to use a weighted average of pitch values of a roof.” EX2031, ¶¶59-70. Petitioner does not dispute this testimony. As Mr. Kestner opines, “[t]o the extent a POSITA desired to use a single ‘predominant slope’ for the entire roof, a POSITA would have been motivated to *use the slope that covered the majority of the roof, rather than an average of multiple slopes,*” which increases the speed of estimation and requires fewer field measurements. EX2031, ¶¶67-68 (emphasis added); POR, 24.

In response, Petitioner asserts that “a POSITA would have been motivated to use a weighted average—as opposed to merely using the slope that appears most frequently—because the resulting pitch value (and any area estimations based on that pitch value) would be more accurate, based on the true pitch and area of the roof.” Reply, 16 (citing EX1003, ¶97). But, as Mr. Kestner explains, a POSITA would have had no reason to use a weighted average pitch value in view of Bailey’s teachings—Bailey already discloses that “a fairly accurate measurement of roofing area can be performed *without* calculating an average of pitches or pitch values.” EX2031, ¶70 (emphasis added). Petitioner does not grapple with Bailey’s already-disclosed procedure for estimating roofing area or explain how using a

weighted average pitch value would improve the accuracy of Bailey's procedure.

Additionally, Petitioner asserts that "a POSITA would have been familiar with the well-known technique of using weighted averages to determine a single value representative of a range," and that "a weighted average is 'more representative of the true mean than that obtained by straight averaging.'" Reply, 14-15 (citing EX1013, 605). That a weighted average is more representative of a true mean than a straight average is of no moment. Petitioner has not established that a POSITA would have sought to use an average pitch value in the first place. Again, Petitioner ignores that Bailey teaches an accurate procedure for calculating roofing area *without* calculating an average of pitches or pitch values. EX2031, ¶70; EX1010, 22, 134-36. That a POSITA would have generally been familiar with the mathematical concept of a weighted average does not counsel that its use for determining roofing area would have been obvious.

At bottom, Petitioner points to nothing in the record showing that weighted average pitch values or pitch factors were ever used to estimate roofing area prior to the '538 patent, or that such use would improve the accuracy of the prior art's teachings. Petitioner thus cannot establish that the prior art renders obvious claims 11 and 18. *See DSS*, 885 F.3d at 1374-1377; *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001) ("[T]he Board must point to some concrete evidence in the record in support of [core factual] findings.").

3. Bailey’s pitch factor table is not used to determine Bailey’s “predominant slope.”

For claim 18, Petitioner further argues that “PO again misunderstands how the Petition relies on Bailey’s pitch factor table.” Reply, 16. Not so. With respect to claim 18, the Petition expressly states that Baily “teaches using the same ‘pitch factors’ shown in Figure 7 of the ’538 patent to *calculate area*.” Pet., 60 (citing EX1010, 137) (emphasis added). Petitioner then concludes, with no explanation, that Bailey renders obvious the language of claim 18. *Id.* Petitioner’s expert, Mr. Cummings, repeats the Petition *verbatim*, providing no additional evidence or analysis. EX1003, ¶127.

Claim 18, however, does not recite use of pitch factors to calculate *area*. Rather, claim 18 recites, “wherein the *predominant pitch* is based on a weighted average of individual pitch factors for two or more portions of the roof.” POR, 29-31. During deposition, Mr. Cummings confirmed that Bailey’s pitch factor table is not used to determine a predominant pitch: “[T]his table doesn't determine pitch. Once you determine the pitch in the field, or off the drawings or whatever, then you can apply this factor to wherever the pitch had been determined.” EX2032, 66:21-67:3 (emphasis added).

Petitioner points to nothing in Bailey, Pershing-789, or Kennedy teaching the use of slope factors to calculate a predominant pitch. Pet., 60; EX1003, ¶127. Nor does Petitioner explain why a POSITA would have used Bailey’s pitch factor

table to compute a predominant pitch, let alone take a weighted average of individual pitch factors. Pet., 60; EX1003, ¶127; 37 C.F.R. § 42.104(b)(4) (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”). Petitioner cannot meet its burden with respect to claim 18 simply by pointing to Bailey’s table of pitch factors. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”).

