

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DJI EUROPE B.V.,
Petitioner,

v.

TEXTRON INNOVATIONS INC.,
Patent Owner.

Case No. IPR2023-01104
U.S. Patent No. 8,682,505 B2

**PATENT OWNER PRELIMINARY RESPONSE
PURSUANT TO 37 C.F.R. § 42.107**

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EXHIBIT LIST

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2002	Plaintiff's Opposition to Motion to Stay in <i>Textron Innovations Inc. v. SZ DJI Technology Co., Ltd.</i> , 2-22-cv-00351-RWS-RSP (E.D. Tex. Sept. 18, 2023)
2003	Judge Schroeder Pre-Institution Stay Statistics
2004	Judge Payne Pre-Institution Stay Statistics
2005	Judge Schroeder Post-Institution Stay Statistics
2006	Judge Payne Post-Institution Stay Statistics
2007	Docket Control Order in <i>Textron Innovations Inc. v. SZ DJI Technology Co., Ltd.</i> , 2-22-cv-00351-RWS-RSP (E.D. Tex. May 11, 2023)
2008	U.S. District Courts – Federal Court Management Statistics (June 30, 2023), <i>available at</i> https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2023.pdf
2009	Defendants' Invalidity Contentions in <i>Textron Innovations Inc. v. SZ DJI Technology Co., Ltd.</i> , 2-22-cv-00351-RWS-RSP (E.D. Tex. Jan. 19, 2023)
2010	Parties' Joint Claim Construction and Prehearing Statement Pursuant to Patent Rule 4-3, <i>Textron Innovations Inc. v. SZ DJI Technology Co., Ltd.</i> , No. 2:22-CV-00351-RWS-RSP (E.D. Tex. Oct. 27, 2023)
2011	<i>Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation Memorandum</i> (June 21, 2022)
2012	Declaration of Professor Soon-Jo Chung, <i>Textron Innovations Inc. v. SZ DJI Technology Co., Ltd.</i> , No. 2:22-CV-00351-RWS-RSP (E.D. Tex. Oct. 27, 2023)

I. INTRODUCTION

This proceeding involves U.S. Patent No. 8,682,505 (the “’505 Patent”), one of four patents that Petitioner is accused of infringing in ongoing litigation in the Eastern District of Texas. Trial in that case is scheduled for July 2024, a few months after an institution decision is due in this proceeding. Petitioner asks the Board to institute a trial on the validity of all claims of the ’505 Patent, but doing so would be inefficient for both the parties and the Board. The district court will resolve the same invalidity challenges eight months before the Board would issue a final written decision in this proceeding, even if it were instituted. Moreover, the Petition’s theories of unpatentability rely on substantially the same disclosures found in the references considered by the Examiner during prosecution. The Petition asks the Board to revisit the Examiner’s conclusions without any evidence supporting a finding that the Examiner erred. Accordingly, the Board should exercise its discretion to deny institution and avoid this unnecessary duplication of efforts.

Should the Board reach the merits of the Petition, it should nevertheless deny institution. Despite having an obligation to explain how the challenged claims should be construed and establish how the construed claims are unpatentable, the Petition advances materially different claim construction positions than Petitioner argues for in the district court and presents improper written description arguments disguised as an obviousness analysis. The result is a deficient Petition and theories

of unpatentability that rely on unfounded assertions of lack of adequate written description to rewrite the claim language to “encompass” disclosure in the relied-upon references, instead of addressing the claim language as written. At bottom, the Petition fails to show a reasonable likelihood that independent Claims 1 and 11 would have been obvious. The Board should therefore deny institution.

II. OVERVIEW OF THE ’505 PATENT

The ’505 Patent, entitled “Flight Control Laws for Constant Vector Flat Turns,” was issued on March 25, 2014. DJI-1001, Cover. The ’505 Patent relates to a flight control system that has flight control laws that enable precise aircraft maneuvering relative to the ground. DJI-1001, 1:8-10. Aircraft that can hover and fly at low speeds, such as helicopters, can spend a large portion of their missions maneuvering relative to the ground, which sometimes must be conducted in confined spaces around external hazards (e.g., buildings, trees, etc.). DJI-1001, 1:12-19. With traditional flight control systems, ground-referenced maneuvering (“GRM”) requires constant control inputs from the pilot to counter disturbances caused by wind and remove the natural coupled response of the aircraft, which is difficult. DJI-1001, 1:20-31.

One problem with prior flight control law designs is that they do not provide a pilot with an easy way to control aircraft crab angle during GRM. DJI-1001, 1:33-34. Crab angle is “the angle between the aircraft’s heading and its actual ground

path.” DJI-1001, 1:34-35. With prior designs, adjusting crab angle while maintaining ground track “took considerable pilot concentration” and “extraordinary pilot skill,” “since the pilot had to coordinate inputs to both the lateral and directional controllers.” DJI-1001, 1:35-40, 1:50-52. During GRM, however, some mission tasks may call for flat yawing turns while maintaining a constant vector across the ground (e.g., to acquire and track a point on the ground without having to fly directly toward it). DJI-1001, 1:41-50.

