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Paper 28
Date: September 24, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIPPERT COMPONENTS, INC.,
Petitioner,

v.

DAYS CORPORATION,
Patent Owner.

IPR2018-00777
Patent 6,619,693 B1

Before SCOTT A. DANIELS, BARRY L. GROSSMAN, and GEORGE R. HOSKINS, *Administrative Patent Judges*.

HOSKINS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Amend
35 U.S.C. § 318(a)

ORDER
Denying Patent Owner's Motion to Exclude Evidence
37 C.F.R. § 42.64(c)

I. INTRODUCTION

Lippert Components, Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") pursuant to 35 U.S.C. §§ 311–319 for *inter partes* review of claims 12 and 13 of U.S. Patent No. 6,619,693 B1 ("the '693 patent").

We instituted a trial to determine whether claims 12 and 13 are unpatentable on all challenges presented in the Petition. Paper 6 ("Institution Decision" or "Inst. Dec."), 6, 25.

Days Corporation ("Patent Owner") then filed a Patent Owner Response (Paper 8, "PO Resp.") to the Petition. Petitioner filed a Reply (Paper 12, "Reply") to the Patent Owner Response. Patent Owner filed a Sur-Reply (Paper 17, "Sur-Reply") to Petitioner's Reply.

Patent Owner also filed a Motion to Amend the '693 patent (Paper 9, "Motion to Amend" or "Mot."). Petitioner filed an Opposition (Paper 13, "Mot. Opp.") to the Motion to Amend. Patent Owner filed a Reply (Paper 16, "Mot. Reply") to Petitioner's Opposition. Petitioner filed a Sur-Reply (Paper 23, "Mot. Sur-Reply") to Patent Owner's Reply.

Patent Owner moreover filed a Motion to Exclude Evidence (Paper 22). Petitioner filed an Opposition (Paper 25) to that Motion.

An oral hearing was held, for which the transcript was entered into the record (Paper 27, "Tr.").

We have jurisdiction under 35 U.S.C. § 6(b)(4) and § 318(a). This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of claims 12 and 13 of the '693 patent, and as to claims 15 and 16 that Patent Owner proposes to add to the '693 patent. We determine Petitioner has shown, by a preponderance of the evidence, that claims 12 and 13 of the '693 patent are unpatentable. We deny the

Motion to Amend as to adding proposed claims 15 and 16. We dismiss Patent Owner's Motion to Exclude as moot.

II. BACKGROUND

A. Real Parties in Interest and Related Proceedings

Petitioner identifies itself as the sole real party in interest. Pet. 1. Patent Owner identifies itself as the sole real party in interest. Paper 5, 1. The parties identify two consolidated U.S. District Court litigations as related to this proceeding. Pet. 1–2; Paper 5, 1–2.

B. The '693 Patent

The '693 patent discloses an apparatus for automatically leveling a vehicle, such as a recreational vehicle, that is located on uneven terrain or an out-of-level surface. Ex. 1001, 1:5–10. Figure 1 of the '693 patent is reproduced below:

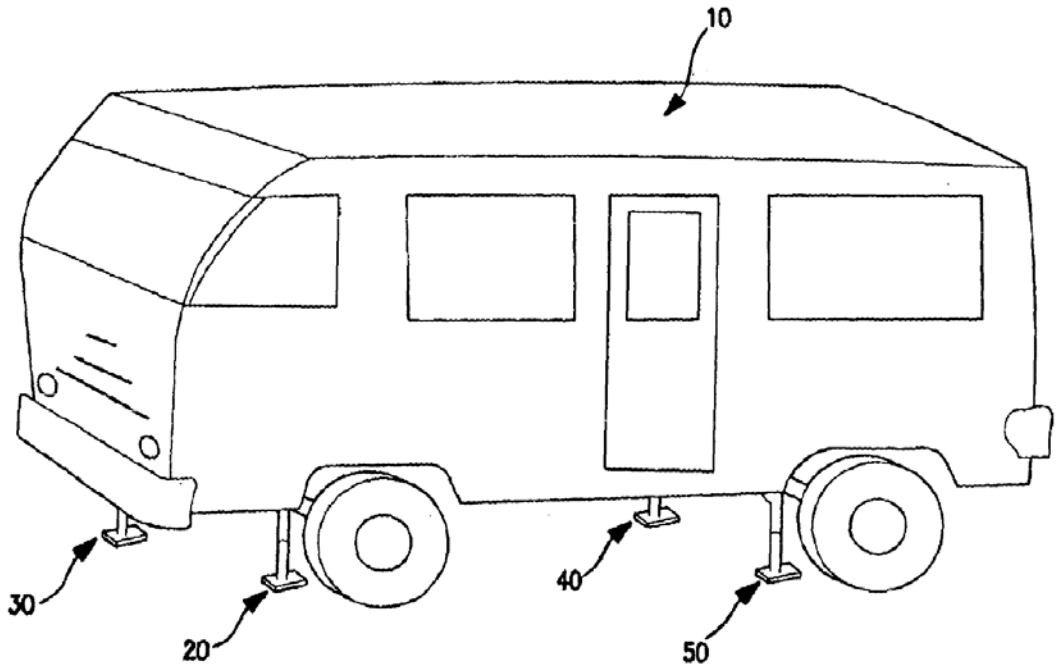

FIG. 1

Figure 1 illustrates vehicle 10, including four adjustable legs 20, 30, 40, and 50. *Id.* at 3:8–11. Each leg may first be lowered from a stowed position to contact the ground underneath vehicle 10, and then lowered or raised (while continuing to contact the ground) to achieve a "vehicle orientation which results in the interior of the vehicle feeling at true level relative to horizontal." *Id.* at 3:11–16, 7:5–43.

A user may command a controller to perform the leveling process automatically. *Id.* at 4:18–20, 4:30–43. Figure 5 of the '693 patent is reproduced below:

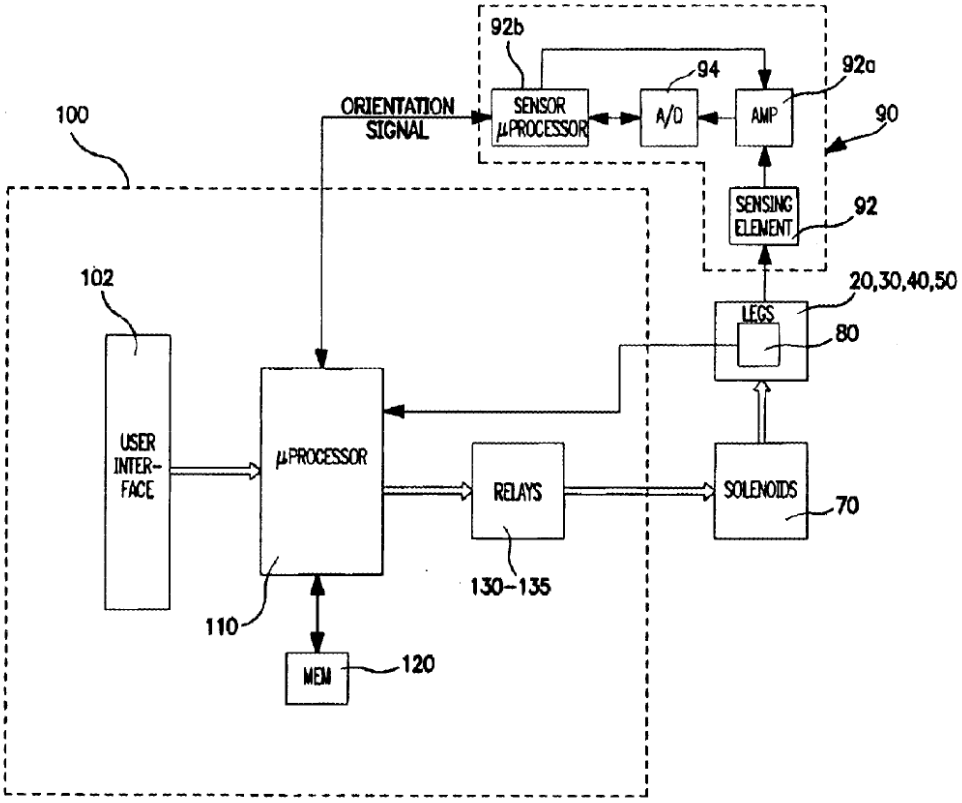

FIG. 5

Figure 5 illustrates controller circuit 100 for performing an automatic leveling operation. *Id.* at 1:56–65, 4:30–33. Microprocessor 110 receives a signal from level sensor 90, derived from "dual axis sensing element 92

which provides a signal indicating whether vehicle 10 is level along its longitudinal axis (pitch, front to back) and a signal indicating whether vehicle 10 is level along its lateral axis (side to side)." *Id.* at 4:57–5:5. Microprocessor 110 compares that signal with "data representing a reference level plane" stored in memory 120, corresponding to "the vehicle feeling at true level relative to horizontal." *Id.* at 4:43–60, 7:31–43, 9:41–48. Microprocessor 110 controls solenoids 70 to extend and/or retract legs 20, 30, 40, or 50, until the actual vehicle orientation is within a specified tolerance difference from the reference level plane. *Id.*

C. The Challenged Claims

The '693 patent contains fourteen claims. Petitioner challenges only claims 12 and 13. *See* Pet. 1, 4–5. Claim 12 recites:

> 12. An apparatus for automatically leveling a vehicle, comprising:
>
> a plurality of legs each of which is mounted to the vehicle;
>
> wherein each of the legs is movable between a retracted stowed position and an extended use position; and
>
> wherein each of the legs is moved to the retracted stowed position to allow the vehicle to travel and each of the legs is moved to the extended use position to engage a ground surface prior to leveling the vehicle;
>
> a sensor mounted to the vehicle to sense pitch and roll of the vehicle relative to a reference level plane;
>
> wherein the sensor produces an orientation signal representing the vehicle pitch and roll; and
>
> a controller coupled to each [of] the legs and the sensor;
>
> wherein the controller monitors the orientation signal received from the sensor and in response to that signal the controller causes at least one of the legs to both extend to

> move the vehicle upwardly and retract to move the vehicle downwardly relative to the ground surface, until the orientation of the vehicle reaches the reference level plane within a tolerance.

Ex. 1001, 12:51–13:5.

Claim 13 also is independent, and is identical to claim 12 except the final limitation of claim 12 ("wherein the controller monitors . . . ") is replaced with the following two limitations, with italics added to emphasize the differences between the two claims:

> wherein the controller monitors the orientation signal received from the sensor and in response to that signal the controller *actuates at least one of the legs to move the vehicle relative to the ground surface* until the orientation of the vehicle reaches the reference level plane within a tolerance; and
>
> *wherein the controller includes a memory for storing data corresponding to the reference level plane and is configured to write data representing an orientation signal to the memory to replace the reference level plane data with orientation signal data*.

Id. at 13:6–32 (emphases added).

D. Asserted Grounds of Unpatentability

Petitioner presents the following three challenges to the '693 patent in this proceeding. *See* Pet. 3–5.

Claims Challenged	Statutory Basis	Reference(s)
12 and 13	§ 102(b)	Uriarte[1]

[1] Ex. 1004, U.S. Patent No. 5,143,386, iss. Sept. 1, 1992.

Claims Challenged	Statutory Basis	Reference(s)
12 and 13	§ 103(a)	Uriarte and Fukumoto[2]
12 and 13	§ 103(a)	Fukumoto and Uriarte

E. Citations to Exhibits in the Record

Patent Owner's Response was accompanied by six Exhibits, numbered 2001 through 2006. *See* PO Resp. iii (Exhibit List). The Exhibits include the '693 patent (Ex. 2001), Uriarte (Ex. 2002), and Fukumoto (Ex. 2003). Those three documents had previously been entered into the record by Petitioner with the Petition (Exhibits 1001, 1004, and 1005). For consistency in this Decision, we cite only to Exhibits 1001, 1004, and 1005, even when discussing Patent Owner's citations to Exhibits 2001, 2002, and 2003. *See, e.g.*, 37 C.F.R. § 42.6(d) ("A document already in the record of the proceeding must not be filed again, not even as an exhibit or an appendix, without express Board authorization.").

III. PATENTABILITY OF CLAIMS 12 AND 13 OF THE '693 PATENT

A. Claim Construction

In this proceeding, we interpret claims of the '693 patent using the broadest reasonable construction in light of the patent's specification. *See* 37 C.F.R. § 42.100(b) (2018)[3]; *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct.

[2] Ex. 1005, U.S. Patent No. 5,580,095, iss. Dec. 3, 1996.

[3] A recent amendment to this rule does not apply here, because the Petition was filed before November 13, 2018. *See* "Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before

2131, 2144–46 (2016) (upholding use of the broadest reasonable construction standard); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,764 (Aug. 14, 2012).

1. "reference level plane" (Claims 12 and 13)

Claims 12 and 13 identically recite "a sensor mounted to the vehicle to sense pitch and roll of the vehicle *relative to a reference level plane*." Ex. 1001, 12:61–62, 13:16–17 (emphasis added).

Petitioner contends the term "reference level plane" "means an established orientation of the vehicle in which the interior of the vehicle feels or measures at true level relative to the horizontal." Pet. 10–11 (citing Ex. 1001, 4:57–60, 7:35–39, 7:64–8:2, 10:15–20; Ex. 1006 ¶ 21).

In the Institution Decision, we concluded a reference level plane, *in one example*, is a plane in which the vehicle feels at true level to horizontal. Inst. Dec. 7 (citing Ex. 1001, 7:35–39, 7:64–8:2). We then determined, under a broadest reasonable construction, that in other embodiments the reference level plane may be some other pre-set plane to be achieved by the vehicle during an automatic leveling operation. *Id.*; Ex. 1001, 7:64–67 (reference level plane "is *preferably* at true level") (emphasis added). Therefore, we construed the term "reference level plane" to refer to a pre-set vehicle orientation plane to be achieved during an automatic leveling operation, which may be a plane in which the vehicle feels at true level to horizontal. Inst. Dec. 7.

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the Patent Trial and Appeal Board," 83 Fed. Reg. 51,340, 51,340 (Oct. 11, 2018).

Patent Owner "accepts" our previous claim construction as the broadest reasonable construction. PO Resp. 3. Petitioner does not address our previous claim construction in the Reply. *See, e.g.*, Reply 1–6.

