Trials@uspto.gov
571-272-7822

Paper 12
Entered: July 20, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHONGSHAN BROAD OCEAN MOTOR CO., LTD.,
BROAD OCEAN MOTOR LLC, and
BROAD OCEAN TECHNOLOGIES, LLC,
Petitioners,

v.

NIDEC MOTOR CORPORATION,
Patent Owner.

Case IPR2015-00762
Patent 7,626,349 B2

Before BENJAMIN D. M. WOOD, JAMES A. TARTAL, and PATRICK M. BOUCHER, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* PATRICK M. BOUCHER, in which *Administrative Patent Judge* BENJAMIN D. M. WOOD joins.

Opinion Dissenting filed by *Administrative Patent Judge* TARTAL.

BOUCHER, *Administrative Patent Judge.*

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

On February 20, 2015, Zhongshan Broad Ocean Motor Co., Ltd., Broad Ocean Motor LLC, and Broad Ocean Technologies, LLC ("Petitioners") filed a Petition (Paper 3, "Pet.") pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1–3, 8, 9, 12, 16, and 19 ("the challenged claims") of U.S. Patent No. 7,626,349 B2 ("the '349 patent"). Concurrent with their Petition, Petitioners filed a Motion for Joinder (Paper 4, "Mot.") to join this proceeding with IPR2014-01121 ("the related proceeding"), which was instituted on January 21, 2015. Nidec Motor Corporation ("Patent Owner") filed a Preliminary Response (Paper 10, "Prelim. Resp.") to the Petition on April 21, 2015. Pursuant to our authorization, Petitioners filed a Reply (Paper 11) on April 28, 2015, limited to addressing the joinder issues.

For the reasons provided below, we deny Petitioner's Motion for Joinder. We also deny the Petition and do not institute an *inter partes* review.

I. BACKGROUND

A. The '349 patent (Ex. 1001)

The '349 patent relates to heating, ventilating and/or air conditioning ("HVAC") systems that use air-moving components, such as a blower. Ex. 1001, col. 1, ll. 8–11. Figure 4 of the '349 patent is reproduced below.

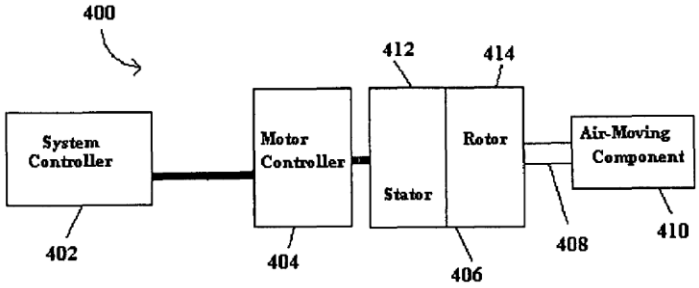
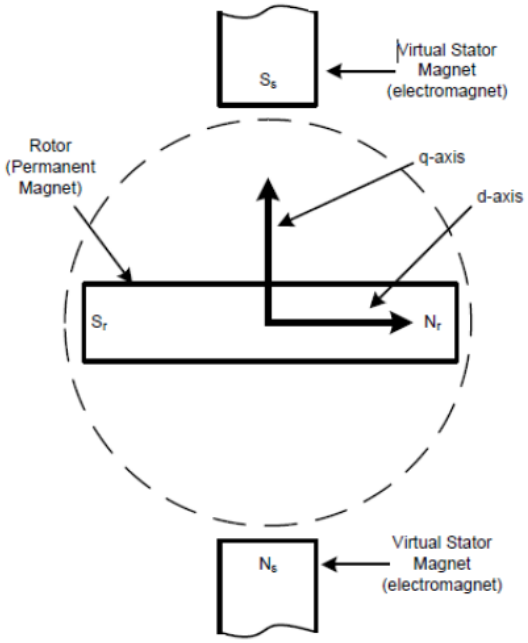


Figure 4

Figure 4 is a block diagram of HVAC system 400, which includes system controller 402, motor controller 404, permanent magnet motor 406, and air-moving component 410. *Id.* at col. 3, ll. 50–52. Permanent magnet motor 406 includes shaft 408, stationary assembly 412, and rotatable assembly 414. *Id.* at col. 3, ll. 52–54. The rotatable and stationary assemblies are coupled magnetically, and the rotatable assembly is coupled to the air-moving component via the shaft to drive rotation of the air-moving component. *Id.* at col. 3, ll. 54–58. The motor controller is configured to perform sinewave commutation in response to one or more control signals received from the system controller to produce continuous-phase currents in the permanent magnet motor for driving the air-moving component. *Id.* at col. 3, ll. 59–63.

