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Paper 51
Date: July 15, 2024

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
Patent 9,135,737 B2

Before THOMAS L. GIANNETTI, GARTH D. BAER, and RUSSELL E. CASS, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

INTRODUCTION

A. BACKGROUND

Nearmap US, Inc. ("Petitioner") filed a Petition (Paper 2, "Pet."), requesting an *inter partes* review of claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 (the "challenged claims") of U.S. Patent No. 9,135,737 B2 (Ex. 1001, "the '737 patent"). Pursuant to 35 U.S.C. § 314, we instituted this *inter partes* review as to all of the challenged claims and all grounds raised in the Petition. Paper 10. Following institution, Patent Owner filed a Response. Paper 16 ("PO Resp."). Petitioner filed a Reply to Patent Owner's Response (Paper 24, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 33, "PO Sur-reply").

After our Final Written Decision (Paper 41) found no challenged claims unpatentable, the Director vacated our Decision and remanded the case back to the Board. Paper 43. With our authorization, Petitioner and Patent Owner filed Briefs on Remand. Paper 45 ("Pet. Remand Br."), Paper 48 ("PO Remand Br.").

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision issued pursuant to 35 U.S.C. § 318(a). For the reasons we discuss below, we determine that Petitioner has proven by a preponderance of the evidence that the challenged claims are unpatentable.

B. RELATED PROCEEDINGS

The '737 patent is at issue in *Eagle View Technologies v. Nearmap US*, 2-21-cv-00283 (D. Utah). Pet. 74; *see* Paper 6, 2. The '737 patent is also the challenged patent in IPR2016-00592. Paper 6, 2.

C. REAL PARTIES IN INTEREST

Petitioner identifies itself as the only real party in interest. Pet. 74. Patent Owner identifies itself and Pictometry International Corp. as real parties in interest. Paper 3, 2.

D. THE '737 PATENT

The '737 patent relates to a roof estimation system that provides a user interface configured to facilitate roof model generation based on one or more aerial images of a building roof. Ex. 1001, code (57). Figure 1 of the '737 patent is reproduced below.

Fig. 1

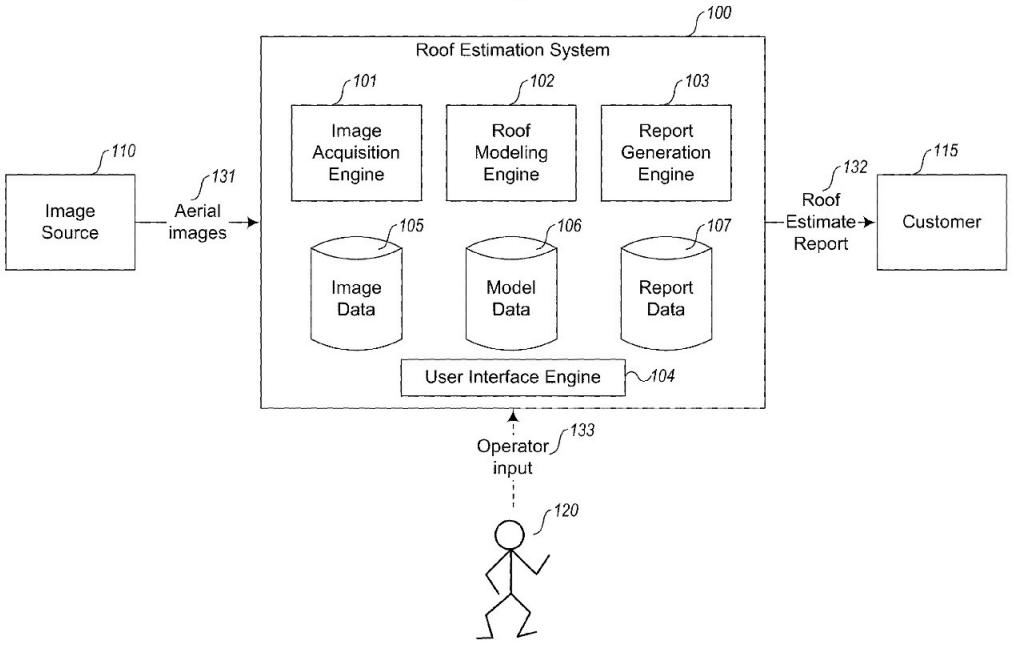

Figure 1 is a block diagram of an example Roof Estimation System ("RES"). *Id.* at 3:42–44. RES 100 includes image acquisition engine 101, roof modeling engine 102, report generation engine 103, image data 105, model data 106, and report data 107. *Id.* at 3:44–46. RES 100 is communicatively coupled to image source 110, customer 115, and operator 120. *Id.* at 3:47–

48. RES 100 is configured to generate roof estimate report 132 for a specified building, based on aerial images 131 of the building received from the image source 110. *Id*. at 3:52–55.

E. CHALLENGED CLAIMS

Petitioner challenges claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34. Of the challenged claims, claims 1, 16, and 26 are independent. Independent claim 1 is representative and is reproduced below:

> 1. A computer-implemented method in a roof estimate report system including at least one processor and a memory coupled to the at least one processor, the method comprising:
>
> displaying, by the at least one processor of the roof estimate report system, a plurality of aerial images of a roof at the same time, each of the aerial images providing a different view, taken from a different angle of the same roof;
>
> displaying, by the at least one processor of the roof estimate report system, respective line drawings representing features of the roof, the respective line drawings overlying a first and a second aerial image of the plurality of aerial images of the roof, the line drawing overlying the first aerial image of the roof having features in common with the line drawing overlying the second aerial image of the roof;
>
> in response to user input, changing, by the at least one processor of the roof estimate report system, the line drawing representing a feature of the roof that overlies the first aerial image of the roof;
>
> in response to the changing, making corresponding changes, by the at least one processor of the roof estimate report system, to the line drawing overlying the second aerial image; and
>
> 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.

