

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NEARMAP US, INC.,
Petitioner

v.

EAGLE VIEW TECHNOLOGIES, INC.,
Patent Owner

IPR2022-00734
U.S. Patent 9,135,737

PATENT OWNER'S RESPONSE

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PATENT OWNER'S EXHIBIT LIST
February 14, 2023

EX2001	Reserved
EX2002	Reserved
EX2003	Complaint, <i>Eagle View Technologies, Inc. and Pictometry International Corp. v. Nearmap US, Inc.</i> , No. 2:21-cv-00283, ECF No. 2 (D. Utah May 4, 2021) (Oberg)
EX2004	Amended Patent Case Scheduling Order, <i>Eagle View Technologies, Inc. and Pictometry International Corp. v. Nearmap US, Inc.</i> , No. 2:21-cv-00283, ECF No. 99 (D. Utah July 26, 2022) (Oberg)
EX2005 (NEW)	Declaration of Dr. Chandrajit L. Bajaj (redacted)
EX2006 (NEW)	Transcript of Deposition of Dr. David A. Forsyth, Ph.D., January 24, 2023
EX2007 (NEW)	Reference Guide: Twister, 10/15/2008 (EX2007 in IPR2016-00592) (filed under seal)
EX2008 (NEW)	Declaration of Dr. Chandrajit L. Bajaj in IPR2016-00592, November 16, 2016 (redacted) (EX2008 in IPR2016-00592)
EX2009 (NEW)	Curriculum Vitae of Dr. Chandrajit L. Bajaj
EX2010 (NEW)	EVT Internal customer quality survey (EX2010 in IPR2016-00592) (filed under seal)
EX2011 (NEW)	Declaration of Chris Johnson (EX2011 in IPR2016-00592)
EX2012 (NEW)	2009 through 2012 revenue data (EX2012 in IPR2016-00592)
EX2013 (NEW)	2013 revenue data (EX2013 in IPR2016-00592)
EX2014 (NEW)	2014 revenue data (EX2014 in IPR2016-00592)

EX2015 (NEW)	2015 revenue data (EX2015 in IPR2016-00592)
EX2016 (NEW)	Comparison of claims 1 and 16 of the '737 Patent (redline comparison), and comparison of claims 1 and 26 of the '737 Patent (redline comparison)
EX2017 (NEW)	Plaintiff's Opening Markman Brief, <i>Eagle View Technologies Inc. et al. v. Nearmap US, Inc.</i> , No. 2:21-cv-00283-TS-DAO, ECF No. 245 (D. Utah Jan. 27, 2023) (Stewart)
EX2018 (NEW)	Defendant's Motion for Claim Construction, <i>Eagle View Technologies Inc. et al. v. Nearmap US, Inc.</i> , No. 2:21-cv-00283-TS-DAO, ECF No. 244 (D. Utah Jan. 27, 2023) (Stewart)
EX2019 - EX2029	Reserved
EX2030 (NEW)	Reference Guide: For Measuring Technicians, 10/15/2008 (Render House) (filed under seal) (EX2030 in IPR2016-00592)
EX2031 (NEW)	Declaration of Dr. Chandrajit L. Bajaj in IPR2016-00592, November 16, 2016 (filed under seal) (EX2031 in IPR2016-00592)
EX2032 (NEW)	Declaration of Dr. Chandrajit L. Bajaj (filed under seal)
EX2033	Reserved
EX2034 (NEW)	Reference Guide: Twister, 10/15/2008 (redacted) (EX2034 in IPR2016-00592)
EX2035 (NEW)	2009 through 2012 revenue data (redacted) (EX2035 in IPR2016-00592)
EX2036 (NEW)	2013 revenue data (redacted) (EX2036 in IPR2016-00592)
EX2037 (NEW)	2014 revenue data (redacted) (EX2037 in IPR2016-00592)
EX2038 (NEW)	2015 revenue data (redacted) (EX2038 in IPR2016-00592)
EX2039 (NEW)	Reference Guide: For Measuring Technicians, 10/15/2008 (Render House) (redacted) (EX2039 in IPR2016-00592)

EX2040 (NEW)	Patent Owner Response in IPR2016-00592 (filed under seal)
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I. INTRODUCTION

Petitioner challenged claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 (“the challenged claims”) of the ’737 Patent as being unpatentable under two different grounds: the Heller-Quam combination (Ground 1) and the Heller-Quam-Deaton combination (Ground 2). The Board should determine that the challenged claims are not unpatentable because both grounds fail to teach every limitation of independent claims 1, 16, and 26, as well as dependent claims 9 and 10.

The Heller-Quam combination fails to teach limitation [1.5] (“generating and outputting a roof estimate report using a report generation engine...”). Ground 1 is facially deficient because Petitioner does not even attempt to show that the features of limitation [1.5] are taught by the Heller-Quam combination. Instead, Petitioner incorrectly asserts that the *entirety* of limitation [1.5] should not be entitled to patentable weight under the printed matter doctrine. However, in IPR2016-00592 (“the Xactware IPR”) involving the ’737 Patent, the Board indicated that only “the *detailed requirements* as to the contents of the roof estimate report” were not entitled to patentable weight under the printed matter doctrine. Because limitation [1.5] is entitled to patentable weight for at least the reasons presented in Section IV.A below, the Heller-Quam combination in Ground 1 fails to teach limitation [1.5] and corresponding limitations [16.3] and [26.3].

Petitioner relies on the Heller-Quam-Deaton combination in Ground 2 “to the extent this limitation [1.5] is found to be entitled to patentable weight.” However, the Heller-Quam-Deaton combination likewise does not teach limitation [1.5]. Further, Petitioner’s motivation to combine Deaton with the Heller-Quam combination is not supportable. Heller and Quam are directed to generating three-dimensional (3D) models that capture the basic geometry of a site under examination based on images. Heller and Quam do not generate or output a roof estimate report as they are unrelated to roof repair or construction. Deaton, by contrast, is directed to conducting *on-site physical measurements and inspections* of a roof under investigation. Petitioner has not shown why a POSITA would have been motivated, based on the teachings of the references, to modify the image-based 3D modeling technique of the Heller-Quam combination with Deaton’s physical, on-site inspection of roofs.

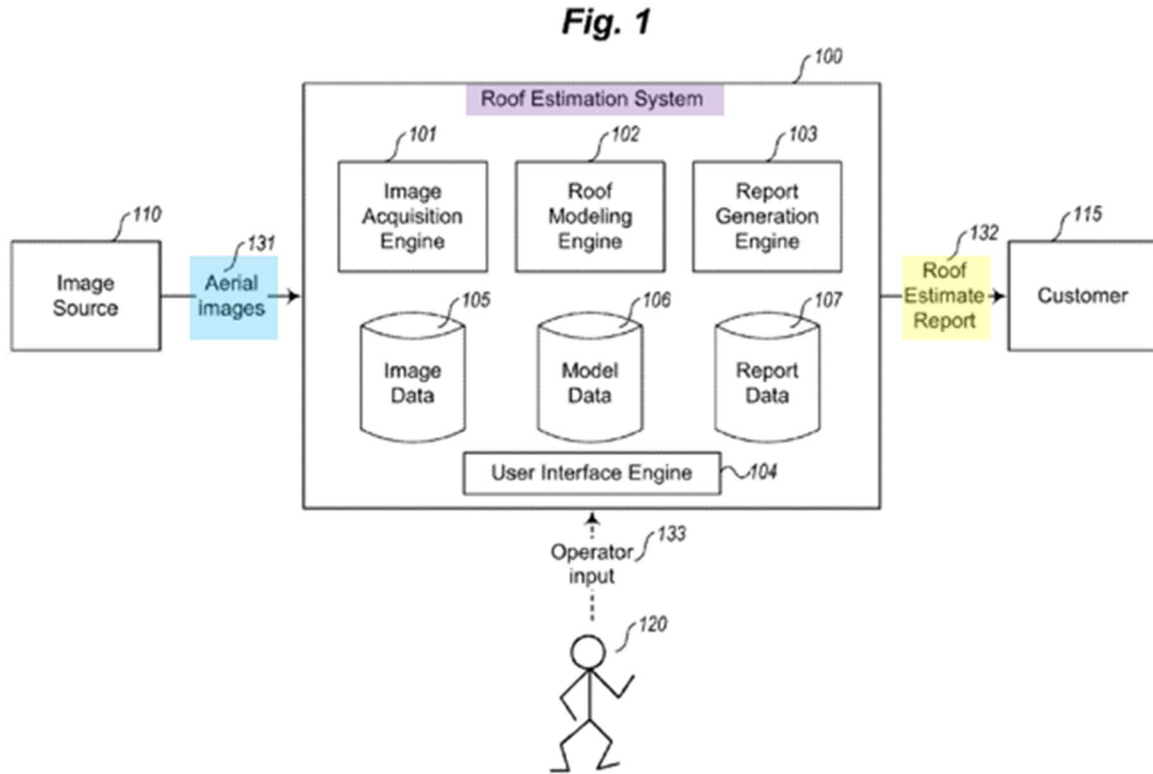
Patent Owner also presents compelling objective evidence of non-obviousness of the challenged claims due to the commercial success of and industry praise for Patent Owner’s Twister and Render House products, which embody the challenged claims. In the Xactware IPR, the Board found the challenged claims non-obviousness based on Patent Owner’s evidence of commercial success and industry praise. That decision was affirmed by the Federal Circuit. Because Petitioner’s proposed combinations do not teach all the recited

features of the challenged claims and Patent Owner presents compelling objective evidence of non-obviousness, the Board should maintain the patentability of the challenged claims again in this IPR.

II. OVERVIEW OF THE '737 PATENT

A. Summary of the '737 Patent

The '737 Patent “relates to systems and methods for estimating construction projects, and more particularly, to such systems and methods for determining roof measurement information based on one or more aerial images of a roof a building.” EX1001, 1:7-11. Figure 1 of the '737 Patent below provides an example of a roof estimation system (RES) 100 with which an operator 120 interacts to generate and output a roof estimate report 132 “for a specified building, based on aerial images 131 of the building received from the image source 110.” EX1001, 3:40-55; EX2032, ¶¶25-26.



EX1001, Fig. 1 (annotated)

The generated roof report 132 may include roof measurement information such as “one or more plan (top-down) views of the model, annotated with numerical values for the slope, area, and/or lengths of the edges of at least some of the plurality of planar roof sections of the model of the roof.” EX1001, 6:31-34. An example roof report is shown in Figure 3C below, which identifies a **line drawing** 303a of the roof structure, **ridge lines** 303b, 303c, and dimensions (in feet) of different roof sections (e.g., 30 feet for **ridge line** 303b, and 25 feet for **ridge line** 303c). EX1001, 8:32-42; EX2032, ¶27.

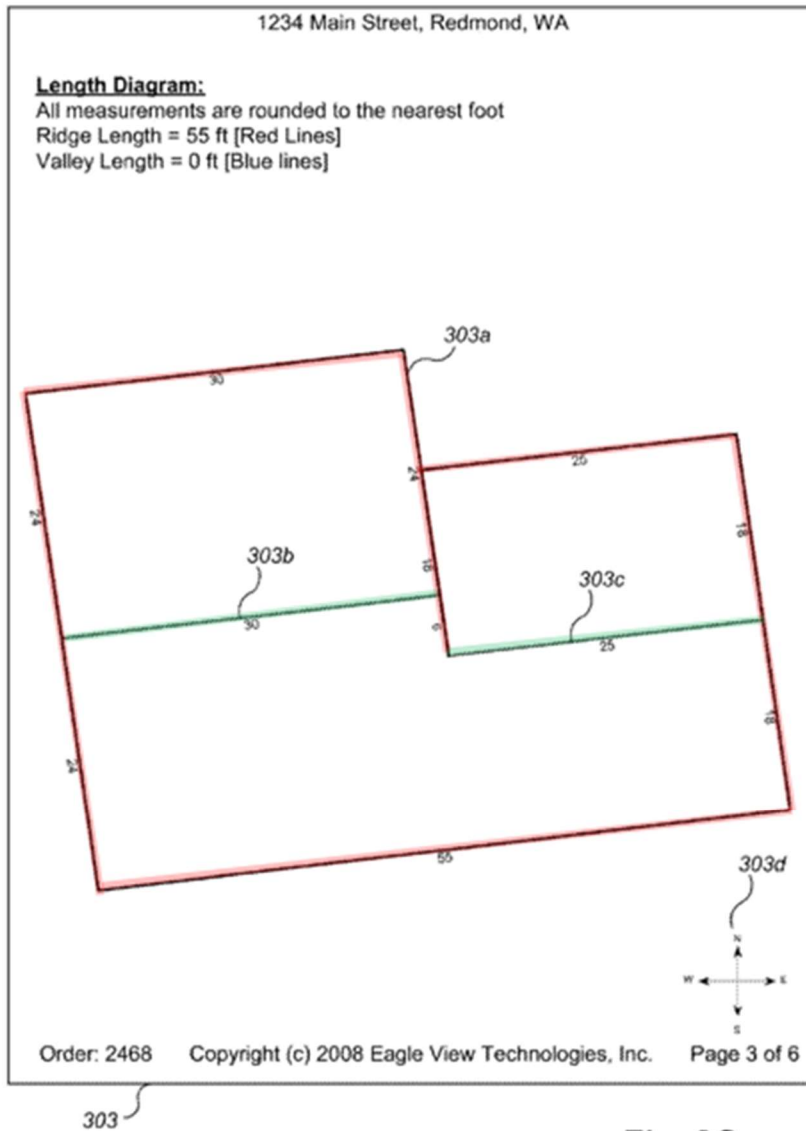


Fig. 3C

EX1001, Fig. 3C (annotated)

Exemplary embodiments of the '737 Patent thus provide useful advancements in a variety of roof report contexts, e.g., for a roof contractor to repair or replace a roof, or to install solar energy panels. EX1001, 1:28-37, 1:56-62; EX2032, ¶28.

The '737 Patent uses first and second aerial images of a building to construct a 3D model, through co-registration of the images onto a 3D grid. The '737 Patent includes displaying a first aerial image and a second aerial image of a roof during the process of generating a roof estimate report, as shown in Figure 11 below (step 1101). EX1001, 22:17-29, 22:39-44, Fig. 11; EX2032, ¶29.

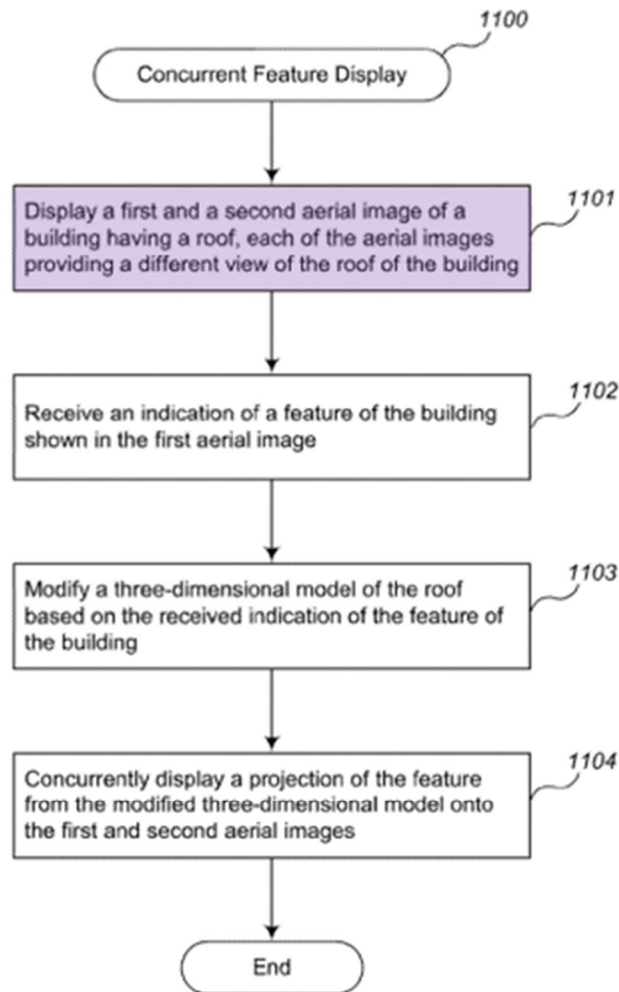


Fig. 11

EX1001, Fig. 11 (annotated)

For example, as shown in Figure 4A below, five **images 402-406** providing

different views of a **building roof 407** are shown on a user interface screen 400

with a control panel 401 having user-selectable controls to set reference points in

images 402-406 for purposes of image registration. EX1001, 9:19-45; EX2032,

¶30.

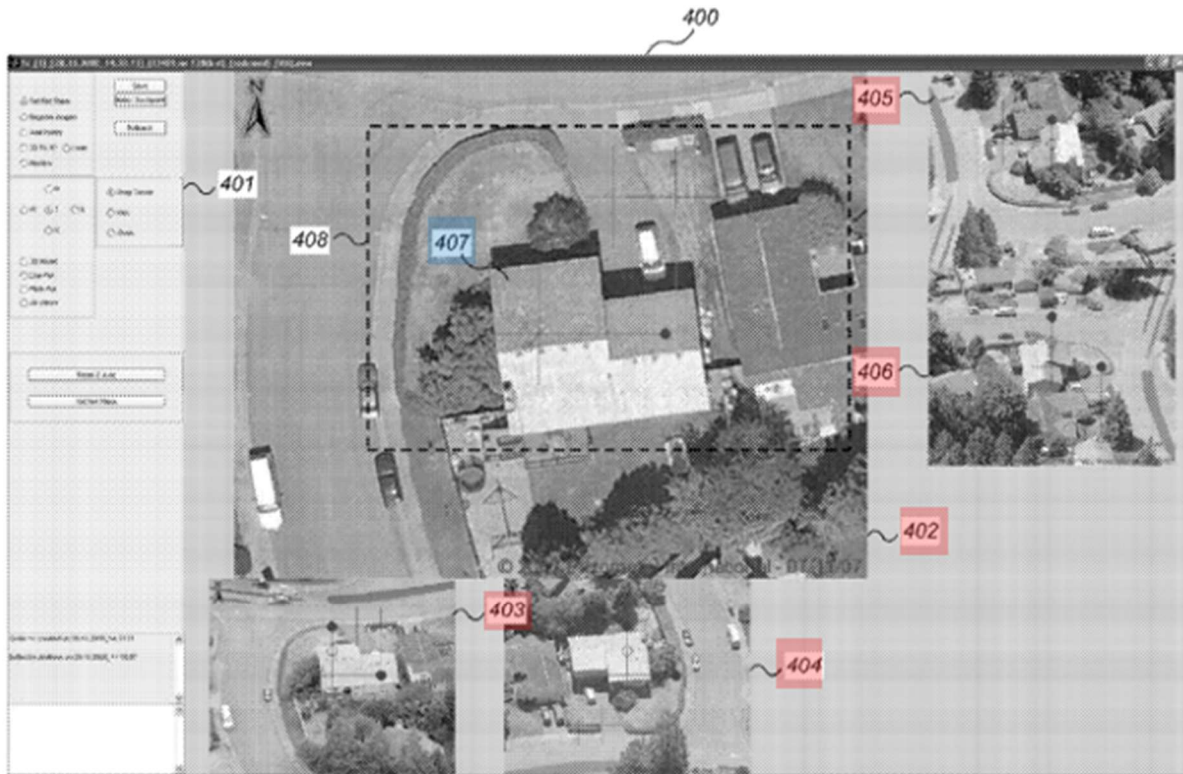


Fig. 4A

EX1001, Fig. 4A (annotated)

User-indicated features are overlaid on the aerial images of the roof.

EX1001, 14:58-60. For example, Figure 6D below shows a **wire frame 613**

representation of a 3D model of the building roof 407. EX1001, 14:51-62;

EX2031, ¶31.

