

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROOFR INC.,
Petitioner,

v.

PICTOMETRY INTERNATIONAL CORP.,
Patent Owner

IPR2023-00436
Patent 9,183,538 B2

Before STACEY G. WHITE, 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)

I. INTRODUCTION

A. Background

Roofer Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–18 (the “challenged claims”) of U.S. Patent No. 9,183,538 B2 (Ex. 1001, “the ’538 patent”). Paper 5, 1 (“Pet.”). 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 14 (“Institution Decision”). Following institution, Patent Owner filed a Response. Paper 28 (“PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response (Paper 33, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 34, “PO Sur-reply”). On April 23, 2024 we held an oral hearing. A transcript of the hearing is included in the record. Paper 40.

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 parties identify the following related matter: *Pictometry International Corp. v. Roofr, Inc.*, 1:21-cv-01852 (D. Del). Pet. 88; Paper 3, 2.

C. The ’538 Patent (Ex. 1001)

The ’538 patent is directed to determining an estimated roofing area based on the predominant pitch and the footprint of the roof. Ex. 1001, code (57). Figure 6 is reproduced below.

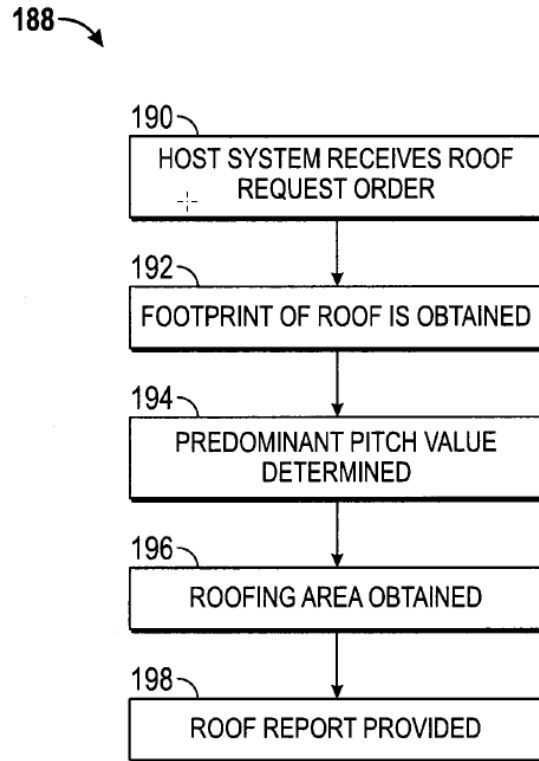


FIG. 6

Figure 6 is an “exemplary embodiment of a program logic.” *Id.* at 1:56–57.

D. Illustrative Claim

Challenged claims 1, 13, and 14 are independent. Claim 1 is illustrative and is reproduced below.

1. One or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems that when executed cause the one or more computer systems to: identify a geographic location of a roof; determine a footprint and predominant pitch of the roof by analyzing one or more image showing the roof; determine an estimated roofing area of the roof based on the predominant pitch and the footprint of the roof; and generate a roof report for determination of an amount of materials needed for a construction project, wherein the roof report includes at least one image showing the roof and the estimated roofing area of the roof.

Ex. 1001, 15:21–32.

E. Asserted Grounds of Unpatentability

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

Claims Challenged	35 U.S.C. §	References/Basis
1–5, 8–13	103(a) ¹	Pershing-789 ² , Bailey ³
6, 7, 14–18	103(a)	Pershing-789, Bailey, Abhyanker ⁴
1–5, 8–13	103(a)	Kennedy ⁵ , Bailey
6, 7, 14–18	103(a)	Kennedy, Bailey, Abhyanker

Petitioner submits a declaration from Tony Cummings. Ex. 1003.

II. DISCUSSION

A. Claim Construction

Neither party proposes an express construction for any claim terms. Pet. 2; *see generally* PO. Resp. We agree that no claim terms require express construction for purposes of this Decision.