Although the claims at issue are drawn to performing sine wave commutation using independent "values of Q and d axis currents," the specification of the '349 patent does not mention "values of Q and d axis currents" outside of its claims. Petitioners' witness, Dr. Mark Ehsani, explains that "vector control" provides one method of controlling permanent-magnet synchronous motors, and that "[t]he concept of vector control, which typically uses d and [Q] current components, arises from [a] principle [in which] torque arrives from the interaction of two magnetic fields, one originating from the stator and one originating from the rotor." Ex. 1009 ¶ 13. The drawing from page 6 of Dr. Ehsani's Declaration is reproduced below.



The drawing from Dr. Ehsani's Declaration illustrates a rotor, which has a permanent magnet having north and south poles N_r and S_r, respectively, and

illustrates a stator, which includes electromagnets that result in a virtual stator magnet having north and south poles N_s and S_s, respectively. *Id.* at ¶ 15. The d axis is aligned with the rotor and the Q axis[1] is offset 90° from the d axis. The motor commutates the winding currents to maintain orthogonality of the d and Q axes as the rotor turns. *Id.* at ¶ 16.

The '349 patent incorporates by reference the disclosure of U.S. Patent No. 7,342,379 B2 (Ex. 3001, "the '379 patent"). Ex. 1001, col. 4, ll. 23–29. The '379 patent describes embodiments in which a Q-axis current is calculated "based on a given [d-axis] current injection to produce a desired rotor torque." Ex. 3001, col. 5, ll. 27–30. The '379 patent also describes embodiments in which the Q-axis current and the d-axis injection current "are multiplexed." *Id.* at col. 5, ll. 51–57.

B. Illustrative Claim

Claim 1 of the '349 patent is illustrative of the claims at issue:

> 1. A heating, venting and/or air conditioning (HVAC) system comprising a system controller, a motor controller, an air-moving component, and a permanent magnet motor having a stationary assembly, a rotatable assembly in magnetic coupling relation to the stationary assembly, and a shaft coupled to the air-moving component, wherein the motor controller is configured for performing sinewave commutation, using independent values of Q and d axis currents, in response to one or more signals received from the system controller to produce

[1] Dr. Ehsani uses a lower-case letter q in referring to this axis. We use an upper-case letter Q for consistency with the claims that are before us.

continuous phase currents in the permanent magnet motor for driving the air-moving component.

C. Asserted Ground of Unpatentability

Petitioners challenge claims 1–3, 8, 9, 12, 16, and 19 as anticipated under 35 U.S.C. § 102(b) by JP 2003-348885, published December 5, 2003 (Ex. 1003, "Hideji"). Pet. 5. Petitioners provide an attested English translation of the reference as Exhibit 1005.

D. Related Proceedings

In addition to IPR2014-01121, the '349 patent is a subject of *Nidec Motor Corp. v. Broad Ocean Motor LLC*, Civil Action No. 4:13-CV-01895-JCH (E.D. Mo.). *Id.* at 3.

E. Claim Construction

The Board interprets claims using the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012).

In the related proceeding, the Board construed "using independent values of Q and d axis currents," which is recited in independent claims 1, 16, and 19, as requiring the use of Q and d axis current values that are developed independently of each other, without relying on one to derive the other; and construed "back-emf motor," which is recited in claim 9, as