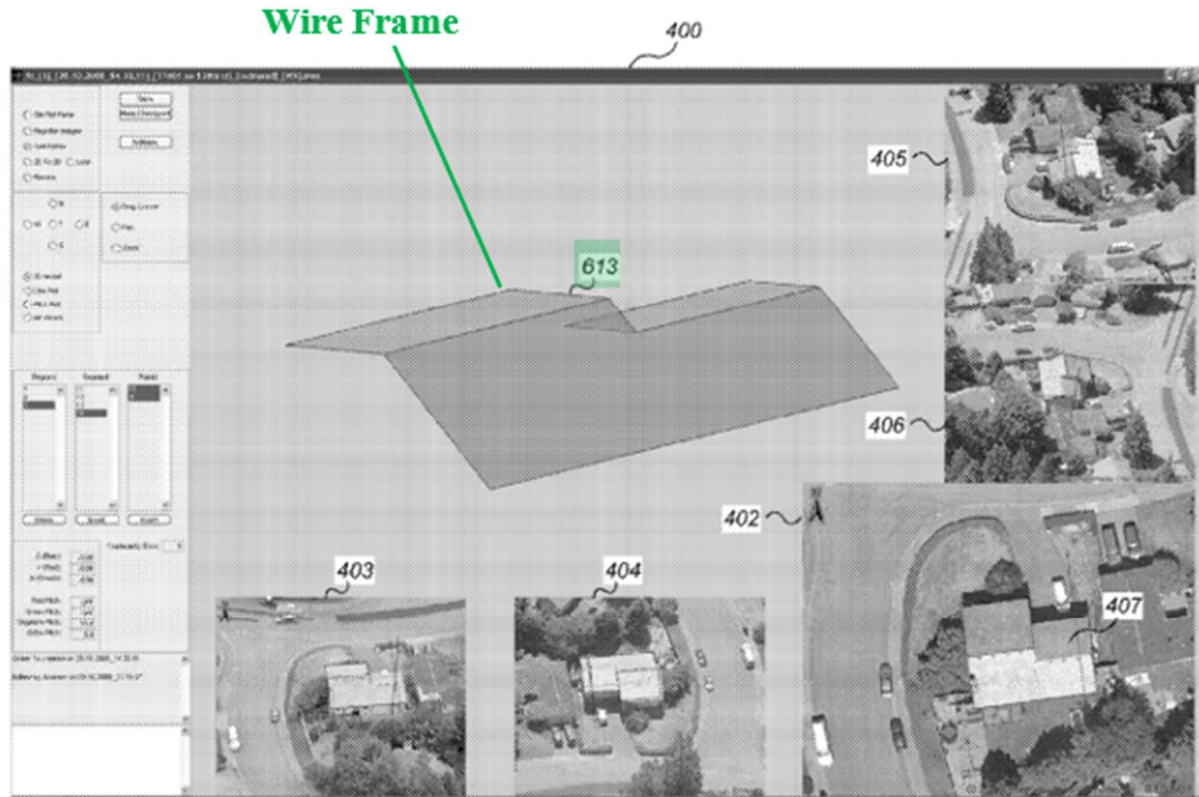


Fig. 6D

EX1001, Fig. 6D (annotated)

The claimed invention permits “the operator [to] switch between various images of the building of the roof 407, making refinements to the 3D model by adjusting the wire frame in whichever image is more convenient and/or provides a more suitable perspective/view of the model.” EX1001, 14:47-50; *see also* EX1001, 15:38-46. These changes to the roof are then propagated and displayed concurrently on the first and second aerial images, so that the user can continue to make changes or verify the accuracy of the model, as shown in steps 1103-1104 of Figure 11 below. EX1001, 22:42-23:13, Fig. 11; EX2032, ¶¶33, 32.

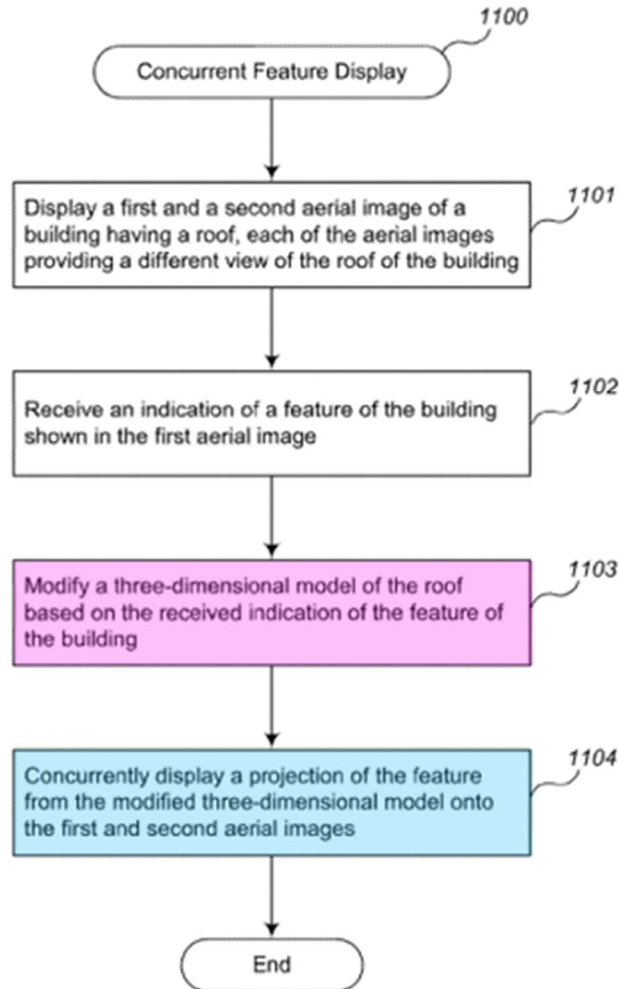
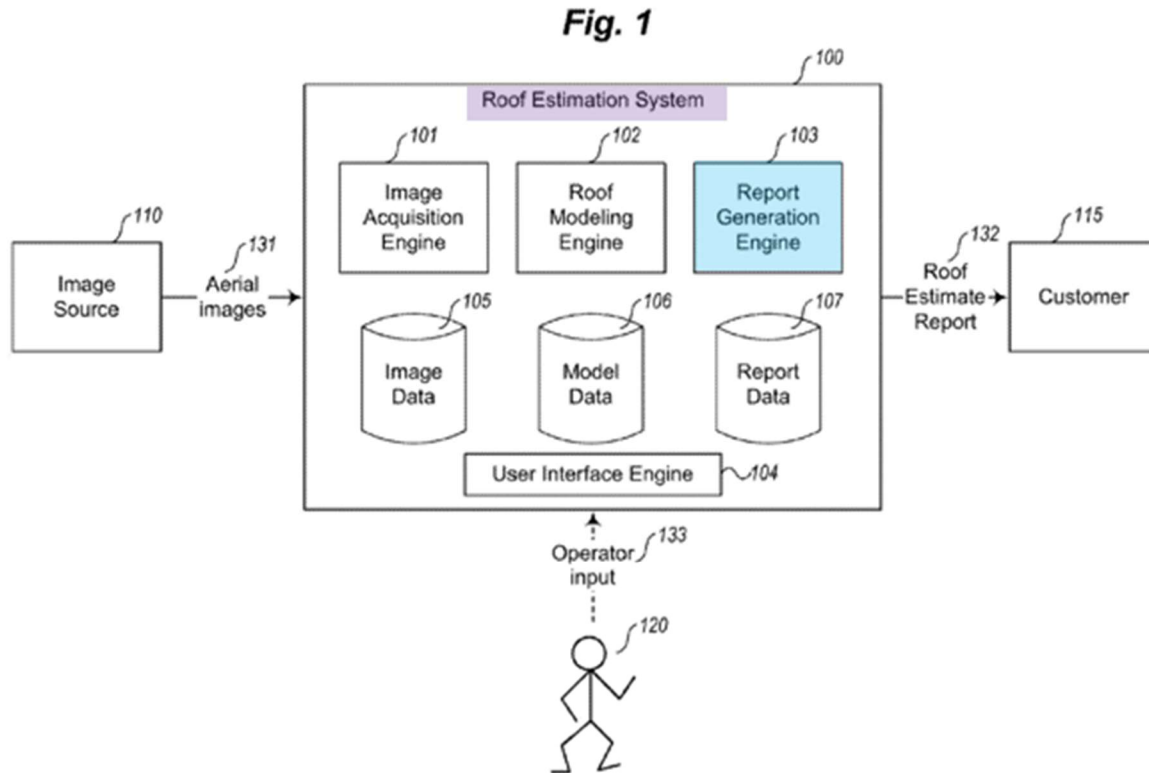


Fig. 11

EX1001, Fig. 11 (annotated)

The '737 Patent explains that the roof estimate report system (e.g., RES 100 in Figure 1) includes a report generation engine (e.g., report generation engine in Figure 1) that generates and outputs a roof estimate report. EX1001, 3:40-46, 6:28-39, 1:55-64; *see also* Fig. 8 (roof estimation system 810 having a report generation engine 813), EX1001, 15:57-16:36; EX2032, ¶34.



EX1001, Fig. 1 (annotated)

B. Prosecution History of the '737 Patent

In the Notice of Allowance, the Examiner identified limitations [1.5], [16.3], and [26.3] as not disclosed in the prior art. EX1002, 155-156. The Examiner added by Examiner's Amendment "wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building" to limitations [1.5], [16.3], and [26.3]. EX1002, 153-155.

III. CLAIM CONSTRUCTION

Patent Owner submits that all terms in the challenged claims of the '737 Patent should be construed according to their plain and ordinary meaning as would

be understood by a POSITA in light of the specification and prosecution history of the '737 Patent. EX2032, ¶49.¹

Petitioner provided constructions of the terms below. Petitioner's proposed constructions are incorrect for the following reasons. EX2032, ¶50.

**A. “Generating and outputting a roof estimate report...”
(independent claims 1, 16, and 26).**

Petitioner argues that *the entirety* of limitations [1.5], [16.3], and [26.3] should not be entitled to any patentable weight. Petitioner's construction is wrong. Petitioner misinterprets the Final Written Decision in the Xactware IPR (“the '592 IPR Final Written Decision”) (EX1010) as suggesting that the entirety of limitations [1.5], [16.3], and [26.3] are not entitled to patentable weight under the printed matter doctrine. This is not what the '592 IPR Final Written Decision states. Petitioner's interpretation is based on an unreasonable reading of the '592 IPR Final Written Decision. EX2032, ¶51.

Limitation [1.5]² recites:

¹ A redacted version of Dr. Bajaj's declaration is submitted as EX2005.

² Limitation [26.3] is identical to limitation [1.5]. *See* EX2016, 3-4 (comparison of claims 1 and 26). Limitation [16.3] is substantially similar to limitation [1.5]. *See* EX2016, 1-2 (comparison of claims 1 and 16).

[1.5] generating and outputting a roof estimate report using a report generation engine, wherein the roof estimate report includes numerical values for corresponding slope, area, or lengths of edges of at least some of a plurality of planar roof sections of the roof, wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building.

EX2032, ¶52.

After reproducing the entirety of limitation [1.5], Petitioner argues that:

These limitations are directed to generating printed matter that has no function or structural relation to the substrate on which it is printed or displayed. Thus, these limitations are entitled to no patentable weight.

Petition, 6 (emphasis original); EX1003, ¶19; EX2032, ¶53.

During his deposition, Dr. Forsyth confirmed that his use of the term “[t]hese limitations” in EX1003, ¶19 means that he is referring to *the entirety* of limitations [1.5], [16.3], and [26.3]. EX2006, 68:16-69:12. Dr. Forsyth interpreted the entirety of limitations [1.5], [16.3], and [26.3] as lacking patentable weight “because the [B]oard told me that these limitations are not entitled to patentable weight.” EX2006, 72:15-17, 73:7-8 (“My understanding is that the [B]oard told me the whole limitation should not be given patentable weight.”); EX2032, ¶¶54-55.

Petitioner and Dr. Forsyth’s interpretation that the entirety of limitations [1.5], [16.3], and [26.3] are not entitled to patentable weight is based on a fundamental misunderstanding of the Xactware IPR. In the ’592 IPR Final Written

Decision (EX1010), the Board explained that “the *claimed content of the information* is not entitled to weight in the patentability analysis,” and that “*the detailed requirements as to the contents of the roof estimate report* are not entitled to patentable weight.” EX1010, 18. There is no basis in the ’592 IPR Final Written Decision to support Petitioner’s argument that the *entirety* of limitations [1.5], [16.3], and [26.3] should not be entitled to weight under the printed matter doctrine. EX2032, ¶56.

To the extent the Board determines that any portion of limitations [1.5], [16.3], and [26.3] may not be entitled to patentable weight under the printed matter doctrine, only the portions of limitations [1.5], [16.3], and [26.3] reciting “wherein the roof estimate report includes numerical values for corresponding slope, area, or lengths of edges of at least some of a plurality of planar roof sections of the roof” could possibly be considered “the claimed content of the information” or “the detailed requirements as to the contents of the roof estimate report.” EX1010, 18; EX2032, ¶57.

As a result, at least the following features (a)-(b) of limitations [1.5], [16.3], [26.3] are entitled to patentable weight:

“[(a)] generating and outputting a roof estimate report using a report generation engine, ... [(b)] wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building”

EX2032, ¶58. In this regard, a POSITA would understand that features (a)-(b) of limitations [1.5], [16.3], and [26.3] are not directed to “the claimed content of the information” or “the detailed requirements as to the contents of the roof estimate report.” This understanding is consistent with the ’592 IPR Final Written Decision because the Board did not find or suggest that features (a)-(b) of limitations [1.5], [16.3], and [26.3] are directed to “the claimed content of the information” or “the detailed requirements as to the contents of the roof estimate report.” EX1010, 18; EX1010, 15-18; EX2032, ¶¶58, 62-63.

The prosecution history of the ’737 Patent further supports Patent Owner’s position that at least features (a)-(b) of limitations [1.5], [16.3], and [26.3] should be entitled to patentable weight. The Examiner identified limitations [1.5], [16.3], and [26.3] as the allowable features of these claims, and specifically added feature (b) in an Examiner’s Amendment. EX1002, 153-156; EX2032, ¶59.

Petitioner’s argument that the entirety of limitations [1.5], [16.3], and [26.3] should not be entitled to patentable weight appears to be based on an attempt to read these limitations out of the claims. As discussed below, Petitioner’s analysis in Grounds 1 and 2 does not specifically address, and cannot meet, the requirements of limitations [1.5], [16.3], or [26.3]. EX2032, ¶60.

Patent Owner and Petitioner have proposed constructions of various terms in the ’737 Patent in parallel litigation. EX2010 (Patent Owner’s claim

constructions); EX2011 (Petitioner's claim constructions). Petitioner's construction that the entirety of limitations [1.5], [16.3], and [26.3] should not be entitled to patentable weight conflicts with Petitioner's construction of the term "roof estimate report" as recited in limitations [1.5], [16.3], and [26.3]. In the district court litigation, Petitioner construes "roof estimate report" in limitations [1.5], [16.3], and [26.3] as "an electronic file or paper document transformed from a roof model and/or determined roof measurements that *graphically shows a representation of the roof model and/or determined roof measurements.*" EX2011, 4-7; EX2010, 7; EX2032, ¶61.

B. "transmitting roof measurement information" (claim 9).

Claim 9 recites "transmitting roof measurement information based at least in part on the change of the line drawing representing a feature of the roof that overlies the first aerial image of the roof." EX1001, 24:52-56.

Petitioner argues that claim 9 "should be interpreted broadly enough to encompass transmitting roof measurement information between components of the same computer system, consistent with the Board's interpretation of the term in the [Xactware IPR]." Petition, 11 (citing EX1010, 18-20). Petitioner argues that claim 9 "does not specify any particular source or destination for the transmission, thereby indicating that transmission within the same computer system is contemplated." Petition, 11 (citing EX1010, 18-20). Petitioner argues that "the

'737 patent's specification contemplates this type of transmission," by referring to Figure 8 and EX1001, 16:15-17. EX2032, ¶65.

However, Petitioner's proposed construction of claim 9 is not supported by the '737 Patent's disclosure. First, Petitioner's construction (and the Board's in the Xactware IPR) interprets 16:15-17 of the '737 Patent out of context. Petitioner left out the preceding sentence (EX1001, 16:13-14), which provides context to the meaning of 16:15-17 of the '737 Patent, and its description of the Roof Estimation System (RES) 810 in Figure 8. EX1001, 15:58-61. With reference to Figure 8, the '737 Patent explains that:

The RES 810 is shown residing in memory 801. In other embodiments, some portion of the contents, some of, or all of the components of the RES 810 may be stored on and/or transmitted over the other computer-readable media 805.

EX1001, 16:13-17; EX2032, ¶66.

Accordingly, this portion of the specification provides that different components of the **RES 810** may be stored on the memory 801 or the other computer-readable media 805. EX2032, ¶66.

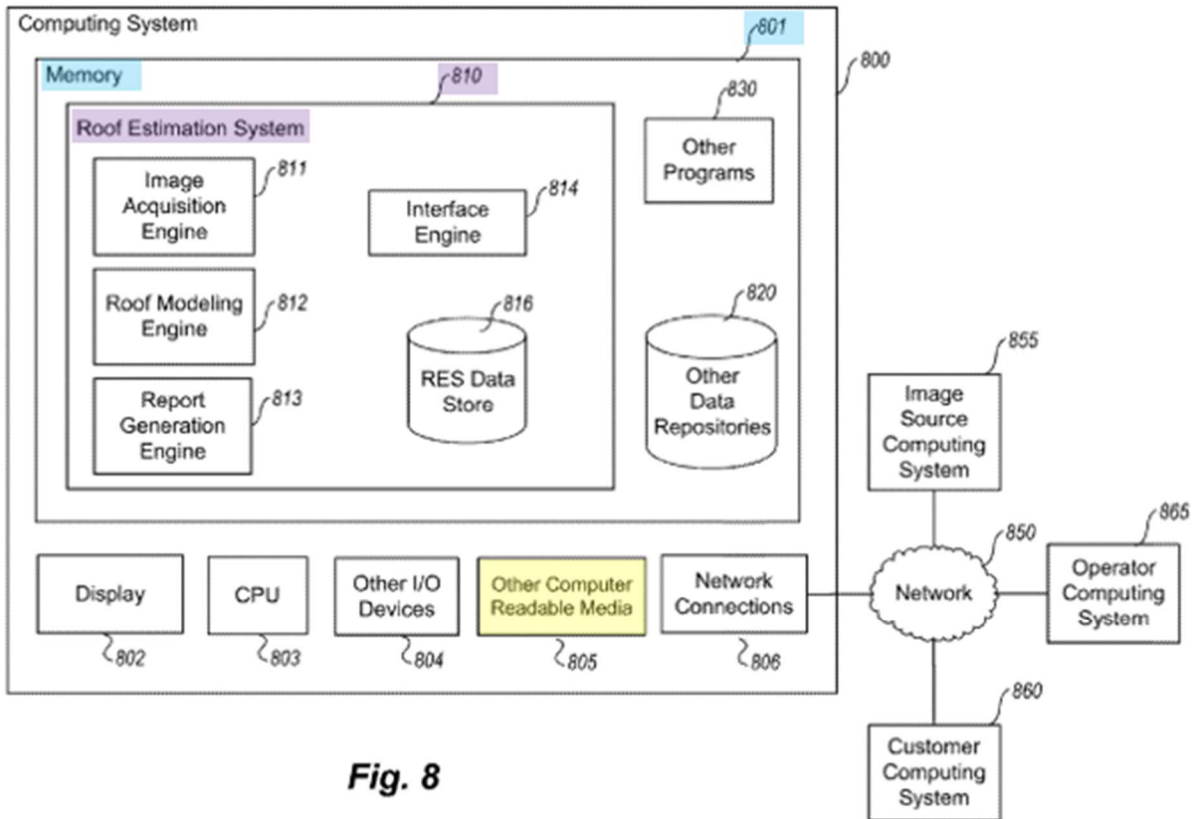


Fig. 8

EX1001, Fig. 8 (annotated)

The above-quoted portion in EX1001, 16:13-17 that Petitioner relies on does not describe *the roof measurement information* being transmitted to the other computer-readable medium 805. Claim 9 specifically recites that “*roof measurement information*” is transmitted, not that components of the roof estimation system (RES) are transmitted. EX2032, ¶67.

Second, a POSITA would construe claim 9 based on the embodiments of the ’737 Patent that describe transmitting the roof measurement information, as that is what is recited in claim 9. Column 17, lines 12-20 of the ’737 Patent describe roof

measurement information as being transmitted to third-party systems that generate roof estimate reports:

Such roof measurement information may be provided to, for example, third-party systems that generate roof estimate reports based on the provided information.

EX1001, 17:12-20; EX2032, ¶68.

Accordingly, a POSITA would construe claim 9 as transmitting the roof measurement information outside the roof estimate report system (e.g., RES in Figure 8), such as to “third-party systems that generate roof estimate reports based on the provided information.” EX1001, 17:12-20. A POSITA would not construe claim 9 as transmitting the roof measurement information to another computer-readable medium (e.g., media 805 in Figure 8) within the roof estimate report system because that is inconsistent with the specification of the '737 Patent.

EX2032, ¶69.

C. Collateral Estoppel Does Not Preclude Patent Owner from Contesting Petitioner's Incorrect Claim Constructions.

Petitioner argues that collateral estoppel precludes Patent Owner from arguing that limitations [1.5], [16.3], and [26.3] are entitled to patentable weight. Petition, 8-11. Petitioner's arguments are legally incorrect for three reasons.

First, Patent Owner cannot be collaterally estopped from contesting Petitioner's claim construction positions that are inconsistent with the Board's interpretation in the Xactware IPR. As discussed above, the Board only found that

“detailed requirements as to the contents of the roof estimate report are not entitled to patentable weight” (EX1010, 18), not that *the entirety* of limitations [1.5], [16.3], and [26.3] should not be entitled to patentable weight, as Petitioner incorrectly argues.