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. § 103 that became effective after the filing of the application that led to the challenged patent. Therefore, we apply the pre-AIA version of 35 U.S.C. § 103.

² US 2008/0262789 A1, Pub. Oct. 23, 2008 (Ex. 1004).

³ *Roofer: Steep Roofing Inventory Procedures And Inspection And Distress Manual for Asphalt Shingle Roofs*, David M. Bailey, U.S. Army Corps of Engineers, CERL Tech. Rept. (December 1999) (Ex. 1010).

⁴ US 2007/0220174 A1, Pub. Sep. 20, 2007 (Ex. 1005).

⁵ US 2009/0304227 A1, Pub. Dec. 10, 2009 (Ex. 1009).

B. Level of Ordinary Skill in the Art and Petitioner's Declarant

Patent Owner contends one skilled in the art “would have had a Bachelor’s degree in an academic area emphasizing construction, architecture, and/or engineering, or similar discipline, and at least two years of experience with roofing measurement and estimation, aerial imagery use in roofing estimation, and roofing measurement software.” PO Resp. 4. Patent Owner’s definition is substantively similar to Petitioner’s. *See* Pet. 2 (“a person of ordinary skill in the art at the time of the alleged invention would have bachelor’s degree in architecture or an equivalent with at least five years of experience performing roof estimation”). We agree with and adopt Patent Owner’s definition with the added provision that, as we noted in our Institution Decision, “experience may compensate for formal education, and vice versa.” Paper 14, 7.

Patent Owner does not contest that Petitioner’s expert, Mr. Cummings, qualifies as a skilled artisan. *See* PO Resp. 39–47. Instead, Patent Owner contends we “should give significantly more weight” to its expert’s testimony than to Petitioner’s because its expert “has much more relevant experience” and Mr. Cunningham’s opinions “are conclusory and merely repeat *verbatim* the arguments presented in the Petition.” PO Resp. 39. We disagree. We do not find that Patent Owner’s expert’s opinions are entitled to significantly more weight than Petitioner’s simply based on the experts’ relative experience. Instead, in our analysis below, where necessary, we have evaluated both experts’ opinions and we base our conclusions on the opinions’ persuasiveness. In addition, we do not find it problematic that the Petition repeats certain portions of Petitioner’s expert’s testimony. Though portions of the Petition may be the same as Mr. Cummings’s testimony, that does not by itself undermine the

testimony’s persuasiveness or its status as evidence, nor does it mean Petitioner’s arguments are conclusory, as Patent Owner suggests. *See* PO Resp. 43–47.

C. Description of Prior Art References

1. Pershing-789 (Ex. 1004)

Pershing-789 teaches “[a] system that allows the remote measurement of the size, geometry, pitch and orientation of the roof sections of a building and then uses the information to provide an estimate to repair or replace the roof.” Ex. 1004, code (57).

2. Bailey (Ex. 1010)

Bailey teaches methods for estimating area of a roof. Ex. 1010, 136–137. Bailey’s method uses “the total projected horizontal areas” and “convert[s] to actual areas with the aid of” a table that indicates slope and an “Area/Rake Factor.” *Id.* at 137. Bailey also teaches methods for collecting data about a roof, including the “predominant slope.” *Id.* at 17.

3. Kennedy (Ex. 1009)

Kennedy teaches “[a] roof estimating software program [that] receives location information of a building in the selected region and then presents the aerial image files showing roof sections of building.” Ex. 1009, code (57). Kennedy further teaches “a sizing tool for determining the size, geometry, and pitch of the roof sections of a building being displayed.” *Id.*

4. Abhyanker (Ex. 1005)

Abhyanker teaches “marker placement in a mapping environment.” Ex. 1005, code (57). Abhyanker teaches that “the method may include applying a drag and drop algorithm that enables the user to sequentially

and/or concurrently relocate markers in the mapping environment, iteratively performing additional verifications.” *Id.* ¶ 11.