Ex. 1001, 23:55–24:19.

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability. Pet. 2.

Claims Challenged	(35 U.S.C. §)[1]	Reference(s)/Basis
1, 6, 7, 9, 10, 16, 17, 25, 26, 34	103	Heller[2], Quam[3]
1, 6, 7, 9, 10, 16, 17, 25, 26, 34	103	Heller, Quam, Deaton[4]

Petitioner also relies on declarations from Dr. David Forsyth (Ex. 1003, Ex. 1041).

II. PRELIMINARY MATTERS

A. Level of Ordinary Skill

Petitioner contends a person of ordinary skill in the art at the time of the '737 patent "would have had at least a Bachelor's Degree in an academic area emphasizing the design of electrical, computer, or software technologies, or a similar discipline, and at least two years of experience related to computerized image analysis and three-dimensional modeling." Pet. 4–5.

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[1] Because the parties agree that the challenged claims of the challenged patent have an effective filing date before March 16, 2013, we apply the pre-AIA ("America Invents Act") version of § 103. Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011).
[2] Heller, "The Site-Model Construction Component of the RADIUS Testbed System," in Proceedings: ARPA Image Understanding Workshop (1997) (Ex. 1004, "Heller").
[3] Quam, "The Radius Common Development Environment," in RADIUS: Image Understanding for Imagery Intelligence (1997) (Ex. 1005, "Quam").
[4] U.S. 2006/0235611 A1, Pub. Oct. 19, 2006 (Ex. 1006, "Deaton").

Further, "education could compensate for a deficiency in work experience, and vice-versa." *Id.* at 5. Patent Owner does not provide a formulation for a person of ordinary skill. We adopt Petitioner's description as it is consistent with the prior art and patent specification before us and supported by credible expert testimony. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself may reflect an appropriate level of skill).

B. Claim Construction

1. *"generat[ing] and output[ting] a roof estimate report" (claims 1, 16, and 26)*

Claims 1, 16, and 26 require "generat[ing] and output[ting] 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." In our Final Written Decision in IPR2016-00592, we addressed the same claim terms and held that "the detailed requirements as to the contents of the roof estimate report" constituted printed matter that has no function or structural relation to the substrate on which it is printed, and thus is not entitled to patentable weight. Ex. 1010, 17–18. The parties do not dispute that same claim construction applies here. *See* Pet. 6–8; Pet. Remand Br. 1–2; *see* PO Resp. 13; Paper 38, 31:24–32:5; PO Remand Br. 4. Thus, for the same reasons explained in our Final Written Decision in IPR2016-00592, we find the roof report's contents are printed matter entitled to no patentable weight. *See* Ex. 1010, 15–18.

2. *"transmitting roof measurement information"(claim 9)*

Claim 9 requires "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." Ex. 1001, 24:53–56.

Petitioner asserts that "this limitation should be interpreted broadly enough to encompass transmitting roof measurement information between components of the same computer system," Pet. 11, whereas Patent Owner contends this limitation requires "transmitting the roof measurement information outside the roof estimate report system . . . such as to third-party systems." PO Resp. 18.

We agree with and adopt Petitioner's construction. As we explained in IPR2016-00592, "[t]he claim term at issue requires only 'transmit[ting]' roof measurement information—it does not specify any particular source or destination for the transmission." Ex. 1010, 20. In addition, the '737 patent's specification states that "the roof [report] generation engine 813 may transmit roof measurement information" and "some portion of the contents . . . of the [Roof Estimation System] 810," which includes roof report generation engine 813, "may be stored on and/or *transmitted* over the other computer readable media 805." Ex. 1001, 17:16–17, 16:13–17 (emphasis added), Fig. 8. Thus, because the '737 patent's specification expressly recognizes transmitting roof-estimate content between components of the same computer system, we maintain our construction from IPR2016-00592—that "transmission" includes transmission within the same system. *See* Ex. 1010, 20.

C. Description of Prior Art References

1. Heller (Ex. 1004)

Heller discloses "the RADIUS model-supported image exploitation paradigm," that "creat[es] a 3-dimensional model that captures the basic geometry of the site under examination." Ex. 1004, Abstr. Heller's Figure 4 is reproduced below.