The systems and methods described in the ’505 Patent “enable seamless and transient free GRM” in part by “enabl[ing] a pilot to use the directional controller to command flat yawing turns at low groundspeeds, while maintaining a constant vector across the ground.” DJI-1001, 2:46-50. The patent describes control laws that “adjust pitch and roll attitude to keep the aircraft moving in the same direction at a constant speed whenever the pilot inputs a directional command at low speed.” DJI-1001, 2:50-55. The control system allows the pilot to complete a constant vector flat turn (CVFT) with minimal workload since the ground vector will be maintained by the control laws. DJI-1001, 2:56-65.

Figure 2 below illustrates a schematic of an aircraft 201 utilizing a control system of the ’505 Patent. DJI-1001, 3:9-11. More specifically, Figure 2 depicts an aircraft 201 operating within a CVFT region of the flight envelope (e.g., region 103 shown in Figure 1 of the ’505 Patent), for example between 10 to 35 knots

groundspeed in any direction relative to the aircraft's body axis. DJI-1001, 3:1-12.

In the example of Figure 2, the aircraft 201 is in forward flight in direction D1. DJI-1001, 3:11-15. Directional inputs turn aircraft 201 in a complete 360-degree yaw movement without changing the speed and flight heading of aircraft 201. DJI-1001, 3:11-15.

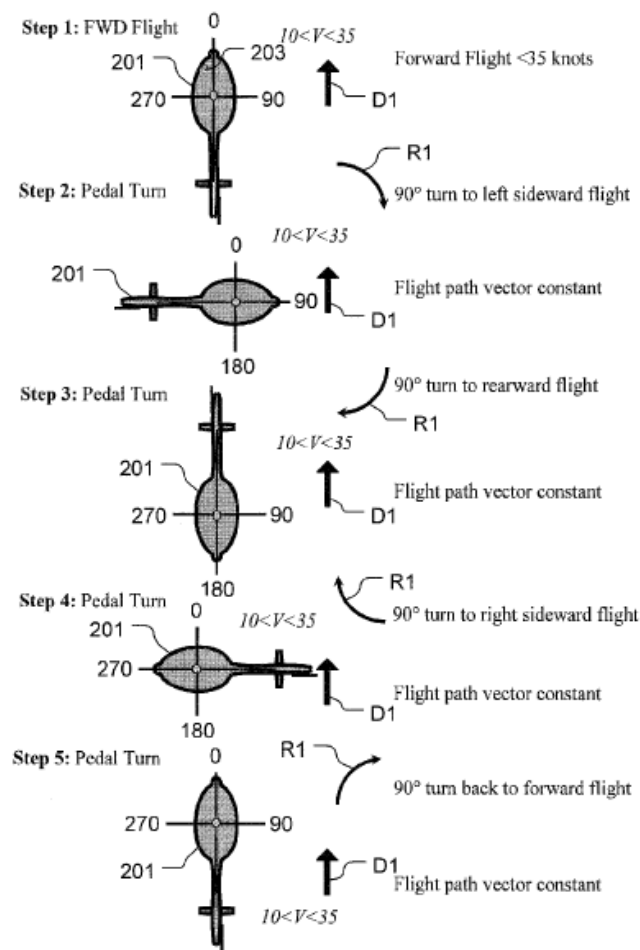


FIG. 2

DJI-1001, Figure 2.

More particularly, at step 1 of Figure 2, aircraft 201 is traveling in a constant forward flight depicted with arrow D1 (e.g., between 10 and 35 knots). DJI-1001, 3:35-37. At step 2, the pilot utilizes the control system to rotate aircraft 201 in the clockwise direction approximately 90 degrees, indicated by arrow R1. DJI-1001, 3:37-41. Step 2 shows aircraft 201 traveling in forward flight while the fuselage faces 90 degrees relative to the directional movement. DJI-1001, 3:41-43. Steps 3-5 illustrate the process being repeated, rotating aircraft 201 in 90-degree increments while maintaining a constant forward heading. DJI-1001, 3:43-46.

During the process illustrated in Figure 2, the control system utilizes relative groundspeed difference to control pitch and roll attitudes so that the aircraft will maintain a constant vector during a flat turn. DJI-1001, 2:58-61. To that end, the '505 Patent describes a control system having lateral, longitudinal, and directional control architectures. DJI-1001, 4:45-52. Together, these control architectures of the CVFT control system enable seamless and transient free GRM. DJI-1001, 4:43-45.

Figure 6 shows architecture 601 of the CVFT control system operably associated with one or more longitudinal control laws. DJI-1001, 4:45-47.