In corresponding infringement litigation between Petitioner and Patent Owner, the District Court entered an Opinion and Order concerning claim construction of the '693 patent, after oral argument was presented in this *inter partes* review proceeding. *See Days Corp. v. Lippert Components, Inc.*, No. 3:17-cv-00208-PPS-MGG (N.D. Ind. July 15, 2019), ECF No. 94 (included herewith as Ex. 3001). The District Court construed the term "reference level plane" to mean "a plane chosen by the user as level." *Id.* at 4–7. The District Court saw "no basis for a construction . . . that would limit the term to 'true level'" as Petitioner had argued. *Id.* at 6. Thus, the District Court's construction is substantively the same as the construction we applied in the Institution Decision, except that the District Court's construction additionally specifies that a user chooses the pre-set plane. Our present Decision does not turn on who sets or chooses the reference level plane. Therefore, there is no need here to decide whether we should limit the term "reference level plane" to being set or chosen by a user.

Upon consideration of the foregoing, we do not discern any reason to deviate from the claim construction set forth in our Institution Decision. Accordingly, we construe the term "reference level plane" to refer to a pre-set vehicle orientation plane to be achieved during an automatic leveling operation, which may be a plane in which the vehicle feels at true level to horizontal.

2. "a sensor . . . to sense pitch and roll of the vehicle relative to a reference level plane" and which "produces an orientation signal representing the vehicle pitch and roll" (Claims 12 and 13)

Claims 12 and 13 identically recite "a sensor . . . to sense pitch and roll of the vehicle relative to a reference level plane," and "the sensor produces an orientation signal representing the vehicle pitch and roll." Ex. 1001, 12:61–64, 13:16–19. We will refer to these limitations as the Sensor Limitations.

Petitioner contends a sensor "to sense pitch and roll," as claimed, "means to detect that the vehicle is tilted about the lateral pitch axis (i.e., the extent of 'pitch') and the longitudinal roll axis (i.e., the extent of 'roll') of the vehicle relative to the reference level plane." Pet. 11 (citing Ex. 1001, 2:2–6, 4:57–65; Ex. 1006 ¶ 22); *see also id.* at 7–8 (discussing '693 patent specification in more detail). Petitioner asserts "[s]uch detection does not necessarily require the level sensor to directly detect vehicle pitch and roll"; in other words, the sensor "may be configured to directly detect vehicle tilt in relation to a set of axes other than the lateral pitch and longitudinal roll axes." *Id.* at 11. According to Petitioner, "[m]easuring changes in vehicle tilt directly about a set of axes other than the lateral pitch and longitudinal roll axes of the vehicle is . . . necessarily indicative of changes in vehicle tilt about the lateral pitch and longitudinal roll axes." *Id.* Based on similar considerations, Petitioner contends the claimed "orientation signal *representing* the vehicle pitch and roll" (emphasis added) "means a signal that is representative of the pitch and roll of the vehicle relative to the reference level plane," and does not require a direct measurement of the pitch and roll. *Id.* at 12 (citing Ex. 1006 ¶ 24).

Patent Owner contends the Sensor Limitations "require a sensor that is *directly aligned along* the vehicle's longitudinal (front-to-back) axis and the vehicle's lateral (side-to-side) axis." PO Resp. 3–8 (emphasis added); Sur-Reply 1. Patent Owner asserts this is demonstrated by the plain language of the claims, because the term "pitch" is defined as corresponding to a vehicle's longitudinal (i.e., front-to-back) axis, and the term "roll" is defined as corresponding to the vehicle's lateral (i.e., side-to-side) axis. *Id.* at 5 (citing Ex. 1001, 4:61–5:5). In Patent Owner's view, a sensor "senses" pitch by "sensing tilt along a longitudinal axis (or sensing rotation about a side-to-side axis)," and "senses" roll by "sensing tilt along a lateral axis (or sensing rotation about a front-to-back axis)." *Id.* Patent Owner argues this construction is confirmed by the '693 patent specification. *Id.* at 5–6 (citing Ex. 1001, 4:61–65, 7:60–8:2). Patent Owner additionally cites testimony provided by Dr. Robert H. Sturges, on behalf of Patent Owner. *Id.* at 4, 6–7, 10 (citing Ex. 2004, 7, 9–11).

The District Court Opinion and Order on claim construction of the '693 patent did not address the Sensor Limitations. *See* Ex. 3001, at 4–7.

Upon consideration of the foregoing, we agree with Petitioner that, under a broadest reasonable construction in light of the '693 patent specification, claims 12 and 13 do not require the sensor to be aligned directly along the vehicle's longitudinal and lateral axes.

First — as a matter of terminology — it is undisputed that the "pitch" of a vehicle corresponds to the angle between the vehicle's longitudinal (front-to-back) axis and the reference level plane. *See* Ex. 1001, 7:65–8:2; Pet. 7–8, 11–12, 22–24, 33–37; PO Resp. 5; Reply 1–5; Sur-Reply 1–2 (citing Ex. 2007, 45–46; Ex. 2008, 45–46; Ex. 2009, 134–135). It is also

undisputed that the "roll" of a vehicle corresponds to the angle between the vehicle's lateral (left-to-right) axis and the reference level plane. *See* Ex. 1001, 7:65–8:2; Pet. 7–8, 11–12, 22–24, 33–37; PO Resp. 5; Reply 1–5; Sur-Reply 1–2. Thus, a positioning of the vehicle may be identified by the plane containing the vehicle's orthogonal longitudinal and lateral axes, with the vehicle's pitch and roll characterizing the relative position of the vehicle's longitudinal-lateral plane with respect to the reference level plane.

Keeping the foregoing context and terminology in mind, we find nothing in the claim language itself that requires the sensor to be aligned directly along the vehicle's longitudinal and lateral axes. Rather, the Sensor Limitations more broadly require that the sensor "sense[s] pitch and roll of the vehicle relative to a reference level plane" to produce a signal "representing the vehicle pitch and roll." Ex. 1001, 12:61–64 (claim 12), 13:16–19 (claim 13). Any sensor that determines the relative positioning of the vehicle's longitudinal-lateral plane with respect to the reference level plane will thereby "sense" the pitch and roll of the vehicle, to produce a signal "representing" the pitch and roll.

This understanding of the claim language is confirmed by the '693 patent specification. The '693 patent specification equates a sensor that "reports an orientation signal representing the orientation (pitch and roll) of vehicle 10" with a dual axis sensor that "provides a signal *indicating whether vehicle 10 is level along*" the vehicle's longitudinal and lateral axes. *Id.* at 4:57–65 (emphasis added).[4] Thus, a sensor *senses* the vehicle's pitch

[4] A vehicle that is not "level along" its longitudinal axis in relation to the reference level plane, and therefore has a non-zero pitch, may be described

and roll, and produces a signal *representing* the vehicle's pitch and roll, if the sensor's signal can be used by a controller to calculate the vehicle's longitudinal-lateral plane, and thereby determine *whether* the vehicle is level with respect to the reference level plane. *Id.*; *see also id.* at Fig. 7, 7:44–8:48 (level sensor 90 is used to determine vehicle's current plane P_1–P_3 at different points in time during an automatic leveling operation, and compare those planes with reference level plane P_R).

The '693 patent specification goes on to provide that, "[i]n one embodiment of the invention," the sensor "provides analog signals *based on the pitch position of conductive fluid* (representing the pitch of the vehicle) *and the roll position of the conductive fluid* (representing the roll of the vehicle)." *Id.* at 4:65–5:5 (emphases added). Thus, in one embodiment, the sensor may be aligned directly along the vehicle's longitudinal and lateral axes. Reading the '693 patent specification as a whole, we conclude a sensor may in one embodiment be aligned directly along the vehicle's longitudinal and lateral axes, but it may be differently aligned in other embodiments. Construing claims 12 and 13 to be limited to a sensor that must be aligned directly along the vehicle's longitudinal and lateral axes would improperly incorporate a limitation into the claims from the

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as *tilted along* the longitudinal axis, or equivalently as *rotated about* the lateral axis. Similarly, a vehicle that is not "level along" its lateral axis, and therefore has a non-zero roll, may be described as *tilted along* the lateral axis, or equivalently as *rotated about* the longitudinal axis. Counsel for the parties have used both formulations in the present proceeding, at times in a somewhat confusing manner. *See, e.g.*, Pet. 7–8, 11–12, 22–24; PO Resp. 5; Reply 1–5; Tr. 18:6–20:19, 44:1–45:5.

specification. *See, e.g.*, *Cisco Sys., Inc. v. TQ Delta, LLC*, 928 F.3d 1359, 1363–64 (Fed. Cir. 2019).

Dr. Sturges has testified that claims 12 and 13 require a sensor that is aligned directly along the vehicle's longitudinal and lateral axes. Ex. 2004, 7, 9–11. In support, Dr. Sturges states that "nowhere in the '693 patent are the 'pitch and roll' limitations given any other meaning than rotations about a lateral horizontal vehicle axis and a longitudinal horizontal vehicle axis, respectively." *Id.* at 9–10. We disagree with this conclusion, for reasons provided above. *See* Ex. 1001, 4:57–65.

We are, moreover, persuaded by the testimony of Dr. Massoud S. Tavakoli, provided on behalf of Petitioner, that a person of ordinary skill in the art would have understood a sensor senses a vehicle's pitch and roll, and produces a signal representing the vehicle's pitch and roll, whenever the sensor detects how the vehicle's longitudinal-lateral plane is different from the reference level plane. *See* Reply 1–6; Ex. 1015 ¶¶ 7–19. That is, a dual axis sensor signal that represents the amount of tilt of the vehicle's longitudinal-lateral plane versus the reference level plane necessarily represents the vehicle's pitch and roll versus the reference level plane, even if the two axes measured to determine the tilt are not the vehicle's longitudinal and lateral axes. *See* Reply 1–6; Ex. 1015 ¶¶ 7–19.

Dr. Sturges further testifies that "[t]he pitch and roll axes are special because they are at right angles to each other," so a change in pitch "does not affect" the roll, and a change in roll does not affect the pitch. Ex. 2004, 10; PO Resp. 6–7. According to Dr. Sturges, this consideration "reduces the complexity of control in leveling to a great degree" versus a sensor aligned along two non-orthogonal axes (such as Uriarte's sensor, as discussed

below), because "[t]he control needs merely to raise and lower the jacks proportionally with respect to the sensor signals" and "iteration may be eliminated." Ex. 2004, 10; PO Resp. 4. Dr. Sturges, moreover, opines that "axes that are not aligned with the longitudinal and lateral axes are not easily transferable to pitch and roll." Ex. 2004, 10–11; PO Resp. 4, 6–7; Sur-Reply 3–4.

This may all be true, but Patent Owner has not explained sufficiently why it is relevant to the claim construction issue presented here, which is whether claims 12 and 13 are limited to require that the sensor be aligned directly along the vehicle's longitudinal and lateral axes. For the reasons provided above, the intrinsic evidence leads us to conclude that claims 12 and 13 are not so limited, even if a sensor aligned along two orthogonal axes, such as the vehicle's longitudinal and lateral axes, avoids the need for iteration in an automatic control leveling routine. *See, e.g.*, *Cisco Sys.*, *supra*. Moreover, the '693 patent itself expressly describes an iterative automatic leveling routine. *See* Ex. 1001, Figs. 7–8, 7:44–9:48. Therefore, the intrinsic evidence does not support Dr. Sturges's testimony that claims 12 and 13 are directed to the computational benefits achieved by a non-iterative leveling routine. *See*, *e.g.*, Reply 5–6.

According to Patent Owner's Sur-Reply, the Sensor Limitations require the calculation of the pitch and roll "*angles*," rather than "a proportionate ratio" that is representative of the pitch and roll angles. Sur-Reply 2–3 (emphasis in original); Tr. 72:21–73:9. We disagree, for the reasons provided above.

For the foregoing reasons, we determine a broadest reasonable construction of claims 12 and 13 includes a sensor that senses the vehicle's

orientation along any two axes that define the vehicle's longitudinal-lateral plane. That is, the claimed sensor is not limited to a sensor that is aligned directly along the vehicle's longitudinal and lateral axes.

3. Remaining Claim Terms

No further explicit construction of any claim term is needed to resolve the issues presented here. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (per curiam) (claim terms need to be construed "only to the extent necessary to resolve the controversy") (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Level of Ordinary Skill in the Art

Petitioner contends a person having ordinary skill in the art pertaining to the '693 patent "would have either a bachelor's degree in engineering, preferably mechanical or electrical, or at least five years of work experience in the field of vehicle leveling systems and related equipment." Pet. 10; Ex. 1006 ¶ 18. "Patent Owner accepts this level," despite the slightly different formulation offered by Dr. Sturges. PO Resp. 11; Ex. 2004, 5. We determine that the level of ordinary skill proposed by Petitioner, and accepted by Patent Owner, is consistent with the '693 patent and the prior art of record. We, therefore, adopt that level in the present Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1354–55 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579–80 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

C. Anticipation by Uriarte

Petitioner asserts claims 12 and 13 of the '693 patent are unpatentable under 35 U.S.C. § 102(b) as anticipated by Uriarte. Pet. 3–4, 12–31. Petitioner cites the Declarations of Dr. Tavakoli in support. Exs. 1006, 1015. Patent Owner opposes Petitioner's assertions. PO Resp. 8–9, 10–14. Patent Owner cites the Declaration of Dr. Sturges in support. Ex. 2004.

We have reviewed the arguments and evidence of record. We conclude a preponderance of the evidence establishes claims 12 and 13 are unpatentable as anticipated by Uriarte. We begin our analysis with a brief summary of the law of anticipation, then we summarize the Uriarte disclosure, and finally we address Petitioner's and Patent Owner's contentions.

1. Law of Anticipation

A patent claim is unpatentable as anticipated under 35 U.S.C. § 102 "if each and every limitation is found either expressly or inherently in a single prior art reference." *WhitServe, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 21 (Fed. Cir. 2012) (quoting *Celeritas Techs., Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998)).