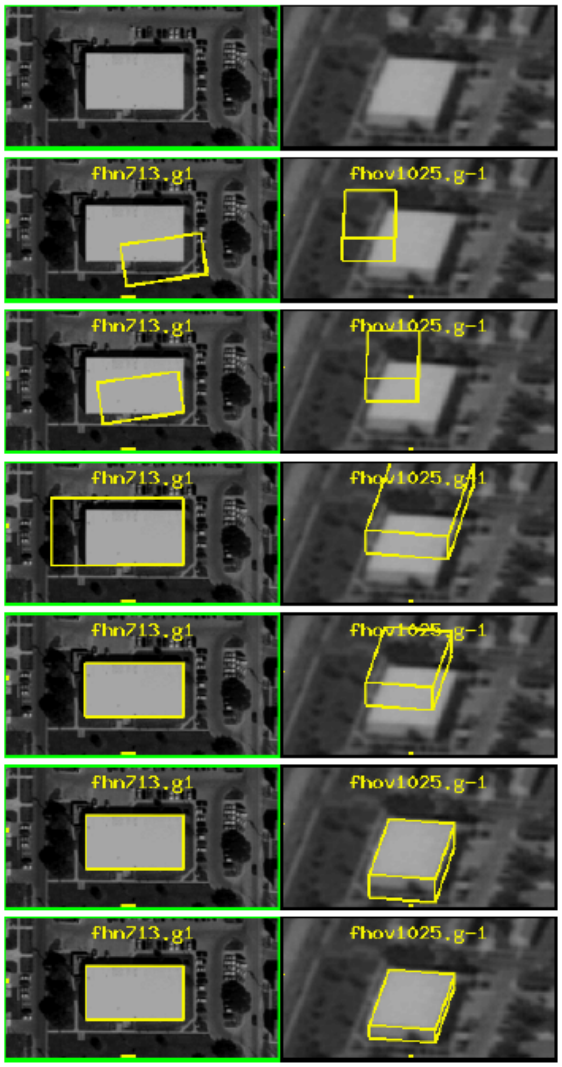

Figure 4 shows "[t]he sequence of adjustments used to manually model a building." *Id*. at 6.

2. Quam (Ex. 1005)

Quam describes the "RADIUS Common Development Environment," which "provides the foundation for the RADIUS Testbed System." Ex. 1005, 1. Quam teaches RADIUS's image registration process, which is "the process of determining and/or refining the internal and external parameters (e.g., position, orientation) of the sensor used to acquire the image." *Id*. at 14. Quam also provides descriptions and screenshots of a "Registration

Tool" that "lead[s] the user through the necessary steps to register a new image." *Id*. at 14–15, Figs. 8–10.

3. Deaton (Ex. 1006)

Deaton describes "a roof inspection system" that generates and outputs various reports. Ex. 1006 ¶ 10.

III. ANALYSIS

A. PETITIONER'S GROUND 1 OBVIOUSNESS CHALLENGE OVER HELLER AND QUAM

In its first obviousness ground, Petitioner asserts that the challenged claims would have been obvious over Heller and Quam. Pet. 12–50. In general, Petitioner corresponds the RADIUS system, as described in Heller and Quam, to the '737 patent's claimed computer-implemented, roof-estimation system. *See* Pet. 19–50. Petitioner describes its proposed combination as "Heller's 'RADIUS Testbed System' (RTS) . . . implemented using the advantageous implementation details and other information about the 'RADIUS Common Development Environment (RCDE)' described by Quam, providing a beneficial implementation environment for the site modeling operations described in Heller." *Id*. at 16. According to Petitioner, a skilled artisan "would have been motivated and found it obvious to implement Heller's 'RADIUS Testbed System (RTS)' using the implementation details and other information about the 'RADIUS Common Development Environment (RCDE)' described by Quam," because "Heller and Quam both describe portions of the 'RADIUS' site modeling platform." *Id*. at 17. Further, Petitioner explains, Quam provides "practical implementation details of the [RADIUS] system" that are not specified in Heller. *Id*.

Patent Owner argues that Petitioner's asserted combination fails to teach several claim elements. *See* PO Resp. 21–30, 64–90. We address those issues below.

1. *"generating and outputting a roof estimate report using a report generation engine . . . wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building*

Claim 1 requires "generating and outputting a roof estimate report using a report generation engine . . . wherein the generated roof estimate report is provided for repair and/or constructing the roof structure of the building." Ex. 1001, 24:13–19. Petitioner asserts that Quam teaches this feature because it teaches displaying roof data including image coordinates, contours, and a map grid. Pet. 34–35, Pet. Reply 6. As Petitioner explains, "[t]hrough these teachings, a POSITA would have understood that the combined system generates and outputs a roof estimate report, and this is done using a report generating engine (e.g., software components of the RCDE involved in generating and outputting the report)." Pet. Reply 6.

Patent Owner argues that Petitioner's challenge fails because it does not adequately address how Quam's data is a "roof estimate report," and Quam does not describe providing a report "for repair and/or constructing the roof structure of the building." PO Resp. 27. We disagree. Patent Owner does not identify any features that a roof estimate report must contain that are missing from Quam's displayed data. *See id.* Absent such analysis, we agree with Petitioner that Quam's display of roof data—including image coordinates, contours, and a map grid—constitutes the claimed roof estimate report. In addition, as Petitioner's expert explains, "information output in the Heller and Quam system provides information about the geometry of roof

structures that would have informed a viewer as to parameters for estimating and implementing roof repair and construction activities." Ex. 1041 ¶ 19. With this explanation, Petitioner adequately accounts for the claim language requiring that the data is "provided for repair and/or constructing the roof structure of the building."

2. Preamble in Claims 16 and 26

Independent claim 16's preamble requires "[a] non-transitory computer-readable storage medium" with "computer executable instructions." Independent claim 26's preamble requires "[a] computer-implemented method in a roof estimate report system including a computer system." Patent Owner asserts that Petitioner's challenge to claims 16 and 26 fails because it does not address the preambles' computing features, but instead relies on the Petition's earlier analysis that addresses claim 1, which does not include these general computing features. PO Resp. 68–70; 75–76. We disagree with Patent Owner's argument.

The at-issue language appears in preambles, which as a general rule are not limiting unless they are "necessary to give life, meaning and vitality to the claim." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002) (internal quotation marks omitted). Because claims 16 and 26 describe structurally complete inventions without their preambles, we find the preambles not limiting. In addition, even if the preambles were limiting, the Petition's analysis, along with Dr. Forsyth's supporting declaration, plainly indicate that the Heller-Quam RADIUS system includes these generic computing features because RADIUS is a software platform executed by a processor on a computer that utilizes memory. *See*, *e.g.,* Pet. 20 (explaining that RADIUS is a "workstation-based image processing system," that "runs

on both SunMicrosystems and Silicon Graphics RISC-based workstations," "utilizes '***memory***,'" and "comprises over ***200,000 lines*** [of code]"); *see also* Ex. 1041 ¶¶ 36, 38–40. Thus, we agree with Petitioner that the Heller-Quam system teaches the preambles in claims 16 and 26.