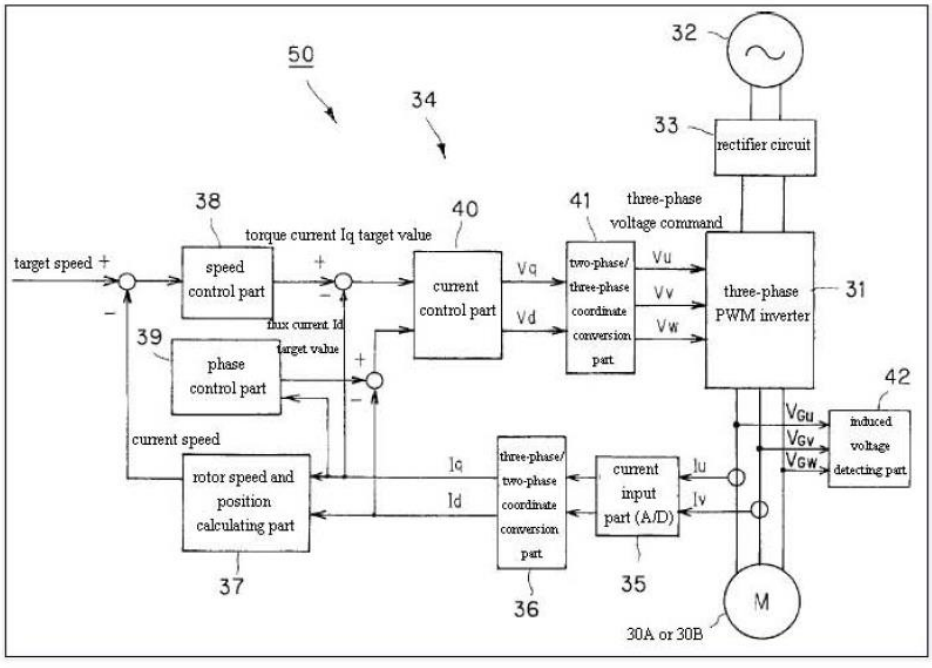
coterminous with "permanent magnet motor." *Zhongshan Broad Ocean Motor Co., Ltd. v. Nidec Motor Corp.*, Case No. IPR2014-01121, slip op. at 7–8 (PTAB Jan. 21, 2015) (Paper 20). Neither party contests these constructions, which we adopt for purposes of this decision.

II. ANALYSIS

A. Anticipation by Hideji

Hideji discloses a refrigerant circuit of an air conditioning device with a compressor driven by a permanent magnet synchronous motor.[2] Ex. 1005 ¶ 22. Figure 2 of Hideji is reproduced below.

【Fig. 2】



[2] Hideji uses the terms "permanent magnet synchronous motor" and "brushless DC motor" synonymously. Ex. 1005 ¶ 22.

Figure 2 is a block diagram of a driving device for a permanent magnet synchronous motor. *Id.* at ¶ 28. Driving device 50 includes three-phase pulse-width modulation ("PWM") inverter 31, alternating-current power supply 32, rectifier circuit 33, and control device 34. *Id.* at ¶ 30. The control device includes power input part 35, three-phase/two-phase coordinate conversion part 36, rotor speed and position calculating part 37, speed control part 38, phase control part 39, current control part 40, two-phase/three-phase coordinate conversion part 41, and induced voltage detecting part 42. Ex. 1005 ¶ 32. Two-phase/three-phase coordinate conversion part 41 outputs pulse-modulated sinusoidal voltage commands V_u, V_v, and V_w to a switching element of the three-phase PWM inverter, thereby providing quasi-sinusoidal three-phase alternating current to the motor. *Id.* at ¶ 33. Three-phase/two-phase coordinate conversion part 36 converts coordinates of two-phase alternating current I_u and I_v introduced by current input part 35 to a revolving coordination system on the rotor of the motor, and calculates flux current I_d (d-axis current) and torque current I_q (Q-axis current). *Id.* at ¶ 35.

We have reviewed Petitioners' analysis of claims 1–3, 8, 9, 12, 16, and 19, and conclude that Petitioners have demonstrated a reasonable likelihood of prevailing on their contention that each of those claims is anticipated by Hideji. Pet. 11–48. In particular, at this stage of the proceeding, Petitioners have identified adequately features of Hideji's air conditioning system that correspond to the system controller (*see id.* at 12–

14), motor controller (*see id.* at 14–15), air-moving component or blower (*see id.* at 15–17, 35), and permanent magnet motor (*see id.* at 17–19), combinations of which elements are recited in each of independent claims 1, 16, and 19. Petitioners also have identified sufficient structure of Hideji's brushless DC motor that includes stator and rotor components, i.e., stationary and rotatable assemblies with a shaft coupled to the air-moving component or blower, as recited in the independent claims. *Id*. at 17–19. Petitioners support their analysis with testimony of Dr. Ehsani. Ex. 1009.