2. Uriarte Disclosure

Uriarte discloses "[a] system for automatically leveling a vehicle, such as a recreational vehicle." Ex. 1004, Abstract. Figure 1 of Uriarte is reproduced below:

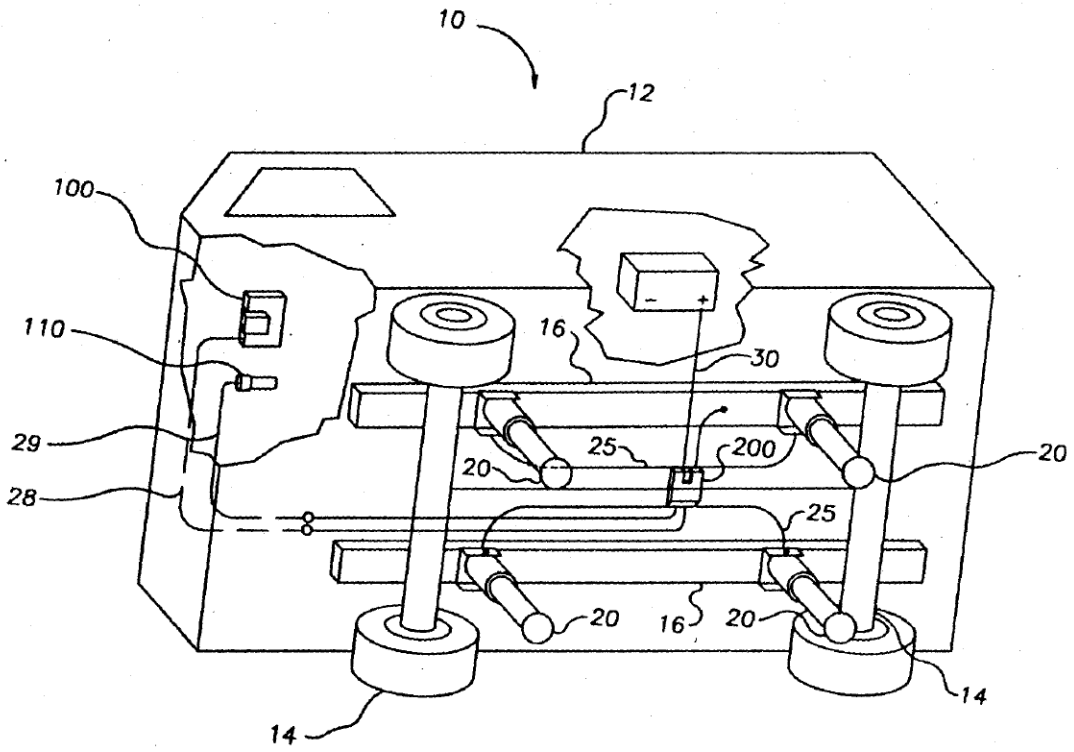


FIG. 1

Figure 1 is a bottom perspective view of motor home vehicle 10, showing four jacks 20, and control unit 200 mounted near the center of vehicle 10 to extend jacks 20 and thereby level the vehicle. *Id.* at 2:8–12, 2:46–61, 3:18–22.

A user may command control unit 200 to perform the leveling process automatically. *Id.* at 6:25–35. That process uses data provided by level sensor 205, which is located directly underneath the lid of control unit 200 where it is mounted to the underside of vehicle 10. *Id.* at 3:18–26, 3:47–52, Figs. 3(a)–3(b) & 4(a)–4(b). Figures 4(a) and 4(b) of Uriarte are reproduced below:

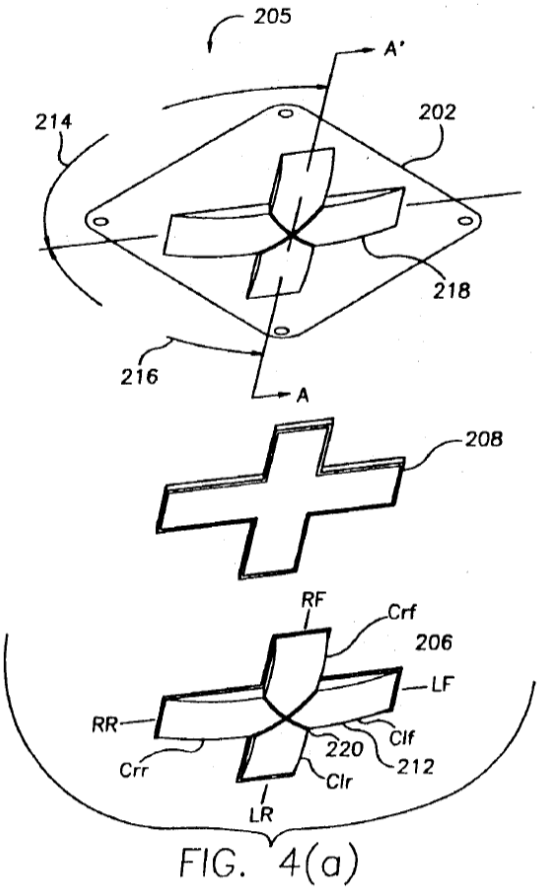
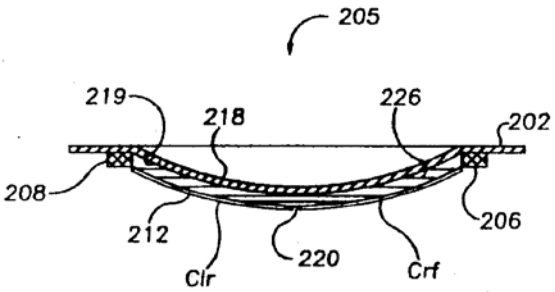


FIG. 4(a)



VIEW A–A'

FIG. 4(b)

Figure 4(a) is a perspective, exploded view of level sensor 205. *Id.* at 2:27–29. Figure 4(b) is a cross section view of level sensor 205, taken along line A–A′ in Figure 4(a). *Id.* Sensor 205 comprises lid 202 of control unit 200 in combination with cover 206 and seal 208, which form a curved, X-shaped cavity 219 partially filled with dielectric liquid 226. *Id.* at 3:24–26, 3:47–66. Two capacitors Crf and Clr sense the tilt of vehicle 10 along diagonal axis RF–LR extending from the vehicle's right front to the vehicle's left rear, and two capacitors Clf and Crr sense the tilt of vehicle 10 along diagonal axis LF–RR extending from the vehicle's left front to the vehicle's right rear. *Id.* at 3:66–4:27. The CPU of control unit 200 monitors the four capacitance values to perform an automatic leveling operation, using jacks 20. *Id.* at 4:28–35, 7:67–9:57.

3. Whether Uriarte is Enabling

Patent Owner asserts "Uriarte's disclosure . . . is not operable," so "Uriarte is non-enabling." PO Resp. 8–9, 11–13.

"A prior art reference cannot anticipate a claimed invention 'if the allegedly anticipatory disclosures cited as prior art are not enabled.'" *In re Antor Media Corp.*, 689 F.3d 1282, 1287 (Fed. Cir. 2012) (quoting *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003)). A prior art patent such as Uriarte is presumptively enabled during examination of pending patent applications at the USPTO, and during a challenge to issued patent validity in District Court. *Id.* at 1287–88 (citing *Amgen*, 314 F.3d at 1354–55). We are unaware of any case law discussing whether a similar presumption applies in an *inter partes* review proceeding. Regardless, the presumption "is a procedural one" such that once Patent Owner "makes a non-frivolous argument that the cited prior art is not enabling," the tribunal "must address that challenge" by "engag[ing] in a proper enablement analysis." *In re Morsa*, 713 F.3d 104, 110–111 (Fed. Cir. 2013).

Patent Owner has made such an argument here. *See* PO Resp. 8–9, 11–13. Therefore, we address Patent Owner's challenge to the enablement of Uriarte, placing the burden on Petitioner to show by a preponderance of the evidence that Uriarte is in fact enabling. *See* 35 U.S.C. § 316(e); *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

Patent Owner firstly contends Uriarte is non-enabling as to a stopping condition for an automatic leveling process. *See* PO Resp. 8–9, 11–13. Patent Owner secondly contends Uriarte is non-enabling as to the automatic leveling logic Petitioner cites for disclosing extension and retraction of the

vehicle's legs. *See* Sur-Reply 5–6. We address these two contentions separately.

a) Uriarte's Stopping Condition for Automatic Leveling Operation

Patent Owner asserts Uriarte is not enabling because it "does not disclose flow charts or logic for stopping the leveling process," so the process is not operable. PO Resp. 8; Ex. 2004, 8. Uriarte's specific disclosure at issue in this regard is: "When . . . Clr/Crf = 0, and Crr/Clf = 0, that is both [axes] are level, then all the jacks are deactivated." Ex. 1004, 8:35–40; PO Resp. 8, 12–13; Ex. 2004, 8. Dr. Sturges testifies this "does not disclose a workable structure" because the indicated "capacitance value conditions are nonsensical, since for either to be true the numerator in the ratio must be zero, or the denominator infinite." Ex. 2004, 8, 13; PO Resp. 12–13. Further according to Dr. Sturges: "There are no other disclosures in Uriarte indicating a level condition, except by manual 'feel' and control," so Uriarte does not enable "a system for *automatically* leveling a vehicle." Ex. 2004, 8 (emphasis added); PO Resp. 12–13. Patent Owner's counsel explains the denominator capacitors Crf and Clf "clearly cannot have an infinite value," and if either numerator capacitor Clr or Crr has a zero value, then "the capacitor is actually at maximum tilt, not level." PO Resp. 8–9 (citing Ex. 1004, 3:66–4:3).

Petitioner replies that the Uriarte disclosure cited by Patent Owner contains "a readily apparent," "typographical mistake," which a person of ordinary skill in the art "would readily perceive and know how to correct." Reply 1, 7. Petitioner contends Uriarte, when read as a whole, teaches vehicle 10 is level when Clr = Crf and Crr = Clf. *Id.* at 7–8 (citing Ex. 1004,

4:17–18, 7:68–8:2). Thus, Petitioner's view is that a person of ordinary skill in the art would understand the disclosure cited by Patent Owner should have indicated the vehicle is level when Clr/Crf = 1 and Crr/Clf = 1, rather than when those ratios equal 0. *Id.* at 8–9 (citing Ex. 1015 ¶ 21; Ex. 1013, 71:9–72:3).

We agree with Petitioner. Uriarte initially discloses vehicle 10 is level "when Clr = Crf, and likewise when Crr = Clf." Ex. 1004, 7:67–8:16. That makes sense, given the disposition of level sensor 205 on the undercarriage of vehicle 10, and the resulting orientation of the sensor's capacitors Clr, Crf, Crr, and Clf in relation to vehicle 10. *Id.* at Fig. 1 (illustrating main control unit 200 on undercarriage of vehicle 10), Fig. 3(a) (illustrating how main control unit 200 includes sensor 205, and the X-shaped orientation of capacitors Clr, Crr, Crf, and Clf in relation to the "FRONT" of vehicle 10), 2:56–61, 3:18–23, 4:10–23. We are, thus, persuaded by Dr. Tavakoli's testimony that a person of ordinary skill in the art would understand from these disclosures that vehicle 10 is level when Clr = Crf and Crr = Clf. Ex. 1015 ¶ 21.

Uriarte goes on to disclose another way of identifying vehicle 10 is level, when Clr/Crf = 0 and Crr/Clf = 0. Ex. 1004, 8:37–40. Dr. Tavakoli and Dr. Sturges both testify, and we are persuaded, that a person of ordinary skill in the art would appreciate this is an incorrect condition for reflecting that the vehicle is level. Ex. 1015 ¶ 21; Ex. 2004, 8, 13. From that baseline, we agree with Dr. Tavakoli, and we part ways from Dr. Sturges, in their differing views as to how a person of ordinary skill in the art would have reacted to the incorrect disclosure.

Enablement here requires that Uriarte teach a person of ordinary skill in the art to make or carry out the invention recited in the '693 patent without undue experimentation. *See Elan Pharms., Inc. v. Mayo Found. for Med. Educ. & Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003). Whether undue experimentation would be necessary is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations. *In re Wands*, 858 F.2d 731, 736–37 (Fed. Cir. 1988) (identifying eight factual considerations).

We determine it would not require undue experimentation to find the proper leveling condition to use in Uriarte for stopping an automatic leveling operation, because Uriarte itself provides the answer: it is when Clr = Crf and Crr = Clf. Ex. 1004, 7:67–8:16; Ex. 1006 ¶¶ 41–43; Ex. 1015 ¶ 21. Given that disclosure, a person of ordinary skill in the art would resolve the later nonsensical disclosure as intending to state the vehicle is level when Clr/Crf = 1 and Crr/Clf = 1, without any experimentation at all, much less undue experimentation. Ex. 1015 ¶ 21. Dr. Sturges's failure to address the first disclosure in Uriarte in his Declaration, when reaching his conclusion that "[t]here are *no other disclosures* in Uriarte indicating a level condition, except by manual 'feel' and control," renders that conclusion unreliable. Ex. 2004, 8 (emphasis added). Moreover, when pressed during deposition, Dr. Sturges testified a person of ordinary skill in the art would understand Uriarte's vehicle 10 is "at least near level" "when the capacitors show equal value." Ex. 1013, 71:9–72:3.

Thus, we determine Petitioner has met its burden to establish, by a preponderance of the evidence, that a person of ordinary skill in the art would be able to carry out an automatic leveling operation based on the

Uriarte disclosure. In particular, the stopping condition indicating the vehicle is level occurs when Clr = Crf and Crr = Clf, or equivalently when Clr/Crf = 1 and Crr/Clf = 1.

b) Uriarte's Automatic Leveling Logic Including Extension and Retraction of the Vehicle's Legs

Patent Owner asserts Uriarte is not enabling as to the second "logic to level the vehicle" disclosed by Uriarte, at column 9, lines 11 through 28.[5] *See* Sur-Reply 5–6. Petitioner relies on Uriarte's second leveling logic as disclosing the limitation in claim 12 requiring the controller to extend and to retract at least one leg during an automatic leveling operation. *See* Pet. 25–26; Ex. 1006 ¶¶ 49–51.

Patent Owner contends, for the first time in the Sur-Reply,[6] Uriarte's inconsistent references to a "minimum" and "maximum" amperage in the second leveling logic renders the logic non-enabling. Sur-Reply 5–6. In particular, Uriarte indicates each of the four jacks should initially be extended to contact the ground, as determined when the CPU "senses a *minimum* amperage," but Uriarte then indicates "[t]he *maximum* amperage indicates that the jack is contacting the ground." Ex. 1004, 9:11–15 (emphases added). Uriarte further discloses the jacks should then be

[5] Uriarte discloses three different logics for leveling the vehicle. *See* Ex. 1004, 7:67–9:10 (first logic), 9:11–31 (second logic), 9:32–55 (third logic); Ex. 2004, 12–13. Only the second logic potentially includes leg retraction. *See, e.g.*, Ex. 2004, 12–13; Ex. 1015 ¶ 22.

[6] Despite this late submission, which deprived Petitioner of the opportunity to address the arguments with further evidence in the Reply, we have decided to address the arguments.

extended to level the vehicle, "making sure that the *minimum* amperage is sensed in all of the jacks." *Id.* at 9:15–22 (emphasis added).