3. "overlaying a line drawing on corresponding locations of a roof"

Claim 16 recites "overlaying a line drawing on corresponding locations of a roof feature of the roof on first and second aerial images of the roof." Ex. 1001, 25:44–46. For this feature, Petitioner relies on Heller's Figure 5, a portion of which is reproduced below, with Petitioner's annotations. *See* Pet. 44, 25.

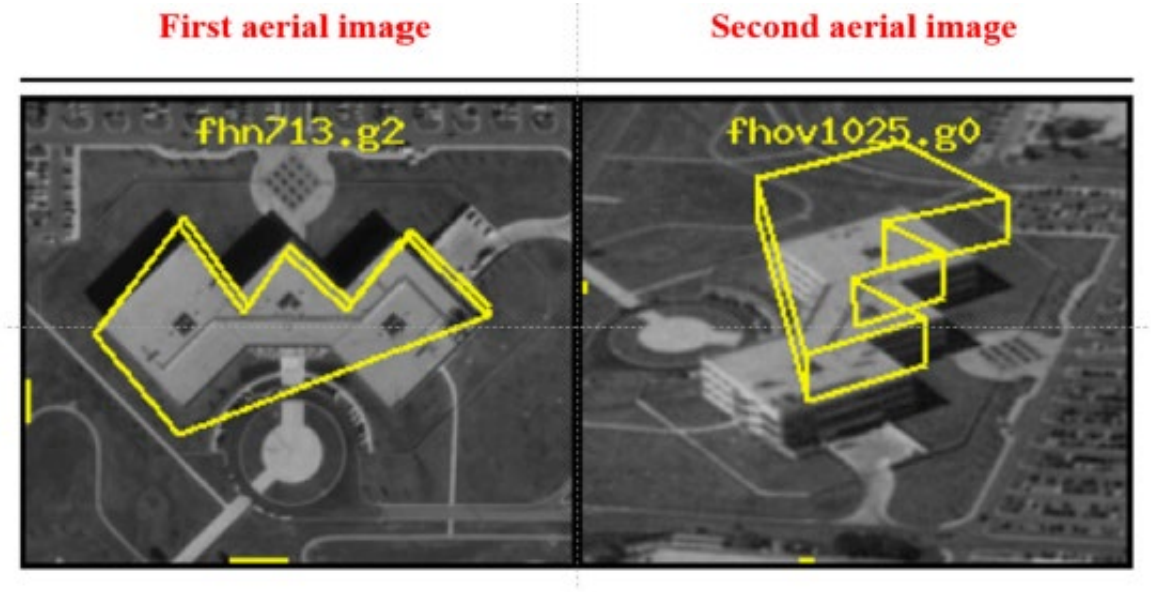

Figure 5 shows "[t]he sequence of steps used to model a complex-shaped building on drawing." Ex. 1004, 7.

Patent Owner argues that "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.'" PO Resp. 72. We disagree. As Petitioner notes, given the features common to both images, as well as the

common "W" shape of both the roof's contour and the yellow line drawing in both images, it is clear that the line drawings overlaying the first and second images is the same drawing, but from different perspectives, and is on corresponding locations of the roof, as claim 16 requires. *See* Pet. 25–26. In addition, as Petitioner notes, "Heller explicitly indicates that features of the line drawing are 'placed at the approximate position and orientation of the image feature to be modeled,' confirming that the line drawings are overlayed on corresponding locations of a roof feature." Pet. Reply 24 (quoting Ex. 1004, 3). Based on Petitioner's analysis as outlined above, we agree with Petitioner that Heller teaches "overlaying a line drawing on corresponding locations of a roof feature of the roof on first and second aerial images of the roof," as claim 16 requires.

4. "changing. . . a line in a second line drawing that corresponds to the same feature in the first line drawing that was changed"

Claim 26 requires "changing . . . a line in a second line drawing that corresponds to the same feature in the first line drawing that was changed." For this feature, Petitioner relies on Heller's Figure 4, a portion of which is reproduced below, with Petitioner's annotations. *See* Pet. 44, 49.