Second, collateral estoppel does not apply to claim interpretation issues in the Xactware IPR because the Board did not expressly construe the claims to determine the patentability of the challenged claims. EX1010, 6. Instead, the Board “conclude[d] [that] no express claim constructions are *necessary* to resolve whether [the Xactware] Petitioner has shown by a preponderance of the evidence that [the challenged] claims [] are unpatentable.” EX1010, 6. Collateral estoppel prevents a party from relitigating an issue if: “(1) a prior action presents an identical issue; (2) the prior action actually litigated and adjudged that issue; (3) the judgment in that prior action *necessarily required determination of the identical issue*; and (4) the prior action featured full representation of the estopped party.” *VirnetX Inc. v. Apple, Inc.*, 909 F.3d 1375, 1377 (Fed. Cir. 2018) (internal quotation omitted).

Factor (3) is not present here because the Board’s judgement in the Xactware IPR did not “necessarily require[] determination” of whether portions of limitations [1.5], [16.3], and [26.3] are not entitled to patentable weight. On the contrary, the Board found the challenged claims not unpatentable based on

“decisive” evidence of non-obviousness despite finding that a portion of limitations [1.5], [16.3], and [26.3]—“the detailed requirements as to the contents of the roof estimate report”—are not entitled to patentable weight when evaluating limitation [1.5] in the Xactware IPR. EX1010, 26 (“We agree with Patent Owner that objective indicia of non-obviousness are *decisive* in this case.”), 26-35 (finding challenged claims not unpatentable based on objective evidence of non-obviousness), 15-18 (evaluating limitation [1.5] in view of the teachings of the “Avrahami” reference).

Petitioner has not cited any legal authority for its position that the collateral estoppel applies to the Board’s interpretation of claims in relation to a prior art reference in a prior IPR when the Board expressly indicated that no claim construction was necessary to resolve the patentability challenges and the Board found the claims not unpatentable. EX1010, 6, 26-35.

Third, collateral estoppel does not apply to the Board’s claim interpretations in the Xactware IPR because the claims “were subject to a different claim construction standard than the claims in this proceeding.” *Palo Alto Networks, Inc. v. Centripetal Networks, LLC*, IPR2021-01147, Paper 40 at 21 (Feb. 9, 2023). In the Xactware IPR, the challenged claims were construed according to the broadest reasonable interpretation standard, but in this IPR the claims are construed according to the *Phillips* standard.

Similarly, Patent Owner is not collaterally estopped from challenging Petitioner's proposed construction of claim 9 because (a) Petitioner's construction is inconsistent with the disclosure of the '737 Patent, (b) the Board's decision in the Xactware IPR finding the challenged claims not unpatentable did not necessarily require the Board's interpretation of claim 9; and (c) the challenged claims were construed according to the broadest reasonable interpretation standard instead of the *Phillips* standard.

IV. PETITIONER'S GROUND 1 DOES NOT SHOW THE PRIOR ART RENDERS THE CLAIMS OBVIOUS

In Ground 1, Petitioner argues that the challenged claims are rendered obvious over the combination of Heller (EX1004) and Quam (EX1005). Petition, 2, 19-50; EX1003, ¶¶34-92. Petitioner's Ground 1 fails because the Heller-Quam combination fails to render obvious all the limitations of independent claims 1, 16, and 26. EX2032, ¶¶71, 92-94.

A. Ground 1 Does Not Render Obvious All the Limitations of Claims 1, 16, and 26

Petitioner's Heller-Quam combination does not teach limitations [1.5]. [16.3], and [26.3]. EX2032, ¶¶71, 92-94.

1. Overview of Heller

Heller is titled "[t]he Site-Model Construction Components of the RADIUS Testbed System." EX1004, 1. Heller explains that the "central component" of the

RADIUS system is “the creation of a 3-dimensional model that captures the basic geometry of the site under examination.” EX1004, Abstract, 1 (Introduction).

Heller describes that “[t]he construction and use of 3-D models of military and industrial sites” will allow advances in “the speed, confidence, and range of analytical techniques with which an image analyst develops and reports intelligence information.” EX1004, 1 (Introduction); EX2032, ¶72.

Figure 1 of Heller below “shows a typical RADIUS site model,” where “[t]he majority of features modeled fall under three broad categories:”

- (1) buildings and other structures (e.g., petroleum and water storage tanks)
- (2) lines of communication (e.g., roads, railroad tracks, rivers, streams)
- (3) functional areas (e.g., parking lots, site perimeters, forested areas, etc.).

EX1004, 1 (Introduction); EX2032, ¶73.

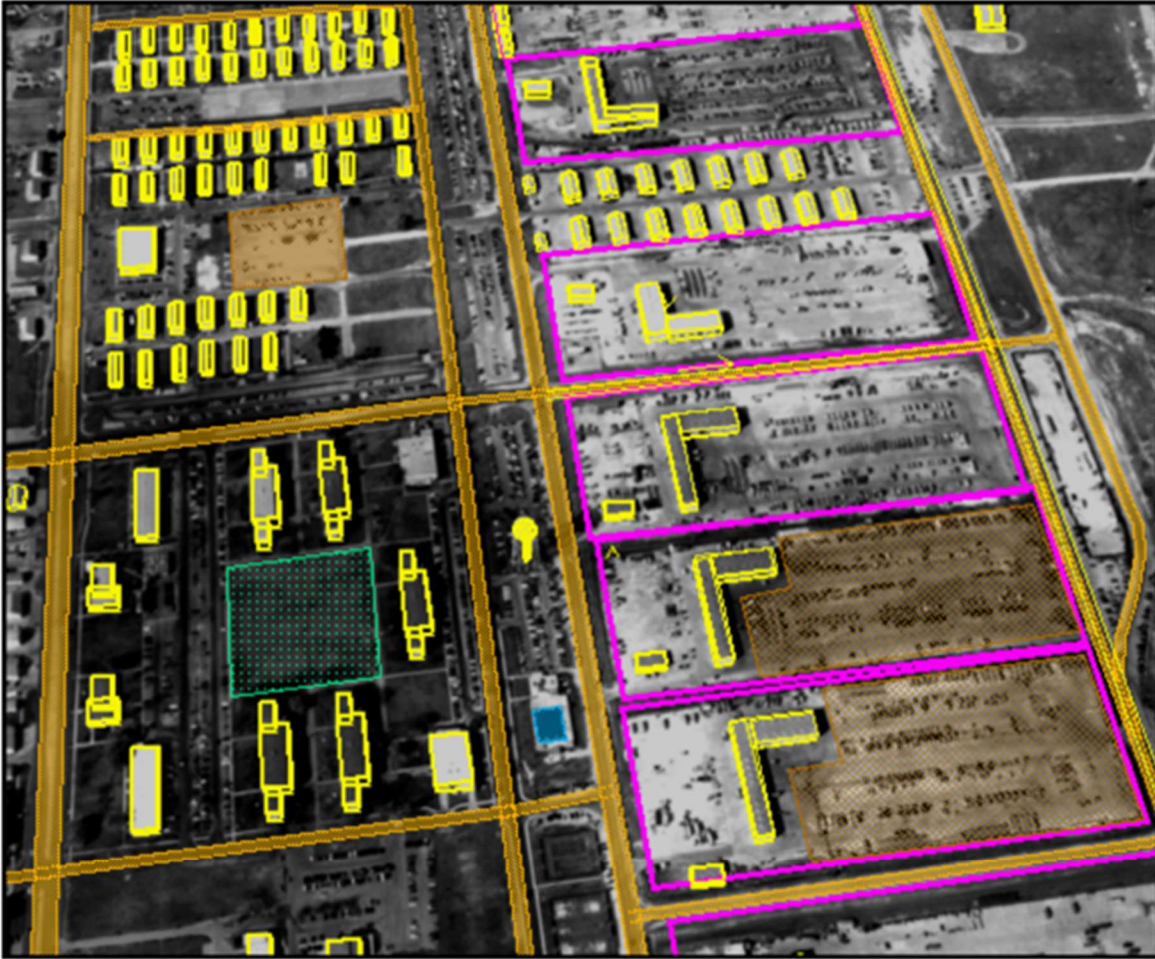


Figure 1: A typical RADIUS site model, projected onto an image of the site. The site model mainly consists of buildings, linear and area features.

EX1004, Fig. 1

Heller describes that “[m]ost buildings are modeled using the following primitives” or line drawings: (1) boxes, (2) houses, (3) Quonset huts, and (4) extrusions. EX1004, 3. Figure 4 of Heller below shows box primitives being manually added to the top of a roof structure. EX1004, 6; EX2032, ¶¶74-75.

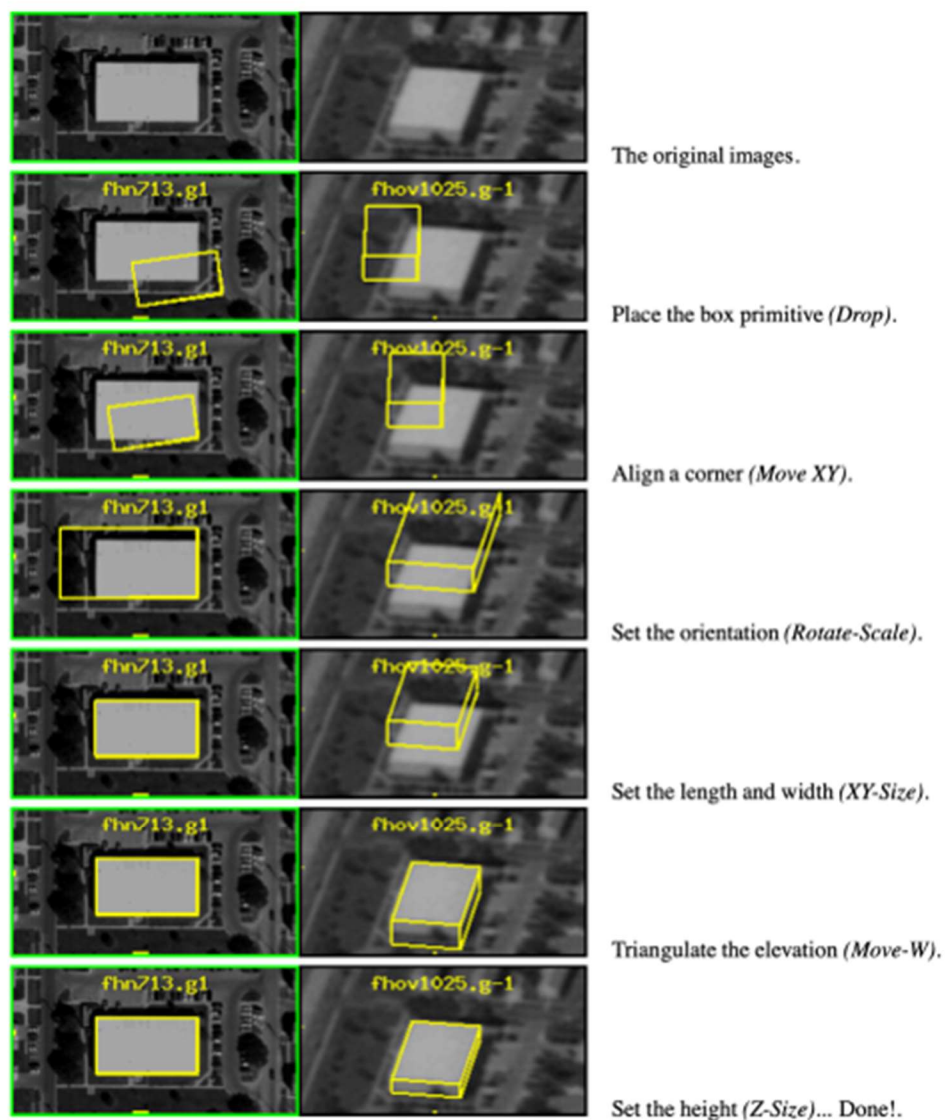


Figure 4: The sequence of adjustments used to manually model a building.

EX1001, Fig. 4

2. Overview of Quam

Quam is titled “[t]he RADIUS Common Development Engine.” EX1005, 1. Quam explains that the “main goal” of the RADIUS Common Development Engine (RCDE) “is to provide a system to carry out interactive cartographic modeling of three-dimensional scenes from multiple images,” and “provide[] the

foundation for the RADIUS Testbed System.” EX1005, Abstract. Quam describes that “[t]he cartographic features and data that can be entered [into RCDE] include multiple images, camera models, digital terrain elevation data, point, line, and area cartographic features, and a wide assortment of 3-D objects.” EX1005, 1; EX2032, ¶¶76-77.

Quam discloses that “[t]he RCDE supports a variety of primitive shapes for modeling cultural features, such as a:

Contour Map This object displays a set of contours of constant elevation computed from a digital terrain model. The elevation spacing can be set to any convenient quantity.

Map Grid This object displays lines of constant latitude and longitude or UTM coordinates.

Text displays a string of text at a 3-D location in a site.

EX1005, 5, 8; EX2032, ¶¶78-79.

3. The Heller-Quam Combination Does Not Render Obvious Limitation [1.5]

As described above, at least the following features (a)-(b) of limitation [1.5] are entitled to patentable weight:

[1.5] [(a)] generating and outputting a roof estimate report using a report generation engine, ... [(b)] wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building.

EX2032, ¶80.

Other than reproducing the entirety of limitation [1.5] in a heading before its analysis of limitation [1.5], Petitioner nowhere mentions, addresses, or shows where either Heller or Quam disclose features (a)-(b) of limitation [1.5]. Petition, 33-35; EX1003, ¶¶57-62; EX2032, ¶81.

Rather, based on its incorrect construction that the entirety of limitation [1.5] should not be entitled to any patentable weight, Petitioner alleges that “a showing of ‘generating and displaying *any graphical or textual information*’ is sufficient to meet [limitation [1.5]].” Petition, 34 (citing EX1010, 18); EX1003, ¶58 (identical). This argument is wrong. To show that limitation [1.5] is taught by the prior art, Petitioner must show that the Heller-Quam combination teaches all of the elements of features (a)-(b) of limitation [1.5]. EX2032, ¶82.

However, Petitioner's analysis of limitation [1.5] does not even attempt to address feature (a) or feature (b) of limitation [1.5], much less show how Heller or Quam allegedly teach these features (a)-(b). Petitioner addresses limitation [1.5] across four paragraphs in the Petition (starting with “In the combination, Quam describes...”) to allege that the Heller-Quam combination teaches displaying data. Petition, 34-35. These four paragraphs, however, nowhere address nor show how the Heller-Quam combination teaches features (a)-(b) of limitation [1.5]. EX2032, ¶¶83-87 (analyzing how Petitioner's analysis fails to show that the Heller-Quam

combination teaches features (a)-(b) of limitation [1.5]). Petitioner has thus failed to show that Heller-Quam combination teaches either of features (a)-(b) of limitation [1.5]. EX2032, ¶88.

Neither Heller nor Quam discloses “generating and outputting a roof estimate report using a report generation engine.” First, there is no teaching in Heller or Quam that corresponds to “generating and outputting a roof estimate report” at all. Heller and Quam each fail to disclose the feature of a “roof estimate report,” let alone generating and outputting such a report using a report generation engine. EX2032, ¶89. Second, there is no disclosure whatsoever in either Heller or Quam of such a generated roof estimate report being “provided for repair and/or constructing the roof structure of the building.” On the contrary, Heller and Quam are merely directed to creating a 3D model of the basic geometry of the site under examination. EX1004, Abstract, 1 (Introduction); EX1005, 1 (Introduction). There is no disclosure in either Heller or Quam of providing a report “for repair and/or constructing the roof structure of the building,” as required by limitation [1.5]. EX2032, ¶89.

Accordingly, the Heller-Quam combination does not disclose, suggest, or render obvious limitation [1.5]. Claim 1 is therefore patentable over the Heller-Quam combination presented in Ground 1. EX2032, ¶90.

V. PETITIONER'S GROUND 2 FAILS BECAUSE PETITIONER DOES NOT SHOW THE PRIOR ART RENDERS THE CLAIMS OBVIOUS

Petitioner additionally challenges claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 as allegedly being obvious over “Heller and Quam in view of Deaton.” Petition, 50 (Ground 2 heading). Petitioner's analysis in Ground 2 differs only with respect to limitation [1.5]. Petitioner argues that “to the extent this limitation [1.5] is found to be entitled to patentable weight, it is nonetheless rendered obvious by the Heller-Quam-Deaton combination.” Petition, 53; EX2032, ¶149.

A. Ground 2 is Facially Deficient.

At the outset, Ground 2 is facially deficient because it does not address all the features of limitation [1.5] that are lacking in the Heller-Quam combination in Ground 1. As described above, limitation [1.5] includes at least the following features (a)-(b) that are entitled to patentable weight:

- (a) generating and outputting a roof estimate report using a report generation engine, and
- (b) wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building.

Petitioner entirely failed to show that Heller or Quam teaches features (a)-(b) of limitation [1.5]. EX2032, ¶¶150-151.

Petitioner's analysis of limitation [1.5] for Ground 2 is deficient because it does not show that Deaton teaches (a) “generating and outputting a roof estimate report using a report generation engine,” as recited in limitation [1.5(a)]. EX2032,

¶152.

Citing only paragraph 10 of Deaton, Petitioner argues that “[i]n the combination, Deaton describes ‘a roof inspection system’ that generates and outputs various reports.” Petition, 53 (citing EX1006, ¶10). There is no discussion or suggestion in paragraph 10 of Deaton supporting the contention that “Deaton describes ‘a roof inspection system’ that *generates and outputs various reports.*” Petition, 53 (citing EX1006, ¶10). Deaton’s paragraph 10 discloses a “roof inspection system” that includes a portable communications device that “collect[s] roof inspection information” at the physical site of a roof structure being investigated, and transmits the collected roof inspection information to a “second computing device” remote from the inspection site. EX1010, ¶10. Deaton’s paragraph 10 does not teach that the portable communications device of the roof inspection system, or any other device for that matter, “generate[s] and output[s] a roof estimate report using a report generation engine,” as recited in limitation [1.5(a)]. EX2032, ¶¶153-154.

Therefore, Petitioner has not shown that Deaton teaches limitation [1.5(a)], because Deaton, like Heller and Quam, fails to teach “generating and outputting a roof estimate report using a report generation engine,” as recited. Consequently, Petitioner has not shown that the Heller-Quam-Deaton combination of Ground 2 renders limitation [1.5] obvious because the Heller-Quam-Deaton combination

fails to teach all the features of limitation [1.5]. EX2032, ¶¶155-156.

In Ground 2, Petitioner again relies exclusively on its analysis of limitation [1.5] for limitations [16.3] and [26.3]. Petition, 54-55; EX1003, ¶¶106, 109. Petitioner's analysis of limitations [16.3] and [26.3] is deficient for the same reasons as limitation [1.5]. EX2032, ¶157.

Therefore, claims 1, 16, and 26, as well as dependent claims 6, 7, 9, 10, 17, 25, and 34, are patentable over the Heller-Quam-Deaton combination. EX2032, ¶158.

B. There is Insufficient Motivation to Combine Deaton with the Heller-Quam Combination.

In addition to the Heller-Quam-Deaton combination failing to teach limitations [1.5], [16.3], and [26.3], Petitioner's proposed motivation to combine Deaton with the Heller-Quam combination lacks merit. EX2032, ¶¶160-172.

Petitioner argues that “the combined system of Heller and Quam is modified to produce a roof estimate report, as taught by Deaton, based on the site models described in Heller and Quam.” Petition, 50; EX1003, ¶94. This proposed combination is not supportable based on the teachings of Heller, Quam, and Deaton. EX2032, ¶162. Heller “create[s] a 3-dimensional model” of the basic geometry of “military and industrial sites” based on image analysis, and Quam “facilitates...three-dimensional (3-D) modeling” with the RADIUS Common Development Environment (RCDE). EX1004, Abstract, 1 (Introduction); EX1005,

Abstract, 1 (Introduction). However, neither Heller nor Quam generates and outputs a roof estimate report based on their 3-D models. EX2032, ¶¶161-162.

Deaton, on the other hand, is directed to a “roof inspection system” that includes a portable computing device that collects “roof measurement information” from the physical, on-site inspection of a roof. EX1006, ¶10. Unlike Heller and Quam that are directed to creating 3D models based on images, Deaton is instead directed to collecting “roof measurement information” based on the physical inspection of a roof on-site. EX1006, ¶10; EX2032, ¶163.

Petitioner argues that “a POSITA would understand that *Deaton’s techniques for generating a roof estimate report based on a three-dimensional model* would operate in the same manner regardless of how the particular three-dimensional model was originally generated,” but Petitioner’s argument cites to no support whatsoever in Heller, Quam, or Deaton. Petition, 53-54; EX2032, ¶164. The only support for this argument is Dr. Forsyth’s declaration (EX1003, ¶102), but Dr. Forsyth merely repeats, verbatim, the same conclusory assertion from the Petition without identifying any disclosure in Heller, Quam, or Deaton to support this conclusory assertion. Therefore, Dr. Forsyth’s unsupported theory is entitled to little or no weight. *See* 37 C.F.R. § 42.65(a); *Xerox Corp. v. Bytemark, Inc.*, IPR2020-00624, Paper 9 at 15-16 (Aug. 24, 2022) (precedential) (declaration testimony that contains only verbatim restatement of conclusory assertion in

petition without citing to additional support is entitled to little or no weight).