D. Obviousness Analysis

1. Obviousness of Claims 1–5 and 8–13 based on Pershing-789 and Bailey

Petitioner contends that claims 1–5 and 8–13 would have been obvious over Pershing-789 and Bailey. Pet. 20–54. For the reasons explained below, we find Petitioner has shown by a preponderance of evidence that claims 1–5 and 8–13 would have been obvious over Pershing-789 and Bailey.

a) Petitioner’s Proposed Combination

In its first ground, Petitioner relies on Pershing-789 for analyzing a roof’s image to identify the roof’s location, footprint, and pitch, and for then estimating the roof’s area and generating a roof report. Pet. 6–8; *see id.* at 25–32, 34–36. Petitioner relies on Bailey for teaching the claimed “predominant pitch.” *See id.* at 31–34. Petitioner argues that one of ordinary skill would have been motivated to modify Pershing-789’s teachings with Bailey’s because “[i]ncluding Bailey’s predominant pitch would allow Pershing-789’s system to estimate roof area accurately with simplified calculations.” *Id.* at 21–22. Further, like Pershing-789, Bailey teaches a known, alternative way “to assess ‘needed level of repair’ of a roof.” *Id.* at 22 (quoting Ex. 1010, 1, 10).

Patent Owner challenges several aspects of Petitioner’s asserted combination. PO Resp. 9–36. We address those issues below.

*b) Analyzing an Image to Determine Roofing Area Based on
Predominant Pitch and Footprint*

Claim 1 requires “determin[ing] a footprint and predominant pitch of the roof by analyzing one or more image showing the roof; [and] determin[ing] an estimated roofing area of the roof based on the predominant pitch and the footprint of the roof.” Ex. 1001, 15:25–29. Independent claims 13 and 14 have similar limitations. *Id.* at 16:46–49, 16:62–65. Petitioner asserts that its proposed combination teaches this feature because Pershing-789 teaches analyzing a roof’s image to identify the roof’s footprint and pitch, and estimating the roof’s area based on those features. Pet. 27–31. Although Pershing-789 teaches using “pitch” instead of the claimed “predominant pitch” to determine area, Petitioner explains that Bailey teaches determining “predominant pitch” and a skilled artisan would have been motivated to Bailey’s predominant slope in calculating area because “it simplifies the calculation of roof estimates, and allows for a more streamlined, yet accurate, estimation.” Pet. Reply 5; *see* Pet. 21–22, 31–34; Ex. 1003 ¶¶ 43–45.

Patent Owner challenges two aspects of Petitioner’s analysis related to this limitation. First, Patent Owner argues that Petitioner’s challenge fails because Bailey does not teach “using its ‘predominant slope’ in calculating the roof’s area,” and in fact teaches away from doing so by teaching “that area calculations should be performed separately for each slope.” PO Resp. 12–13; *see id.* at 14, 16. We disagree with Patent Owner’s argument because it attacks Bailey individually, rather than the combined teachings of Bailey and Pershing-789 that Petitioner asserts. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Specifically, it is not necessary that Bailey teaches determining an estimated roofing area based on the roof’s predominant pitch

and footprint because, as outlined above, Petitioner relies on the combined teachings of Pershing-789 and Bailey for the disputed area-determination feature. *See* Pet. 20–21, 27–34. That is, Petitioner relies on Bailey not for the claimed area determination, but only for teaching predominant pitch. *See id.* In addition, even if Patent Owner is correct that Bailey elsewhere teaches using actual individual slopes rather than predominant slope to calculate a roof’s area, that does not teach away from Petitioner’s proposed combination because it does not criticize or counsel against using predominant slope instead. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (“A reference does not teach away . . . if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.”) (internal quotation marks omitted). Moreover, nothing in Bailey’s teaching related to using actual slope measurements undermines Petitioner’s explanation that one skilled in the art would implement a different feature in Bailey—Bailey’s predominant slope—as a simplified, yet accurate way to calculate area. *See* Pet. 21–22.