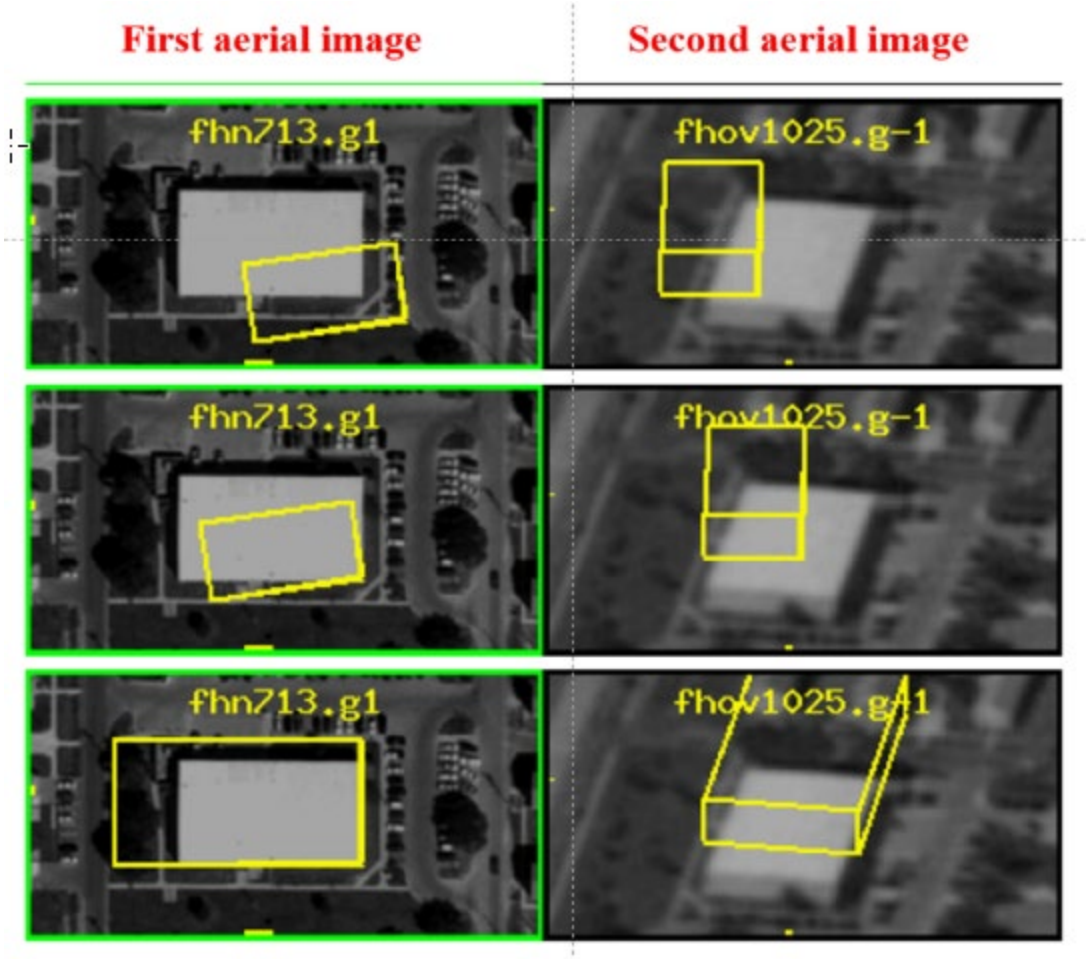

Figure 4 shows "[t]he sequence of adjustments used to manually model a building." Ex. 1004, 6.

Patent Owner argues that "Heller contain[s] 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." PO Resp. 78. We disagree. As Petitioner notes and Dr. Forsyth explains, a skilled artisan would understand that user-input adjustments to the first column of images results in corresponding changes to the second column of images based on the similarity of the changes as the images progress, and on Heller's explanation that "[t]he Move W operation ***moves the box*** along the camera ray of the

selected image and ***along the corresponding epipolar lines in the other images***" and "[t]he results of the semi-automated site model construction are continuously displayed to the model builder." Pet. 31–32 (quoting Ex. 1004); *see* Ex. 1003 ¶ 53. We agree with Petitioner's analysis and therefore agree with Petitioner that 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 claim 26 requires.

5. Claim 9

Dependent claim 9 requires "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." Ex. 1001, 24:53–56. Petitioner asserts that Heller teaches this feature because it teaches transmitting changes in the size of the line drawing into an event history when a user adjusts the size of the wireframe overlay. Pet. 38–39; Ex. 1003 ¶ 69; *see* Ex. 1004, 5 ("Every mouse motion associated with making adjustments to object parameters, and every mouse click is captured into an event history."). Patent Owner challenges two aspects of Petitioner's argument. First, Patent Owner asserts that neither Heller nor Quam teaches "transmitting roof measurement information outside of Heller's RADIUS Testbed System as implemented on Quam's RCDE." PO Resp. 84. We disagree with Patent Owner's argument because it relies on Patent Owner's construction of "transmitting roof measurement information" to require external transmission, which we do not adopt for the reasons outlined above in Section II.B.2. Because "transmission" includes transmission within the same system, we agree with Petitioner that Heller's transmission to an internal event history is sufficient.

Second, Patent Owner argues that changing the size of a line drawing is not a change in measurement information as claimed because Heller does not tie its line size to any 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." PO Resp. 85–86. We disagree with Patent Owner's argument because it is not commensurate in scope with the at-issue limitation's language, which requires transmitting "roof measurement information," a term that is broader than transmitting actual "roof measurements." Nothing in the limitation's plain language requires transmitting specific parameters expressed in standard units as Patent Owner suggests. *See id.* at 86. Instead, as Petitioner's expert, Dr. Forsyth explains, "[b]ecause the line drawings are used to model the roof structure of a building (*see* [1.2]- [1.4]), a change in the size of the line drawing represents a change in the measurement[information] of the roof represented by the model." Ex. 1003 ¶ 69. We agree with Dr. Forsyth's analysis and thus agree with Petitioner that transmitting Heller's "adjustments to object parameters . . . captured into an event history" (Ex. 1004, 5) is a description of transmitting roof measurement information, as claimed. *See* Pet. 38–39; Pet. Reply 27–28.

In addition, as Petitioner notes in its Reply,[5] even if roof measurement information were limited to measurements such as "lengths of the edges of

[5] Petitioner's reliance on Heller's slope adjustment and map grid in its Reply is permissible because it is responsive to Patent Owner's claim construction argument. *See Axonics, Inc. v. Medtronic, Inc.*, 75 F. 4th 1374, 1383 (Fed. Cir. 2023) (holding that "the petitioner must be afforded a reasonable opportunity in reply to present argument and evidence under [a] new construction").

sections of the roof, pitches of sections of the roof, areas of sections of the roof, etc.," as Patent Owner suggests (PO Resp. 85), Heller explicitly indicates changing such measurements—i.e., that the "slope of the roof can be adjusted as well as the amount of overhang." Ex. 1004, 3, *see* Pet. Reply 27. As Dr. Forsyth explains, Heller's changes are "relative to a 'Map Grid,' which further allows determination of dimensions and areas of the modeled structure, similar to placing a ruler next to an object." Ex. 1041 ¶ 45. Because in Heller, "[e]very mouse motion associated with making adjustments to object parameters, and every mouse click is captured into an event history" (Ex. 1004, 5), we agree with Petitioner that Heller's various adjustments, including slope/overhang adjustments, constitute transmitted roof measurement information, even under Patent Owner's narrow construction.