Of particular relevance to Petitioners' analysis is their further contention that Hideji discloses "performing sinewave commutation, using independent values of Q and d axis currents, in response to one or more control signals received from the system controller to produce continuous phase currents in the permanent magnet motor for driving the air-moving component," recited in each of independent claims 1, 16, and 19. Pet. at 19–26. Patent Owner contends that Hideji fails to disclose the use of independent values of Q and d axis currents: "In fact, Hideji discloses that it employs calculations in the rotating frame of reference in which Q and d axis currents depend on each other." Prelim. Resp. 20.

Petitioners observe that Figure 2 of Hideji illustrates that three-phase / two-phase coordinate conversion part 36 outputs separate values for I_q and I_d, i.e. the Q and d axis currents.[3] Pet. 23–24. Hideji discloses that

[3] We note that the labels "I_q" and "I_d" output from part 36 of Hideji are identified directly as such in the original Japanese reference. Ex. 1003, 8.

> [t]he three-phase/two-phase coordinate conversion part 36 converts the coordinates of the alternating current Iu and Iv introduced by the current input part 35 to a revolving coordination system (d-q coordination system) on the rotor of the brushless DC motor 30A, and calculates flux current I_d (d-axis current) and torque current I_q (q-axis current).

Ex. 1005 ¶ 35. Petitioners reason that such transformation results in separate, independent values of Q and d axis currents determined from control signals received from the system controller. Pet. 23. Petitioners support this reasoning with testimony by Dr. Ehsani. Ex. 1009 ¶ 38.

Patent Owner responds that "the values coming from part 36 are at best a transform into the rotating frame of reference of actual measured currents" and that "[t]hey are not the demanded currents generated by the controller." Prelim. Resp. 22. Notwithstanding the explicit identification of these values as "I_q" and "I_d" in the original Japanese reference, Patent Owner also contends that they "are not values one of ordinary skill would refer to as Iq and Id." *Id.* at 23. In addition, Patent Owner contends that "[i]t is the current control part 40 output that is used to create the continuous phase sine wave commutated currents for the motor after being transformed back out of the rotating frame of reference," reasoning that "[i]f Iq and Id are not independent at this step, the 'motor controller' is not using 'independent values of Q and d axis current' to perform 'sine wave commutation.'" *Id.* at 24. Patent Owner contends that such inputs are not independent, noting

Hideji's disclosure that the flux current I_d *target* value is expressed in terms of I_q as $k \times I_q^2$. *Id.* (citing Ex. 1005 ¶¶ 38–39).

We conclude that Petitioners have established a reasonable likelihood of prevailing on their contention that Hideji discloses performing sinewave commutation using independent values of Q and d axis currents in the manner recited in each of independent claims 1, 16, and 19. Thus, we conclude that Petitioners have established a reasonable likelihood of prevailing on their challenge of claims 1–3, 8, 9, 12, 16, and 19 as anticipated by Hideji.

B. Time Bar Under 35 U.S.C. § 315(b)

Section 315(b) provides:

> An inter partes review may not be instituted if the petition requesting the proceeding is filed more than 1 year after the date on which the petitioner . . . is served with a complaint alleging infringement of the patent. The time limitation set forth in the preceding sentence shall not apply to a request for joinder under subsection (c).

Petitioners were served with a complaint alleging infringement of the '349 patent on September 25, 2013. The Petition was filed on February 20, 2015, more than a year later. Notwithstanding our determination that the Petition meets the standard set forth in 35 U.S.C. § 314(a), we conclude that institution of an *inter partes* review is barred by § 315(b).

Different panels of the Board have reached different conclusions whether the exception to the time bar applies when a party requests joinder of issues to a proceeding to which it is already a party. *Compare Target Corp. v. Destiny Maternity Corp.*, Case No. IPR2014-00508, slip op. (PTAB Feb. 12, 2015) (Paper 28) (expanded panel) *with SkyHawke Techs., LLC v. L&H Concepts, LLC*, Case No. IPR2014-01485, slip op. (PTAB Mar. 20, 2015) (Paper 13). Petitioners contend that "[t]he Board has discretion to join a properly filed IPR petition to a previously instituted IPR proceeding, even where the petitioner seeking joinder is already a petitioner in the instituted proceeding." Mot. 4 (citations omitted). Patent Owner responds that the "[t]he plain language of the statute, considered in light of its legislative history and the overall purpose and policy objectives of the AIA, strongly supports an interpretation of [§] 315(c) that does not permit joinder of a second petition by the same party, particularly when that petition is otherwise time-barred under [§] 315(b)." Prelim. Resp. 4.