III. PETITIONER FAILS TO SHOW THAT EITHER PERSHING-789 OR KENNEDY DETERMINES A ROOF’S FOOTPRINT.

As noted above, “the burden of proving invalidity in an IPR remains on the petitioner throughout the proceeding.” *Fanduel*, 966 F.3d at 1341; *see also In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016). Petitioner has not met that burden here.

In its reply, Petitioner asserts, “PO’s argument that Pershing-789 does not disclose determining a footprint of a roof relies on an erroneous construction of ‘footprint’ as requiring the display of a horizontal area measurement.” Reply 17; *see also* Reply, 22 (similar argument, discussing Kennedy). But, this construction was proposed by Petitioner in its Petition—not by Patent Owner: “The ’538 patent teaches that the ‘footprint may provide a two-dimensional boundary and/or outline of the roof.’ Ex. 1001 at 12:8-9. *Thus, the ‘footprint’ of the roof includes at least*

its area.” Pet., 28 (emphasis added). And Petitioner has not met its burden to show the claimed footprint under its *own* interpretation of the term. POR, 32-38. In an IPR, “the *petitioner’s* contentions . . . define the scope of the litigation all the way from institution through to conclusion.” *Fanduel*, 966 F.3d at 1342 (quoting *SAS Inst., Inc. v. ComplementSoft, LLC*, 138 S. Ct. 1348, 1357 (2018)) (emphasis in original).

Petitioner faults PO for not explaining how Pershing-789 or Kennedy fails to disclose the claimed footprint. *See* Reply, 20, 24. This is not the correct inquiry. Here, as in *Magnum Oil*, the burden is *not* on PO to prove patentability of the claims, but rather the burden is on Petitioner to prove the unpatentability thereof. *Magnum Oil*, 829 F.3d at 1376 (“the notion of burden-shifting is inapposite because the patentee’s position is that the patent challenger failed to meet *its* burden of proving obviousness.”) (emphasis in original); *E.I. DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1007 (Fed. Cir. 2018) (“[T]his burden [of production] did not shift to the patentee to generally prove nonobviousness following institution.”).

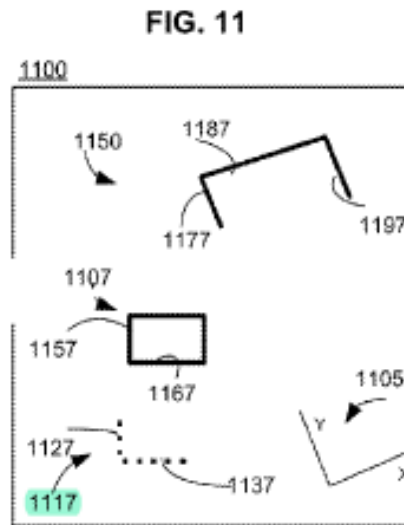
The Board cannot adopt arguments on behalf of Petitioner that *could have been, but were not*, raised by Petitioner. *Magnum Oil*, 829 F.3d at 1381; *see also id.* (“[T]he Board must base its decision *on arguments that were advanced by a party . . .*”). In an attempt to salvage its case, Petitioner now recasts the arguments

relating to the “footprint” limitation in its Reply. The Board should not consider Petitioner’s revised arguments.

For example, in an attempt to fix its original conflation of footprint and surface area, POR, 33, in the Reply, Petitioner argues “Figure 5E of Pershing-789 shows a page of a roof report that displays the footprint of the roof, *along with* area calculations,” and that “[t]he footprint may be *used* ‘to compute area’ but the area calculation is not a necessary part of a ‘footprint.’” Reply 18, 21 (internal citation omitted, emphasis in original). Again, this is *not* what Petitioner argued in the Petition regarding Pershing-789’s Figure 5E disclosure vis-à-vis the footprint limitation. Rather, in the Petition, Petitioner argued that “the ‘footprint’ of the roof *includes at least its area*. Pershing-789 teaches determining the claimed ‘footprint’ of the roof by drawing two-dimensional boundaries/outlines of roof sections, e.g., *to compute area*.” Pet., 28 (emphasis added, Petitioner’s emphasis removed). Petitioner immediately follows with details about the *surface area* of the roof sections as supporting evidence that Pershing-789 allegedly “*determin[es]* the footprint.” Pet., 28-30. The Petition did not recognize any distinction between the surface area of the roof sections and the footprint area of the roof, and these two areas are *not* the same. POR, 32-35; EX2031, ¶¶40-46.