6. Claim 10

Dependent claim 10 requires "registering . . . the aerial image to a reference grid corresponding to a three-dimensional model of the roof." Ex. 1001, 24:62–64. Petitioner asserts that Quam teaches this feature because it teaches "***[r]egistration of multiple data sources, including*** stereographic or ***multiple images***, terrain elevation models, and 3-D object models, ***to the same world coordinate system***." Pet. 43 (quoting Ex. 1005, 5). According to Petitioner, "[a] POSITA would have understood the 'world coordinate system' described in Quam to be a 'reference grid.'" *Id.*

Patent Owner asserts that Petitioner's challenge to claim 10 fails because "[Quam's] 'world coordinate system' is not shown to correspond to a 3D model of the roof." PO Resp. 89. We disagree. As Petitioner notes, Quam's 3D model corresponds to Quam's world coordinate system because

Quam describes "regist[ering]" its 3d models to its world coordinate system. Pet. Resp. 28 (quoting Ex. 1005, 5). Patent Owner's argument does not explain why this registration is insufficient for the claimed correspondence. PO Resp. 89; PO Sur-reply 20. Based on the Petition's analysis as outlined above, we agree with Petitioner that Quam teaches "registering . . . the aerial image to a reference grid corresponding to a three-dimensional model of the roof" as claim 10 requires.

7. Additional Unchallenged Limitations

For independent claims 1, 16, and 26, Petitioner asserts that the Heller-Quam combination teaches the claimed "plurality of aerial images of a roof" that provide "different view[s], taken from a different angle of the same roof" because Heller's Figures 4 and 5 both show two aerial images with different views of the same roof, taken at different angles. *Id.* at 21–24. Petitioner asserts that the Heller-Quam combination also teaches the claimed overlaid "line drawings representing features of the roof" because those Figures 4 and 5 include images with yellow wireframe drawings that approximate the buildings' structures. *Id*. at 25–27. Petitioner further asserts that the Heller-Quam combination teaches the various dependent-claim features including simultaneous line-drawing display (claim 6), top-plan/perspective views (claim 7) transmitting based on changes (claim 9), point marker/reference grid (claim 10), adding a planar roof section (claim 17), 3D model modification (claim 25), and concurrent roof-measurement display (claim 34). *See id.* at 35–50. Patent Owner does not additionally challenge Petitioner's ground-1 obviousness analysis.

B. Petitioner's Ground 2 Obviousness Challenge Over Heller, Quam, and Deaton

Petitioner's second asserted ground mirrors its first, except that Petitioner adds Deaton for its explicit teaching of producing a roof estimate report. *See id*. at 50–51. According to Petitioner, one skilled in the art would have been motivated to combine Deaton with the Heller-Quam system because "including the production of such a report . . . 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." *Id*. at 51. Patent Owner raises two additional arguments in challenging Petitioner's ground-2 analysis. We address those issues below.

1. "generating and outputting a roof estimate report using a report generation engine"

Claim 1 requires "generating and outputting a roof estimate report using a report generation engine." Ex. 1001, 24:13–14. Petitioner asserts that Deaton discloses the claimed roof report generation/output feature because it "describes 'a roof inspection system' that generates and outputs various reports," such as a "'project report' that 'provides specification details and work items for repairing or replacing the [roof's] infrastructure.'" Pet. 53 (quoting Ex. 1006 ¶¶ 10, 107).

Patent Owner argues that Deaton does not teach the claimed report generation and features. PO Resp. 28. We disagree. Patent Owner's criticism focuses only on Deaton's paragraph 10, which, according to Patent Owner, "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." *Id.* Patent

Owner's criticism ignores the Petition's reliance on Deaton's paragraph 107, which clearly addresses the roof-report feature by disclosing "[a] project report [that] provides specification details and work items for repairing or replacing the [roof's] infrastructure." Ex. 1006 ¶ 107, *see* Pet. 53 (quoting Ex. 1006 ¶ 7). Patent Owner's criticism does not identify any features of a roof estimate report that are missing in Deaton's project report. *See* Pet. Reply 29.

In its Sur-reply, Patent Owner argues for the first time that "Deaton does not teach that the 'project report' (or any report for that matter) is 'generat[ed] and output[] . . . using a report generation engine,'" as the challenged claims require. PO Sur-Reply 11. We disagree with Patent Owner's argument for two reasons. First, the argument is procedurally flawed because Patent Owner did not raise it in the Response. *See* Paper 11, 9 ("Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived."). In addition, we disagree with Patent Owner's argument substantively because Deaton teaches that its "reports . . . may be generated by data reporting module 906." Ex. 1006 ¶ 105. Thus, Deaton's reporting module clearly teaches the claimed report generation engine.

Based on the Petition's analysis outlined above, we agree with Petitioner that Deaton teaches generating and outputting a roof estimate report, as the challenged claims require.

2. Petitioner's Rationale for Combining Deaton

According to Petitioner, one skilled in the art would have been motivated to combine Deaton's roof report generation and output feature with the Heller-Quam system because "including the production of such a report

. . . 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." *Id*. at 51.