We conclude Uriarte's inconsistent usage of "minimum" and "maximum" amperages in this regard does not rise to the level of non-enablement. A person of ordinary skill in the art would readily understand the amperage value at issue is intended to reflect that the jack has contacted the ground, thereby increasing the amperage required to extend the jack further, because further extension will require raising the weight of the vehicle as the jack is extended. *See id.* at 9:11–22; Ex. 1015 ¶¶ 24–25. A person of ordinary skill in the art would further understand that such an amperage value could be viewed alternatively as a *minimum* amperage indicative of contact with the ground (which is the prevalent usage in Uriarte, *see* Ex. 1009, 9:11–28), or as a *maximum* amperage because lesser amperages are indicative of lack of contact with the ground (*see id.* at 5:2–4 ("Resistor 264 enables adjustment of the low current setting that is higher than the current used before the jacks contact the ground.")). Either way, the substance of Uriarte's disclosure is the same. If viewed as a minimum, the CPU determines there *is* ground contact when the amperage *rises above the minimum*. If viewed as a maximum, the CPU determines there *is not* ground contact when the amperage is *below the maximum*. Thus, we conclude it would not require undue experimentation to implement Uriarte's second leveling logic in this regard.

Patent Owner also contends Uriarte is non-enabling as to determining when to retract a leg as part of the second leveling logic. The Uriarte disclosure at issue in the regard provides: "*In the event that any of the jacks has yet to reach its extension limit* and the vehicle is not yet level, the CPU,

using a reverse logic, retracts the other jacks in an attempt to level the vehicle," and the "retraction sequence is repeated as long as vehicle is not level and all the jacks are sensing the minimum amperage." Ex. 1004, 9:22–28 (emphasis added).

Patent Owner contends "Uriarte cannot automatically retract a leg" as part of the second leveling logic. PO Resp. 1, 10–11, 14. In support, Dr. Sturges dismisses Uriarte's statement that "the CPU, using a reverse logic, retracts the other jacks" (Ex. 1004, 9:24–25) as "illogical." Ex. 2004, 12. In particular, Dr. Sturges opines:

> This logic makes no sense since it is satisfied *before* the first extension event. If the specification is in error, and would read "any of the jacks has reached its extension limit", the logic still makes no sense since retracting the other jacks does not eliminate the extension limit condition. Therefore this "logic" cannot be correct, and there is no provision for retracting any jack.

Id. To the extent this testimony is meant to opine that Uriarte *does not disclose* leg retraction as part of the second leveling logic, it is plainly wrong. *See* Ex. 1004, 9:22–28 (disclosing that "the CPU, using a reverse logic, retracts the other jacks in an attempt to level the vehicle" and the "retraction sequence is repeated"). Therefore, we understand Dr. Sturges to opine that Uriarte *does not enable* leg retraction as part of the second leveling logic.

Petitioner replies that Uriarte's second leveling logic provides for extending and retracting at least one jack 20. Reply 11–13 (citing Ex. 1004, 9:11–26); Ex. 1015 ¶¶ 22–27. In support, Dr. Tavakoli states that Uriarte's second leveling logic initially "determine[s] the exact amount of *extension* required for each jack to level the vehicle" based on readings from level sensor 205, and then extends the jacks accordingly in repeated steps until the

vehicle is level. Ex. 1004, 9:15–22 (emphasis added); Ex. 1006 ¶ 49; Ex. 1015 ¶ 24. Dr. Tavakoli testifies that a person of ordinary skill in the art "would understand that in some circumstances at least one of the jacks 20 may not be extendable to its calculated extension," such as when the calculated extension exceeds the remaining extension range of a jack, which is tracked by Uriarte's CPU. Ex. 1015 ¶ 26 (citing Ex. 1004, 9:5–10). This testimony is unrebutted by Patent Owner, and is supported by the Uriarte disclosures cited by Dr. Tavakoli.

Dr. Tavakoli then states that Uriarte discloses, in such a scenario, that the CPU will use a reverse logic in which some of jacks 20 are retracted in order to level the vehicle. *Id.* ¶¶ 26–27 (citing Ex. 1004, 9:22–27). As one example, Dr. Tavakoli opines that "the CPU can retract the highest corner jack by the same amount that it had just re-computed for the extension of the lowest corner jack before the CPU determined that that jack did not have enough extension range." *Id.* ¶ 26. Dr. Tavakoli concludes a person of ordinary skill in the art "would recognize that the intent of [Uriarte's] statement 'In an event that any of the jacks have yet to reach its extension limit and the vehicle is not yet level, the CPU . . . (Col. 9, ll. 22–24)' is to invoke jack retraction if, following a round of jack-extension after initial contact with ground, the vehicle is not yet level and the CPU determines that one or more of the jacks cannot be extended to the amount computed for the next round of jack extension." *Id.* ¶ 27.

We recognize, as Patent Owner urges, that Dr. Tavakoli's foregoing testimony is somewhat at odds with, and adds something to, a literal reading of the statement in Uriarte that the CPU implements a reverse logic "[i]n the event that any of the jacks has yet to reach its extension limit." Ex. 1004,

9:22–28; Sur-Reply 6; Ex. 2004, 12. For example, we are persuaded by Dr. Sturges's testimony that a person of ordinary skill in the art would realize this disclosure, if read literally, does not make sense. Ex. 2004, 12. However, that does not end the enablement inquiry, which asks whether it would require undue experimentation to carry out the leg retraction step that is, at a minimum, disclosed by Uriarte. *See Elan Pharms.*, 346 F.3d at 1054; Ex. 1004, 9:11–22 (leg extension), 9:22–28 (leg retraction); Ex. 1006 ¶¶ 49–51. Dr. Sturges's testimony does not address this issue. Ex. 2004, 12.

In considering this issue, we evaluate the evidence using the *Wands* factors, which "include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims." *Wands*, 858 F.2d at 737. The second and third factors tend to favor Patent Owner's position, because the only pertinent disclosure in Uriarte is very sparse. *See* Ex. 1004, 9:22–26.

The remaining factors, however, favor Petitioner's position. As to the eighth factor, claims 12 and 13 pertinently require only that at least one leg is both extended and retracted as part of an automatic vehicle leveling operation. Ex. 1001, 12:66–13:5 (claim 12), 13:21–27 (applying Patent Owner's construction of "actuates"). The claims do not, for example, specify any particular triggering event for determining when to extend, or to retract. *Id.* As to the remaining factors, we find a person of ordinary skill in the art could readily determine any number of appropriate triggering events for when it might be useful to retract a leg during an automatic vehicle

leveling operation. For example, Dr. Tavakoli persuasively testifies that one appropriate triggering event is when a leg approaches its extension limit, thereby limiting the usefulness of extending the leg further to level the vehicle. *See* Ex. 1015 ¶¶ 26–27 (summarized above). More generally, the evidence of record establishes that various leveling logics were available to persons of ordinary skill in the art, demonstrating the advanced state of the art and the skill of those in the art in this regard, when implementing Uriarte's disclosure of leg retraction as part of a leveling operation. *See* Ex. 1004, 7:67–9:55; Ex. 1005, 3:44–4:13; Ex. 1010, 6:62–7:2; Ex. 1011, 6:44–7:4.

Thus, on balance, we determine a preponderance of the evidence establishes that a person of ordinary skill in the art would be able to carry out an automatic leveling process, involving extension and retraction of at least one leg, in light of Uriarte's disclosure of a second leveling logic.

4. Claim 12

Petitioner provides detailed arguments and evidence in support of contending Uriarte discloses each and every limitation of claim 12. Pet. 12–26; Ex. 1006 ¶¶ 29–51.

In particular, Petitioner contends Uriarte discloses an apparatus for automatically leveling vehicle 10, wherein the apparatus comprises a plurality of legs 20 mounted to vehicle 10. Pet. 16–17 (citing Ex. 1004, Abstract, 1:5–9, 1:23–25, 1:39–42, 2:56–60, Figs. 1 & 2(a)); Ex. 1006 ¶¶ 29–32. Petitioner also contends each leg 20 is movable between a retracted stowed position to allow the vehicle to travel, and an extended use position to engage a ground surface prior to leveling the vehicle. Pet. 17–20

(citing Ex. 1004, 2:62–3:3, 3:8–17, 4:45–50, 4:58–65, 6:30–35, 6:52–64, 7:31–35, 7:47–52, 9:11–28, Figs. 2(a) & 5(a)); Ex. 1006 ¶¶ 33–39. Patent Owner does not dispute these contentions, which we find to be supported by a preponderance of the evidence. *See* Ex. 1004, Abstract, 2:56–60, 2:66–3:3, 3:8–17, 4:58–65, 9:11–28; Ex. 1006 ¶¶ 29–39. We, therefore, turn to Petitioner's contentions that are disputed by Patent Owner.

a) Sensor

Petitioner contends Uriarte's level sensor 205 is mounted to vehicle 10 to sense pitch and roll of vehicle 10 relative to a reference level plane, and produce an orientation signal representing the pitch and roll of vehicle 10. Pet. 20–24 (citing Ex. 1004, 2:60–61, 3:24–26, 3:50–4:23, 7:25–47, 7:66–8:16, Figs. 3(a), 4(a), & 4(b)); Ex. 1006 ¶¶ 40–46.

Patent Owner disagrees, on the basis that Uriarte's sensor 205 "does not sense pitch and roll" and "can only sense angles along oblique angles" — that is, the vehicle's diagonal axes RF–LR and LF–RR. PO Resp. 1, 6–7, 10, 13–14; Ex. 2004, 17–18. This argument is not persuasive, because it rests upon an overly narrow claim construction. *See supra* Section III.A.2.

Properly construed, the Sensor Limitations of claims 12 and 13 include a sensor that senses the vehicle's longitudinal-lateral plane along any two axes defining the plane, for comparison with the reference level plane. *See id.* Uriarte's sensor 205 is such a sensor, because it senses the orientation of vehicle 10 along two axes RF–LR and LF–RR that define the vehicle's longitudinal-lateral plane. *See* Ex. 1004, 3:50–4:23, Figs. 3(a), 4(a), & 4(b); Ex. 1006 ¶¶ 40–46. Thus, we determine a preponderance of

the evidence supports Petitioner's contention that Uriarte's sensor 205 satisfies the Sensor Limitations of claims 12 and 13.

b) Controller and Leg Retraction

Petitioner contends Uriarte's CPU 282 is a controller coupled to each leg 20 and to level sensor 205, wherein CPU 282 monitors the orientation signal received from level sensor 205. Pet. 24–25 (citing Ex. 1004, 4:30–45, 7:67–8:16, 9:15–18); Ex. 1006 ¶¶ 47–48. Petitioner asserts CPU 282, in response to the signal from level sensor 205, causes at least one leg 20 to extend and to retract to move vehicle 10 upwardly and downwardly, until the orientation of vehicle 10 reaches the reference level plane within a tolerance. Pet. 25–26 (citing Ex. 1004, 9:11–28); Ex. 1006 ¶¶ 49–51. Patent Owner's only opposition to these contentions concerns leg retraction in Uriarte, which we discuss next. We determine Petitioner's other contentions in these regards are supported by a preponderance of the evidence. *See* Ex. 1004, 4:30–45, 7:67–8:16, 9:11–28; Ex. 1006 ¶¶ 47–51.

As to leg retraction, Patent Owner contends "Uriarte *does not disclose* logic for retracting a leg during an automatic leveling process," as well as a lack of enablement in this regard. *See* PO Resp. 10–11, 14 (emphasis added); Sur-Reply 5–6; Ex. 2004, 12–13. The enablement aspects of Patent Owner's arguments have been addressed above. *See supra* Section III.C.3.b. As to disclosure, we determine a preponderance of the evidence establishes that Uriarte's CPU 282, as part of Uriarte's second leveling logic, both extends and retracts at least one leg. *See* Ex. 1004, 9:11–22 (leg extension), 9:22–28 (leg retraction); Ex. 1006 ¶¶ 49–51. Because Uriarte discloses leg retraction, we do not need to resolve the parties' dispute over whether

claim 13, like claim 12, requires leg retraction. *See* PO Resp. 10–11, 14; Reply 11.

c) Tolerance

The Petition acknowledges claim 12 requires that the automatic leveling process proceeds "until the orientation of the vehicle reaches the reference level plane *within a tolerance*." Pet. 25 (section title "i."); Ex. 1001, 12:66–13:5 (emphasis added). However, the Petition's analysis does not address, expressly, the "tolerance" claim term. Pet. 25–26.

Patent Owner contends "Uriarte does not disclose a tolerance." PO Resp. 1, 14. In support, Patent Owner cites Uriarte's disclosure that the leveling process stops when Clr/Crf = 1 and Crr/Clf = 1. *Id.* at 14 (discussing Ex. 1004, 8:35–40); Ex. 2004, 13; *supra* Section III.C.3.a (person of ordinary skill in the art would understand the cited disclosure to indicate the stopping condition is reached when the ratios equal 1, not 0). Patent Owner argues "Uriarte only uses an equal sign," so there is no tolerance in Uriarte's stopping algorithm. PO Resp. 14.

Petitioner replies that "Uriarte's leveling system necessarily operates to level a vehicle within a tolerance, consistent with how all vehicle leveling systems operate." Reply 1, 13–14. In support, Dr. Tavakoli testifies a person of ordinary skill in the art "would understand and acknowledge that 'achieving a target signal value' inherently involves a tolerance within which the target value would be considered to have been met," and "would not attach any need or novelty to stating the use of 'tolerance' in conjunction with a 'reference plan[e]' for leveling a vehicle." Ex. 1015 ¶ 34; Reply 13 (also citing Ex. 1013, 18:5–19:11, 79:13–20). Thus, in Petitioner's view,

"Uriarte's leveling sequences necessarily incorporate a tolerance around its programmed level condition" using level sensor 205, despite Uriarte's silence on this point. Reply 13–14.

Patent Owner responds that Dr. Tavakoli errs in citing a wall thermostat thermometer as a common device that determines a target temperature is achieved within a tolerance, because Dr. Tavakoli "confuses hysteresis with tolerance." Sur-Reply 7 (citing Ex. 1015 ¶ 34; Ex. 2010; Ex. 2011).

Testimony from persons of ordinary skill in the art may be used to explain, but not expand, the meaning of a prior art reference in an anticipation analysis. *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991). For example, the *Baxter* decision held that a prior art reference disclosure of "[Baxter] Travenol's commercial, two bag blood container" anticipated a claim reciting a primary bag "plasticized with DEHP," despite that the prior art reference did not expressly refer to DEHP, based on testimony from persons of ordinary skill that Baxter's commercial systems all contained a primary bag plasticized with DEHP. *Id.*

In this case, Uriarte expressly discloses stopping an automatic leveling process when "Clr = Crf" and "Crr = Clf," or equivalently when Clr/Crf = 1 and Crr/Clf = 1. Ex. 1004, 7:67–8:2, 8:35–40; *supra* Section III.C.3.a. We credit the testimony of Dr. Tavakoli that a person of ordinary skill in the art would understand the "equals" sign in this disclosure reflects an inherent tolerance in the capacitance measurements, accounting for the lack of precision in the level sensing capabilities of Uriarte's capacitors. Ex. 1034 ¶ 34. Claim 12 requires no more than that. Patent Owner's quibble over an alleged difference between "hysteresis" and "tolerance" is undeveloped and

unsupported by evidence in the record. *See* Sur-Reply 7. Moreover, it overlooks the core of Dr. Tavakoli's testimony, which concerns when a target value (whether temperature or levelness) has been achieved, not how the system reacts to such a detection. *See* Ex. 1015 ¶ 34. Indeed, Dr. Sturges testified during his deposition that one would expect "some error" in commercially available sensors determining levelness has been achieved. *See* Ex. 1016, 18:16–19:4; Tr. 31:12–33:10.