Similar deficiencies apply to Petitioner’s showing regarding Kennedy. In the Reply, Petitioner argues that “Kennedy’s sizing tool is displayed as an outline of

the roof structure to be measured, thus providing the boundary or outline of the roof,” pointing to Kennedy’s Figures 35 and 36. Reply, 22. But, again, this is *not* what was argued in the Petition. Rather, the Petition asserted “Kennedy expressly discloses a ‘sizing tool’ that is superimposed on an aerial image *to determine* ‘surface dimensions’ of a roof.” Pet., 64. First, Figure 35 (cited in the Reply) is not cited for this limitation at all in the Petition, and sizing tool 1117 (which is actually relied on at Pet., 65), does not even provide a boundary or outline as it is only two sided.



EX1009, FIG. 11 (annotated).

Second, the Petition immediately follows with the argument that “Kennedy discloses ‘generating length and width measurements for a generally *rectangular planar installation surface* such as a side of a roof.’” Pet., 64-65 (emphasis added, Petitioner’s emphasis removed). Again, the Petition did not recognize any

distinction between the *surface area of the roof sections* and the *footprint area* of the roof, and these two areas *are not the same*. POR, 37-38; EX2031, ¶¶47-50.

For these reasons, Petitioner does not meet its burden to show either Pershing-789 or Kennedy teaches the claimed “footprint” under the very construction Petitioner presented in its Petition, and that was *confirmed* by Mr. Cummings during his deposition. EX2032, 69:13-70:7. Petitioner attempts to rehabilitate Mr. Cummings’s testimony by noting that he was discussing his “opinions regarding Figure 5E—which illustrates both the footprint of the roof and surface area information,” Reply, 21 (Petitioner’s emphasis removed), and pointing to other testimony for a different claim, Reply, 22 (citing EX1003, ¶126, related to claim 17). But this does not change the fact that Petitioner’s and Mr. Cummings’s original position related to the footprint limitation consistently relies on the surface area information in addition to any alleged outline. And Mr. Cummings expressly stated—both in his Declaration and confirmed at deposition—that he considered footprint to include “at least[] the area.” EX2032, 69:13-70:7; EX1003, ¶54.

For these reasons, Petitioner has not met its burden to demonstrate that either Pershing-789 or Kennedy determines a roof’s footprint, under its own construction of that term. This fatal flaw affects all of Petitioner’s asserted grounds.

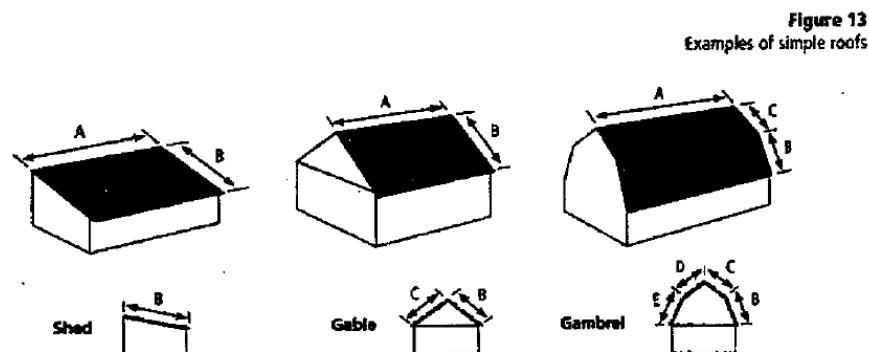
IV. MR. CUMMINGS’S TESTIMONY SHOULD BE GIVEN LITTLE TO NO WEIGHT.

The Board should give little to no weight to Mr. Cummings’s opinions because his testimony is conclusory and not credible. Any experience Mr. Cummings may have in roof estimation is *decades old* and certainly not related to using aerial images for roofing measurement. Expertise in roofing measurement is necessary to provide useful testimony in this proceeding. EX2031, ¶28.