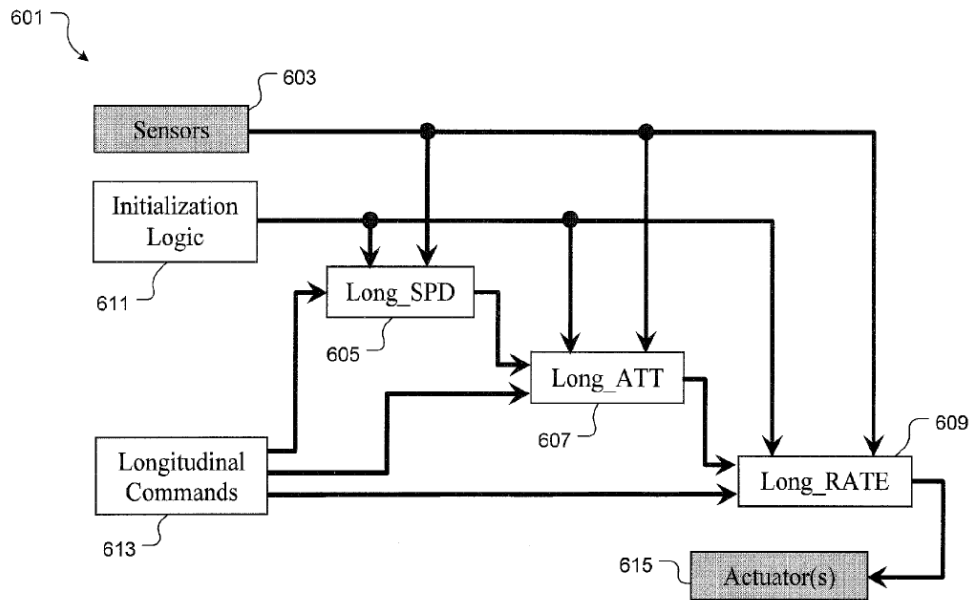


FIG. 6

DJI-1001, Fig. 6. Figure 7 shows architecture 701 of the CVFT control system operably associated with one or more lateral control laws. DJI-1001, 4:47-49.

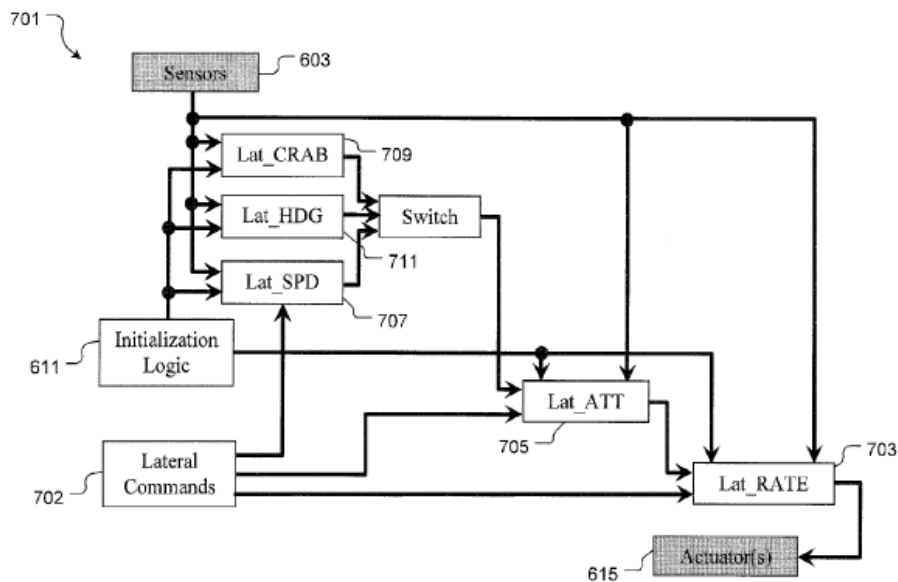


FIG. 7

DJI-1001, Fig. 7. Figure 8 depicts architecture 801 that comprises one or more directional control laws. DJI-1001, 6:27-30.

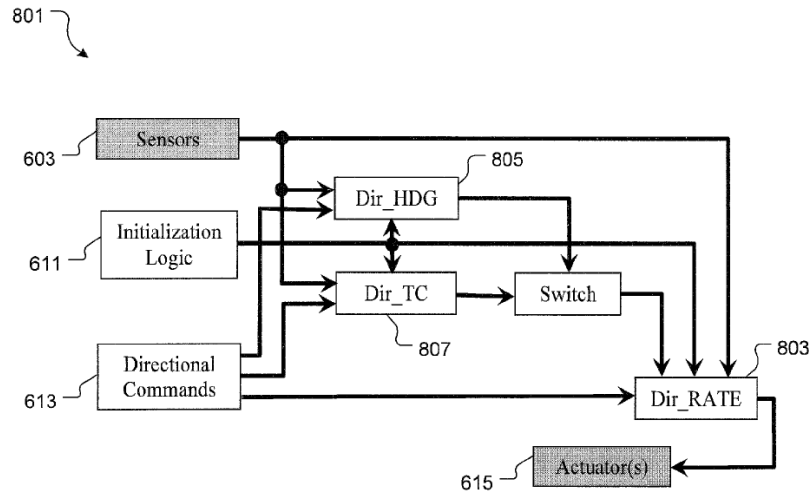


FIG. 8

DJI-1001, Figure 8. The control laws of each of the architectures 601, 701, and 801 are operably associated with sensors 603, logic 611, commands, and actuators 615. DJI-1001, 4:53-5:38, 5:53-56, 6:27-30.