Section 315(c) provides:

> If the Director institutes an inter partes review, the Director, in his or her discretion, may join as a party to that inter partes review any person who properly files a petition under section 311 that the Director, after receiving a preliminary response under section 313 or the expiration of the time for filing such a response, determines warrants the institution of an inter partes review under section 314.

In our view, the phrase "join as a party" indicates that only a person who is not already a party to an instituted *inter partes* review can be joined to the

proceeding. A person cannot be joined *as a party* to a proceeding in which it is already a party. That the statute uses the expansive term "any person" is of little moment because the overall language of the statute places unambiguous limits on the term. Specifically, the phrase "join as a party" excludes a person who is already a party.

It is instructive to recall the factual circumstances that led to the filing of the instant Petition. In the related proceeding, Petitioners filed a petition for *inter partes* review challenging, *inter alia*, claims 1–3, 8, 9, 12, 16, and 19 as anticipated under 35 U.S.C. § 102(b) by Hideji. *Zhongshan Broad Ocean Motor Co., Ltd. v. Nidec Motor Corporation*, Case No. IPR2014-01121, slip op. at 6 (PTAB Jan. 21, 2015) (Paper 20). Although a purported English translation of Hideji was filed as an exhibit, it did not include an affidavit attesting to the accuracy of the translation as required by 37 C.F.R. § 42.63(b). *Id.* at 9. After briefing by the parties and the submission of testimonial evidence by Petitioners, a unanimous panel concluded that the petition was defective with respect to the ground based on Hideji, and denied institution of that ground. *Id.* at 13. A unanimous panel also denied Petitioners' Request for Rehearing of that decision, noting that "it is not the inability to file attesting affidavits late that precludes Petitioner[s], but the fact that complete translations with attesting affidavits were not obtained and filed prior to the date on which institution of *inter partes* review was barred under 35 U.S.C. § 315(b)." *Zhongshan Broad Ocean Motor Co., Ltd. v. Nidec Motor Corporation*, Case No. IPR2014-01121, slip op. at 7 (PTAB

Feb. 24, 2015) (Paper 25). Petitioners filed the instant Petition and Motion for Joinder in a further effort to have an attested translation of Hideji considered, despite the time bar of § 315(b). Mot. 5–6.

Petitioners trivialize the defect in their original petition by their characterization that "[w]ith [their] original petition, [Petitioners] filed an English translation of Hideji, but omitted an affidavit attesting to the accuracy of that translation." Mot. 2. In fact, Petitioners were not even in possession of an attested translation of Hideji until more than a year after they were served with a complaint alleging infringement of the '349 patent. *See* Ex. 1005, 26 (attestion dated October 28, 2014). They could not have filed an affidavit attesting to the accuracy of the translation at any time during the one-year window provided by § 315(b) because no such affidavit existed. This is a more substantively significant defect than the mere omission of an existing affidavit that could establish the accuracy of the translation.

Petitioners' filing of the instant Petition and Motion for Joinder begs the obvious question: What is different now? In the related proceeding, Petitioners requested that the Board exercise its discretion to institute based on a ground for which insufficient evidence existed until after the statutory

time window had closed.[4] In this proceeding, Petitioners also request that the Board exercise its discretion to institute based on a ground for which insufficient evidence existed until after the statutory time window had closed. For the reasons expressed above, we disagree that we have such discretion through the joinder provision of § 315(c).

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied and no *inter partes* review is instituted.

[4] In the related proceeding, the parties did not raise, and we did not address, whether we even had discretion to do so in light of 35 U.S.C. § 312(a)(3)(B): "A petition filed under section 311 may be considered only if . . . the petition identifies the evidence that supports the grounds for the challenge to each claim, including . . . affidavits or declarations of supporting evidence and opinions, if the petitioner relies on expert opinions."

Opinion Dissenting filed by *Administrative Patent Judge* TARTAL.