Thus, we determine a preponderance of the evidence establishes that Uriarte's CPU 282 stops its automatic leveling process when the orientation of vehicle 10 reaches the reference level plane within a tolerance.

d) Conclusion Regarding Anticipation of Claim 12 by Uriarte

Based on the foregoing arguments and evidence, a preponderance of the evidence establishes Uriarte discloses each and every limitation of claim 12 of the '693 patent. Therefore, we conclude claim 12 is unpatentable as anticipated by Uriarte under 35 U.S.C. § 102(b).

5. Claim 13

Petitioner provides detailed arguments and evidence in support of contending Uriarte discloses each and every limitation of claim 13. Pet. 27–31; Ex. 1006 ¶¶ 52–75.

In particular, Petitioner contends Uriarte discloses the limitations of claim 13 that are identical to limitations of claim 12, as already discussed in Section III.C.4 above. Pet. 27; Ex. 1006 ¶¶ 52–71. Petitioner also contends Uriarte's CPU 282, in response to the signal from level sensor 205, "actuates" (as required by claim 13) at least one leg 20 to move vehicle 10 relative to the ground surface, until the orientation of vehicle 10 reaches the

reference level plane within a tolerance. Pet. 28–29 (citing Ex. 1004, 7:67–8:40, 8:45–47, 9:11–28); Ex. 1006 ¶¶ 72–74. To the extent Patent Owner opposes these contentions, the oppositions have been considered above in connection with claim 12. We find Petitioner's foregoing contentions are supported by a preponderance of the evidence. *See supra* Section III.C.4.

Petitioner, further, contends Uriarte's CPU 282 includes a memory for storing data corresponding to the reference level plane, and is configured to write data representing an orientation signal to the memory to replace the reference level plane data with orientation signal data. Pet. 29–31 (citing Ex. 1004, 7:25–47, 7:67–8:2); Ex. 1006 ¶ 75. Patent Owner does not dispute this contention. We find Petitioner's contention is supported by a preponderance of the evidence. *See* Ex. 1004, 7:25–47; Ex. 1006 ¶ 75.

Thus, a preponderance of the evidence establishes Uriarte discloses each and every limitation of claim 13 of the '693 patent. Therefore, we conclude claim 13 is unpatentable as anticipated by Uriarte under 35 U.S.C. § 102(b).

D. Obviousness over Uriarte and Fukumoto

Petitioner asserts claims 12 and 13 of the '693 patent are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte and Fukumoto. Pet. 3–4, 31–37. Petitioner cites the Declarations of Dr. Tavakoli in support. Exs. 1006, 1015. Patent Owner opposes Petitioner's assertions. PO Resp. 9–10, 15–19. Patent Owner cites the Declaration of Dr. Sturges in support. Ex. 2004.

We have reviewed the arguments and evidence of record. We conclude a preponderance of the evidence establishes claims 12 and 13 are unpatentable as having been obvious over Uriarte and Fukumoto. We begin our analysis with a brief summary of the law of obviousness, then we briefly summarize the Fukumoto disclosure, and finally we address Petitioner's and Patent Owner's contentions.

1. Law of Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, if made available in the record. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

2. Fukumoto Disclosure

Fukumoto discloses a device for automatically leveling a working vehicle, such as a crane, on inclined ground. Ex. 1005, 1:1–18, 1:37–44. In a first embodiment, shown in Figures 1–3, controller 10 relies on "a front to rear inclination detector 13 for detecting the inclination of the vehicle body l*a* in the front to rear directions thereof," and "a left to right inclination detector 14 for detecting the inclination of the vehicle body l*a* in the left to

right directions thereof." *Id.* at 2:31–35, 3:8–14. In a second embodiment, shown in Figures 6, 7, and 9, controller 120 relies on two axis inclination detector 115, comprising front to rear inclination detector 115*a* and left to right inclination detector 115*b*. *Id.* at 2:8–10, 2:40–48, 4:47–61. Controller 10 or 120, based on signals received from detectors 13 and 14, or 115*a* and 115*b*, automatically extends piston rods 7*a* of jack cylinders 7 to level the vehicle. *Id.* at 1:37–44, 2:3–7, 3:44–67, 5:54–6:13.

3. Claims 12 and 13

Petitioner provides detailed arguments and evidence in support of contending the subject matter of claims 12 and 13 would have been obvious over Uriarte and Fukumoto. Pet. 31–37; Ex. 1006 ¶¶ 76–134. Petitioner presents this challenge in the event the Sensor Limitations are construed to require a sensor that is aligned directly along the vehicle's longitudinal and lateral axes. Pet. 31–32; Ex. 1006 ¶¶ 88–95, 117–128. As discussed above, we have determined a proper construction of the Sensor Limitations indicates the claims are not so limited. *See supra* Section III.A.2. Nonetheless, we address Petitioner's alternative obviousness theory, to provide a complete record.

For obviousness, Petitioner contends Uriarte discloses each and every limitation of claims 12 and 13, as discussed in Sections III.C.4–5 above, except for the Sensor Limitations. Pet. 31–32; Ex. 1006 ¶¶ 76–134. As discussed above, we determine a preponderance of the evidence establishes Uriarte discloses the subject matter of claims 12 and 13 in these regards. *See supra* Sections III.C.4–5.

For example, Uriarte discloses an automatic leveling logic that both extends and retracts at least one leg, as required at least by claim 12. *See supra* Section III.C.4.b; Ex. 1004, 9:11–28. Therefore, Patent Owner's contention that Fukumoto fails to disclose retraction of any legs as part of Fukumoto's automatic leveling operation does not identify a deficiency in Petitioner's proposed obviousness. *See* PO Resp. 2, 11, 18; Ex. 2004, 8–9, 15, 18; *Bradium Techs., LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019) (upholding Board's conclusion of obviousness in an *inter partes* review, noting Patent Owner's arguments that "attack[ed] the disclosures of the two references individually" "lack[ed] merit") (citing *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986)).

Petitioner next contends Fukumoto discloses a level sensor that is aligned directly along the vehicle's longitudinal and lateral axes to perform a vehicle leveling operation. Pet. 32–34 (citing Ex. 1005, Abstract, 1:7–8, 1:11–14, 1:48–55, 2:66–3:3, 3:8–32, 3:44–67, 4:17–22, 4:36–53, 4:59–63, 5:60–6:19, Figs. 3 & 6); Ex. 1006 ¶¶ 27–28, 89–90, 118–119. In particular, according to Petitioner, Fukumoto's front to rear inclination detector 13 or 115a is a level sensor aligned directly along the vehicle's longitudinal axis, and Fukumoto's left to right inclination detector 14 or 115b is a level sensor aligned directly along the vehicle's lateral axis. Pet. 33 (citing Ex. 1005, 3:8–17, 3:44–67, 4:48–53, 5:60–6:19); Ex. 1006 ¶¶ 28, 89–90, 118–119.

Patent Owner contends Fukumoto is not enabling as to how a controller might perform an automatic leveling operation based on the signals from sensors 13, 14, 115. PO Resp. 1–2, 9–10; Sur-Reply 7–10. However, we agree with Petitioner's argument that Patent Owner's contentions in this regard are "immaterial to" Petitioner's reliance on

Fukumoto in relation to obviousness over Uriarte and Fukumoto. Reply 1, 14–15. "Enablement of prior art requires that the reference teach a skilled artisan to make or carry out what it discloses in relation to the claimed invention." *Antor*, 689 F.3d at 1290 (citations omitted). Thus, "a prior art reference need not enable its full disclosure; it only needs to enable the portions of its disclosure alleged to anticipate the claimed invention." *Id.*

Here, in relation to obviousness over Uriarte and Fukumoto, Petitioner relies on Fukumoto solely for its disclosure of a sensor that is aligned directly along the vehicle's longitudinal and lateral axes to determine the positional relationship between the vehicle's longitudinal-lateral plane and a reference level plane. *See* Pet. 32–34. By contrast, the enablement issues raised by Patent Owner relate to execution of Fukumoto's automatic leveling operation, *after* the positional relationship between the vehicle's longitudinal-lateral plane and a reference level plane has *already* been determined using a sensor. *See* PO Resp. 1–2, 9–11; Sur-Reply 7–10. Thus, the enablement issues raised by Patent Owner are irrelevant to Petitioner's proposed obviousness over Uriarte and Fukumoto.

Patent Owner also contends Fukumoto's inclination detectors 13, 14, 115 do not meet the Sensor Limitations of claims 12 and 13, because the sensors' signals "represent[] vehicle orientation with an inclination direction and an angle, not two independent angles," and "Fukumoto does not describe a signal representing vehicle pitch and roll." PO Resp. 2, 18. Dr. Sturges correspondingly testifies that Fukumoto's sensor "signal does not represent the vehicle pitch and roll, since it discloses an 'inclination direction and angle of vehicle body.'" Ex. 2004, 15, 17 (apparently quoting, without citation, Ex. 1005, Fig. 5, steps 202 & 205). According to

Dr. Sturges: "A representation of vehicle attitude based on a single magnitude and direction is not equivalent to a pair of angles." *Id.*

We determine a preponderance of the evidence supports Petitioner's contention that Fukumoto's sensors satisfy the Sensor Limitations of claims 12 and 13, even if those limitations require a sensor that is aligned directly along the vehicle's longitudinal and lateral axes. Fukumoto describes "a front to rear inclination detector 13 for detecting the inclination of the vehicle body l*a* in the front to rear directions thereof," which is a sensor aligned directly along the vehicle's longitudinal axis to calculate inclination angle α (i.e., the vehicle's pitch). Ex. 1005, 3:9–12, 3:44–47, Figs. 3 & 5. Fukumoto also describes "a left to right inclination detector 14," which is a sensor aligned directly along the vehicle's lateral axis to calculate inclination angle β (i.e., the vehicle's roll). *Id.* at 3:9–14, 3:44–49, Figs. 3 & 5. In an alternative embodiment, the two detectors 13 and 14 are replaced by "a two axial inclination detector 115 comprising a front to rear inclination detector 115a . . . and a left to right inclination detector 115b." *Id.* at 4:48–53, Fig. 6.

Thus, contrary to Patent Owner's assertions and Dr. Sturges's testimony, Fukumoto discloses the calculation of *two* angles α and β, respectively corresponding to the vehicle's pitch and roll. We, therefore, agree with Dr. Tavakoli's testimony that Fukumoto's sensors satisfy the Sensor Limitations, if they are construed narrowly as proposed by Patent Owner. Ex. 1006 ¶¶ 28, 89–90, 118–119; Ex. 1015 ¶¶ 35–38.

Petitioner next contends it would have been obvious to modify Uriarte, in light of Fukumoto, to include a sensor that is aligned directly along the vehicle's longitudinal and lateral axes to perform a vehicle

leveling operation. Pet. 31–32, 34–37; Ex. 1006 ¶¶ 88–99, 116–128. In support, Petitioner contends Uriarte's level sensor 205 and Fukumoto's inclination detectors 13, 14, 115 "perform the same functions within their respective vehicle leveling systems," because they each "detect the tilt of their respective vehicles about two axes and relay vehicle tilt information to a controller" to perform a vehicle leveling operation. Pet. 34–35; Ex. 1006 ¶¶ 91, 120. According to Petitioner, "[r]earranging" or "reorienting" Uriarte's level sensor 205 "so that it directly detects vehicle tilt about the pitch and roll axes of the vehicle . . . will not change [the] result" of Uriarte's vehicle leveling operation, because it would "just us[e] different reference coordinate axes." Pet. 35–36; Ex. 1006 ¶¶ 92, 121. Petitioner asserts this modification would have been obvious because it is merely "the substitution of one known element (a level sensor aligned along diagonal axes of a vehicle) with another known element (a level sensor aligned along lateral pitch and longitudinal roll axes of a vehicle body)," predictably to "accomplish the same objective." Pet. 36 (citing *KSR*, 550 U.S. at 417); Ex. 1006 ¶¶ 92–93, 121–122. The modification, in Petitioner's view, would have had a reasonable expectation of success because it "would require nothing more than adjusting the alignment of [Uriarte's level sensor 205] and the mathematics of processing the tilt information received by" Uriarte's CPU 282 from level sensor 205. Pet. 36–37; Ex. 1006 ¶¶ 94–95, 99, 123–124, 128.

Patent Owner construes the "rearranging" and "reorienting" of Uriarte's level sensor 205, as described by Petitioner and Dr. Tavakoli, to be limited to mere rotation of Uriarte's obliquely oriented (non-perpendicular) sensor 205 underneath the vehicle. PO Resp. 4, 6–7; Ex. 2004, 10–11.

Applying the constriction that the oblique axes remain obliquely oriented after rotation of sensor 205, Patent Owner contends Petitioner's modification will not lead to the claimed invention, because the two axes of Uriarte's sensor 205 remain arranged at an oblique angle, and so are not alignable along *both* of the vehicle's longitudinal and lateral axes at the same time. PO Resp. 4, 6–7, 10; Ex. 2004, 10–11. Patent Owner further contends the signals from the oblique (non-perpendicular) axes of Uriarte's sensor 205 are "not easily transferable," mathematically, to correspond to equivalent signals representing the vehicle's longitudinal and lateral axes. PO Resp. 4, 6–7; Ex. 2004, 10–11. According to Patent Owner, this "requires coordinate transforms of non-Cartesian systems," which is "taught in advanced mathematics or robotics courses," and the proposed modification is therefore beyond the level of ordinary skill in the art. PO Resp. 19; Ex. 2004, 19–20.