During the CVFT, when the directional controller is first moved out of detent, the control laws will capture the aircraft's current groundspeed in the earth axis coordinate system. DJI-1001, 7:5-8. The control laws keep track of the difference between the aircraft's actual groundspeed and the captured groundspeed. DJI-1001, 7:8-9. The groundspeed difference in the body axis forward direction and the groundspeed difference in the body axis sideward direction are used to command the

pitch and roll attitudes needed to minimize the relative groundspeed difference during the flat turn. DJI-1001, 7:10-26.

A. Prosecution History of the '505 Patent

The '505 Patent issued from U.S. Patent Application No. 13/711,234 filed December 11, 2012. DJI-1001, Cover. The '505 Patent is a continuation of U.S. Patent Application No. 13/391,522, filed as application No. PCT/US2011/030498 on March 30, 2011, now U.S. Patent No. 8,332,082. DJI-1001, Cover.

The Examiner issued a non-final office action on July 17, 2013 rejecting the as-filed claims as allegedly being anticipated by U.S. Patent Application Publication No. 2010/0324758 by Piasecki et al. ("Piasecki," DJI-1013). DJI-1002, 36-40. On October 16, 2013, the applicant filed a response amending as-filed independent Claim 1 as shown below:

1. **(Currently Amended)** A control system for an aircraft, comprising:
a lateral control architecture configured to control lateral motion of the aircraft;
and
a longitudinal control architecture configured to control longitudinal motion of the aircraft;
wherein the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface; and
wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading.

DJI-1002, 23. A similar amendment was made to as-filed independent Claim 11:

11. **(Currently Amended)** A method, comprising:
sensing a directional movement of ~~[[a]]~~ an aircraft;
determining lateral and longitudinal movements of the aircraft; and
selectively controlling flat yaw movement of the aircraft while maintaining a
constant vector flat turn relative to a ground surface;
wherein the aircraft continuously moves in a yaw direction while maintaining the
constant vector heading.

DJI-1002, 25. In response to the amendment, the Examiner issued a notice of allowance on November 1, 2013, allowing all pending claims. DJI-1002, 10.

III. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION

The Board should exercise its discretion to deny institution under 35 U.S.C. §§ 314(a) and 325(d). First, institution should be denied under 35 U.S.C. § 314(a) because each factor set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5-6 (P.T.A.B. Mar. 20, 2020) (precedential) weighs in favor of denying institution. Second, the Board should deny institution under 35 U.S.C. § 325(d) because Petitioner relies on “the same or substantially the same prior art or arguments” previously presented to the Office during prosecution. 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. MED-EL Elektromedizinische Gerate GmbH*, IPR2019-01469, Paper 6 at 7 (P.T.A.B. Feb. 13, 2020) (precedential).

A. The *Fintiv* factors favor denying institution.

Under § 314(a), the Board has discretion to deny institution when there is a parallel district court proceeding. In considering whether to exercise discretion, the Board balances six factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Fintiv, IPR2020-00019, Paper 11 at 5-6. In evaluating the factors, the Board takes “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* at 6.

Patent Owner asserted the ’505 Patent against Petitioner in *Textron Innovations Inc. v. SZ DJI Tech. Co., Ltd. et al.*, Case No. 2:22-CV-00351-RWS-RSP (E.D. Tex.) (complaint filed September 9, 2022) (“the district court litigation”).

In view of the advanced nature of this parallel litigation, discretionary denial under *Fintiv* is warranted.

1. Factor 1 Favors Denial or is Neutral (Likelihood of a Stay)

Petitioner has requested a stay in the district court litigation, but there is no evidence indicating that the stay will be granted as the court has a “universal” practice to deny pre-institution stays. EX2001; EX2002 at 2-3. Indeed, neither Judge Schroeder nor Judge Payne, who are assigned to the district court litigation, appear to have granted any contested pre-institution stays. EX2003; EX2004. The likelihood of any post-institution stay is similarly slim. EX2005; EX2006. Absent evidence indicating a stay is likely, this factor weighs in favor of discretionary denial or, at a minimum, is neutral. *See, e.g., Mylan Labs. Ltd. v. Janssen Pharmaceutica NV*, IPR2020-00440, Paper 17 at 13-14 (P.T.A.B. Sept. 16, 2020) (this factor “leans towards denial of institution[]” where the facts “indicate that no stay is likely to be entered”); *Sand Revolution II, LLC v. Cont’l Intermodal Grp.-Trucking LLC*, IPR2019-01393, Paper 24 at 7 (P.T.A.B. June 16, 2020) (without “specific evidence” of whether a stay would be granted, this factor is neutral).

2. Factor 2 Strongly Favors Denial (Timing of Trial)

An institution decision is expected no later than March 18, 2024 and, if this proceeding is instituted, a final written decision is expected in March 2025. Trial in the district court litigation is scheduled for July 2024—a few months after the

expected date for an institution decision and approximately eight months before the final written decision due date. Paper 5; EX2007.

This factor therefore “weighs heavily” in favor of denial. *See, e.g., Zhuhai Cosmx Battery Co., Ltd. v. Ningde Ampere Tech. Ltd.*, IPR2023-00585, Paper 12 at 12-13 (P.T.A.B. Oct. 24, 2023) (“A trial date about eight or nine months before our statutory due date weighs heavily in favor of discretionary denial.”); *Samsung Elecs. Co., Ltd. v. Cal. Inst. of Tech.*, IPR2023-00130, Paper 10 at 16 (P.T.A.B. May 4, 2023) (denying institution where the final decision would be eight months after trial); *Roku, Inc. v. IOENGINE, LLC*, IPR2022-01553, Paper 11 at 10-11 (P.T.A.B. May 5, 2023) (denying institution where the final decision would be seven months after trial).