In this case the Board is presented with the issues of: (1) whether the Petitioners may be joined to an *inter partes* review previously instituted to which it is a party; and, (2) whether grounds of unpatentability asserted in the Petition not previously instituted may be joined. For the reasons explained by several majority opinions in prior decisions of the Board, I am of the opinion that 35 U.S.C. § 315(c) permits the joinder of any person who properly files a petition under § 311, including a petitioner who is already a party to the earlier instituted *inter partes* review. *See Medtronic Inc. v. Troy R. Norred, M.D.*, Case IPR2014-00823 (PTAB December 8, 2014) (Paper 12); *Target Corp. v. Destination Maternity Corp.*, Case IPR2014-00508 (PTAB Feb. 12, 2015) (Paper 28). I am also of the opinion that § 315(c) encompasses both party joinder and issue joinder, and, as such, permits joinder of issues, including new grounds of unpatentability, presented in the petition that accompanies the request for joinder. *See id.*

Joinder may be authorized when warranted, but the decision to grant joinder is discretionary. *See* 35 U.S.C. § 315(c); 37 C.F.R. § 42.122. The Board will determine whether to grant joinder on a case-by-case basis, taking into account the particular facts of each case, substantive and procedural issues, and other considerations. *See* 157 CONG. REC. S1376 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl) (when determining whether and when to allow joinder, the Office may consider factors including "the breadth or unusualness of the claim scope" and claim construction issues).

When exercising its discretion, the Board is mindful that patent trial regulations, including the rules for joinder, must be construed to secure the just, speedy, and inexpensive resolution of every proceeding. *See* 35 U.S.C. § 316(b); 37 C.F.R. § 42.1(b).

The Petition presents only one ground of unpatentability, alleging claims 1–3, 8, 9, 12, 16, and 19 of the '349 patent are anticipated by Hideji under 35 U.S.C. § 102(b). Pet. 5. Although the same ground was asserted by Petitioners in IPR2014-01121, institution was denied in the earlier proceeding, not on the merits, but because Petitioners failed to include an attesting affidavit with the English translation of Hideji, counter to the requirement set forth in 37 C.F.R. §42.63(b). *See Zhongshan Broad Ocean v. Nidec Motor*, Case IPR2014-01121 (PTAB Jan. 21, 2015) (Paper 20). In the institution decision in IPR2014-01121 the Board denied Petitioners' motion to submit corrected exhibits to include an attesting affidavit to Hideji because Petitioners did not demonstrate that the failure to include the required affidavit was a clerical mistake that could be remedied in accordance with 37 C.F.R. §104(c). *Id*. at 9–12.

It is my opinion that the public interest in securing the just, speedy, and inexpensive resolution of every proceeding would be served in this case more fully by considering the merits of the alleged ground of unpatentability based on Hideji rather than by denying consideration on reasons tied to Petitioners' previous failure to attach the requisite attesting affidavit. With respect to the impact of joinder on the trial schedule, Petitioners states that it

will accept a reduced period of time to reply to Patent Owner's response to the Petition, and will accommodate reasonable logistical and scheduling requests by Patent Owner to accommodate joinder of the proceedings. Paper 4, 10.

I have further considered Patent Owners arguments against joinder (Paper 10, 4–18), and it is my opinion that joinder is warranted under the particular facts of this case. While Patent Owner is correct that Petitioners have unsuccessfully pursued multiple approaches to resolve the deficiency in its petition in IPR2014-01121, Petitioners are not attempting to cure a deficiency in the merits of a ground asserted in the prior Petition by filing a second petition. Thus, contrary to Patent Owner's assertion, this case is not similar to a case in which a petitioner seeks to introduce additional grounds based on additional prior art through a second petition. Patent Owner has been aware of the ground of unpatentability based on Hideji asserted in the Petition in this proceeding since a petition was filed in IPR2014-01121 on July 3, 2014. The Petition also relies upon the same declaration provided by Dr. Mark Ehsani in IPR2014-01121 (Ex. 2009). Thus, it is my opinion that the prejudice to Patent Owner of joining the ground at this stage of the proceeding is minimal. I also agree with the analysis and conclusion set forth in the majority opinion that Petitioners have established a reasonable likelihood of prevailing on their challenge of claims 1–3, 8, 9, 12, 16, and 19 as anticipated by Hideji.

For the reasons above, I dissent from the majority decision not to institute *inter partes* review on the ground of unpatentability of claims 1–3, 8, 9, 12, 16, and 19 of the '349 patent as anticipated by Hideji under 35 U.S.C. § 102(b) and would join this proceeding with IPR2014-01121.

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PETITIONER

Steven Meyer
Seth Atlas
LOCKE LORD LLP
smeyer@lockelord.com
ptopatentcommunications@lockelord.com

PATENT OWNER

Scott Brown
Matthew Walters
HOVEY WILLIAMS LLP
jcrawford@hoveywilliams.com
mwalters@hooveywilliams.com