Patent Owner asserts that Petitioner's reason to combine fails because Deaton is "directed to collecting 'roof measurement information' based on the physical inspection of a roof on-site," whereas Heller and Quam "are directed to creating 3D models based on images." PO Resp. 31, *see id.* at 33; PO Sur-reply 12–13. We disagree. Petitioner's rationale for combining references (i.e., increasing utility by enabling the Heller-Quam site models to be used to plan and execute roof maintenance, repair, and construction) explains why one skilled in the art would have added Deaton's report to the Heller-Quam site-modeling system. Patent Owner's argument, in contrast, assumes a skilled artisan could do no more than bodily incorporate Deaton's on-site surveying method with Heller and Quam's remote, image-based system. That, however, is not the test for obviousness. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016); *see also Axonics, Inc. v. Medtronic, Inc.*, 73 F. 4th 950, 957 (Fed. Cir. 2023) (explaining that "a skilled artisan may be motivated to combine particular features of different references, *e.g.*, to secure some benefits at the expense of others, even when bodily incorporation would be impossible or inadvisable"). In short, we agree with Petitioner's expert, Dr. Forsyth, that a skilled artisan "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." Ex. 1003 ¶ 102.

In challenging whether a skilled artisan would have combined Deaton's report with the Heller-Quam system, Patent Owner also argues that that Deaton fails to disclose creating a report based on a 3D model (PO Resp. 32) while Heller and Quam fail to disclose creating 3D models based on on-site surveys, (*id*. at 35, 34). We disagree with those arguments because they attack the references individually, rather than the combined teachings that are asserted in the Petition. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In light of Petitioner's increased-utility rationale outlined above, we find Petitioner has articulated sufficient reasoning with some rational underpinning to support the legal conclusion that its proffered combination of references would have been obvious to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 418 (2007).

C. SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS

Patent Owner asserts objective indicia of nonobviousness confirm that the claimed invention is nonobvious. *See* PO Resp. 36–63. According to Patent Owner, its "roof report service used the patented invention to achieve tremendous commercial success." *Id*. at 57. Specifically, Patent Owner presents evidence showing its roof report sales grew dramatically in the six years immediately following the products' release, that a significant market share of insurance companies relied on that its reports, and that a competitor's CEO acknowledged the high value of Patent Owner's patent portfolio. PO Resp. 58–60. Patent Owner also asserts that its invention has been the subject of significant industry praise. *Id.* at 61. Specifically, Patent Owner notes that those in the roofing industry characterized Patent Owner's invention as a "breakthrough" and its reports as "the industry standard," that

surveyed customers praised the "[q]uality of reports," and that a competitor's CEO praised Patent Owner's products. PO Resp. 61–62.

Petitioner does not challenge that Patent Owner's products enjoyed commercial success or were the subject of industry praise. *See* Pet. Reply 15–22. Instead, Petitioner asserts that there is no nexus between the claimed invention and the asserted commercial success and industry praise. PO Resp. 12–22; Pet. Remand Br. 5–12. For the reasons below, we agree with Petitioner that the asserted commercial success and industry praise lacks the requisite nexus with the invention's merits.

1. Nexus Presumption

To be accorded substantial weight, there must be a nexus between the claimed invention's merits and the secondary considerations evidence. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995).

> [P]resuming nexus is appropriate when the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features, and is coextensive with them. Conversely, when the thing that is commercially successful is not coextensive with the patented invention—for example, if the patented invention is only a component of a commercially successful machine or process, the patentee is not entitled to a presumption of nexus.

Fox Factory, Inc. v. SRAM, LLC, 944 F.3d 1366, 1377–78 (Fed. Cir. 2019) (internal quotation marks and citations omitted).

To demonstrate that its Twister and Render House products embody and are coextensive with the challenged claims, Patent Owner steps through each challenged claim on an element-by-element basis and, for each limitation, directs us to screen shots from its Render House and Twister products as well as passages from the products' user guides to show that the

products embody the challenged claims. PO Resp. 38–57. On the other side, Petitioner asserts that Patent Owner's correspondence analysis is flawed because it relies on the roof report content limitation, which is printed matter that is not entitled to patentable weight. Pet. Remand Br. 3–5. According to Patent Owner, "Rather than supporting correspondence between the alleged embodying products and the claims, roof report content in fact highlights a significant aspect of Twister and Render House directed to features beyond the claimed limitations entitled to patentable weight." *Id*. at 5.

We agree with Petitioner that Patent Owner's Twister and Render House products are not entitled to a presumption of nexus. Patent Owner's evidence of coextensiveness relies on report content features such as "numerical values corresponding to the slope, area, or lengths of edges of at least some of the roof sections" that, as outlined above in Section II.B.1, constitute printed matter. *See, e.g.*, PO Resp. 43–44. Because those features are printed matter, they carry "no patentable weight in an obviousness analysis" and therefore do not support coextensiveness between the claims and Petitioner's products. *See Praxair Distrib. v. Mallinckrodt Hosp. Prods. IP*, 890 F.3d 1024, 1035 (Fed. Cir. 2018) (finding printed matter claim language cannot provide basis for secondary considerations).

To the contrary, because the report's content features are not entitled to patentable weight, those features in Patent Owner's Twister and Render House products undermine the products' coextensiveness with the claims. *See Teva Pharms. Int'l GMBH v. Eli Lilly and Co.*, 8 F. 4th 1349, 1361 (Fed. Cir 2021) (explaining the "presumption analysis requires the fact finder to consider the unclaimed features of the stated products to determine their level of significance and their impact on the correspondence between the claim and

the products"). Based on the parties' arguments in this proceeding and the record before us, the evidence indicates that the report's content is important to the success of the products at issue because, as explained below, Patent Owner bases much of the asserted commercial success and industry praise on it. *See* Ex. 1019, 3, Ex. 1020; Ex. 1025, 2; Ex. 1026, 1; Ex. 1027; Ex. 1028; Ex. 2010, 1. Patent Owner has not introduced evidence that the report's content features "amount to nothing more than additional insignificant features" to the success of the products at issue. *Fox Factory*, 944 F.3d at 1374. Thus, the record shows that those features "go to the 'heart' of Patent Owner's patent," such that without them, "the patented invention is only a component of a commercially successful machine or process." *See Fox Factory,* 944 F.3d at 1374. For these reasons, we find that Patent Owner has not established a presumed nexus between the claimed invention and the asserted secondary-considerations evidence related to the Render House and Twister products.