Nothing indicates that the litigation is departing from the scheduled July 2024 trial date. The most recent trial statistics indicate a median time-to-trial for civil cases is 16.7 months. EX2008, 35. This would place trial around February 2024, which is even earlier than the scheduled trial date, indicating the scheduled date is conservative and will be maintained.

3. Factor 3 Strongly Favors Denial (Investment in Parallel Proceedings)

Both Petitioner and Patent Owner will have invested significantly and expended considerable resources in the district court litigation by the time the Board

issues a decision on institution. *Fintiv*, IPR2020-00019, Paper 11 at 9 (this factor considers work completed at the time of the institution decision). The Board is projected to issue a decision on institution by March 18, 2024. By that time, the parties will have fully briefed, argued, and obtained claim constructions. EX2007, 3-4. Fact discovery will be complete. *Id.* at 3 (deadline is February 26, 2024). Completion of expert discovery will be approximately two weeks away. *Id.* Document production will be substantially completed. *Id.* Petitioner has already served invalidity contentions including the same combinations presented in the Petition. EX2009, 17-19, 54.

Accordingly, this factor heavily favors denying institution because the parties will have expended significant time and resources in the district court litigation, including work relevant to validity, claim construction, and fact discovery, before an institution decision. *See, e.g., Zhuhai Cosmox Battery*, IPR2023-00585, Paper 12 at 15 (“[T]his factor heavily favors denial of institution, because the district court proceeding has already advanced beyond fact discovery to the completion of initial expert reports.”); *Fintiv*, IPR2020-00019, Paper 15 at 13-14 (P.T.A.B. May 13, 2020) (finding this factor favored discretionary denial where the parties had fully briefed claim construction, conducted the *Markman* hearing, and exchanged both initial and final infringement and invalidity contentions—“including detailed

invalidity claim charts addressing the prior art cited in th[e] Petition[]”—despite fact discovery being in its early stages).

4. Factor 4 Strongly Favors Denial (Overlap of Issues)

The Petition challenges all claims of the '505 Patent asserted in the district court litigation (Claims 1-20). EX2009, 1; Petition, 1-2. Moreover, in the district court litigation, Petitioner is challenging *all of the asserted claims* using the *same references* and *same grounds* raised in the Petition. EX2009, 1, 17-19, 25, 53-54 (combination “20” alleging obviousness over “Gold ’812” “Alone or in Combination With One or More of” Skonieczny (“203”) and “Adams (“962”)”). Institution would therefore result in a high likelihood of inconsistent results and be inefficient, with the parties, Board, and district court all analyzing the same issues. It is well settled that this factor weighs strongly in favor of discretionary denial in these circumstances. *See, e.g., Fintiv*, IPR2020-00019, Paper 11 at 12 (“[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial[,]” because “concerns of inefficiency and the possibility of conflicting decisions [are] particularly strong.”); *Resmed Corp v. Cleveland Med. Devices, Inc.*, IPR2023-00565, Paper 13 at 13-15 (P.T.A.B. Sept. 25, 2023) (“Given the overlap in claims, prior art, and arguments between this IPR and the district court, we have concerns regarding duplicative efforts and potentially conflicting positions[.]”).

Additionally, Petitioner has not offered any stipulation (*Sotera* or otherwise) or taken any other actions to mitigate the duplicative challenges. For at least these additional reasons, this factor weighs strongly in favor of discretionary denial. *See, e.g., Resmed*, IPR2023-00565, Paper 13 at 14-15 (“Petitioner could have expressly waived in district court any overlapping patentability or invalidity defenses but chose not to. Given the facts here, this factor weighs in favor of exercising discretion to deny institution.”); *Apcon, Inc. v. Gigamon Inc.*, IPR2020-01579, Paper 9 at 26 (P.T.A.B. Mar. 16, 2021) (finding this factor favored denial where the art was substantially the same and no stipulation had been made by the petitioner).

5. Factor 5 Strongly Favors Denial (Overlapping Parties)

Patent Owner is the plaintiff in the district court litigation. EX2007, 1. The named defendants in the litigation include Petitioner as well as a number of the real parties-in-interest identified in the Petition. EX2007, 1; Petition, 92. “Because the petitioner and the defendant in the parallel proceeding are the same party, this factor weighs in favor of discretionary denial.” *Fintiv*, IPR2020-00019, Paper 15 at 15.

6. Factor 6 Strongly Favors Denial (Other Circumstances)

This factor is “a catch-all that takes into account any other relevant circumstances[,]” including “strengths or weaknesses” of the parties’ arguments. *Samsung Elecs. Co., Ltd. v. Clear Imaging Rsch., LLC*, IPR2020-01401, Paper 12 at 23 (P.T.A.B. Feb. 17, 2021).