EX2032, ¶164.

Further, this argument lacks merit, because there is no disclosure in Deaton of creating a report based on a 3D model. EX2032, ¶164. Deaton's "project report" is created "*in accordance with the conditions identified in the assessment report*," which "include[s] a summary of the inspected infrastructure and a listing of the deficiencies identified during inspection data collection." EX1006, ¶¶106-107. Thus, Deaton provides that the "project report" is generated based on a physical inspection of the infrastructure. EX1006, ¶¶106-107. Deaton's "project report" is created without relation to any 3D model and is certainly not "based on a three-dimensional model" as alleged by Petitioner. Petition, 53-54. Instead, Deaton makes clear that the "project report" is based on Deaton's "assessment report" that is based on an on-site, physical inspection of the roof. *Id.* There is simply no disclosure or suggestion anywhere in Deaton that the "project report" (or "assessment report") is in any way generated based on a 3D model. EX2032, ¶164.

Petitioner alleges that "Deaton's report is produced based on similar models to those in Heller-Quam" (Petition, 52 (citing EX1006, ¶70)), but Deaton provides no teaching—and Petitioner has not pointed to any—that Deaton's "project report" or "assessment report" is created based on a "graphical model," as discussed in Deaton's paragraph 70, or even whether Deaton's "graphical model" is a 2D or 3D

model. EX2032, ¶165.

Therefore, the basic premise behind Petitioner's argument that "Deaton's techniques for generating a roof estimate report *based on a three-dimensional model would operate in the same manner regardless of how the particular three-dimensional model was originally generated*" (Petition, 53-54; EX1003, ¶102) has no merit and is contradicted by the actual disclosure of Deaton. EX2032, ¶166.

Petitioner has not pointed to any teaching in Heller, Quam, or Deaton to support its proposed modification of the Heller-Deaton combination to "produce a roof estimate report, as taught by Deaton, based on the site models described in Heller and Quam." Petition, 50; EX2032, ¶167. Petitioner argues that "including the production of [Deaton's project] report in the system resulting from the combination of Heller and Quam would advantageously enable the site models described in Heller and Quam to be utilized to plan and execute maintenance, repair, and new construction projects, thereby increasing the utility of the combined system." Petition, 51 (EX1006, ¶107); EX1003, ¶95. This argument lacks merit because Petitioner has not shown why or how a POSITA would have modified the Heller-Quam combination—that is directed to building 3D models from images to capture the basic geometry of a site—to incorporate the "project report" of Deaton that is generated based on the physical, on-site inspection of a roof structure. EX2032, ¶168.

Petitioner argues, without any support, that “[a] POSITA would have recognized that applying Deaton’s teachings to augment the Heller-Quam system would have led to predictable results without significantly altering or hindering the functions performed by the Heller-Quam system.” Petition, 51-52; EX1003, ¶97. In addition to not citing any support in Heller, Quam, or Deaton for this alleged motivation, modifying the Heller-Quam combination in the manner proposed would, in fact, “significantly alter[] or hinder[] the functions performed by the Heller-Quam system” because there is no teaching in Heller or Quam of being able to incorporate “roof inspection information” from the physical, on-site inspection that is performed in Deaton. EX1006, ¶¶10, 106, 107. Similarly, there is no teaching in Deaton of being able to generate a “project report” from a 3D model, such as the 3D models capturing the basic geometry of a site as created by Heller-Quam. EX2032, ¶168. Therefore, a POSITA would not have been motivated to modify the Heller-Quam combination to additionally include Deaton’s project report as proposed by Petitioner. EX2032, ¶169.

Further, contrary to Petitioner’s argument, a POSITA would not have been “motivated to incorporate the well-known techniques of Deaton into Heller-Quam to achieve the predictable benefits described in Deaton.” Petition, 52 (citing EX1003, ¶97; EX1005, 34; EX1006, ¶¶9, 12-13). None of the cited portions of Quam and Deaton support Petitioner’s argument that a POSITA would have been

motivated to generate a “project report” from an on-site inspection of an infrastructure (EX1006, ¶¶9, 12-13) using basic 3-D site models that are generated from imagery in Heller and Quam. EX2032, ¶170. Deaton suggests the opposite because Deaton’s “project report” is created based on the on-site, physical inspection of the infrastructure being investigated. EX1006, ¶¶106-107, 10. Heller and Quam are not directed to roof repair and/or construction and are instead directed to creating basic 3D models of a site under inspection. EX1004, 1; EX1005, 1. The Petition identifies no disclosure in Heller or Quam showing that the Heller-Quam combination creates 3D models based on information obtained from the on-site, physical inspection of the infrastructure being investigated. EX2032, ¶170.

Accordingly, in addition to the Heller-Quam-Deaton combination failing to teach limitations [1.5], [16.3], and [26.3], a POSITA would not have been motivated to additionally modify the Heller-Quam combination with Deaton as proposed by Petitioner. Therefore, Ground 2 fails to render obvious the challenged claims. EX2032, ¶¶171-172.

C. Grounds 1 and 2 Fail to Teach Additional Limitations of Claims 1, 16, and 26.

Limitations [1.5], [16.3], and [26.3] recite “wherein the roof estimate report includes numerical values for corresponding slope, area, or lengths of edges of at least some of a plurality of planar roof sections of the roof.” To the extent the Board

gives patentable weight to this phrase, Petitioner has not shown that the Heller-Quam combination of Ground 1 or the Heller-Quam-Deaton combination of Ground 2 teaches a “roof estimate report” that includes these features. Petitioner does not address these features other than to reproduce the text of limitations [1.5], [16.3], and [26.3]. Petition, 33-35, 53-54; EX2032, ¶¶91, 159.

VI. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

To further illustrate the non-obviousness of the challenged claims, Patent Owner submits compelling objective indicia of non-obviousness, including evidence showing both commercial success of and industry praise for Patent Owner's Twister and Render House products that embody the claimed invention. In the Xactware IPR, the Board found that Patent Owner presented “extensive evidence” indicating that Patent Owner's “Twister and Render House products are coextensive with the challenged claims, and that the commercial success of and industry praise for these products confirmed that the challenged claims are non-obvious. EX1010, 31, 32-33, 34. Further, in the Xactware IPR, the Patent Owner provided “extensive evidence of nexus” between the evidence of commercial success and industry praise and the challenged claims. EX1010, 27, 33, 34; EX2040, 49-71 (citing EX2031, pp. 41-100). The Federal Circuit affirmed the Board's finding of non-obviousness based on Patent Owner's secondary considerations evidence. EX1016, 2.

In this IPR proceeding, Patent Owner presents the same “decisive” and “extensive” evidence the Board relied on in the Xactware IPR. The Board should similarly find in this IPR proceeding that the challenged claims are non-obvious based on this evidence. EX2032, ¶¶174-176.

As shown below, Patent Owner's Twister and Render House software products embody the invention disclosed and claimed in the '737 Patent (EX2032, ¶¶177-179), and Patent Owner's Twister and Render House software has achieved commercial success and praise in the roof estimation market. While Patent Owner must show sufficient nexus that the indicia of non-obviousness are tied to the novel elements of the claims at issue, the “[o]bjective indicia need only be reasonably commensurate with the scope of the claims.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013) (internal quotation omitted). Patent Owner is not required to “produce evidence of nonobviousness for every potential embodiment of the claim.” *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013). Because Patent Owner's Twister and Render House products are the invention disclosed and claimed in the '737 Patent, Patent Owner is entitled to a presumption of nexus between the secondary considerations evidence and the challenged claims. *PPC Broadband, Inc. v. Corning Optical Communications RF, LLC*, 815 F.3d 734, 747 (Fed. Cir. 2016). Further, Patent Owner shows below how there is an extensive nexus between the challenged

claims and the secondary considerations evidence.

The evidence cited below and by Dr. Bajaj to show that the Twister and Render House products embody the challenged claims is evidence that was in existence as of October 15, 2008, which is contemporaneous with the October 31, 2008 priority date of the '737 Patent. EX2032, ¶¶177-179. Similarly, Patent Owner cites evidence of commercial success and industry praise contemporaneous with the priority date of the '737 Patent and the issuance of the '737 Patent.

A. Patent Owner's Twister and Render House Products Embody the Claimed Invention of the '737 Patent.

Patent Owner's Twister and Render House products practice at least claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 of the '737 Patent. In this section, Patent Owner produces the same evidence from the Xactware IPR showing that Patent Owner's Twister and Render House products embody claims 1, 9, 10, 16, 25, 26, and 34. Dependent claims 6, 7, and 17 were not addressed in the Xactware IPR. Patent Owner newly shows how the Twister and Render Products embody claims 6, 7, and 17. Dr. Bajaj's declaration contains claim charts showing how each limitation of the challenged claims is embodied by the Twister and Render House products. EX2032, ¶¶177-179.

1. Twister and Render House Embody Claim 1 of the '737 Patent

Twister and Render House the computer-implemented method in a roof

estimate report system as disclosed and claimed in claim 1 of the '737 Patent.

EX2007, 4 [REDACTED]

[REDACTED]

[REDACTED] EX2030, 4 [REDACTED]

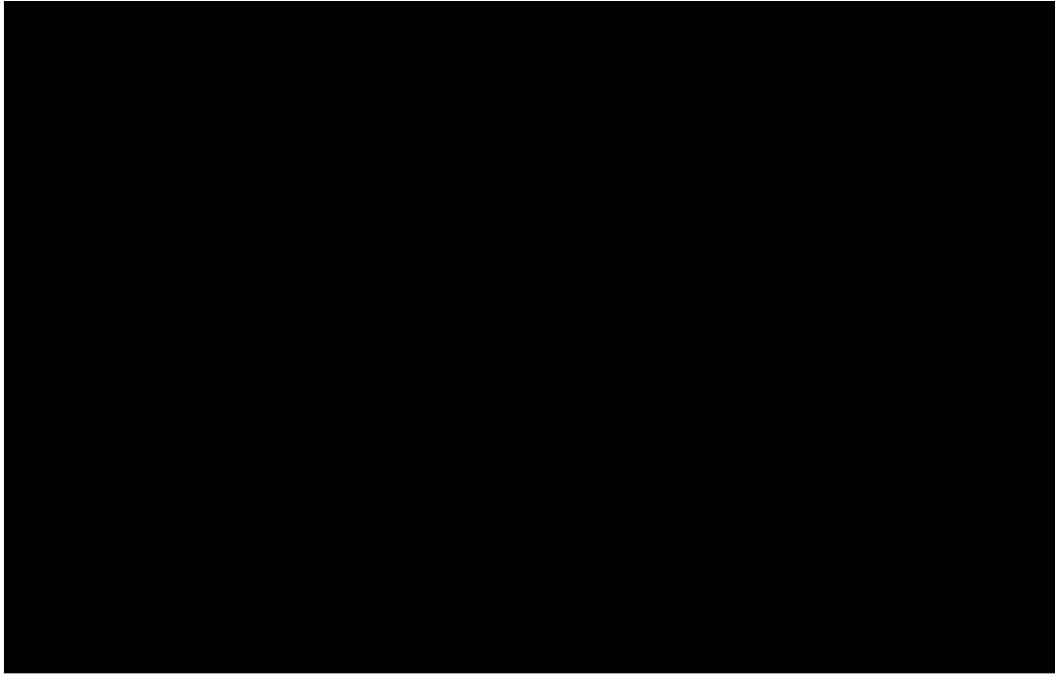
[REDACTED]

[REDACTED]; EX1001, claim 1.

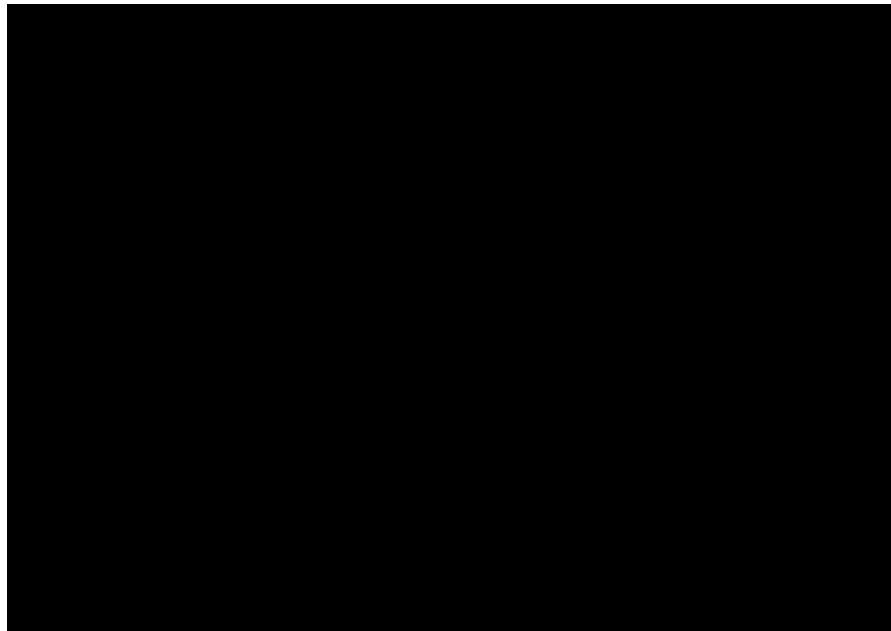
As the screenshots below show, Twister and Render House display a plurality of aerial images of a roof at the same time where each image provides a different view of the same roof. Twister and Render House also display line drawings overlying a first and a second aerial image, in which the line drawings have features in common. For example, [REDACTED]

[REDACTED]

[REDACTED]



EX2032, ¶179, limitation [1.2].



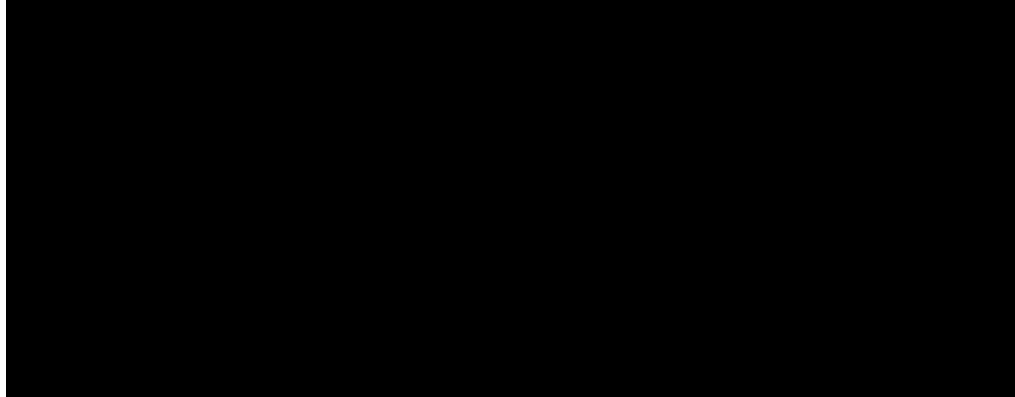
Id.

Twister and Render House will change the line drawing overlying the first aerial image in response to a user input. For example, both Twister and Render

House allow [REDACTED]

[REDACTED] EX2032, ¶179, limitation [1.2]. In the screenshots below from Twister, [REDACTED]

[REDACTED] has been straightened in response to user input.”

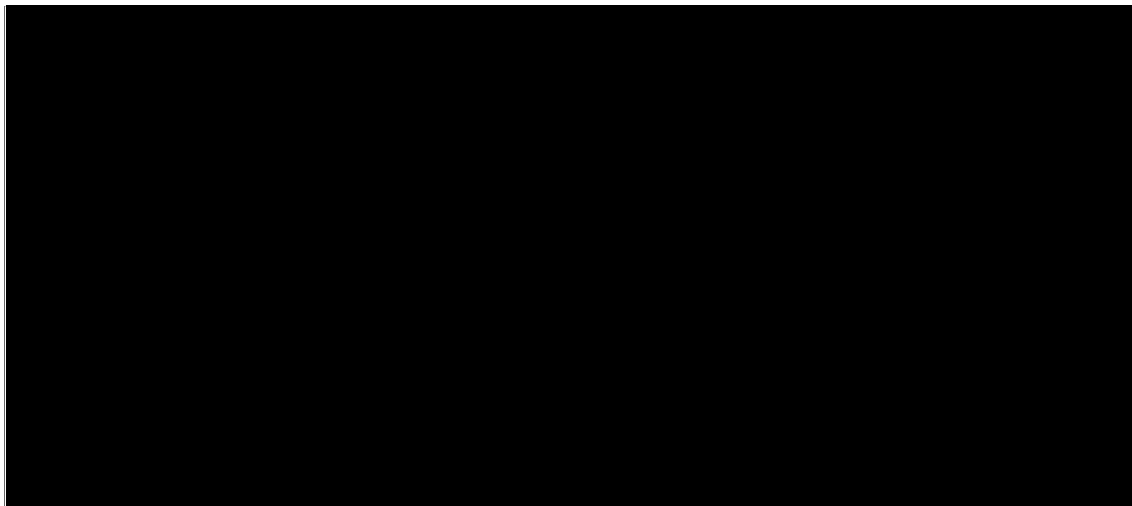


Id., limitation [1.2]

Id., limitation [1.3]

Similarly, in the screenshots below from Render House, [REDACTED]

[REDACTED] have been changed in response to user input.”



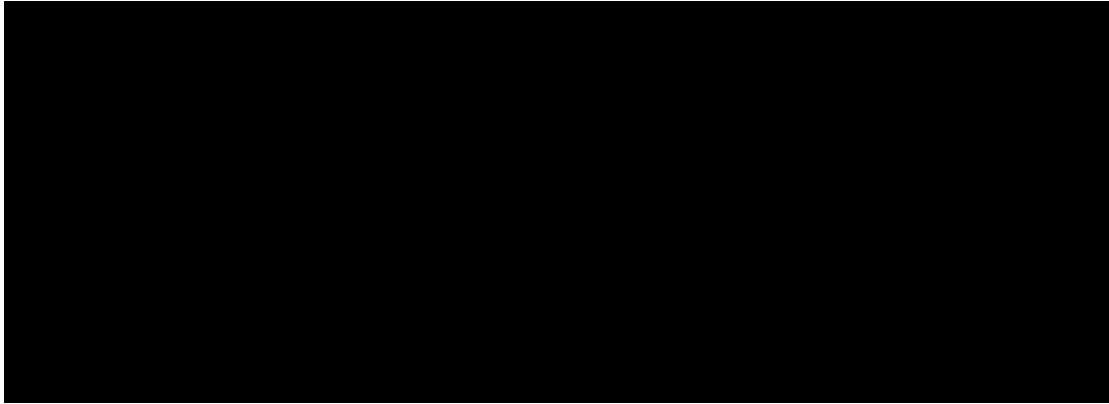
Id., limitation [1.2]

Id., limitation [1.3]

Twister and Render House make corresponding changes to the line drawings

overlying the second aerial images:

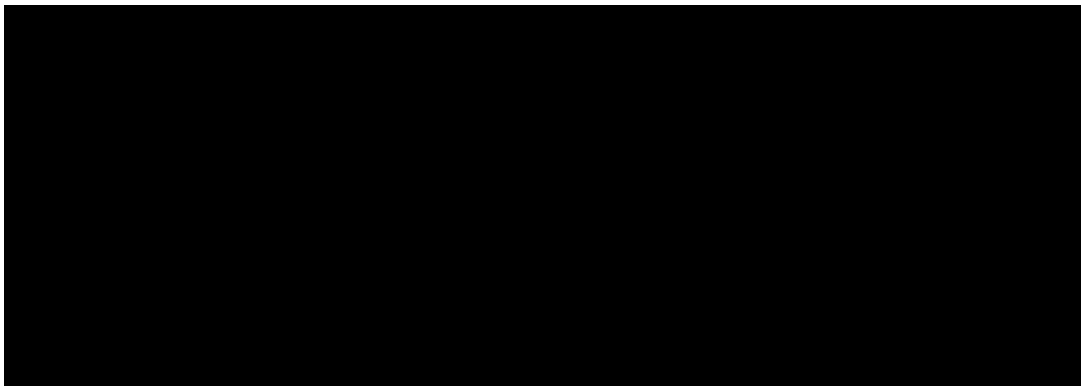
Screenshots from Twister



Change to First Aerial Image

Corresponding Change to Second
Aerial Image

Screenshots from Render House



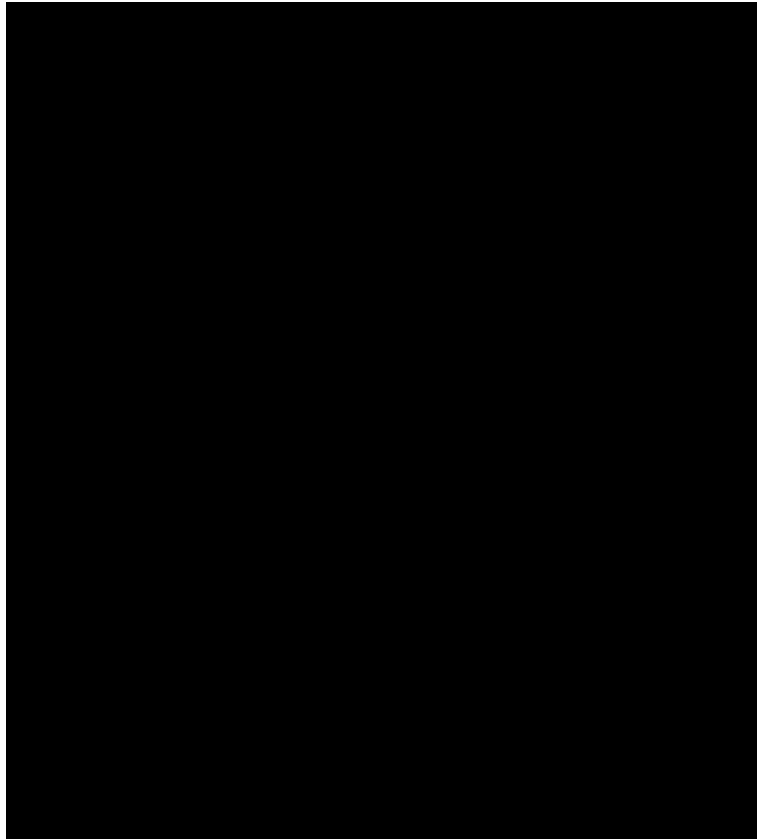
Change to First Aerial Image

Corresponding Change to Second
Aerial Image

Id., limitation [1.4].