Second, Patent Owner argues that Petitioner’s challenge fails because Bailey “does not disclose or suggest determining a predominant pitch of a roof *by analyzing one or more images showing the roof*” as the challenged claims require. PO Resp. 17; *see id.* at 18–19. We disagree with this argument because it once again attacks Bailey individually, rather than the combined teachings of Bailey and Pershing-789 that Petitioner asserts. Specifically, it is not necessary that Bailey teaches analyzing roof images because Petitioner relies on Pershing-789, not Bailey, for that feature. *See* Pet. 2–28; Pet. Reply. 10–12. In addition, Petitioner’s rationale, as outlined

above, explains why one skilled in the art would have combined Pershing-789's image analysis with Bailey's predominant-slope feature.

In light of Petitioner's analysis as outlined above, we agree with Petitioner that together, Pershing-789 and Bailey teach "determin[ing] a footprint and predominant pitch of the roof by analyzing one or more image showing the roof; [and] determin[ing] an estimated roofing area of the roof based on the predominant pitch and the footprint of the roof," as claimed. Further, given Petitioner's rationale as outlined above, Petitioner has articulated sufficient reasoning with rational underpinning to support its assertion that it would have been obvious to combine Bailey's predominant-slope teaching with Pershing-789's area calculation. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 419 (2007).

c) Dependent Claims 11 and 18

Dependent claims 11 and 18 require using a weighted average to determine predominant pitch. Specifically, dependent claim 11 requires that the claimed "predominant pitch" is calculated by "determining a plurality of pitch values with each pitch value associated with a portion of the roof" and "each pitch value is associated with an estimated percentage of roof area." Ex. 1001, 16:15–23. Dependent claim 18 requires that the claimed predominant pitch is based on a weighted average of individual pitch factors for two or more portions of the roof." *Id.* at 17:16–18.

Patent Owner asserts Petitioner's challenges to dependent claims 11 and 18 fail because Bailey does not describe or provide any details about how its predominant slope is calculated, and Bailey's "predominant pitch" was not a term of art in the roofing industry" that a skilled artisan would know necessarily involves weighted averages. PO Resp. 23–28. Further,

Patent Owner asserts that Bailey's slope-factor chart is insufficient for the claimed feature because Bailey uses its slope factors to calculate area, but not to determine predominant pitch. *Id.* at 29–31.

We disagree with Patent Owner's argument because, beyond Bailey's disclosures, Petitioner presents evidence that adequately supports its challenge to the weighted-average feature in dependent claims 11 and 18. Specifically, Petitioner presents a 2010 "Construction Dictionary" that teaches "weighted average" was a known way of obtaining an average. Ex. 1013, 605; *see* Pet. 51–52; *id.* at 60 (Petitioner's claim 18 analysis citing its earlier analysis of claims 10 and 11). Petitioner also explains that one skilled in the art would have been motivated to use a weighted average to calculate Bailey's predominant slope because, as the dictionary explains, it is "more representative of the true mean than that obtained by straight averaging." Ex. 1013, 65; *see* Pet. 51–52. With this evidence, Petitioner has adequately supported its assertion that a skilled artisan "would have been familiar with the use of weighted averages generally to determine an average representative of a range of values," and "would have known that using a weighted average to determine a value representative of a range of source values leads to a more accurate result." Pet. Reply 15 (citing Ex. 1003 ¶ 97). Thus, Petitioner has shown that the weighted-average feature in dependent claims 11 and 18 would have been "nothing more than the application of a known technique to yield a predictable result" and thus obvious to one skilled in the art at the time of the '583 patent. *Id.* at 16.

d) Footprint

Independent claims 1, 13, and 14 require determining a roof's "footprint." Ex. 1001, 15:25–27, 16:46–47, 16:62–67. According to