Petitioner did not address *Fintiv* other than providing a cursory argument that the Petition presents a “compelling unpatentability challenge” and reserving its right to offer a stipulation “should Patent Owner raise discretionary denial under *Fintiv* in its preliminary response[.]” Petition, 91-92. Petitioner’s chosen strategy is problematic for multiple reasons and favors denial.

Petitioner’s allegation that its petition “presents a compelling unpatentability challenge” is undercut not only by the fatal deficiencies identified below (*see* Sections IV-V), but also the Director’s precedential opinion in *Commscope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 (P.T.A.B. Feb. 27, 2023) (Director Review Decision) (precedential). Under *Commscope*, the Board “should first assess *Fintiv* factors 1-5” and “if that analysis supports discretionary denial, the Board should engage the compelling merits question.” *Id.* at 6. Petitioner did not address *Fintiv* factors 1-5. Its compelling challenge argument is therefore improper and carries no weight.

And as a broader issue, Petitioner’s chosen strategy is an example of the “inefficiency and gamesmanship” the Director intended to eliminate in the *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation Memorandum* (June 21, 2022). EX2011 at 1. Petitioner had good reason to expect the preliminary response would address discretionary denial under *Fintiv* in view of the July 2024 trial date and advanced stage of

litigation, and because Petitioner waited until close to the statutory deadline to file its petition. Petitioner apparently recognized this by expressly “reserv[ing] the right to offer a stipulation” to “mitigate or foreclose *Fintiv* discretionary denial[.]” Petition, 92. But within the current context, premising an offer of stipulation on whether “PO raise[s] discretionary denial under *Fintiv* in its preliminary response” feigns ignorance on the issue. As such, this inefficient, gamesmanship strategy—apparently so that Patent Owner must expend a significant portion of its word count to address *Fintiv* even though Petitioner apparently intends to offer a stipulation to mitigate or foreclose the issue after the preliminary response is filed—weighs in favor of discretionary denial at least for fairness and efficiency reasons. Should Petitioner request authorization to address *Fintiv* with a more complete analysis after the filing of this preliminary response, such a request should be denied for analogous reasons.

* * * * *

In sum, the *Fintiv* factors strongly weigh in favor of discretionary denial. The Board should therefore exercise its discretion to deny institution.

B. The Board should deny institution under 35 U.S.C. § 325(d)

The Board should also deny institution because U.S. Patent No. 5,553,812 to Gold et al. (“Gold”) is substantially the same as, and cumulative of, Piasecki, which the Examiner considered during prosecution of the ’505 Patent. DJI-1002, 38-39.

During prosecution the Examiner rejected all claims as allegedly anticipated by Piasecki. DJI-1002, 38. In response, the applicant amended the independent claims to recite “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading.” DJI-1002, 23. In response to this amendment, the Examiner allowed the claims over Piasecki. DJI-1002, 16.

In this proceeding, Petitioner relies on Gold as the primary reference for each of the Petition’s three grounds. In particular, Ground 1 presents a single-reference obviousness ground relying solely on Gold as allegedly disclosing every element of Claims 1 and 11, the only challenged independent claims. The relied-upon disclosures in Gold, however, are substantially the same as, and cumulative of, the disclosures in Piasecki that the Examiner considered and determined failed to disclose “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as recited in Claims 1 and 11. Because Petitioner has not shown error in the Examiner’s decision to allow the claims over Piasecki, the Board should deny institution under 35 U.S.C. § 325(d).

1. Legal Standard

Advanced Bionics established a two-part framework for evaluating whether to deny institution under 35 U.S.C. § 325(d). IPR2019-01469, Paper 6 at 8. The first inquiry is whether “the same or substantially the same” art or arguments were previously presented to the Office. *Id.* Prior art or arguments are “substantially the

same” where the art is “cumulative to or substantially overlap[s] with issues previously considered by the Office with respect to the patent.” *Ziegmann N.P.Z., Inc. v. Stephens*, IPR2015-01860, Paper 13 at 8 (P.T.A.B. Sept. 6, 2017).

If either condition of the first inquiry is satisfied, the second inquiry concerns “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8. Where, as here, “a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute[.]” *Id.* at 8-9. “If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.” *Id.* at 9.

The Board considers several non-exclusive factors in applying the *Advanced Bionics* framework. *See Gator Bio, Inc. v. Sartorius Bioanalytical Instruments, Inc.*, IPR2023-00215, Paper 19 at 7-8 (P.T.A.B. June 20, 2023). Those factors include:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

(d) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art or patent owner distinguishes the prior art;

(e) whether petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments.

See id. (citing *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (P.T.A.B. Dec. 15, 2017) (precedential as to Section III.C.5, first paragraph) (“*Becton, Dickinson*”). *Becton, Dickinson* factors (a), (b), and (d) relate to whether the art or arguments in the Petition are the same or substantially the same as those previously presented to the Office. *Id.* at 8. Factors (c), (e), and (f) relate to whether a petitioner has demonstrated material error. *Id.* “At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 9.