We conclude, however, that a person of ordinary skill in the art would not have been restricted to mere rotation of Uriarte's level sensor 205 underneath the vehicle when seeking to utilize, in Uriarte's overall system, a sensor that is aligned directly along the vehicle's longitudinal and lateral axis. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 550 U.S. at 421. Fukumoto establishes that the structure of such a sensor was known prior to the '693 patent. *See* Ex. 1005, 3:9–14, 3:44–49, 4:48–53. The '693 patent likewise indicates that the structure of such a sensor was known prior to the '693 patent. *See* Ex. 1001, 4:65–5:5. As Petitioner points out, Hanser[7] discloses the structure of yet another such level sensing unit 100, which is used to level a recreational

[7] Ex. 1010, U.S. Patent No. 4,746,133, iss. May 24, 1988.

vehicle automatically. *See* Ex. 1010, 4:22–27, 5:30–37, 8:6–47 (Figs. 4–5), 10:6–8; Reply 17–20; *infra* Section IV.D.2. Thus, a person of ordinary skill in the art would not have been limited to using the structure of Uriarte's level sensor 205 itself, when modifying Uriarte's leveling system to utilize a sensor that is aligned directly along the vehicle's longitudinal and lateral axes.

We are persuaded by Dr. Tavakoli's testimony that this modification to Uriarte's system would require only "a few simple changes" in the processing logic used by CPU 282 to determine whether the vehicle is level, using the new sensor. Ex. 1015 ¶ 30. Patent Owner's arguments, and the supporting testimony of Dr. Sturges, do not persuade us otherwise, because they are limited to mere rotation of Uriarte's sensor 205 underneath the vehicle. *See* PO Resp. 4, 6–7, 19; Ex. 2004, 10–11, 19–20.

Patent Owner also argues there is no motivation to combine Uriarte with Fukumoto in the manner claimed, "because Uriarte teaches away from sensing pitch and roll." PO Resp. 2, 16, 17. However, to teach away, a reference must criticize, discredit, or otherwise discourage the claimed solution. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Patent Owner offers no evidence that Uriarte criticizes, discredits, or otherwise discourages using a sensor that is aligned directly along the vehicle's longitudinal and lateral axes to perform a vehicle leveling operation.

Based on the foregoing arguments and evidence, a preponderance of the evidence establishes claims 12 and 13 are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte and Fukumoto.

E. Obviousness over Fukumoto and Uriarte

Petitioner asserts claims 12 and 13 of the ’693 patent are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Fukumoto and Uriarte. Pet. 3–5, 37–56. This challenge differs from the previous challenge based on obviousness over Uriarte and Fukumoto, in that Petitioner relies on Fukumoto as disclosing most of the claimed subject matter, and relies on Uriarte in contending it would have been obvious to modify Fukumoto to (1) incorporate leg retraction in the automatic leveling operation, and (2) include a memory to reset the reference level plane data. *Id.* at 37–38.

We have already determined claims 12 and 13 are unpatentable as anticipated by Uriarte if the Sensor Limitations are broadly (but reasonably) construed, or alternatively as obvious over Uriarte and Fukumoto if the Sensor Limitations are more narrowly construed. Moreover, the order of references in an obviousness challenge is irrelevant. *See, e.g.*, *In re Bush*, 296 F.2d 491, 496 (CCPA 1961) (“In a case of this type where a rejection is predicated on two references each containing pertinent disclosure which has been pointed out to the applicant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of B in view of A, or to term one reference primary and the other secondary.”); *see also In re Cook*, 372 F.2d 563, 566 n.4 (CCPA 1967). Thus, we determine claims 12 and 13 to be unpatentable based on the analysis provided above. *See supra* Section III.D.

IV. MOTION TO AMEND THE ’693 PATENT

Having determined claims 12 and 13 of the ’693 patent are unpatentable, we turn to Patent Owner’s contingent Motion to Amend the

’693 patent, which requests “that *any claim that is found unpatentable* be replaced with [a] corresponding proposed substitute claim.” Mot., Cover Page (emphasis added).

A. The Proposed Substitute Claims

Patent Owner’s Motion to Amend seeks to add two claims: independent claim 15 as a substitute for existing claim 12, and independent claim 16 as a substitute for existing claim 13. Mot. 1–3. Each proposed substitute claim is identical to the corresponding existing claim, except the substitute claims would each add two limitations: (1) “wherein the sensor senses pitch along a longitudinal axis and the sensor senses roll along a lateral axis,” and (2) “wherein the reference level plane is other than true level relative to horizontal.” *Id.*

B. Claim Construction

1. “the sensor senses pitch along a longitudinal axis and the sensor senses roll along a lateral axis” (Claims 15 and 16)

The parties agree the claim limitation reciting “the sensor senses pitch along a longitudinal axis and the sensor senses roll along a lateral axis” requires a sensor that is aligned directly along the vehicle’s longitudinal and lateral axes. *See* Mot. 5–7; Mot. Opp. 13–14. We see no persuasive reason to depart from this agreed-upon scope of proposed claims 15 and 16.

2. “the reference level plane is other than true level relative to horizontal” (Claims 15 and 16)

Claims 15 and 16 identically recite “the reference level plane is other than true level relative to horizontal.” This begs the question, what does “true level to horizontal” mean? In particular, is “true level” determined by

the *subjective* feelings of an occupant in the vehicle, or *objectively* determined by using a leveling tool or the like? *See, e.g.*, Mot. 7–8; Mot. Opp. 2, 10–12, 20–24; Mot. Reply 3–7; Mot. Sur-Reply 8–10.

We find the answer in the '693 patent specification, which provides "the reference level plane generally corresponds to a vehicle orientation which results in the interior of the vehicle *feeling at true level relative to horizontal*." Ex. 1001, 7:36–39 (emphasis added). That is, in some orientations the vehicle "feels" subjectively to an occupant, as if it is "at true level," whereas in other orientations the occupant would not "feel" as if the vehicle is "at true level." Separating out the occupant's subjective sensory "feelings" from "true level," this description uses the term "true level" as corresponding to an objective determination of levelness, based on a leveling tool or the like. That understanding is consistent with the plain and ordinary meaning of the term "true," which is defined in the dictionary as meaning "reliable," "certain," "in accordance with fact," "accurate," "right," and "correct." *See Webster's New World Dictionary of American English* (3rd College Ed., © 1988, Ed. Victoria Neufeldt), at 1435 (included herewith as Ex. 3002).

The '693 patent specification also discloses that "level sensor 90 should be installed on vehicle 10 such that the reference level plane P_R is *as close to true level as possible*." Ex. 1001, 10:7–12 (emphasis added). Like the previous disclosure, this disclosure suggests the term "true level" corresponds to an objective determination of levelness, based on a leveling tool or the like.

The '693 patent specification goes on to reflect that "after time or when the vehicle is loaded with equipment or fueled up," the initial

reference level plane setting may need to be reset or recalibrated. *Id.* at 10:7–29. This recalibration involves (1) "positioning vehicle 10 *on a flat surface*," or (2) "using the manual controls to level the system, such that the vehicle *feels or measures level* from the inside of the vehicle." *Id.* at 10:16–20 (emphases added). Importantly, the '693 patent does not describe this recalibration, which can be either objective (flat surface, or measures level) or subjective (feels level), as being a "true level." *Id.* Based on the other disclosures discussed above, and reading the '693 patent specification as a whole, we conclude the term "true level" is reserved for an objective determination of levelness.

There is one further discussion of "true level" in the '693 patent specification. *See id.* at 7:60–8:2. Here, the '693 patent first indicates the reference level plane P_R "contains the X and Y axes," and then describes "*when vehicle 10 is in the reference level plane P_R*, or a plane which is parallel to the plane P_R, *vehicle 10 is preferably at true level* (the pitch of vehicle 10 front to back is parallel with the X axis, and the roll of vehicle 10 side to side is parallel with the Y axis)." *Id.* (emphases added). This passage suggests the reference level plane defines "true level," via the X and Y axes that are contained by the reference level plane. The claim limitation at issue here, by contrast, recites "the reference level plane is other than true level relative to horizontal." This apparent inconsistency is resolved by reading the '693 patent specification together as a whole, as discussed above, to understand that the term "true level" is reserved for an objective determination of levelness. In that context, the description here that the reference level plane "is preferably at true level" simply means that the reference level plane is preferably at true level, as objectively

determined, but in other embodiments the reference level plane may be other than true level. *See infra* Section IV.C.3 (addressing Petitioner's argument that the '693 patent does not demonstrate possession of claims 15 and 16 in this regard).

For the foregoing reasons, we construe the claim term "true level" to correspond to an objective determination of levelness, based on a leveling tool or the like. In reciting that "the reference level plane is other than true level relative to horizontal," claims 15 and 16 require the reference level plane to be different from an objective determination of levelness. For example, the reference level plane may be set to a level that the user "feels" is level, even if such a setting is different from an objective determination of levelness. Ex. 1001, 10:7–20; *see also* Mot. Reply 3–4 ("So the sensation of the user is critical. One user may feel the vehicle is at true level when it is level relative to the horizontal; another user may feel the vehicle is at true level at another orientation.").

C. Prohibition Against Introducing New Matter

Before the burden of persuasion regarding the patentability of proposed claims 15 and 16 comes into play, "*the patent owner must satisfy* the Board that the statutory criteri[on] in [35 U.S.C.] § 316(d)(3) [is] met and that any reasonable procedural obligations imposed by the Director are satisfied." *Aqua Prods.*, 872 F.3d at 1305–06 (lead plurality opinion by J. O'Malley) (emphasis added); *see also id.* at 1341 ("There is no disagreement that the patent owner bears a burden of production in accordance [with] 35 U.S.C. § 316(d).") (majority opinion by J. Reyna). Accordingly, "a patent owner still must meet the requirements for a motion

to amend under 37 C.F.R. § 42.121." PTAB Memorandum, *Guidance on Motions to Amend in view of Aqua Products*[8], 2 (Nov. 21, 2017); Trial Practice Guide Update (July 2019)[9], 35–36.

One of those requirements is that a motion to amend may not introduce new matter. 35 U.S.C. § 316(d)(3); 37 C.F.R. § 42.121(a)(2)(ii). Thus, a "motion to amend claims must . . . set forth: (1) The support in the original disclosure of the patent for each claim that is added or amended . . . ." 37 C.F.R. § 42.121(b).

1. Support in Original Application Disclosure

Patent Owner bears a burden of production to demonstrate support for claims 15 and 16 in "the original disclosure of the application, as filed, rather than to the ['693] patent as issued." *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 7–8 (PTAB Feb. 25, 2019) (precedential); *Western Digital Corp. v. SPEX Techs., Inc.*, IPR2018-00082, Paper 13 at 7–8 (PTAB Apr. 25, 2018).[10] Therefore, in this case, the disclosure at

[8] This Memorandum is available at https://www.uspto.gov/sites/default/files/documents/guidance_on_motions_to_amend_11_2017.pdf.

[9] This Update is available at https://www.uspto.gov/sites/default/files/documents/trial-practice-guide-update3.pdf.

[10] The *Lectrosonics* decision was issued and designated "precedential" after Patent Owner filed the present Motion to Amend on December 19, 2018. However, as of that date, the *Western Digital* decision was an "informative" decision, and pertinently contained the same substance. As noted in e-mail correspondence with the parties in the days leading up to December 19, Patent Owner waited until December 17 at 5:30 p.m. to request a conference with the Board to discuss the Motion to Amend, which was due on December 19. The Board was unable to accommodate Patent Owner's untimely request. *See* Paper 7, 5–6 (Scheduling Order indicating "Patent

issue is U.S. Patent Application No. 09/522,545 as originally filed (Ex. 1009, "the original application"), rather than the '693 patent (Ex. 1001) that issued therefrom. *See* Ex. 1001, (21).

The Motion to Amend is deficient in citing to Exhibit 1001 rather than Exhibit 1009, as is undisputed. *See* Mot. Opp. 5; Mot. Reply 1 (stating the Motion to Amend "inadvertently" and "mistakenly cited to" Ex. 1001). However, there do not appear to be any material differences between Exhibit 1001 and Exhibit 1009 in this regard. Therefore, we will consider the arguments presented, in light of the disclosure in Exhibit 1009. We do not rely on this deficiency as a basis to deny the Motion to Amend.

2. Support for Claims As a Whole

Patent Owner's Motion to Amend asserts proposed claims 15 and 16 do not introduce new matter. *See* Mot. 3–5. The Motion to Amend cites disclosures that Patent Owner contends support the two newly added limitations in proposed claims 15 and 16. *Id.*

In opposition, Petitioner asserts the Motion to Amend fails to satisfy Patent Owner's burden of production, which requires demonstration of possession of the claimed invention as a whole, not just the newly added subject matter. Mot. Opp. 1, 3–5.

In reply, Patent Owner concedes Petitioner's point, and produces two charts attempting to show the original application demonstrates possession of claims 15 and 16 as a whole. Mot. Reply 1 (citing Exs. 2012, 2013).

Owner should request a conference call with the Board no later than two weeks prior to" the deadline). If the conference call had been held, we would have directed Patent Owner's attention to the *Western Digital* decision for guidance in preparing the Motion to Amend.

Patent Owner asserts "Petitioner cannot possibly be prejudiced" by this late submission, because "Petitioner made no issue of any lack of written support for any limitation in claims 12 and 13 as issued." *Id.*

Petitioner replies that its initial opposition to the Motion to Amend was "not required to preemptively oppose the evidence that [Patent Owner] should have presented earlier but did not," and Petitioner "had nothing to contest since [Patent Owner] failed to come forward with evidence of written description support." Mot. Sur-Reply 2–3. Petitioner also contends Exhibits 2012 and 2013 are deficient on the merits, because they merely provide string citations, without explanation. *Id.* at 3–4.

We conclude Patent Owner has not met its burden of production in asserting that proposed claims 15 and 16 have written description support in the original application. "[T]he motion must set forth written description support for each proposed substitute claim as a whole, and not just the features added by the amendment." *Lectrosonics*, at 7–8; *Western Digital*, at 7–8. The Motion to Amend does not address, in any fashion, the limitations of the existing claims that are carried forward in the proposed claims. *See* Mot. 3–5. Thus, there was nothing for Petitioner to oppose in that regard when filing the initial opposition. Patent Owner's attempt to rectify this deficiency in the Motion to Amend, via reply to Petitioner's opposition, is unavailing for two reasons.

First, the attempt came too late. *See* 37 C.F.R. § 42.23(b) ("All arguments for the relief requested in a motion must be made in the motion," and "[a] reply may only respond to arguments raised in the corresponding opposition"); *Lectrosonics*, at 8 ("All arguments and evidence in support of the motion to amend shall be in the motion itself."); *Western Digital*, at 8.

Only in this way is a petitioner accorded a fair opportunity to address an issue on which, ultimately, Petitioner bears a burden of persuasion (assuming Patent Owner meets its burden of production).