Petitioner, “Pershing-789 teaches determining the claimed ‘*footprint*’ of the roof by drawing two-dimensional boundaries/outlines of roof sections,” as shown in Pershing-789’s Figure 5E. Pet. 28. Figure 5E is reproduced below:

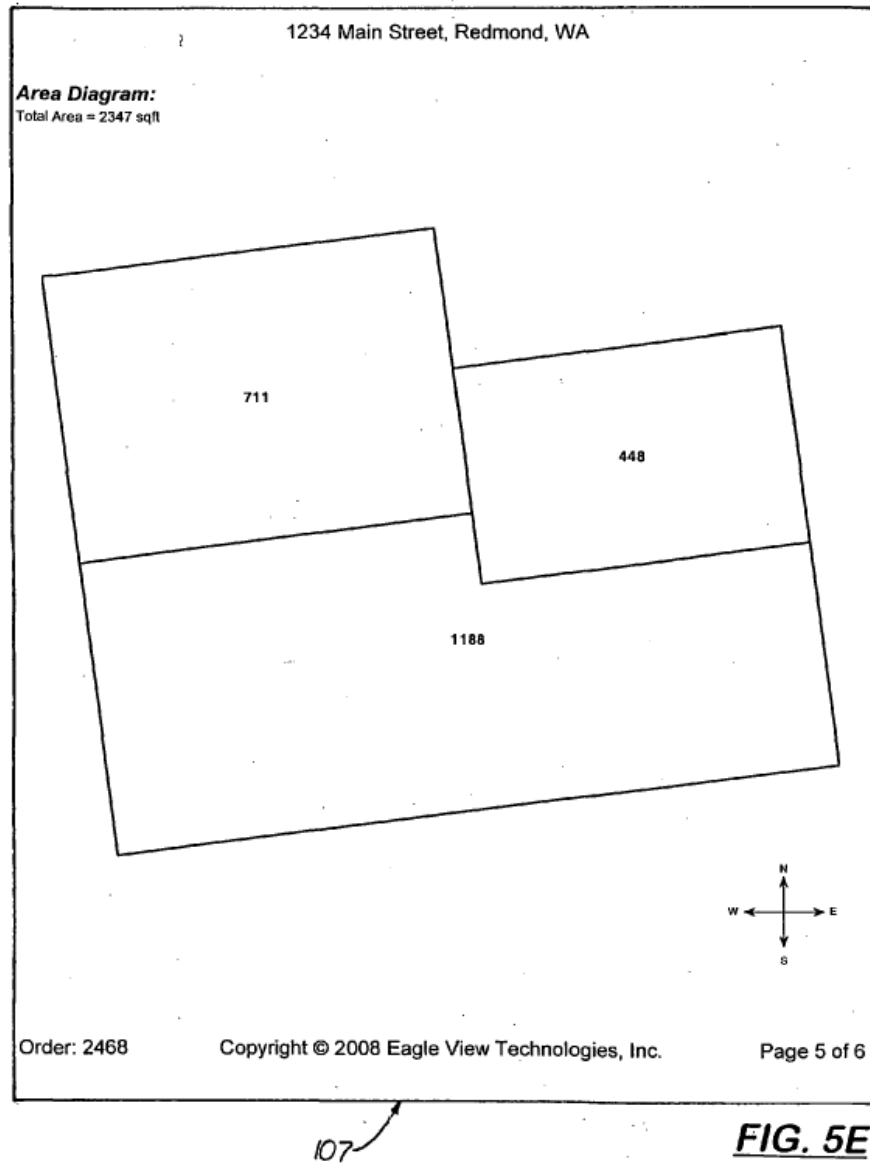


Figure 5E is an illustration from a report “showing the square footage of each roof section along with the total square foot area value.” Ex. 1004 ¶ 28.

Patent Owner argues that Pershing-789's Figure 5E is not a footprint because "Figure 5E shows the total surface area of the example roof. But because the roof is pitched, the roof's total surface area is not the same as and does not indicate the roof's footprint, which is the roof's outline or boundary projected on the ground." PO Resp. 34–35 (citation omitted).