2. The Petition relies on the same or substantially the same art previously presented to the Office.

Ground 1 alleges that independent Claims 1 and 11 are obvious over Gold. Petition, 2. The Petition’s analysis, however, relies on substantially the same disclosures in Gold as those found in Piasecki, without identifying any material differences among Gold’s and Piasecki’s disclosures.

a. The relied-upon disclosures in Piasecki

When the application leading to the '505 Patent was filed, Claim 1 recited:

1. A control system for an aircraft, comprising:
a lateral control architecture configured to control lateral motion of the aircraft;
and
a longitudinal control architecture configured to control longitudinal motion of the aircraft;
wherein the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface.

DJI-1002, 168. In a non-final office action dated July 17, 2013, the Examiner rejected Claim 1 as allegedly anticipated by Piasecki. DJI-1002, 38-39. Piasecki relates to “a control system for a compound aircraft.” DJI-1013, ¶0003. The Examiner mapped the claimed “lateral control architecture” and “longitudinal control architecture” to items 74 and 72 in Piasecki’s Figure 5 below, which illustrates “a schematic representation of information flow through the control system of the Invention.” DJI-1002, 38; DJI-1013, ¶0031.

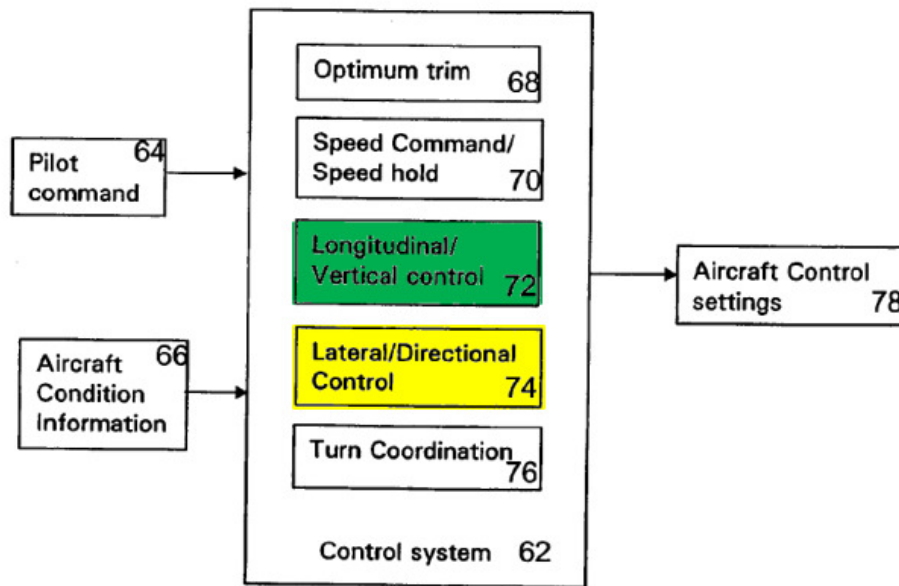


Fig. 5

DJI-1013, Fig. 5 (annotated). Piasecki's "lateral/directional control system 74" is configured to control roll while the "longitudinal/vertical control subsystem" is configured to control pitch. *See* DJI-1013, ¶¶0091, 0065. Piasecki's control system 62 (including both the longitudinal/vertical control 72 and lateral/directional control 74) receive "a pilot command 64" and "aircraft condition information 66" that is "generated by sensors[.]" DJI-1013, ¶0052. The control system uses this information to "determine the appropriate aircraft control settings 78 to accomplish the pilot command 64 and transmits those control settings 78 to the appropriate actuators[.]" DJI-1013, ¶0053.

With respect to the last limitation of as-filed Claim 1, “wherein the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface,” the Examiner identified Piasecki’s disclosure including “at least figures 5-7, 10, 11 and the related text[.]” DJI-1002, 38-39. The identified portions of Piasecki, in part, describe the operation of the lateral/directional control subsystem 74, which takes as an input a pilot “commanded yaw rate.” DJI-1013, ¶¶0090-92; *see also* DJI-1013, ¶0045 (describing that a “pilot operates control inceptors 36” including “*pedal yaw control*”). In relevant part, Piasecki describes:

The lateral/directional control system 74 uses a model following/model inversion architecture. The model and the control subsystem 74 are configured to achieve attitude command/attitude hold in a roll so that the aircraft will respond to a command to achieve a desired roll and roll rate and will hold a selected roll angle. **The model and the control subsystem 74 also are configured to achieve rate command heading/heading hold in yaw, so that the aircraft will achieve a commanded yaw rate and will hold a specified yaw angle in flight.**

DJI-1013, ¶0091. Thus, the Examiner relied on Piasecki’s disclosure describing that, in response to a yaw command by a pilot, the aircraft will achieve a commanded yaw rate and will hold a specified yaw angle in flight. The Examiner relied on the same disclosure in Piasecki as allegedly anticipating as-filed Claim 11. *See* DJI-

1002, 39 (“[C]laims 11-20 are rejected for the same rationales set forth for claims 1-10.”).

In response to the non-final office action, the applicant filed a response amending independent Claims 1 and 11 to further recite “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading.” DJI-1002, 23, 11. The Examiner subsequently allowed the claims. DJI-1002, 16. The Examiner did not provide reasons for allowance. DJI-1002, 16. However, because the Examiner allowed the claims in response to the amendment, it is reasonable to conclude that the Examiner determined that the limitation involving “the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” was not taught by Piasecki’s disclosure of using its lateral/directional control architecture 74 to achieve rate command heading/heading hold in yaw, so that the aircraft will achieve a commanded yaw rate and will hold a specified yaw angle in flight.

b. Gold’s disclosure is substantially the same as the relied-upon disclosures in Piasecki.