Second, Exhibits 2012 and 2013 are deficient on the merits. As other Board panels have found, mere string citations to an original application's disclosure without explanation are insufficient to meet a patent owner's burden of production. *Intel Corp. v. Alacritech, Inc.*, IPR2017-01392, Paper 81 at 61 (PTAB Nov. 26, 2018); *see also B.E. Tech., L.L.C. v. Google., Inc.*, No. 2015-1827, 2016 WL 6803057, at *7 (Fed. Cir. Nov. 17, 2017) (burden of production not met by "a string citation to eighteen different pages of the [challenged] patent's original specification, without explaining how those various pages supported each of the proposed substitute limitations"). With the meager showing in Exhibits 2012 and 2013, it is unclear whether the citations for a given claim limitation are to be understood as a combination of disclosures that, taken together, disclose the corresponding limitation, or whether Patent Owner contends each citation within a string is sufficient to disclose the corresponding limitation. It is not the Board's responsibility to search through the string citations to find sufficient written description support for each limitation, and we decline to do so.

Thus, we deny the Motion to Amend on the basis that Patent Owner did not satisfy its burden of production under 35 U.S.C. § 316(d)(3).

3. Support for "the reference level plane is other than true level relative to horizontal"

Patent Owner contends support for the added limitation reciting "the reference level plane is other than true level relative to horizontal" may be

found in the original application's disclosure that "the reference level plane *generally corresponds to* a vehicle orientation which results in the interior of the vehicle feeling at true level relative to horizontal." Ex. 1009, 14:18–21 (emphasis added); Mot. 4–5; Mot. Reply 2. Patent Owner additionally cites the original application's disclosure that the reference level plane is where "vehicle 10 *is preferably at* true level." Ex. 1009, 15:14–21 (emphasis added); Mot. 4–5; Mot. Reply 2–3. Patent Owner contends its position is consistent with our construction of "reference level plane" as not being limited to a plane in which the vehicle feels at true level to horizontal. Mot. 5; Mot. Reply 3; *supra* Section III.A.1.

Petitioner disagrees. Mot. Opp. 1–2, 5–10. Petitioner contends the subject matter at issue "constitutes a negative limitation because it defines the reference level plane in terms of what is excluded or absent from the scope of that term." *Id.* at 5–6 (citations omitted). Therefore, according to Petitioner, in order to support the subject matter, the original application's disclosure must "describe[] a reason to exclude the relevant limitation." *Id.* at 6 (quoting *Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1351 (Fed. Cir. 2012), and citing *Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1356 (Fed. Cir. 2015)); Mot. Sur-Reply 6. The original application's disclosure does not do so, in Petitioner's view, because it "consistently describe[s]" the reference level plane as being "'at true level relative to horizontal' or simply 'level.'" Mot. Opp. 6–7 (quoting Ex. 1009, 14:18–21, 15:14–21, 20:5–14); Mot. Sur-Reply 5. Petitioner asserts the original application "does not teach or even imply that the reference level plane may be programmed to represent a vehicle orientation that is anything other than true level." Mot. Opp. 7–9 (citing Ex. 1013, 11:25–12:19, 12:23–14:8, 88:8–12).

Patent Owner replies that nothing in the original application disclosure "requires" that the reference level plane "must be level." Mot. Reply 3–4.

The test for sufficiency of a written description under 35 U.S.C. § 112, ¶ 1, is whether the disclosure at issue "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). The written description "test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Id.*

We conclude the original application demonstrates possession of a reference level plane being "other than true level relative to horizontal," as recited in proposed claims 15 and 16. It does so by disclosing that the reference level plane "*is preferably at* true level." Ex. 1009, 15:14–21 (emphasis added). The unmistakable implication of this disclosure is that the preferred embodiment is a reference level plane at true level, but in other embodiments, the reference level plane may not be at true level. Nothing more is required to demonstrate possession of the presently claimed invention.

The *Santarus* decision cited by Petitioner is not to the contrary. In that case, the claim recited a pharmaceutical composition that contained omeprazole and "no sucralfate." *Santarus*, 694 F.3d at 1350. The disclosure at issue indicated sucralfate had "certain disadvantages associated with [its] use" versus omeprazole in the context of the claimed invention, which the Court held provided sufficient support for the claimed invention. *Id.* at 1350–51. Thus, the *Santarus* decision did not involve the "preferably"

verbiage at issue here. The *Santarus* decision, further, stated: "In fact, it is possible for the patentee to support both the inclusion and exclusion of the same material." *Id.* at 1351. That is the situation here: the "preferably" verbiage demonstrates possession of a reference level plane that is at true level, and a reference level plane that is not at true level.

The *Inphi* decision cited by Petitioner also is not to the contrary. Like the *Santarus* decision, it did not involve the "preferably" verbiage at issue here. Moreover, the *Inphi* decision held that "properly describing *alternative features* — without articulating advantages or disadvantages of each feature — can constitute a 'reason to exclude' under the standard articulated in *Santarus*." *Inphi*, 805 F.3d at 1355–56 (emphasis added). That is exactly the situation presented by the "preferably" verbiage at issue here.

Finally, we appreciate that Dr. Sturges, during deposition, could not recall any disclosures in the '693 patent reflecting that the reference level plane may be anything other than true level relative to horizontal. Ex. 1013, 11:25–14:8, 88:8–12. However, Dr. Sturges apparently had not previously reviewed the Motion to Amend. *See, e.g.*, Ex. 2004, Ex. B. More importantly, Dr. Sturges was not directed to the disclosures cited by the Motion to Amend as demonstrating possession of claims 15 and 16, including the "preferably" verbiage that we determine is dispositive of the issue presented. Therefore, we find Dr. Sturges's testimony has little probative value here.

For the foregoing reasons, we determine the original application disclosure that led to issuance of the '693 patent demonstrates possession of

a reference level plane being "other than true level relative to horizontal," as recited in proposed claims 15 and 16.

D. Patentability of Proposed Claims 15 and 16

Petitioner contends the Motion to Amend should be denied because proposed claims 15 and 16 are unpatentable as indefinite under 35 U.S.C. § 112 ¶ 2, and as having been obvious under 35 U.S.C. § 103. Mot. Opp. 2–3, 10–24. In the latter regard, Petitioner somewhat ambiguously asserts "claims 15 and 16 would have been obvious . . . over Uriarte or the combination of Uriarte and Fukumoto, as applied in [the Petition], and further in view of [Hanser] and [Amelotte[11]]." Mot. Opp. 13. We understand Petitioner to rely on the following three challenges to the patentability of claims 15 and 16.

Claims Challenged	Statutory Basis	References
15 and 16	§ 112 ¶ 2	n/a
15 and 16	§ 103(a)	Uriarte, Hanser, and Amelotte
15 and 16	§ 103(a)	Uriarte, Fukumoto, Hanser, and Amelotte

In considering the patentability arguments presented by the parties, we note the burden of persuasion lies with Petitioner to show proposed claims 15 and 16 are unpatentable by a preponderance of the evidence. *See Bosch Auto. Serv. Sols., LLC v. Matal*, 878 F.3d 1027, 1040 (Fed. Cir. 2018) ("[T]he petitioner bears the burden of proving that the proposed amended claims are

[11] Ex. 1011, U.S. Patent No. 3,680,836, iss. Aug. 1, 1972.

unpatentable by a preponderance of the evidence.") (as amended on rehearing); *Lectrosonics*, at 3–4; *Western Digital*, at 3–4.

1. Indefiniteness

Petitioner contends proposed claims 15 and 16 are indefinite under 35 U.S.C. § 112 ¶ 2 in reciting that "the reference level plane *is other than true level relative to horizontal*" (emphasis added). Mot. Opp. 2, 10–12. Petitioner contends the '693 patent "specification fails to inform a person of ordinary skill in the art . . . how to objectively ascertain the boundary between 'true level' and 'other than true level' with reasonable certainty." *Id.* at 2. According to Petitioner, "the subjective 'feeling' of an individual" is not a definite differentiator in this regard, because it provides "no objectively discernible limits" to the claim scope. *Id.* at 2, 10–12 (citations omitted).

Patent Owner responds that "a person of skill in the art would have little difficulty determining what is 'other than true level relative to the horizontal'" because "[a]ll the person has to do is use a level, a basic tool well within the skill set of the person of skill in the art in this matter." Mot. Reply 6.

Petitioner replies that Patent Owner's argument "is not aligned with the scope of" proposed claims 15 and 16. Mot. Sur-Reply 8. According to Petitioner, "[t]he claims do not state that the reference level plane 'measures' other than true level," but rather "are drafted broadly to allow the distinction between 'true level' and 'other than true level relative to horizontal' to be achieved through measurement or the subjective vagaries of what countless individual users may feel." *Id.* at 8–10 (citing Reply 3–4).

We have construed the claim term "true level" to correspond to an objective determination of levelness, based on a leveling tool or the like. *See supra* Section IV.B.2. Thus, Petitioner's fears of the vagaries introduced by a subjective determination are unfounded. Petitioner has not met its burden to demonstrate, by a preponderance of the evidence, that claims 15 and 16 are unpatentable as indefinite.

2. Obviousness Over Uriarte, Hanser, and Amelotte

Petitioner asserts proposed claims 15 and 16 are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte, Hanser, and Amelotte. Mot. Opp. 13–24; Mot. Sur-Reply 10–12. Petitioner cites the Declarations of Dr. Tavakoli in support. Exs. 1006, 1015. Patent Owner opposes Petitioner's assertions. Mot. 5–8; Mot. Reply 7–8.

Petitioner relies on the challenge to existing claims 12 and 13 as anticipated by Uriarte to establish that Uriarte discloses each and every limitation of claims 15 and 16 carried forward from claims 12 and 13. *See* Mot. Opp. 13 ("claims 15 and 16 would have been obvious . . . *over Uriarte . . . as applied in [the Petition]*, and further in view of [Hanser] and [Amelotte]"). For the reasons provided above, a preponderance of the evidence supports Petitioner's underlying contentions here. *See supra* Section III.C.

a) Obviousness of Claimed Sensor Orientation

Petitioner contends Uriarte does not disclose the new claim limitation reciting "the sensor senses pitch along a longitudinal axis and the sensor senses roll along a lateral axis," which requires a sensor that is aligned directly along the vehicle's longitudinal and lateral axes. *See* Mot. Opp. 13–

14. Petitioner cites Hanser as disclosing such a sensor, via level sensing unit 100, which is used to level a recreational vehicle automatically. *Id.* at 15 (citing Ex. 1010, 4:30–34, 8:6–12, 10:14–17). Figures 4 and 5 of Hanser are reproduced below:

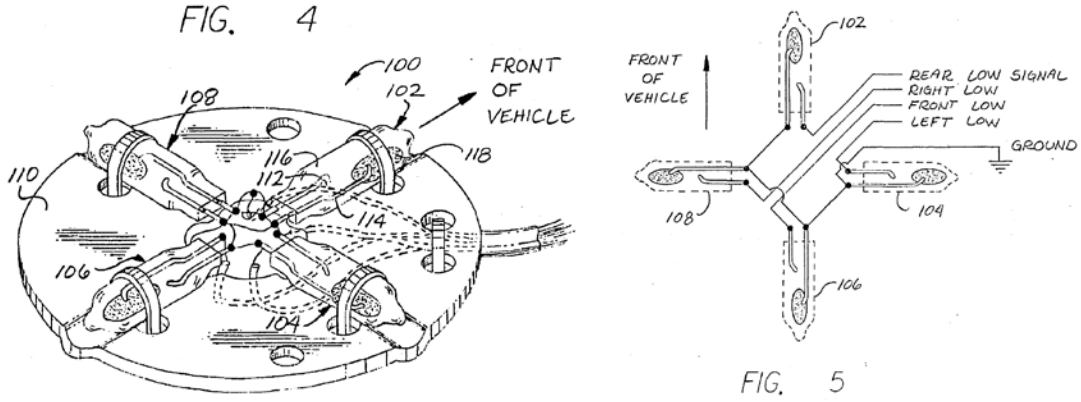


Figure 4 is a schematic perspective view of level sensing unit 100, and Figure 5 is a circuit diagram showing electrical connections between switches 102, 104, 106, and 108 in Figure 4. Ex. 1010, 4:8–14, 8:6–11, 10:6–8. Petitioner points out that, as indicated by the "FRONT OF VEHICLE" arrows in Figures 4 and 5, switches 102 and 106 are aligned directly along the vehicle's longitudinal axis, and switches 104 and 108 are aligned directly along the vehicle's lateral axis. Mot. Opp. 16 (citing Ex. 1010, 8:27–63); Ex. 1015 ¶ 60. Patent Owner does not dispute these contentions, which we find to be supported by a preponderance of the evidence. *See* Ex. 1010, 8:6–56; Ex. 1015 ¶ 60.

Petitioner contends "Hanser explains that having the switches 102, 104, 106, 108 of the level sensing unit 100 aligned along the longitudinal and lateral axes of the vehicle 10 has certain benefits when compared to aligning the switches along diagonal axes of the vehicle," as had been

previously disclosed in Hanser '584.[12] Mot. Opp. 16–19 (citing Ex. 1010, 1:67–2:3, 2:33–46, 2:50–3:2; Ex. 1012, 6:38–59, Figs. 4 & 11); Ex. 1015 ¶¶ 57–61.

Patent Owner replies that it is technically infeasible merely to rotate Uriarte's level sensor 205 as proposed by Petitioner. Mot. Reply 7 (citing PO Resp. 8). We are not persuaded by this argument, for reasons provided above. *See supra* Section III.D.3.

Patent Owner also contends Hanser "applies only to the special situation of a square vehicle," because "Hanser's Figure 4 shows that the vehicle must be square, as the sensors are at 90 degrees" resulting from the described "forty-five degree shift" versus Hanser '584. Mot. Reply 7 (citing Ex. 1010, 2:50–54). Patent Owner contends that in the special situation of a square vehicle as addressed by Hanser and Hanser '584, "the translation from diagonal [as in Hanser '584] to orthogonal [as in Hanser] is easy," but this "rotation" "for any vehicle other than a square vehicle" is beyond the capabilities of a person of ordinary skill in the art. *Id.* at 7–8 (citing Ex. 2004, 10–11).