The Twister and Render House products each generate and output roof

estimate reports using the House Report tool:



Id., limitation [1.5] (example cover page of an Eagle View roof estimate report).

The roof estimate reports can include numerical values corresponding to the slope, area, or lengths of edges of at least some of the roof sections:

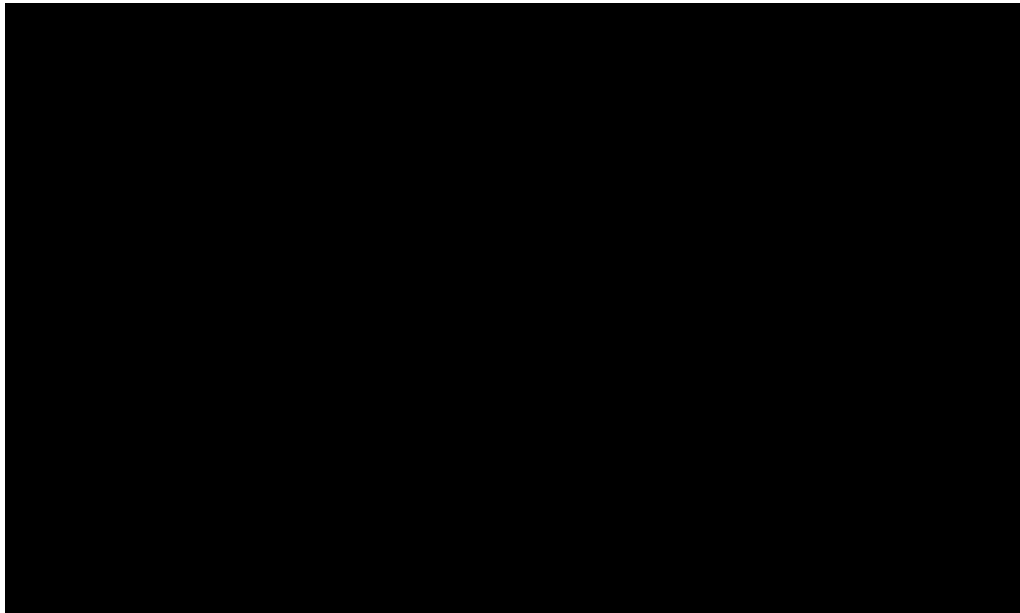


Id., limitation [1.5] (example page of roof estimate report showing the area of the roof facets).

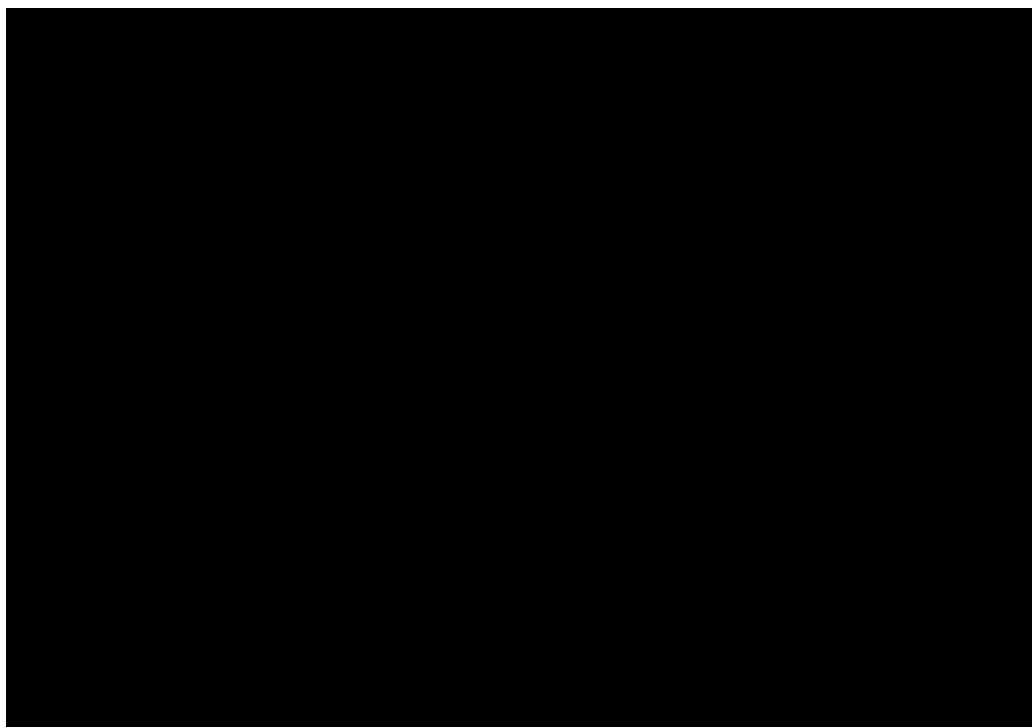
2. Twister and Render House Embody Claim 6 of the '737 Patent.

In addition to embodying the invention of claim 1, Twister and Render House and Twister also meet the limitations of dependent claim 6 by [REDACTED] [REDACTED] as the following screenshots of Twister and Render illustrate. EX2032, ¶179, claim 6.

Twister



Render House



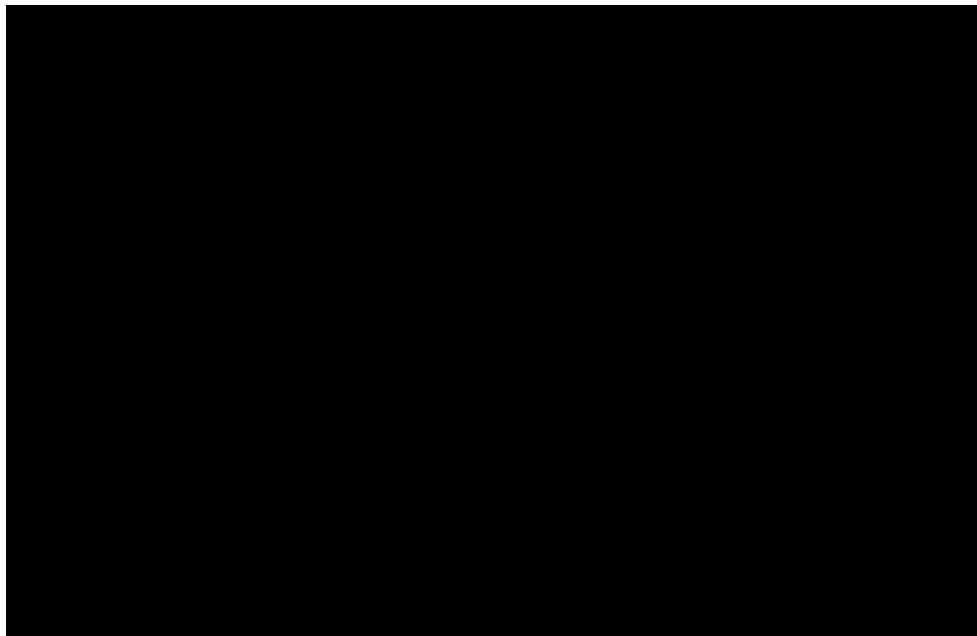
3. Twister and Render House Embody Claim 7 of the '737 Patent.

Twister and Render House also meet the limitations of claim 7. For example, as shown in the following screenshots of Twister, [REDACTED]

[REDACTED]

[REDACTED].

Twister



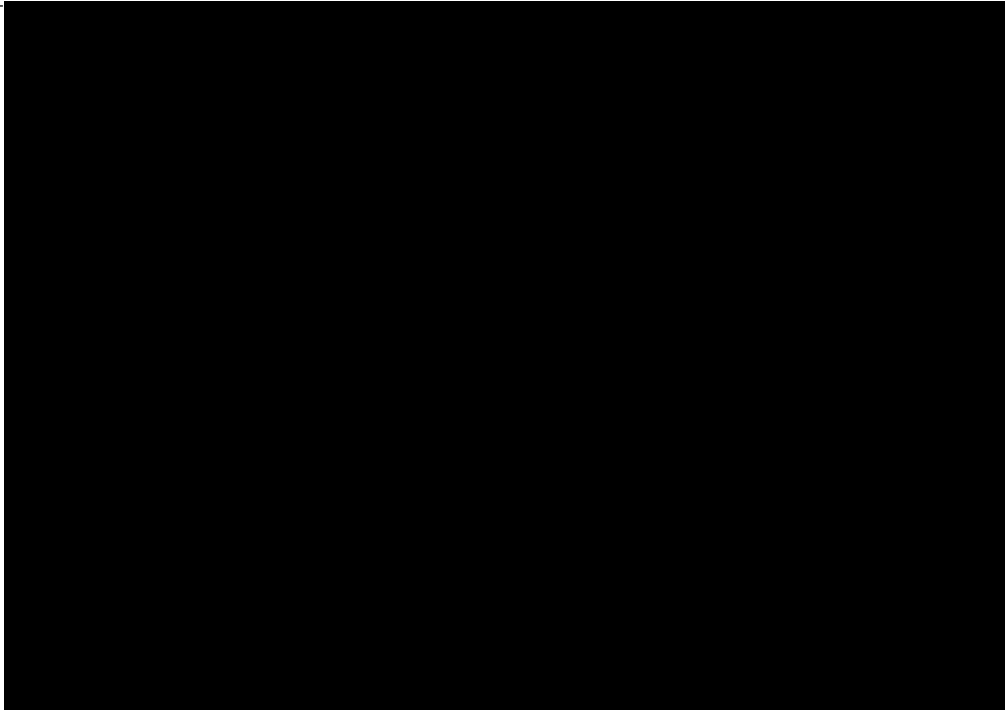
In the following screenshots of Render House, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

Render House



Id., ¶179, claim 7.

4. Twister and Render House Embody Claim 9 of the '737 Patent.

Twister and Render House also meet the limitations of claim 9 by

 when a change is made” as claimed in dependent claim 9 of the '737 Patent. EX2032, ¶179, claim 9.

5. Twister and Render House Embody Claim 10 of the '737 Patent.

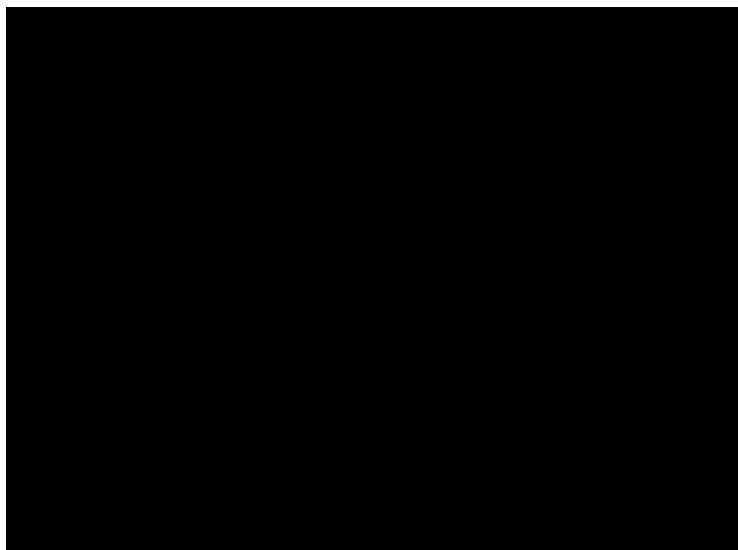
Twister and Render House also embody the invention claimed in claim 10.

For example, Twister displays an operable marker indicated :



EX2032, ¶179, limitation [10.1] (red arrow in the screenshot “shows a visual marker that is moveable by a user”).

Similarly, Render House displays a marker indicated



Id., ¶179, claim 10 (red arrow in the screenshot “shows a visual marker that is moveable by a user”).

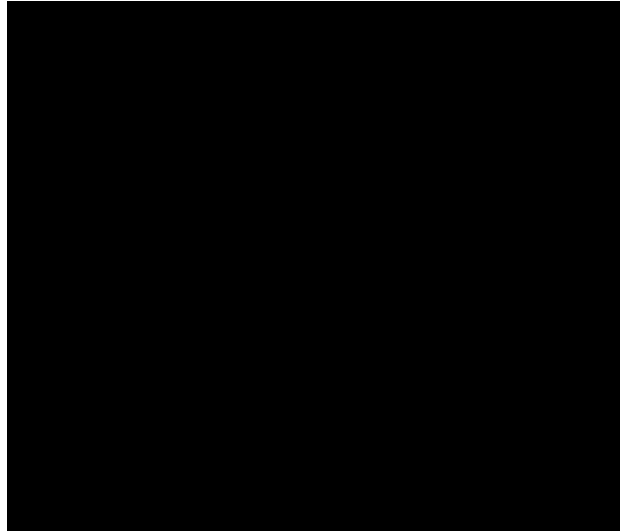
In the screenshots above, the Twister and Render House software receive an indication of the point indicated by the red arrows. *Id.*, [10.2] (The red arrows...show a point where the Twister and Render House products have received an indication via the marker on the first aerial image.).

Then, based on the received indication, Twister and Render House register the aerial image to a reference grid corresponding to the three-dimensional model of the roof. The Twister software registers the received indications to a 3D model, as shown below.



EX2007, 24 (showing an example of [REDACTED] in the Twister program).

Similarly, the Render House software registers the received indications to a 3D roof model, as shown below.



EX2030, 23.

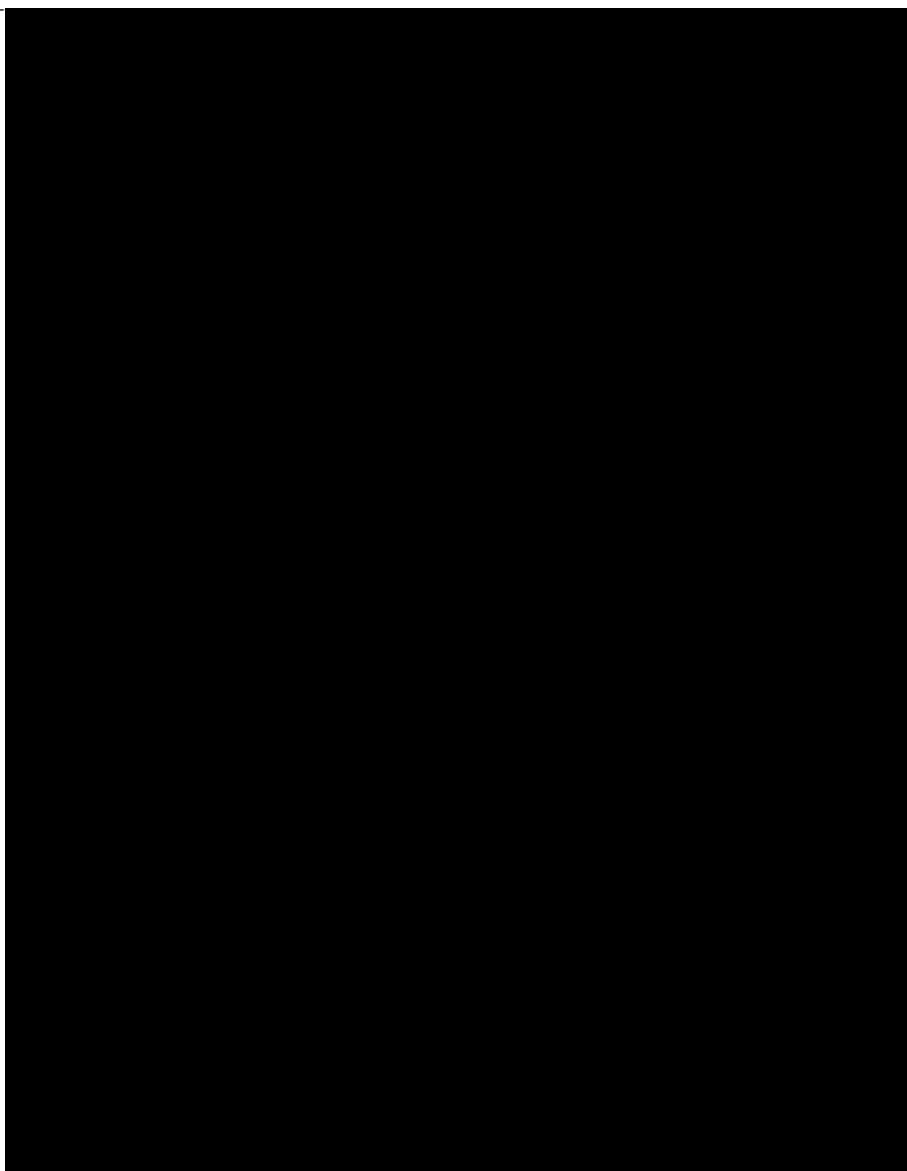
6. Twister and Render House Embody Claim 16 of the '737 Patent

As explained above with respect to claims 1 and 10 of the '737 Patent, both the Twister and Render House and Twister software embody the invention disclosed and claimed in independent claim 16 of the '737 Patent. *See* Section VI.A.1, 5; EX2032, ¶179, claim 16.

7. Twister and Render House Embody Claim 17 of the '737 Patent.

Twister and Render House also embody the invention claimed in claim 17 of the '737 Patent. For example, as shown in the following screenshots, Twister



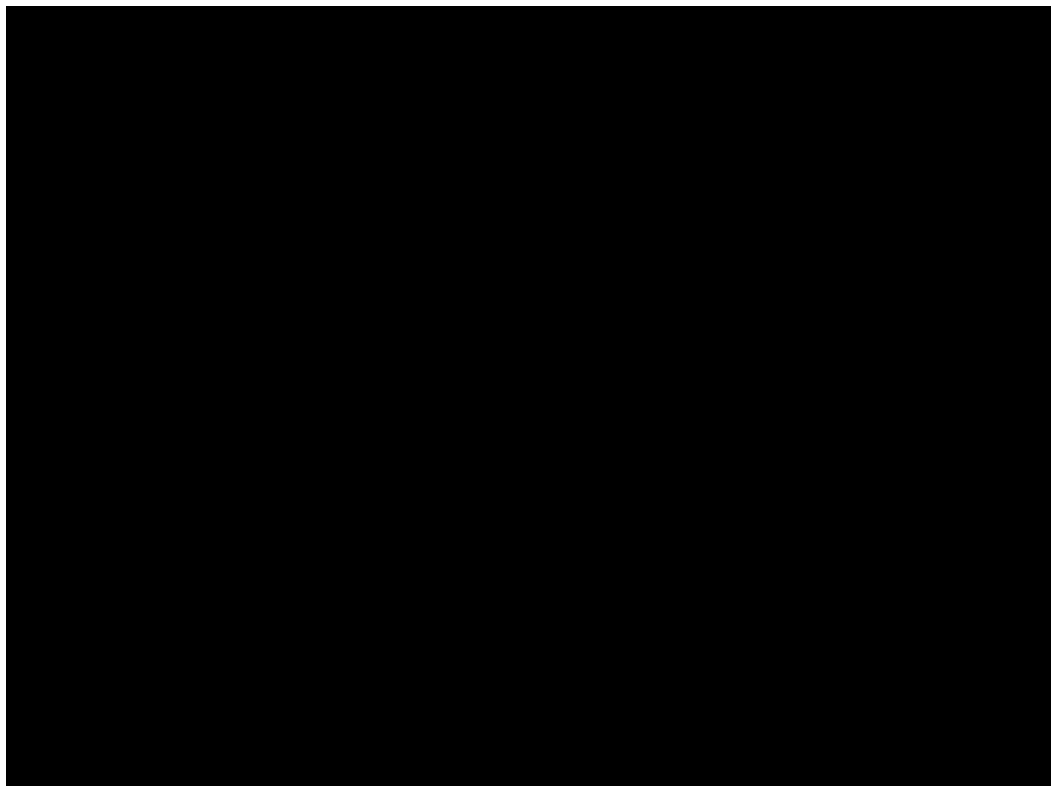


EX2032, ¶179, claim 17.