We agree with Petitioner that Pershing-789's Figure 5E teaches the claimed footprint. As Petitioner notes, "the '538 patent teaches that the 'footprint may provide a two-dimensional boundary and/or outline of the roof.'" Pet. 28 (quoting Ex. 1001, 12:8–9). Figure 5E shows just that—a two-dimensional boundary and/or outline of the roof. Although we agree with Patent Owner that the roof's surface area and its footprint are distinct, that does not mean that Figure 5E is not a footprint simply because it includes corresponding surface area values. Thus, for the reasons above, we agree with Petitioner that Pershing-789's Figure 5E teaches the claimed footprint. *See* Pet. 28–30.

e) Additional Undisputed Elements and Summary for Ground 1

Petitioner asserts Pershing-789 teaches the additional undisputed elements in independent claims 1, 13, and 14 including identifying a roof's location, analyzing roof images, determining roofing area, and generating a roof report. Pet. 25–31, 34–35; *see id.* at 53–54; 59–61. As outlined above, Petitioner relies on Bailey for teaching the claimed "predominant pitch." *See id.* at 31–34. Petitioner further asserts Pershing-789 teaches the additional dependent claim features such as contractor/customer contact information, multiple host systems, roof edges, 3-D roof information, oblique images, and boundary information. *Id.* at 36–61. Other than the arguments addressed above, Patent Owner does not additionally challenge

Petitioner's ground-1 obviousness analysis. We have reviewed Petitioner's arguments and evidence outlined above and, based on that analysis and for the reasons above, we find Petitioner has shown by a preponderance of the evidence that claims 1–5 and 8–13 would have been obvious over Pershing-789 and Bailey.

2. *Obviousness of Claims 6, 7, and 14–18 based on Pershing-789, Bailey, and Abhyanker*

In its second ground, Petitioner adds Abhyanker “to address the additional limitations of claims 6–7 and 14–18” including “allow[ing] users . . . to specifically designate the geographic position of a roof to be analyzed, and to include a subsequent user confirmation option to ensure that the correct roof is being analyzed.” Pet. 54–55, *see id.* at 83. Petitioner explains that one skilled in the art would have been motivated to add Abhyanker's user inputs to promote the system's accuracy and add convenience. *Id.* at 55–56, 84–85. Other than as outlined above, Patent Owner does not additionally challenge Petitioner's ground-2 obviousness analysis. We have reviewed Petitioner's arguments and the underlying evidence cited in support, *see id.* at 54–61, and, based on that analysis and for the reasons above, we find Petitioner has shown by a preponderance of evidence that claims 6, 7, and 14–18 would have been obvious over Pershing-789, Bailey, and Abhyanker.

3. *Petitioner's Alternative Kennedy-based Grounds*

Petitioner asserts alternative grounds that also challenge claims 1–18, but with Kennedy as a primary reference instead of Pershing-789. *See* Pet. 61–87. Because we have already determined that Petitioner has demonstrated the unpatentability of claims 1–18 in its Pershing-789-related

grounds, we need not address Petitioner's additional contentions for the same claims based on Kennedy.

III. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated by a preponderance of the evidence that claims 1–18 of the '538 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
1–5, 8–13	103	Pershing-789, Bailey	1–5, 8–13	
6, 7, 14–18	103	Pershing-789, Baily, Abhyanker,	6, 7, 14–18	
1–5, 8–13	103	Kennedy, Bailey ⁶		
6, 7, 14–18	103	Kennedy, Baily, Abhyanker ⁷		
Overall Outcome			1–18	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown that claims 1–18 of the '538 patent are unpatentable; and

⁶ As noted above, we do not reach this ground because we determine the same claims unpatentable over Pershing-789 and Bailey.

⁷ As noted above, we do not reach this ground because we determine the same claims unpatentable over Pershing-789, Bailey, and Abhyanker.

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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