Despite Petitioner’s assertion otherwise, Reply, 29, PO *did* address the Board’s preliminary level of skill findings in the POR. As argued in the POR, “the Board’s [preliminary] definition was inappropriately devoid of any mention of roofing measurement experience,” and “[g]iven that the focus of the ’538 patent is roofing measurement using aerial imagery, a POSITA would necessarily need to have experience in the area of roofing measurement and the use of aerial imagery used in roofing estimation.” POR, 4; EX2031, ¶28. In fact, Petitioner agrees that a POSITA would have “at least five years of experience performing roof estimation.” Pet., 2. The disputed issues in this case are not focused on the “computerized image analysis” or “three-dimensional modeling” portions of the Board’s preliminary POSITA definition. DI, 7. Rather, the key disputes relate to the meaning of several terms in the roofing industry, e.g., predominant pitch and footprint, which emphasizes Patent Owner’s position that a POSITA would need experience in the area of roofing measurement.

Mr. Cummings simply cannot credibly opine on these disputed issues. *See* POR, 39-47. Mr. Cummings testified that in the last 30 years he has only performed about 15 roof measurements, and his opinions are otherwise based on decades-old experience. *Id.* Petitioner argues that the timing and relative amount of quantifiable experience of the two experts is not relevant. Reply, 30-31. What *is* relevant, however, is whether an expert is competent to testify on the relevant issues. Mr. Cummings has shown he is not. Throughout this proceeding, his testimony has conflated and confused simple roofing concepts, such as surface area and footprint, that should not confuse a POSITA having experience in roofing estimation.

Further still, in his deposition, Mr. Cummings could not accurately answer questions about how to determine the footprint of a simple gable roof, such as that shown in Figure 13 of Bailey, reproduced below. *See* EX2032, 71:11-75:18.



EX1010, 132.

First asked how to calculate the “surface area” of the gable roof, Mr.

Cummings confirmed that the area would be calculated as “A times B.” EX2032, 73:9-14. But, when asked how to determine the “area of the footprint” of the gable roof shown in Figure 13, Mr. Cummings answered, “Again, it’s A times B. If it’s a rectangular house.” *See* EX2032, 74:13-75:2. This is clearly incorrect. EX2031, ¶40 (Mr. Kestner testifying that footprint and area are not the same). When Patent Owner’s counsel followed up, Mr. Cummings realized his mistake, and further responded “It would be -- there’s -- there’s probably a way. I don’t -- off the top of my head, I’ve never calculated a roof that direction. So there would have to be a way to get to, basically, forming a triangle. I don’t -- I don’t know that -- off the top of my head, I don’t know how you'd calculate that.” EX2032, 75:12-18. He simply could not provide an answer.

And, regarding the numeric area annotations shown on Figure 5E of Pershing-789, Mr. Cummings testified that they are the footprint areas (i.e., the area of the horizontal projection):

Q Okay. And what is the area you're referring to?

A The area, according to 5E, is the two dimensional -- based on this, what's supposed to be an aerial image, it's the horizontal area of the roof.

Q Okay. So is it your view that the areas indicated in that figure are areas of the horizontal projection of the roof?

A That’s how I'm reading it.

EX2032, 69:3-12. But, Petitioner makes very clear in its Reply that it agrees with Patent Owner that in Figure 5E, the numeric annotations are the surface area of the roof. Reply, 20. Again, this additional example of Mr. Cummings's confusion regarding basic roofing concepts in the prior art is telling.

If Mr. Cummings is confused on such basic roofing concepts, his testimony about more nuanced issues related to the claims should be given little to no weight. This applies to all of Mr. Cummings's testimony, but it is particularly applicable to his wholly unsupported testimony that "predominant slope" "is a weighted average of roof pitches." EX1003, ¶44. Petitioner cannot rely solely on conclusory, unsupported testimony of an unqualified expert to supply a claim limitation that is entirely missing from the prior art. POR, 45; *DSS*, 885 F.3d at 1374-1377.

V. CONCLUSION

Petitioner fails to meet its burden in this proceeding. The Board should, thus, confirm the patentability of all challenged claims.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner's Sur-Reply complies with the type-volume limitation of 5,600 words, comprising 5,593 words, excluding the parts exempted by 37 C.F.R. § 42.24(c).
2. This Patent Owner's Sur-Reply complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

Respectfully submitted,

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER'S SUR-REPLY** was served in its entirety on March 12, 2024, upon the following parties via electronic mail:

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