Further, in the following screenshot, the Twister product



.



EX2032, ¶179, claim 17 (citing EX2007, 28).

Similarly, in the following screenshots, Render House





EX2032, ¶179, claim 17.

8. Twister and Render House Embody Claim 25 of the '737 Patent.

Twister and Render House also embody the invention claimed in claim 25 of the '737 Patent. For example, Twister modifies a three-dimensional model of a roof based on modifications to the line drawing overlaying a first aerial image, as shown below:

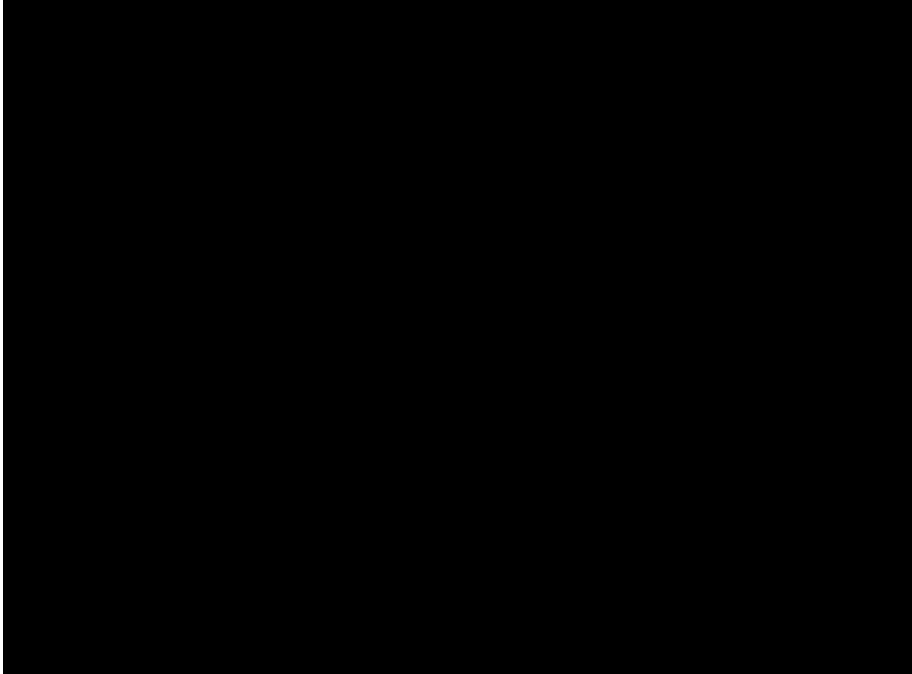


EX2032, ¶179, claim 25

[REDACTED]

[REDACTED]

Similarly, Render House modifies [REDACTED] of a roof in the below screenshot:



Id., claim 25



9. Twister and Render House Embody Claim 26 of the '737 Patent

As explained above with respect to claims 1 and 10 of the '737 Patent, both the Twister and Render House and Twister software embody the invention disclosed and claimed in independent claim 26 of the '737 Patent. *See* Section VI.A.1, 5; EX2032, ¶179, claim 26.

10. Render House And Twister Embody Claim 34 of the '737 Patent

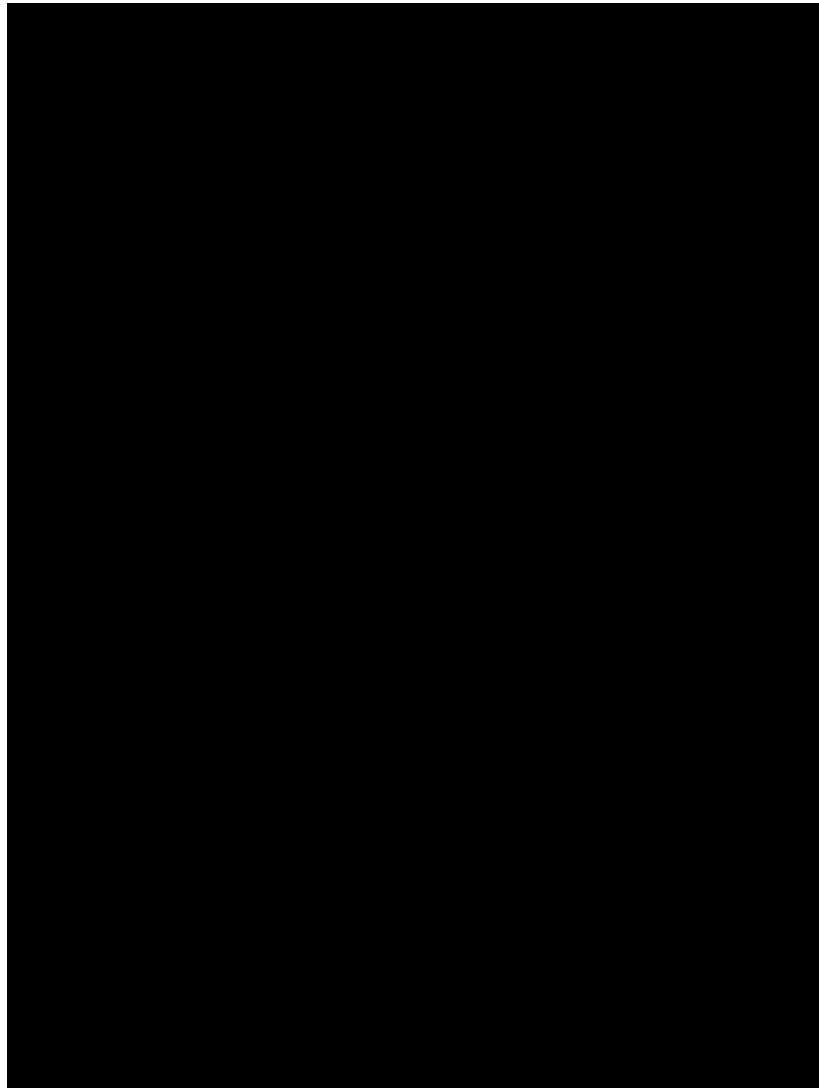
In addition to embodying the invention of independent claim 26 of the '737 Patent, Render House and Twister also embody the invention disclosed and claimed in dependent claims 34 and 35 of the '737 Patent. For example, the

excerpted screenshots of the Twister and Render House products show that [REDACTED]

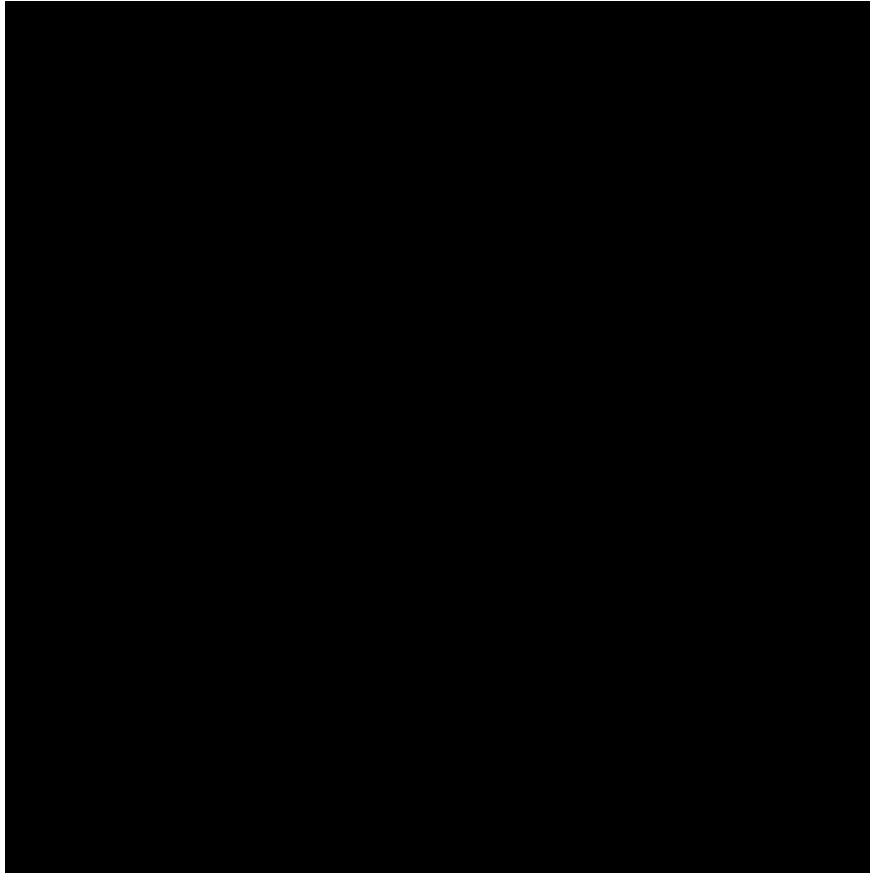
[REDACTED]

[REDACTED] EX2032, ¶179, claim 34.

Twister



Render House



B. The Twister and Render House Products Achieved Significant Commercial Success As a Result of the Patented Features.

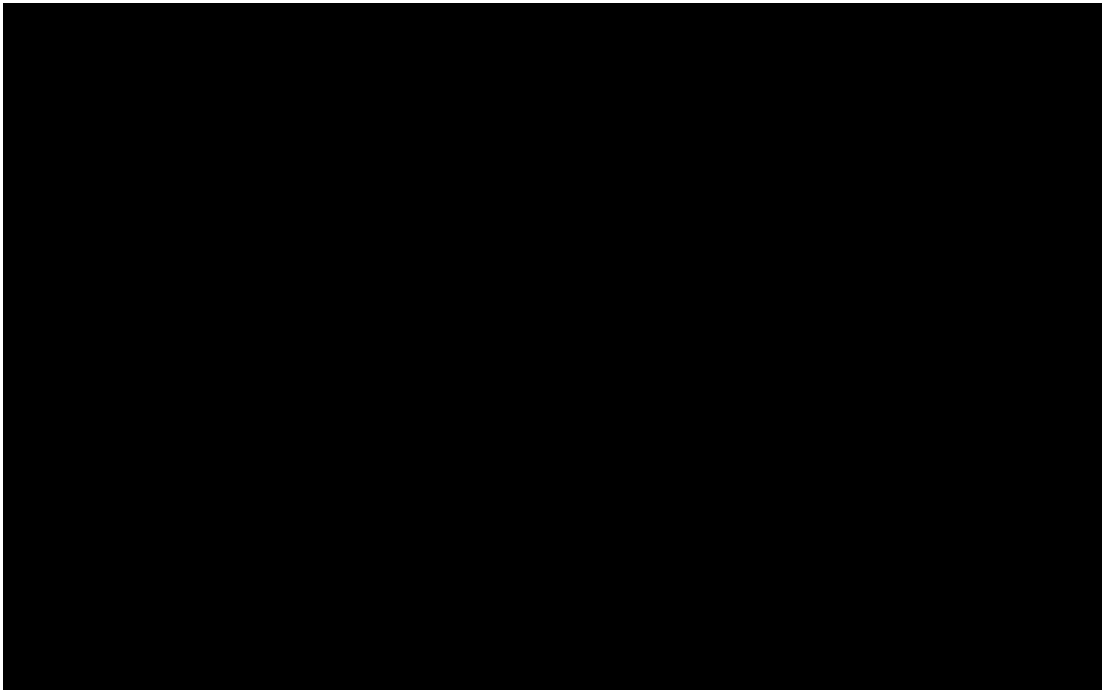
Patent Owner's roof report service used the patented invention to achieve tremendous commercial success by creating accurate roof estimate reports faster and at less expense than previous solutions. Patent Owner pioneered a novel process whereby a user can generate roof estimate reports from complex 3D models based on analysis of particular types of high-resolution aerial photographs and new photogrammetry techniques. The inventiveness of Patent Owner's process generates more consistently accurate roof measurements than could be achieved using older methods. *See, e.g.*, EX1019 at 3 ("We also know the total bottom line

number is more accurate so we stand behind that. We don't have to worry that we may have made a mistake on the measurement."); EX1020. Patent Owner's process also saves time and money, and reduces liability and risk to contractors. *See* EX1019; EX1020 (showing a \$617,500 "cost savings" by using EagleView). Further, "***approximately 96 percent*** of the top 25 insurance companies rely on [Eagle View Technologies 3D aerial roof measurement reports] in their claims departments." EX1010, 30 (citing Ex.1020, 1; Ex.1029, 8).

Patent Owner's success is directly tied to the patented invention. The Twister and Render House products embody the claimed invention of the '737 Patent to create roof reports that are then transmitted to customers. *See* Section VI.A. Patent Owner first began producing roof reports using its patented invention in 2008, contemporaneous with the priority date of the '737 Patent. Recognizing the benefits of Patent Owner's technology, Xactware, the Petitioner in the prior IPR involving the '737 Patent (IPR2016-00592), entered into a contract with Patent Owner for its roof reports soon after the release of Patent Owner's first product. EX1021 (announcing "a new technology integration" between EagleView and Xactware). Over the next several years, Patent Owner's services achieved rapid growth in sales due to its invention. *See, e.g.*, EX1022 ("EagleView was ranked No. 13 in the software category and No. 133 overall in *Inc. Magazine's*

recently released 31st annual Inc. 500. The ranking was determined by the company's *three-year revenue growth of 2,406 percent.*"').

Patent Owner's sales information further demonstrates the commercial success of its invention:³



In 2009, Patent Owner sold [REDACTED] roof reports using the patented invention for a total revenue of approximately [REDACTED]. EX2012, 3. The

³ Revenue data comes from the gross revenue from roof reports found in Patent Owner's financial records. EX2012, 3; EX2013, 7, EX2014, 6, EX2015, 12.

This revenue reflects sales of roof reports created using Patent Owner's Twister and Render House products. EX2011 (Declaration of C. Johnson).

number of roof reports [REDACTED] in 2015.

EX2015, 12 [REDACTED]. Patent Owner's commercial success from the patented invention resulted in an increase in revenue over [REDACTED] of more than [REDACTED]. *Compare* EX2012, 3 with EX2015, 12 (calculated growth in revenue from [REDACTED] in 2009 to approximately [REDACTED] in 2015).

Xactware and its parent company Verisk recognized the commercial success of Patent Owner's invention when Verisk announced a plan to acquire Patent Owner. EX1023. Verisk valued Patent Owner's business at \$650 million. *Id.* Verisk's CEO explained to its investors that this valuation was due to the value of Patent Owner's patent portfolio: "Additionally, [Patent Owner] has significant intellectual property, including over 20 issued patents." EX1023, 3. Patent Owner's commercial success using its patented invention is strong evidence of the non-obviousness of the challenged claims. *Intri-Plex Tech.*, IPR2014-00309, Paper 83 at 38 ("[T]he commercial success...weighs heavily in favor of non-obviousness of the invention."). The core of Patent Owner's business is the novelty and innovativeness of its technology embodying the patented invention. It would not have achieved commercial success or disrupted the roofing and insurance industry had its patented invention been obvious at the time as Petitioner now argues. The patentability of the challenged claims should be upheld.

C. Patent Owner's Invention Has Been Recognized and Praised by the Roof and Insurance Industry

Patent Owner created a fundamentally new way of measuring roofs and creating roof reports. Prior to Patent Owner's invention, "[r]oofers once had to spend hours with ladders and tape measures to figure out the size of a job."

EX1024, 1. Patent Owner's invention created a new avenue for "determining roof measurement information based on one or more aerial images of a roof of a building." EX1001, 1:6-11. The roofing measurement industry took notice of Patent Owner's invention and uniformly praised its innovativeness.

While the industry was initially skeptical of Patent Owner's new process, it soon became an accepted industry standard. EX1025, 2 ("When [the inventor] began telling contractors and insurance claims adjusters about his technology, they were skeptical."); *id.*, 1 ("Having an Eagle View report has become an industry accepted standard" (quotation omitted)); EX2026 ("EagleView invented the concept of 3D aerial roof measurements and has quickly become the industry standard in both the roofing and insurance industries."). Experts in the industry "consider Eagle View's invention the 'greatest technological breakthrough' in the industry." EX1027, 2; *see also id.*, 1 ("Eagle View made one of the biggest breakthroughs in the history of the industry by creating a state-of-the-art software program that remotely snaps sophisticated aerial pictures of roofs and accurately measures lengths, pitches, valleys and other hard-to-see areas on roofs.").

As explained above, a feature of the patented invention is the increased accuracy of roof measurements by modifying and displaying line drawings overlaid over aerial images of the roof. *E.g.*, EX1001, Claim 1; EX2032, ¶18. Not surprisingly, the industry praises the accuracy of Patent Owner's roof reports, which is a direct result of the innovative features. EX1028 (describing Patent Owner Eagle View's reports as "consistent, accurate measurements every time"); *id.* (explaining that "similar services . . . just don't compare to EagleView in terms of accuracy . . ."); EX1025, 2 ("The software also produced *more precise* estimates than workers with tape measurers.") (emphasis added). Indeed, a survey of Patent Owner's customers in 2009 found that [REDACTED] praised the [REDACTED] by giving them an [REDACTED] rating. EX2010, 1.

Verisk's executives also touted the benefits of Patent Owner's technology to its investors by noting that "[a]erial imagery [was] emerging as a disruptive innovation for insurance," and stating that Patent Owner's use of imagery for roof estimating was a "killer app." EX1029, 12; EX1023, 16. Verisk's CEO acknowledged Patent Owner's pioneering work in rooftop aerial measurement technology, describing Patent Owner's "unique" ability to span two technologies: the "very complex" worlds of 3D imaging, on the one hand, and analytics based on aerial photographs, on the other. EX1023, 14. Verisk's CEO specifically noted that one of the "special things" about Patent Owner was the "over 20 patents that

[Patent Owner] has.” EX1023, 17. Patent Owner's uniform praise from the roofing industry, experts, and even prior Petitioner Verisk is strong evidence that Petitioner Nearmap's manufactured obviousness arguments are without merit.

D. Petitioner's Secondary Considerations Arguments are Nothing but Unsupported Speculation.

Petitioner's arguments that the redacted information in the Xactware IPR does not establish a nexus with the claimed invention are now moot. Petition, 57-61.

Petitioner also presented numerous unsubstantiated theories why Patent Owner's secondary considerations arguments in the Xactware IPR do not show non-obviousness, including that higher resolution aerial images lead to more accurate reports rather than the non-obviousness of the claimed invention. Petition, 62-64. This is nothing but misguided speculation because the evidence presented above shows unequivocally that the improved accuracy of the reports, as recognized by industry participants detailed in Section VI.C above, is due to the accuracy of the information contained in the roof estimate reports that are generated and output, as recited in claims 1, 16, and 26. Petitioner's next argument that the techniques recited in the challenged claims are not responsible for the increased accuracy of the reports is similarly misguided speculation that is directly rebutted by the evidence presented herein. Petition, 64-65. Lastly, Petitioner theorizes that Petitioner's merger with Pictometry is the reason for Patent Owner's

success because the merger “eliminated a clear competitor to Patent Owner’s roof estimate reports.” Petition, 65-66. This argument has no merit because the evidence presented above is related to Patent Owner’s Twister and Render House products, which embody the claimed invention. Further, Petitioner’s theory is based on Patent Owner’s products using high-quality imagery from Pictometry, but Petitioner admits that “the Challenged Claims do not recite any limitations relating to capturing the first and second aerial images.” Petition, 63. Consequently, the extensive evidence of nexus between the challenged claims and Patent Owner’s Twister and Render House products was made independent of the particular resolution of the “aerial photos” recited in the challenged claims.

VII. PETITIONER’S GROUNDS FAIL TO RENDER OBVIOUS INDEPENDENT CLAIMS 16 AND 26, AND DEPENDENT CLAIMS 9 AND 10

Petitioner attempts to show that independent claims 16 and 26 are obvious in Ground 1 by referring only to its analysis of claim 1. Petition, 44 (claim 16), 48-49 (claim 26). In Ground 2, Petitioner addresses only limitations [1.5], [16.3], and [26.3] with respect to Deaton. Petition, 53-55. Petitioner has not shown that the Heller-Quam combination or the Heller-Quam-Deaton combination renders obvious independent claims 16 and 26 or dependent claims 9 and 10. EX2032, ¶¶96, 116, 141, 142.