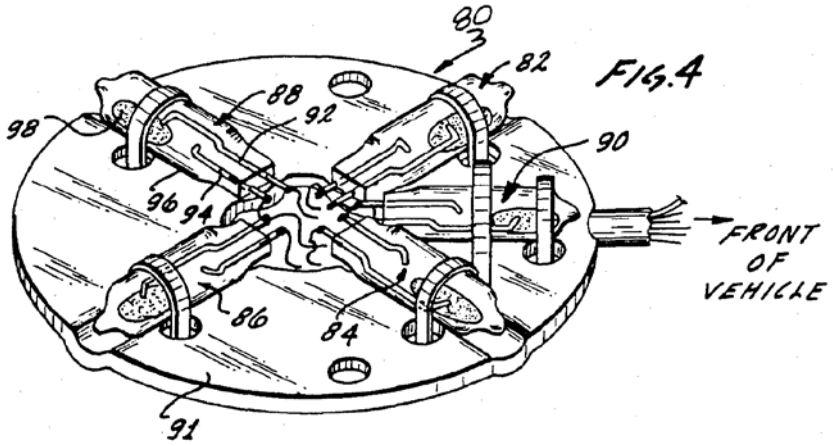
Petitioner replies that Patent Owner "misstates" Petitioner's case for obviousness, which "is not limited to a fixed rotation of Uriarte's level sensor 205 within the plane of a square vehicle." Mot. Sur-Reply 10. Rather, Petitioner contends Hanser provides "a reason to align the reference axes of Uriarte's level sensor 205 with the longitudinal and lateral axes of the vehicle — regardless of the shape of the vehicle," and Petitioner "never argued that the axes of Uriarte's level sensor 205 must remain fixed during

[12] Ex. 1012, U.S. Patent No. 4,597,584, iss. July 1, 1986.

the realignment." *Id.* at 10–11. In particular, according to Petitioner, neither Hanser nor Hanser '584 discloses a square vehicle. *Id.* at 11 (citing Ex. 1010, Figs. 1 & 6; Ex. 1012, Figs. 1, 10, & 14).

We determine Petitioner's case for the obviousness of modifying Uriarte in view of Hanser is supported by a preponderance of the evidence. We find Hanser discloses that aligning the two axes of level sensing unit 100 directly along the vehicle's longitudinal and lateral axes provides benefits, versus an older sensor. Hanser identifies Hanser '584 as the "prior art system" improved by level sensing unit 100 disclosed in Hanser. Ex. 1010, 1:66–2:3, 2:34. Hanser then indicates the prior art system of Hanser '584 had "problems" in some situations, including that it could "produce considerable stress and deflection in the vehicle" during an automatic leveling operation. *Id.* at 2:34–47; Ex. 1015 ¶ 59. Hanser's level sensing unit 100 overcomes this problem, because it "is designed and mounted so as to indicate if the right or left side is low, or if the front or back is low," based on the orientation of its two axes aligned directly along the vehicle's longitudinal and lateral axes. Ex. 1010, 2:50–64, 8:27–56; Ex. 1015 ¶¶ 59–60.

Hanser describes this orientation of sensing unit 100 as "*essentially* a forty-five degree shift in position" versus the sensor of the prior art system of Hanser '584. Ex. 1010, 2:52–54 (emphasis added); Ex. 1015 ¶ 59. Figure 4 of Hanser '584 is reproduced below:



Hanser '584 describes Figure 4 as illustrating switching assembly 80 comprising four switches 82, 84, 86, and 88, which respectively "point towards the four corners of the recreational vehicle," as reflected by the "FRONT OF VEHICLE" arrow. Ex. 1012, 6:38–62; Ex. 1015 ¶ 58. We, thus, agree with Dr. Tavakoli's testimony that switching assembly 80 is oriented on the vehicle "similar[ly] to" level sensor 205 of Uriarte. Ex. 1015 ¶ 58. Based on that similarity, a person of ordinary skill in the art would reasonably expect to achieve the same benefits in Uriarte that Hanser discloses are achieved by using the vehicle orientation of sensing unit 100 rather than the vehicle orientation of switching assembly 80. *See id.* ¶¶ 59–61. In particular, it allows the legs of Uriarte's system to be adjusted "in pairs to change the altitude of either side or the front and back . . . as opposed to individual corners," thereby reducing stress placed on the vehicle. *Id.* (citing Ex. 1010, 2:39–43, 2:52–54, 8:27–33).

We, further, agree with Petitioner that both Hanser and Hanser '584 disclose vehicles with a rectangular, and not a square, profile. *See* Ex. 1010, Fig. 1; Ex. 1012, Fig. 1. It is therefore somewhat unclear whether the two axes of switching assembly 80 are aligned *precisely along* the diagonal axes of the vehicle and are therefore oblique (non-perpendicular) to each other, or

are aligned *approximately along* the diagonal axes and are perpendicular to each other. *See* Ex. 1012, 6:57–62; Ex. 1010, 2:52–54. This is a distinction without a difference here. Either way, the similar (if not identical) orientations of switching assembly 80 in Hanser '584 and level sensor 205 in Uriarte provide ample motivation for the modification proposed by Petitioner. In addition, for the reasons provided above concerning obviousness over Uriarte and Fukumoto, the modification had a reasonable expectation of success. *See supra* Section III.D.3.

b) Obviousness of Claimed Reference Level Plane Other Than True Level

Petitioner next contends Uriarte discloses that the reference level plane is set, initially, to correspond to true level. Mot. Opp. 20; Pet. 14 (citing Ex. 1004, 7:25–47); Ex. 1006 ¶ 75; Ex. 1015 ¶¶ 63–65. Petitioner asserts Uriarte nonetheless "expressly teaches that the level condition to which it drives the vehicle 10 during leveling" may be changed to a different orientation, including one that is "other than true level" as we have construed that term above. Mot. Opp. 20–21 (citing Ex. 1004, 4:17–18, 7:68–8:4); Ex. 1015 ¶¶ 63–67; *supra* Section IV.B.2.

Patent Owner opposes on the basis that "Uriarte discloses a controller that has procedures for permanently saving a plurality of values, including proportional sensor values present when the vehicle is level," so Uriarte "clearly cannot teach a reference plane that is other than level." Mot. 7 (citing Ex. 1004, 7:25–57).

A preponderance of the evidence supports Petitioner's contention that Uriarte initially sets the reference level plane to correspond to true level. *See* Ex. 1004, 7:25–37 (CPU 282 initially saves the "level sensor values

present when the vehicle is level," "using conventional leveling tools"). Patent Owner cites the same disclosure in asserting that Uriarte "cannot teach" other reference plane orientations. Mot. 7. We disagree. Instead, we agree with Petitioner that Uriarte discloses "[a]ny other [capacitor] values will work" for setting the reference level plane, in addition to the values that correspond to true level. Ex. 1004, 4:10–23, 7:68–8:4. This finding, in addition to the findings and analysis above, is sufficient to establish that proposed claims 15 and 16 are unpatentable as having been obvious over Uriarte and Hanser.

Petitioner additionally cites Hanser and Amelotte as disclosing, independently, a reference level plane that may be other than true level. Mot. Opp. 21–23; Ex. 1015 ¶ 68. In support, Petitioner cites Hanser's disclosure that "the recreational vehicle should *preferably* be level relative to gravity." Ex. 1010, 1:25–34 (emphasis added); Mot. Opp. 21–22. For substantially the same reasons expressed above in relation to a similar disclosure in the '693 patent, we find this disclosure in Hanser reflects that the reference level plane may be either at true level, or other than true level. Patent Owner does not argue to the contrary.

Amelotte discloses a trailer equipped with an automatic orientation system that relies on an orientation sensor mounted below a floor of the trailer. Ex. 1011, Fig. 1, 2:56–58, 2:67–3:2. Figure 3 of Amelotte is reproduced below:

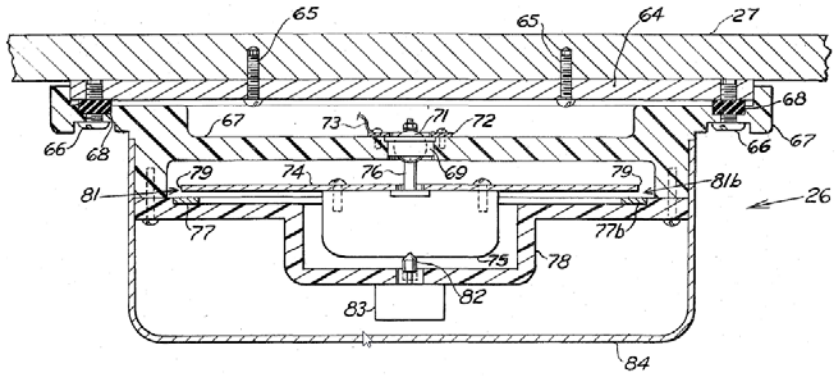


Fig. 3.

Figure 3 is a cross-sectional view of orientation sensor 26 mounted below floor 27 of a trailer. *Id.* at 2:47–48, 2:67–3:2. "Adjustments in the position of the sensor 26 can be made by manipulation of the screws 66, which causes compression of the rubber washers 68 and changes in angle between the frame 67 and the mounting plate 64." *Id.* at 4:8–12; Mot. Opp. 22–23. This "adjustable support . . . permit[s] the relative orientation of the vehicle to be easily changed." Ex. 1011, 1:60–62; Mot. Opp. 23. Petitioner contends Amelotte discloses that this relative orientation may be adjusted to set the reference level plane to other than true level, for proper operation of the refrigerator and plumbing, or for the comfort and convenience of the occupants. Mot. Opp. 23–24 (citing Ex. 1011, 1:8–15, 2:27–30).

Patent Owner concedes "Petitioner's citation to Amelotte . . . demonstrate[s] merely that a user may want a reference level plane other than 'true level.'" Mot. Reply 8; *see also* Sur-Reply 11 (Amelotte "allows leveling other than true horizontal" if desired and set by a user). Nonetheless, Patent Owner argues "Amelotte does not describe how to achieve this 'other than true level' reference plane in the way" required by proposed claims 15 and 16. Mot. Reply 8.

The problem with Patent Owner's argument is that claims 15 and 16 do not specify any particular method for achieving a reference plane that is other than true level. Based on Patent Owner's concession, and a preponderance of evidence in the record, we find Amelotte discloses a reference level plane that is other than true level. For example, Amelotte indicates its trailer may be "leveled for proper orientation of the refrigerator and plumbing" or "for the comfort and convenience of the occupants," and further "there are times when unusual orientations of the vehicle are desired for short periods of time." Ex. 1011, 1:8–15, 2:27–30; Mot. Opp. 23–24. A preponderance of the evidence also supports Petitioner's contention that Amelotte thereby provides an express motivation for setting the reference level plane in Uriarte to be other than true level, if this is not already disclosed in Uriarte. Mot. Opp. 23–24; Ex. 1015 ¶¶ 62, 68.

Patent Owner's rebuttal to the foregoing is the naked assertion that "Amelotte at best shows that there was a long-felt need for a system to achieve 'other than true level,'" so Amelotte "demonstrates a secondary consideration of non-obviousness." Mot. Reply 8. There is no evidence of long felt need here. Amelotte discloses the usefulness of orienting a trailer (or other vehicle) in a plane that is other than true level. *See* Ex. 1011, 1:8–15, 2:27–30. Thus, there is no need in the prior art that is addressed by claims 15 and 16 in this regard.

c) Conclusion

Based on the foregoing arguments and evidence, a preponderance of the evidence establishes proposed claims 15 and 16 are unpatentable under

35 U.S.C. § 103(a) as having been obvious over Uriarte, Hanser, and Amelotte.

3. Obviousness Over Uriarte, Fukumoto, Hanser, and Amelotte

Petitioner asserts proposed claims 15 and 16 are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte, Fukumoto, Hanser, and Amelotte. Mot. Opp. 13–24; Mot. Sur-Reply 10–12. Petitioner cites the Declarations of Dr. Tavakoli in support. Exs. 1006, 1015. Patent Owner opposes Petitioner's assertions. Mot. 5–8; Mot. Reply 7–8.

This second obviousness challenge to claims 15 and 16 is identical to the first such challenge, except it adds Fukumoto as an additional disclosure of the new claim limitation reciting "the sensor senses pitch along a longitudinal axis and the sensor senses roll along a lateral axis," substantially as provided in Petitioner's challenge to claims 12 and 13 as having been obvious over Uriarte and Fukumoto. *See* Mot. Opp. 13–24; *id.* at 13 (relying on "the combination of Uriarte and Fukumoto, as applied in" the Petition), 14 (citing Pet. 34–37, which concerns obviousness over Uriarte and Fukumoto). Thus, the merits of Petitioner's challenge, and Patent Owner's opposition, have already been considered above and resolved in Petitioner's favor. We determine a preponderance of the evidence establishes proposed claims 15 and 16 are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte, Fukumoto, Hanser, and Amelotte.

V. MOTION TO EXCLUDE EVIDENCE

Patent Owner's Motion to Exclude seeks exclusion of Exhibit 1014 from evidence, because Exhibit 1014 is not prior art to the '693 patent. *See*

Paper 22. Petitioner responds that Exhibit 1014 is not cited as prior art, but instead is cited properly as contemporaneous background information reflecting the meaning of the terms "pitch" and "roll." *See* Paper 25. Our Decision does not rely on Exhibit 1014 in any respect. We, therefore, dismiss Patent Owner's Motion to Exclude as moot.

VI. SUMMARY OF CONCLUSIONS

In summary:

Reference(s)	**Basis**	**Claims**	**Claims Shown Unpatentable**	**Claims Not Shown Unpatentable**
Uriarte	§ 102(b)	12, 13	12, 13	none
Uriarte and Fukumoto	§ 103(a)	12, 13	12, 13	none
Fukumoto and Uriarte	§ 103(a)	12, 13	12, 13	none
Overall Outcome			**12, 13**	**none**

Motion to Amend Outcome	**Claims**
Original Claims Canceled by Amendment	none
Substitute Claims Proposed in Amendment	15, 16
Substitute Claims: Motion to Amend Granted	none
Substitute Claims: Motion to Amend Denied	15, 16
Substitute Claims: Not Reached	none

VII. ORDER[13]

In consideration of the foregoing, it is hereby:

ORDERED that claims 12 and 13 of the ’693 patent have been shown to be unpatentable under 35 U.S.C. § 102(b) as anticipated by Uriarte;

FURTHER ORDERED that claims 12 and 13 of the ’693 patent have been shown to be unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte and Fukumoto;

FURTHER ORDERED that claims 12 and 13 of the ’693 patent have been shown to be unpatentable under 35 U.S.C. § 103(a) as having been obvious over Fukumoto and Uriarte;

FURTHER ORDERED that the Motion to Amend is *denied* as to adding claims 15 and 16 to the ’693 patent, because Patent Owner has not met its burden of production in asserting that those claims have written description support in the original application that issued as the ’693 patent;

FURTHER ORDERED that the Motion to Amend is *denied* as to adding claims 15 and 16 to the ’693 patent, because those claims are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte, Hanser, and Amelotte;

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[13] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

FURTHER ORDERED that the Motion to Amend is *denied* as to adding claims 15 and 16 to the '693 patent, because those claims are unpatentable under 35 U.S.C. § 103(a) as having been obvious over Uriarte, Fukumoto, Hanser, and Amelotte; and

FURTHER ORDERED that the Motion to Exclude is *dismissed* as moot.

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