2. Nexus in Fact

Absent a presumption of nexus, a patentee may still establish nexus by showing that the objective indicia are the "direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373–74. Patent Owner points to two features to establish this nexus. First, Patent Owner asserts that the generated report's accuracy drove commercial success and industry praise, and, as support, points to evidence that repeatedly emphasizes the reports' accuracy and quality. PO Resp. 57 (citing Ex. 1019, 3, Ex. 1020); *id.* at 62 (citing Ex. 1028, 1025, 2; 2010, 1); *see* Ex. 1026, 1; Ex. 1027. Second, Patent owner asserts that its reports were less expensive, saved time, and reduced injury risk as compared to manual, on-site surveys,

and again cites evidence emphasizing those advantages. PO Resp. 58 (citing Ex. 1019; Ex, 1020); *id.* at 61 (citing Ex. 1024, 1); PO Remand Br. 9 (citing Ex. 1021, 1; Ex. 1023, 4).

We agree with Petitioner that Patent Owner has not established nexus in fact. As Petitioner explains, the reports' accuracy and quality "corresponds to the roof report content features" and is "based on numerical measurements and other content of the roof report." Pet. Remand Br. 8–9. Further, we agree with Petitioner that Patent Owner's "primary evidence of success is based on sales of roof reports—reports purchased for their roof report content." Pet. Remand Br. 11. Because the reports' content is printed matter that is not entitled to patentable weight, commercial success and industry praise based on that content "has no patentable weight in an obviousness analysis." *See Praxair,* 890 F.3d at 1035.

We also disagree with Patent Owner that advantages over on-site surveys establish nexus. *See* PO Remand Br. 9. To establish nexus, Patent Owner cannot tie commercial success and praise to aspects of its invention "that were already present in the prior art." *Campbell Soup Co. v. Gamon Plus, Inc.*, 10 F.4th 1268, 1277, 1278 (Fed. Cir. 2021). Here, Patent Owner's asserted advantages are tied to surveying a roof using photographs instead of manually measuring on-site. *See, e.g.,* Ex. 1019, 2, 4; Ex. 1025, 2; Ex. 1028). That feature, however, was clearly disclosed in the asserted prior art. *See* Ex. 1004, 2 (describing "automatic or semi-automatic model construction . . . by marking points in an image along the boundaries of the desired regions"), Ex. 1005, 1 (describing "interactive cartographic modeling of three-dimensional scenes from multiple images"). Thus, we agree with Petitioner

that Patent Owner's alleged advantages over on-site surveys does not establish nexus. *See* Pet. Remand Br. 12.

3. Secondary Considerations Summary

Because the report's content is a critical feature of Patent Owner's products that is not entitled to patentable weight in the challenged claims, Patent Owner has not established a presumption of nexus between the claims and its Twister and Render House products. In addition, because Patent Owner ties its commercial success and industry praise to printed matter or features already known in the art, we agree with Petitioner that Patent Owner has not established a nexus in fact with the invention's merits. Because there is no nexus, Patent Owner's secondary-considerations evidence does not substantially support nonobviousness.

We acknowledge that in an earlier IPR, the Board found there was a presumed nexus between the claimed invention and the commercial success and industry praise of Patent Owner's Twister and Render House products. Ex. 1010, 26–29. With the benefit of that presumption, the Board found that secondary considerations were decisive in concluding that the petitioner had not shown the challenged claims were unpatentable. *Id.* at 34–35. Ultimately, the Federal Circuit affirmed the Board's decision. Ex. 1016, 2–3; *see* PO Resp. 36–37. In that case, however, the petitioner did not argue, and the Board did not consider, how the reliance on printed matter—i.e., the report's content, which was not entitled to patentable weight—impacted nexus. *See* Ex. 1010, 26–29. For the reasons outlined above, that issue is critical to our lack-of-nexus conclusion here.

D. SUMMARY

Other than the arguments addressed above, Patent Owner does not additionally challenge Petitioner's obviousness analysis. We have reviewed Petitioner's arguments and evidence (*see* Pet. 12–52) and, based on that analysis, we find Petitioner has shown by a preponderance of the evidence that claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 would have been obvious over Heller and Quam, and that those same claims would also have been obvious over Heller, Quam, and Deaton.

IV. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated by a preponderance of the evidence that claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 of the '737 patent are unpatentable. Our conclusions are summarized in the following table.

Claim(s)	**35 U.S.C. §**	**Reference(s)/Basis**	**Claims Shown Unpatentable**	**Claims Not shown Unpatentable**
1, 6, 7, 9, 10, 16, 17, 25, 26, 34	103	Heller, Quam	1, 6, 7, 9, 10, 16, 17, 25, 26, 34	
1, 6, 7, 9, 10, 16, 17, 25, 26, 34	103	Heller, Quam, Deaton	1, 6, 7, 9, 10, 16, 17, 25, 26, 34	
Overall Outcome			1, 6, 7, 9, 10, 16, 17, 25, 26, 34	

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown that claims 1, 6, 7, 9, 10, 16, 17, 25, 26, and 34 of the '737 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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