A. Ground 1 Does Not Render Obvious Claims 16 and 26

Limitation [1.5] is not taught by the Heller-Quam combination for the reasons presented above. Limitation [16.3] is substantially identical to limitation [1.5], and limitation [26.3] is identical to limitation [1.5]. EX2016, 2 (comparison of limitations [1.5] and [16.3]), 4 (comparison of limitations [1.5] and [26.3]); EX2032, ¶52.

For claims 16 and 26 in Ground 1, Petitioner relies exclusively on its analysis of claim 1. Petition, 44, 48-49; EX1003, ¶¶78-81, 87-90; EX2006, 182:13-183:25 (Dr. Forsyth confirming in his deposition that his analysis of claims 16 and 26 relied on his analysis for claim 1). For limitations [16.3] and [26.3], Petitioner relies exclusively on its analysis of limitation [1.5] in Ground 1. Petition, 44, 49. As described above, Petitioner has not shown that the Heller-Quam combination renders obvious limitation [1.5]. Therefore, Petitioner has also failed to show that the Heller-Quam combination renders obvious limitations [16.3] and [26.3] since Petitioner's relies on its unsupportable analysis of limitation [1.5] in Ground 1. Petition, 44, 49; EX1003, ¶¶81, 90. Consequently, claims 16 and 26 are patentable over the Heller-Quam combination at least because Heller and Quam fail to teach at least limitations [16.3] and [26.3]. EX2032, ¶¶96, 116.

B. Petitioner Fails to Demonstrate the Heller-Quam Combination Teaches Additional Claim Elements of Independent Claims 16 and 26

Petitioner's analysis of claims 16 and 26 also fails to show that all the

limitations of these claims are taught by the Heller-Quam combination. As noted above, Petitioner relies exclusively on its analysis of claim 1 for claims 16 and 26. Petition, 44, 48-49; EX1003, ¶¶78-81, 87-90; EX2006, 182:13-183:25. EX2032, ¶96.

Petitioner's reliance on claim 1 for claims 16 and 26 is defective and incomplete because Petitioner fails to address specific limitations of claims 16 and 26 that are unique to these claims. *See* EX2016 (comparison of claims 16 and 26 to claim 1). To prevail in a patentability challenge in an IPR, a petitioner must show with particularity where each element of a challenged claim is taught in the prior art. 35 U.S.C. § 312(a)(3); 37 C.F.R. 42.104(b)(4) ("The petition must specify where *each element of the claim* is found in the prior art."). The burden of persuasion to show unpatentability never shifts to the Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). The Board may not alter grounds or fill in deficiencies of the petitioner's grounds, because the petition defines "the metes and bounds of an inter partes review." *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1336 (Fed. Cir. 2020) (citing *SAS Inst. v. Iancu*, 138 S.Ct. 1348, 1355-56 (2018)).

1. The Petition Fails to Show that Limitation [16.0] is Taught by the Heller-Quam Combination

Petitioner relies on its analysis for limitation [1.0] in an attempt to show that the preamble of claim 16 (limitation [16.0]) is rendered obvious. Petition, 44.

Limitation [16.0] recites the following features:

- (a) A non-transitory computer-readable storage medium,
- (b) having computer executable instructions stored thereon that,
- (c) when executed by at least one computer processor,
- (d) cause the at least one processor to enable a computing system
- (e) to generate a roof estimate report for a building having a roof, by performing a method comprising:

Limitation [16.0] is limiting because the body of claim 16 relies upon and derives antecedent basis from the preamble of claim 16 (limitation [16.0]). For example, the preamble of claim 16 recites “a building having a roof,” which provides antecedent basis for the “roof of *the building*” in limitations [16.1] and [16.3]. Thus, the preamble of claim 16 is limiting. *See Eaton Corp. v. Rockwell Intern. Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003) (preamble is limiting “[w]hen limitations in the body of the claim rely upon and derive antecedent basis from the preamble.”); *see also Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017); EX2032, ¶100.

Petitioner's analysis of limitation [1.0] does not show that Heller or Quam discloses a non-transitory computer-readable storage medium that stores computer executable instructions, which cause at least one processor of a computing system to generate a roof estimate report for a building having a roof, as required by limitation [16.0]. EX2032, ¶¶99, 101.

For example, there is no showing of how Heller or Quam teaches the claimed “non-transitory computer-readable storage medium,” as recited in limitation [16.0a]. EX2032, ¶102. Petitioner argues that Heller’s RADIUS Testbed System (RTS) is “a software program,” and “Quam’s RADIUS Common Development Engine (RCDE)...provides the foundation for [Heller’s] RADIUS Testbed System.” Petition, 20, 16. Thus, Petitioner appears to allege that Heller’s RTS implemented on Quam’s RCDE corresponds to the claimed “computer-implemented method” as recited in [1.0], despite not making that correspondence explicit. Petition, 20-21. EX2032, ¶103.

Petitioner has not shown that Heller’s RTS implemented on Quam’s RCDE corresponds to the claimed “computer executable instructions” in limitation [16.0b]. There is no analysis of “computer executable instructions” in limitation [1.0]. Even if Heller’s RTS implemented on Quam’s RCDE is interpreted to correspond to the claimed “computer executable instructions” in limitation [16.0b], Petitioner has not shown that Heller’s RTS is stored on a “non-transitory computer-readable storage medium” as required by [16.0a]. Petitioner alleges that “Quam...makes clear that the RADIUS system utilizes ‘*memory*’ when performing computations, such as using a ‘[t]iled memory layout for image storage.’” Petition, 20 (emphasis original); EX1003, ¶35. At best, this sentence shows that a “memory” is used to “perform[] computations,” such as “tiled memory layout for

image storage.” Petitioner has not, however, shown that Heller’s RTS is stored on this “memory,” even if this “memory” is alleged to correspond to the claimed “non-transitory computer-readable storage medium” that stores the claimed “computer executable instructions,” as required by [16.0a]-[16.0b]. Petitioner makes no showing of what components of Heller or Quam correspond to the features of [16.0] other than to refer to Petitioner’s mapping of [1.0], which does not address the claimed “non-transitory computer-readable storage medium” that stores the claimed “computer executable instructions,” as required by [16.0a]-[16.0b]. EX2032, ¶104.

Further, Petitioner’s reference to “[t]iled memory layout for image storage” on page 17 of Quam is not tied to any “memory.” Petition, 20; EX1003, ¶35. Petitioner generically cites to pages 4-5, 8, 16 of Quam without explanation. Petition, 20; EX1003, ¶35. The discussion of a “memory” on Quam’s pages 4-5, 8, 16 refers to storing images, not to storing “computer executable instructions” as in [16.0b] that are executed to cause at least one processor to enable a computing system to generate a roof estimate report, as required by [16.0a]-[16.0e]. EX2032, ¶105.

Similarly, Petitioner’s analysis of limitation of [1.0] also does not address what elements of Heller or Quam allegedly correspond to the claimed “computing system.” The term “computing system” appears only in Petitioner’s analysis when

Petitioner reproduces the text of limitation [16.0]. Petition, 44; EX2032, ¶106.

Thus, Petitioner has not shown that the Heller-Quam combination teaches limitation [16.0]. EX2032, ¶107.

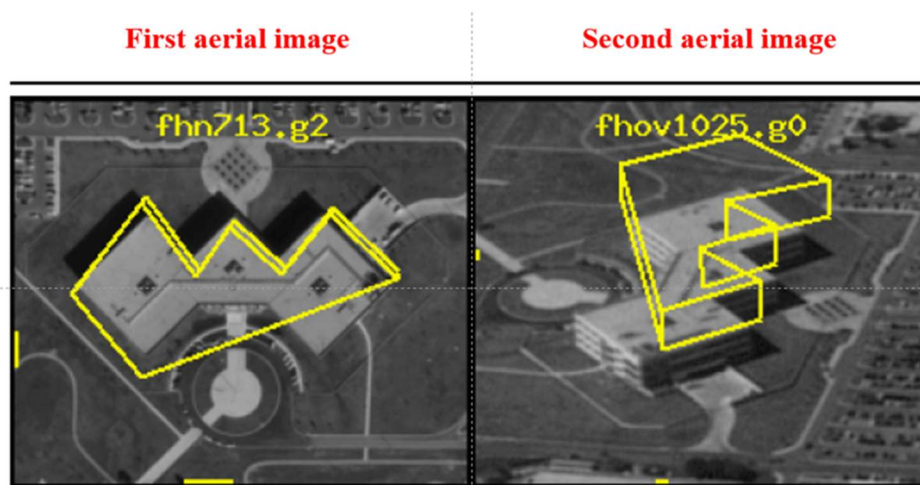
2. The Petition Fails to Show that Limitation [16.1] is Taught by the Heller-Quam Combination

Petitioner's analysis of limitation [16.1] refers exclusively to its analysis of limitations [1.1] and [1.2]. Petition, 44; EX1003, ¶79; EX2006, 182:13-183:15. But Petitioner's analysis of limitations [1.1]-[1.2] does not show that the Heller-Quam combination teaches all the features of limitation [16.1]. In particular, Petitioner's analysis of limitations [1.1]-[1.2] does not show how "*overlaying a line drawing on corresponding locations of a roof feature of the roof*," as recited in limitation [16.1], is met by the Heller-Quam combination. The phrase "corresponding locations of a roof feature of the roof" appears only when Petitioner reproduces the text of limitation [16.1]. Petition, 44; EX2032, ¶108.

Petitioner's analysis of limitation [1.2] does not address nor show how a line drawing is overlaid on the same "locations of a roof feature of the roof" in both the first and second aerial images. Petitioner's analysis of limitation [1.2] addresses the feature of "displaying...line drawings overlaying a first and second aerial image," as recited in limitation [1.2], with respect to the teachings of Heller. Petition, 25-27; EX2032, ¶109.

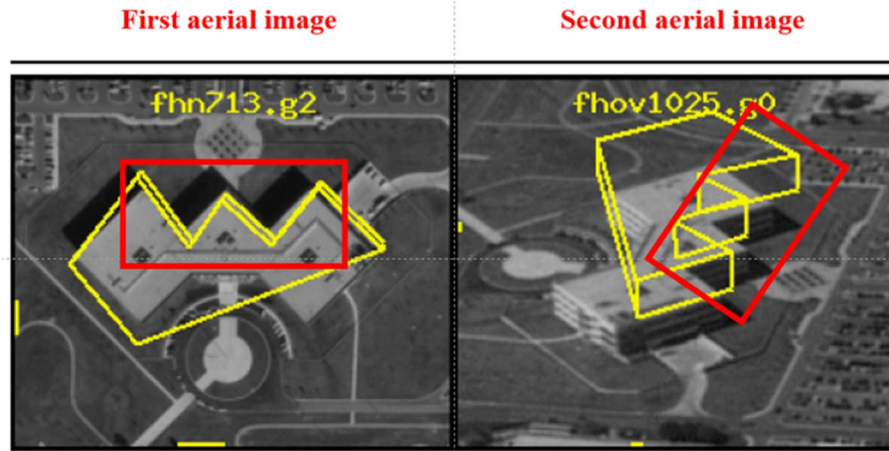
In its analysis of limitation [1.2], Petitioner first provides the following

annotation of Heller's Figure 5 and alleges that "Heller depicts a first and second aerial image of the roof, each overlaid with a yellow wireframe (i.e., a 'line drawing')." Petition, 25 (citing EX1004, 3); EX2032, ¶110.



NEARMAP-1004, Detail of FIG. 5 (annotations in original)

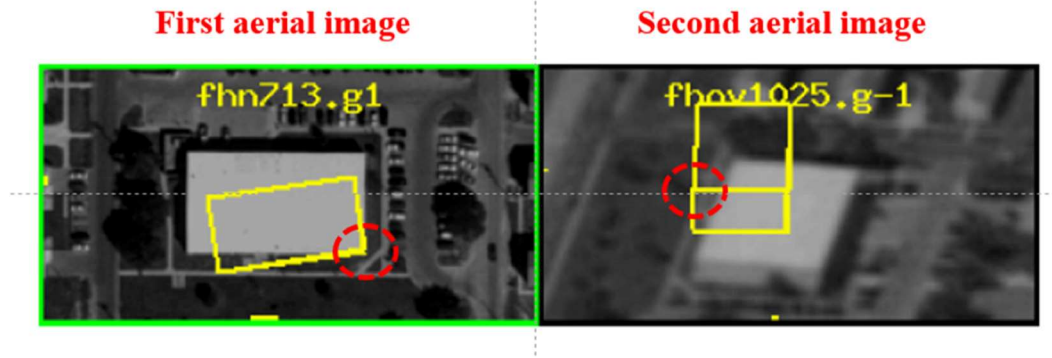
Petitioner then argues that "the yellow line drawings overlaying the first and second images have 'features in common' as the claim [i.e., claim 1] requires." Petition, 26. Petitioner then refers to the following second annotation of Heller's Figure 5 and alleges that the "features in common" are shown by "the 'W' shape of the roof contour at the top of the first image [being] present in the yellow line drawings in both the first and second images." Petition, 26; EX2032, ¶110.



NEARMAP-1004, Detail of FIG. 5 (annotated)

Petitioner's above-identified analysis of the features of limitation [1.2] does not, however, show that Heller teaches "*overlaying a line drawing on corresponding locations of a roof feature of the roof*," as recited in limitation [16.1]. Even if the "yellow wireframe" in the above pairs of first and second aerial images in Heller's Figure 5 correspond to a "line drawing," Petitioner has not shown that the line drawings for the first and second images are the same such that "a line drawing" is overlaid "on corresponding locations of a roof feature of the roof on first and second aerial images of the roof," as required by limitation [16.1]. The wireframe in the "Second aerial image" does not intersect the roof and therefore cannot be a corresponding location of the roof feature. Petitioner's allegation that the yellow wireframes "have 'features in common' as...claim [1] requires" is insufficient to establish that these yellow wireframes are overlaid on *corresponding locations of the same roof feature of the roof*. EX2032, ¶111.

To further illustrate the deficiency in Petitioner's reliance on its analysis of limitation [1.2] for limitation [16.1], Petitioner refers to the "simple 'box' example from FIG. 4 of Heller [below as] similarly depict[ing] a first second aerial image of the building roof, each overlaid with a yellow wireframe (i.e., a 'line drawing')." Petition, 26 (citing EX1004, Fig. 4). Petitioner alleges that "the first and second aerial images of FIG. 4 also have 'features in common,' such as the aligned corner denoted in red in both images below." Petition, 26-27. However, as is plainly visible from the first and second aerial images shown in Heller's annotated Figure 4 below, the corner denoted in red in the "First aerial image" does not correspond to the same feature of a roof in the "Second aerial image," because the corner in red in the "Second aerial image" is not part of a line drawing that is *"overlay[ed]...on corresponding locations of a roof feature of the roof,"* as recited in limitation [16.1]. Instead, the corner in red in the "Second aerial image" is not overlaid on a roof, let alone on corresponding locations of a roof feature of the roof. As shown, the corner in red in the "Second aerial image" is offset from the roof. EX2032, ¶112.



NEARMAP-1004, Detail of FIG. 4 (annotated)

Petition, 27.

Having line drawings with “features in common” (e.g., red box in Petitioner’s second annotation of Heller’s Figure 5 or red circle in Petitioner’s annotation of Heller’s Figure 4) as Petitioner alleges for limitation [1.2] (Petition, 25-26) does not show that “a line drawing” is overlaid “on corresponding locations of a roof feature of the roof on first and second aerial images of the roof,” as required by limitation [16.1]. Petitioner’s mapping for limitation [1.2] simply does not show that “a line drawing” is overlaid on “corresponding locations” of the same roof feature (“a roof feature”) in both first and second aerial images of that roof. EX2032, ¶113.

Accordingly, Petitioner’s analysis of claim 1 does not show that the Heller-Quam combination teaches limitations [16.0] and [16.1]. Claim 16 is therefore patentable over the Heller-Quam combination. EX2032, ¶114.

3. The Petition Fails to Show that Limitation [26.0] is Taught by the Heller-Quam Combination

Petitioner relies entirely on its analysis of limitation [1.0] for limitation [26.0]. Petition, 48. Petitioner's analysis of limitation [1.0] does not show that the unique features of limitation [26.0] are taught by the Heller-Quam combination. See EX2016, 3-4 (comparison of claims 1 and 26); EX2032, ¶¶116-117. Limitation [26.0] is limiting because the body of claim 26 derives antecedent basis from the preamble. For example, limitation [26.0] recites "a computer system," which provides antecedent basis for the term "the computer system" in limitations [26.1] and [26.2]. See *Eaton Corp.*, 323 F.3d at 1339; *Georgetown Rail Equip.*, 867 F.3d at 1236; EX2032, ¶¶118.

Limitation [26.0] recites "[a] computer-implemented method in *a roof estimate report system* including *a computer system* and a memory coupled to the computer system, the method comprising." Thus, limitation [26.0] recites *both* "a roof estimate report system" and a "computer system." Limitation [1.0] does not recite "a computer system," but Petitioner relies exclusively on its analysis of limitation [1.0] for limitation [26.0]. Petition, 48; EX2016, 3. EX2032, ¶119.

Petitioner's analysis of limitation [1.0] appears to allege that Heller's RADIUS Testbed System (RTS) implemented on Quam's RCDE corresponds to the claimed "computer-implemented method." Petition, 19-20. However, Petitioner does not establish what features of Heller or Quam correspond to the "computer

system” as recited in limitation [26.0]. Petitioner’s analysis for limitation [1.0]

alleges that Quam describes that Heller’s RADIUS “runs on both Sun []

Microsystems and Silicon Graphics RISC-based workstations.” Petition, 20;

EX1003, ¶35. If these “workstations” are alleged to correspond to the claimed

“roof estimate report system,” then Petitioner has not shown any feature of Heller

or Quam that corresponds to the claimed “computer system” in limitation [26.0].

To the extent Petitioner is alleging that Quam’s “workstations” correspond to the

claimed “computer system and a memory coupled to the computer system” in

limitation [26.0], Quam’s “workstations” cannot correspond to the claimed “roof

estimate report system” as recited in limitation [26.0] because neither Heller nor

Quam generate or output roof estimate reports, as discussed above with respect to

limitation [1.5]. EX2032, ¶120.

Thus, Petitioner’s analysis of limitation [1.0] does not show that the Heller-Quam combination teaches “a roof estimate report system” *and* a “computer system,” as recited in limitation [26.0]. EX2032, ¶121.

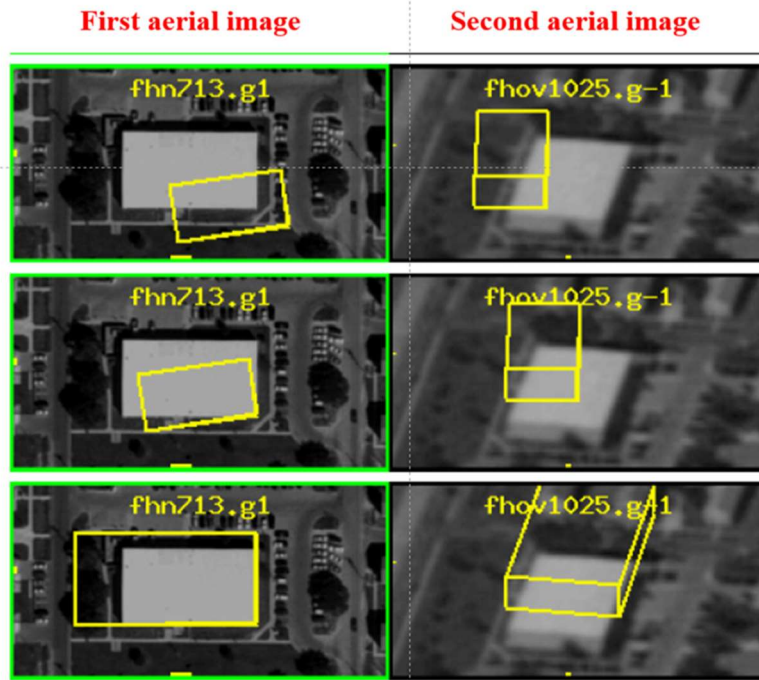
4. The Petition Fails to Show that Limitation [26.2] is Taught by the Heller-Quam Combination

Petitioner has not shown that the Heller-Quam combination teaches limitation [26.2]. Petitioner relies exclusively on its mapping of limitation [1.4] for limitation [26.2]. Petition, 49. Petitioner’s analysis of limitation [1.4] does not show that the Heller-Quam combination teaches all of the features of limitation

[26.2]. EX2032, ¶122.

Despite a generic reference to “[i]n the combination” at the beginning of its analysis of limitation [1.4], Petitioner cites only to the teachings of Heller in its analysis of limitation [1.4]. Petition, 30-33; EX2032, ¶123.

Petitioner's analysis of limitation [1.4] does not show where Heller teaches “changing...a line in a second line drawing that *corresponds to the same feature in the first line drawing* that was changed,” as recited in limitation [26.2]. Petition, 30-33; EX1003, ¶¶52-55. With reference to the annotated version of Heller's Figure 4 below, Petitioner alleges that “Heller teaches that the line drawing overlying the second aerial image is updated in response to changes to the line drawing overlaying the first aerial image.” Petition, 30-31 (citing EX1004, 2, 3, Fig. 4, Fig. 5); EX2032, ¶124.



NEARMAP-1004, Detail of FIG. 4

Importantly, Petitioner does not address any actual teachings in pages 2 and 3 of Heller to support its contention that “Heller teaches that the line drawing overlying the second aerial image is updated in response to changes to the line drawing overlaying the first aerial image.” Petition, 30-31 (citing EX1004, 2, 3, Fig. 4, Fig. 5). Sections 2, 2.1, and 2.3 on pages 2-3 of Heller contain no discussion of displaying a plurality of aerial images of a roof at the same time, let alone making corresponding adjustments to the overlying line drawings of roof features on different aerial images of a roof. EX2032, ¶125. The only portion on page 3 of Heller that refers to more than one image is the following paragraph in section 2.2.

Id.

Finally, a road that has been initially modeled either fully manually or with the road tracker or ziplock snakes can be simultaneously optimized in two or more images with the MBO system, resulting in a highly accurate, full 3-D model of the road. Figure 3 shows the pre- and post- optimization versions of a road.

EX1004, 3 (annotated)

However, the above-reproduced portion of Section 2.2 on Heller's page 3 relates to optimizing an input sketch of a line drawing representing a road, as shown in Heller's Figure 3 below, where the left-hand side of Figure 3 includes the road on the image, and the right-hand side of Figure 3 includes an optimization of that road using a "Model Based Optimization" (MBO) tool *on the same image*. EX2032, ¶125. Petitioner does not rely on or cite to the road-optimization technique illustrated in Heller's Figure 3 in its analysis of limitation [1.4]. Petition, 30-33. Moreover, the above-reproduced portion of Section 2.2—the only portion of Heller's pages 2 and 3 that discuss more than one image—does not support Petitioner's contention that "Heller teaches that the line drawing overlying the second aerial image is updated in response to changes to the line drawing overlaying the first aerial image." Petition, 30-31 (citing EX1004, 2, 3, Fig. 4, Fig. 5); EX2032, ¶125.

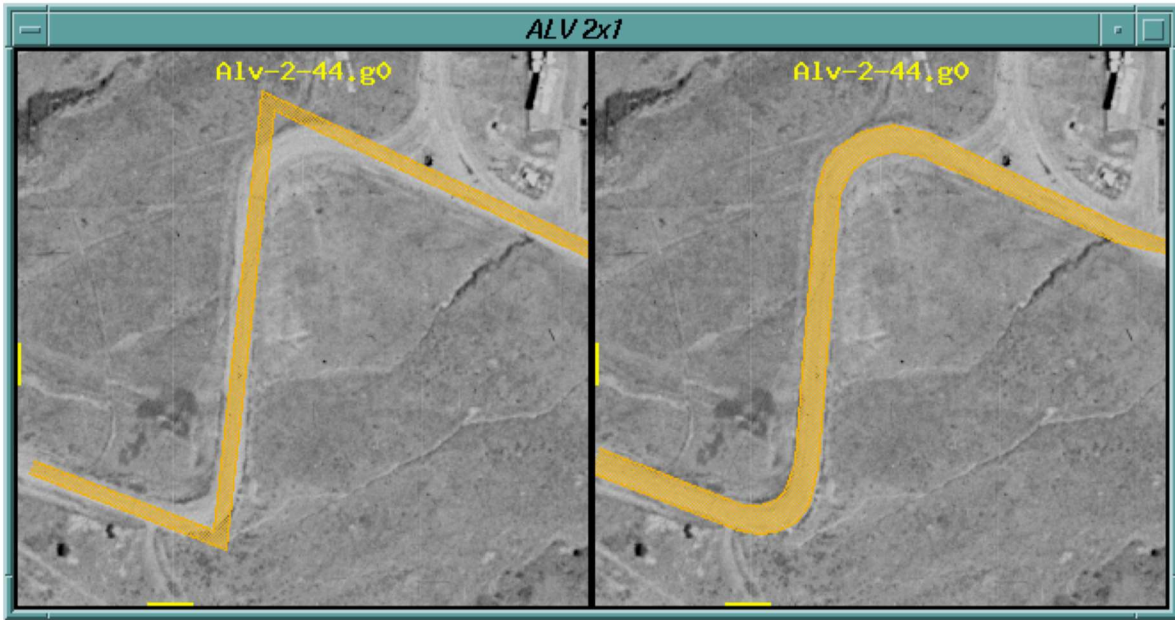
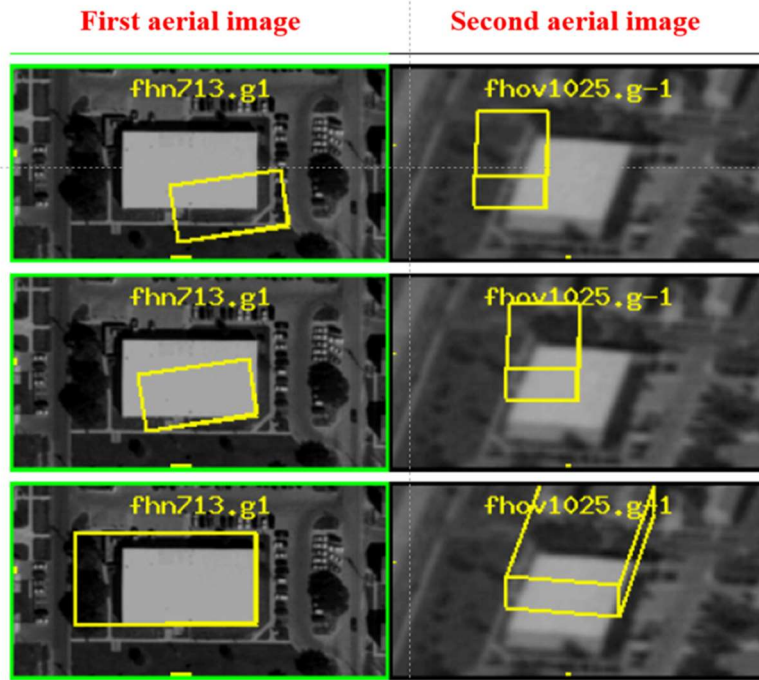


Figure 3: A road model, before and after optimization.

EX1004, Fig. 3 (annotated)

Limitation [26.1] recites “changing...a line in a first line drawing representing a feature of a roof.” Petitioner’s analysis of limitation [1.4] with respect to its annotations of Heller’s Figures 4-5 does not show that Heller teaches “changing...a line in a second line drawing that *corresponds to the same feature in the first line drawing [representing a feature of the roof]* that was changed,” as recited in limitation [26.2]. Petition, 30-33; EX2032, ¶126.

Petitioner relies on the following annotation of Figure 4 and alleges that “[a]s shown in FIG. 4, the line drawing overlying the second image also changes position and size as we progress down from the top row.” Petition, 31 (citing EX1004, Fig. 4). EX2032, ¶127.



NEARMAP-1004, Detail of FIG. 4

Petition, 31.

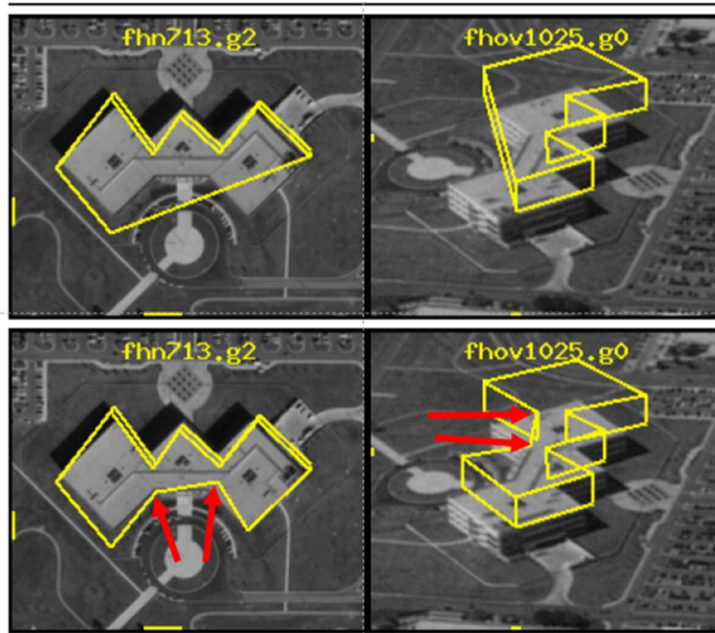
In analyzing limitation [1.4], Petitioner does not show that Heller teaches “changing...a line in a second line drawing that *corresponds to the same [represented] feature [of the roof] in the first line drawing* that was changed,” as recited in [26.2]. Petition, 30-33; EX1003, ¶¶52-55; EX2032, ¶127. Petitioner may attempt to rely on the following sentence in Section 2.3.1 on page 5 of Heller: “The *Move W* operation moves the box along the camera ray of the selected image and along the corresponding epipolar lines in the...other images.” EX1004, 5; Petition, 32 (citing EX1004, 5). This sentence, however, does not teach that roof feature changes in the line drawing in the “Second aerial image” in Heller’s Figure 4

“correspond[] to *the same [represented] feature* in the first line drawing that was changed,” as recited in limitation [26.2]. EX2032, ¶127. On the contrary, the above-quoted sentence merely states that the box is moved “along the corresponding epipolar lines in the...other images.” *Id.* There is no teaching in this cited portion of Heller supporting Petitioner’s argument that Heller teaches “changing...a line in a second line drawing that *corresponds to the same feature [of the roof represented] in the first line drawing* that was changed,” as recited in limitation [26.2]. EX2032, ¶127.

Likewise, Petitioner points to no teaching regarding annotated Figure 5 below to establish that Heller teaches “changing...a line in a second line drawing that *corresponds to the same feature [of a roof represented] in the first line drawing* that was changed,” as recited in limitation [26.2]. EX2032, ¶128.

First aerial image

Second aerial image



NEARMAP-1004, Detail of FIG. 5 (annotated)

Petition, 32-33. With reference to Heller's annotated Figure 5 above, Petitioner argues that vertices are added to the line drawing overlaying the first aerial image, and "the line drawing over the second aerial image is also changed to add these two vertices (denoted by red arrows).". Petition, 32-33. However, Petitioner's analysis with respect to annotated Heller's Figure 5 in its analysis of limitation [1.4] does not show that the added vertices in the first overlay line drawing represents a feature of the roof, and that added vertices in the second line drawing are for the *same roof feature* in the first line drawing, as recited in limitation [26.2]. EX2032, ¶128.

Accordingly, Petitioner's analysis of limitation [1.4] fails to show that the

Heller-Quam combination teaches limitation [26.2]. EX2032, ¶129.

Therefore, Petitioner has failed to show that the Heller-Quam combination renders obvious claims 16 and 26. EX2032, ¶¶114, 130.

C. Petitioner Fails to Demonstrate that the Heller-Quam Combination Teaches All of the Features of Claim 9.

Claim 9 recites “transmitting roof measurement information based at least in part on the change of the line drawing representing a feature of the roof that overlies the first aerial image of the roof.” EX1001, 24:52-56; EX2032, ¶131.

Petitioner's analysis of claim 9 is incorrect for three reasons.

First, Petitioner's analysis of claim 9 is based on its incorrect proposal that claim 9 should be interpreted “to encompass transmitting roof measurement information between components of the same computer system.” Petition, 38 (citing EX1010, 18-20); EX2032, ¶132. Petitioner does not allege that Heller or Quam teaches transmitting roof measurement information outside of Heller's RADIUS Testbed System as implemented on Quam's RCDE. Instead, Petitioner alleges that Heller's “object adjustment events” would be understood by a POSITA to “include roof measurement information.” Petition, 38 (citing EX1004, 5).

Petitioner alleges that the “object adjustment events” relate to user manipulation of a wireframe or primitive, where such “object adjustment events” include “mouse-position deltas” if the user's mouse is moved during the adjustment, an “Object ID” of the object that is moved, an “Adjustment type: (for example, vertex-xy,

vertex-z, vertex-width, ...),” and a “Sequence of time deltas and mouse position deltas of the form: delta-t dx dy).” Petition, 38-39 (citing EX1004, 4-5, Figs. 4-5). However, none of these “object adjustment events” are transmitted outside the Heller-Quam combination, nor does Petitioner allege that they are. EX2032, ¶¶134-135.

Second, even if claim 9 is improperly construed to encompass transmission of “roof measurement information” within the same computer system, none of Heller’s “object adjustment events” amount to “measurement information” about a roof, as the term “roof measurement information” requires. The ’737 Patent explains that “roof measurement information may include measurements such as lengths of the edges of sections of the roof, pitches of sections of the roof, areas of sections of the roof, etc.” EX1001, 2:55-58; EX2032, ¶136.

Petitioner theorizes that changing the size of a line drawing in Heller would “include roof measurement information,” because “mouse movement during the adjustment represents the change in the size of the line drawing during the measurement.” Petition, 38-39. This argument is not supported by Heller or Quam. EX2032, ¶137.

Petitioner has not pointed to any disclosure in Heller or Quam that links a line drawing to a measurement (or reference) scale such that moving a line drawing would also constitute a change in measurement information of a real-world

structure associated with that line drawing. Petition, 38-39; EX2032, ¶137. For example, Petitioner has not identified any teaching in Heller or Quam that a line drawing of length “X pixels” (or other length reference scale) on an image represents a length of “Y inches/feet” (or other length reference scale) of a real-world structure shown in that image. Similarly, Petitioner has not pointed to any teaching in Heller or Quam that a rectangular line drawing having an area “XxZ pixels” on an image represents a particular size area (e.g., square inches/feet) of a real-world structure shown in that image. EX2032, ¶137. Without some explicit link between the scale of a line drawing and the real-world structure, any change in the line drawing is immaterial to measurement information of the real-world structure. EX2032, ¶137. Heller makes clear that the “central component” of its system “is the creation of a 3-dimensional model that captures the basic geometry of the site under examination.” EX1004, 1. Consistent with this goal, a POSITA would understand that Heller’s system creates the 3D model capturing the basic geometry of the site under examination using image analysis without the need for a link between the scale of the 3D model and measurements of the real-world structures represented by the 3D model. Consequently, Petitioner has not shown that Heller or Quam teaches that adjusting a line drawing means that roof measurement information is attributed to that change in the line drawing, let alone that any such alleged roof measurement information would be transmitted based on

a change of the line drawing. EX2032, ¶137.

Petitioner's argument that "a change in the size of the line drawing represents a change in the measurements of the roof represented by the model" has no support in Heller. Petition, 39 (citing EX1004, 5, analysis of [1.2]-[1.4])). A careful reading of the portions that Petitioner cites to (EX1004, 5; limitations [1-2]-[1.4]) reveals that there is no teaching in Heller that links mouse movements or the placement of primitives (wire drawings) to specific measurement information about a roof. Heller is directed to "the creation of a 3-dimensional model that captures the basic geometry of the site under examination," and contains no disclosure linking precise measurements to its 3D models. Therefore, there is no teaching in Heller or Quam for Petitioner's attempt to tie "mouse movements" or "adjustments to object parameters" to "roof measurement information," as recited in claim 9. EX2032, ¶138.

There is no support in Petitioner's analysis of limitations [1.2]-[1.4] or in pages 4-5 or Figures 4-5 of Heller to support Petitioner's argument that the sizes of wireframes are associated with specific measurement information about a roof, and that adjustments to the wireframes represent adjustment to such (non-existent) measurement information. Petitioner's Heller-Quam combination fails to teach transmitting roof measurement information, as recited in claim 9. EX2032, ¶139.

Third, Petitioner has not shown that Heller teaches that roof measurement

information is transmitted based on the condition that there is a “change of the line drawing representing a feature of the roof that overlies the first aerial image of the roof,” as required by claim 9. EX2032, ¶¶140, 131. Again, Petitioner attempts to rely on Heller’s “object adjustment events,” but Heller’s “object adjustment events” are not transmitted *based on* satisfaction of condition that there is a “change of the line drawing representing a feature of the roof that overlies the first aerial image of the roof,” as recited by claim 9. EX2032, ¶140.

Accordingly, Petitioner has failed to show that the Heller-Quam combination teaches all the recited features of claim 9. EX2032, ¶141.

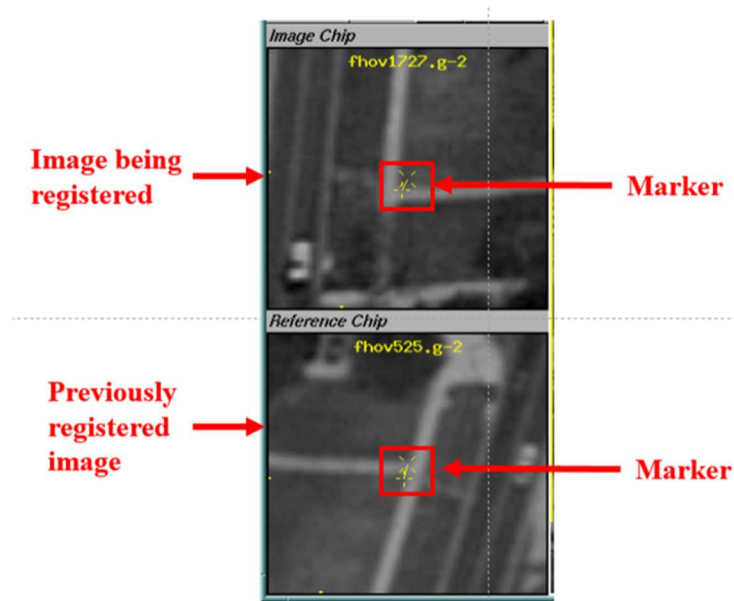
D. Petitioner Fails to Demonstrate that the Heller-Quam Combination Teaches All the Features of Claim 10.

The Heller-Quam combination does not teach all the features of claim 10. Petitioner argues that “the combination” teaches claim 10, but Petitioner relies exclusively on Quam in its analysis of claim 10. Petition, 40-44. Quam does not teach limitation [10.2]. Thus, Petitioner has not shown that the Heller-Quam combination renders obvious claim 10. EX2032, ¶¶142-143.

Contrary to Petitioner’s argument, Quam (and the Heller-Quam combination) does not disclose “registering, based on the received indication of the point, the aerial image to a reference grid corresponding to a three-dimensional model of the roof,” as recited in [10.2]. EX2032, ¶144.

Quam registers a point in an image based on that point in a previously

registered image, as shown in Petitioner's annotation of Quam's Figure 8 below.



NEARMAP-1005, Detail of FIG. 8 (annotated)

Petition, 42-43; EX2032, ¶145.

In contrast to limitation [10.2], Quam does not disclose “registering, based on the received indication of the point, the aerial image to a reference grid corresponding to a three-dimensional model of the roof.” EX2032, ¶146. There is no disclosure in Quam of a “reference grid corresponding to a three-dimensional model of the roof,” or a registration of the aerial image to such a reference grid. *Id.*

Petitioner alleges that a “world coordinate system” is a “reference grid” (Petition, 43-44), but even if that were true, that “world coordinate system” is not shown to correspond to a 3D model of the roof, as required by [10.2]. A “world coordinate system,” by itself, simply does not correspond to a 3D model of a roof.

Therefore, Petitioner has not shown that Quam, or the Heller-Quam combination, teaches “registering, based on the received indication of the point, the aerial image *to a reference grid corresponding to a three-dimensional model of the roof,*” as recited in claim 10. EX2032, ¶147.

Accordingly, Petitioner failed to show that the Heller-Quam combination teaches all the features of claim 10. EX2032, ¶148.

VIII. CONCLUSION

The Board should find the challenged claims patentable for the reasons presented above.

Respectfully submitted,

Dated: February 14, 2023

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Lead Counsel for Patent Owner

IX. CERTIFICATE OF WORD COUNT

Under 37 C.F.R. § 42.24(b)(1), the undersigned attorney for the Patent Owner declares that the argument section of this Patent Owner's Preliminary Response (Sections I-VIII) has 13,995 words, according to the word count tool in Microsoft Word™.

/Kyle Howard/
Kyle L. Howard
Registration No. 67,568
Lead Counsel for Patent Owner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Eagle View Technologies, Inc.	§ Patent Owner's Response
and Pictometry International	§
Corp.,	§ U.S. Patent No. 9,135,737
Patent Owner	§

CERTIFICATE OF SERVICE

The undersigned certifies, under 37 C.F.R. §§ 42.105 and 42.6, that service was made on Petitioners' counsel as detailed below.

Date of service February 14, 2023

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Documents served Patent Owner's Response; Exhibits 2005-2018, 2030-2032, and 2034-2040; Motion to Seal

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