Petitioner relies on substantially the same disclosures in Gold as those in Piasecki relied upon by the Examiner. For the claimed “lateral control architecture,” Petitioner relies on Gold’s disclosure of roll control modules that, similar to Piasecki, receive a pilot command and data from sensors in order to generate command signals

that control the roll (lateral motion) of the aircraft. *See* Petition, 25-27 (citing DJI-1005, 3:17-18, 3:45-46, 3:10-13; 3:40-42, 2:25-29, Fig. 3). For the claimed “longitudinal control architecture,” Petitioner relies on Gold’s disclosure of pitch control modules that, similar to Piasecki, receive a pilot command and data from sensors in order to generate commands that control the pitch (longitudinal motion) of the aircraft. *See* Petition, 21-23 (citing DJI-1005, 3:10-13, 3:40-42, 2:25-29, Fig. 3). A comparison of Piasecki’s Figure 5 side-by-side with Petitioner’s annotated version of Gold’s Figure 3 demonstrates the substantial similarity of Piasecki’s and Gold’s control systems as it relates to the relevant claim limitations.

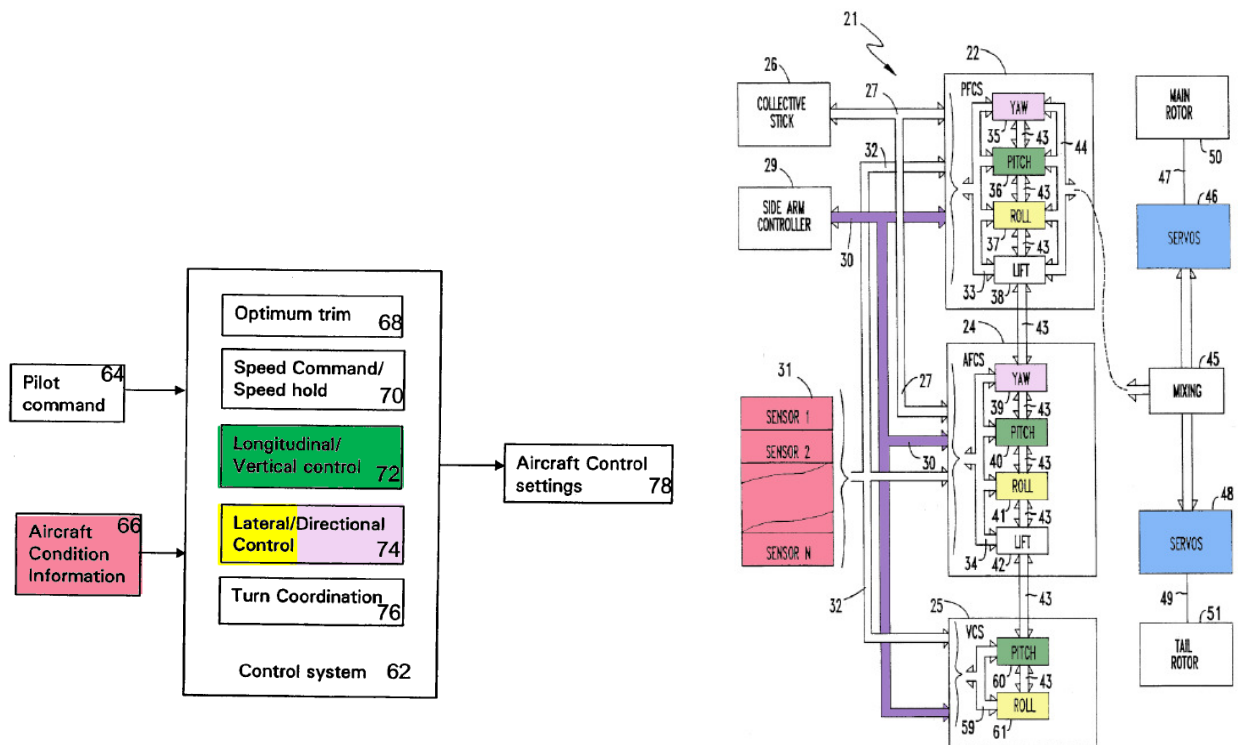


Fig. 5

Gold, Annotated Figure 3

DJI-1013, Fig. 5 (annotated); Petition, 18. Petitioner identifies no material differences between Piasecki's and Gold's control systems as it relates to the claimed lateral and longitudinal control systems.

With respect to the claim limitation “wherein the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface,” the Petition relies on Gold's disclosure related to control modules for controlling yaw. Petition, 30 (citing DJI-1005, 3:17-18). In particular, the Petition relies on Gold's disclosure that in response to a yaw command, “the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a.” Petition, 33 (citing DJI-1005, 2:60-64). This is substantially the same as the disclosure in Piasecki, relied upon by the Examiner, describing that “[t]he model and the control subsystem 74 also are configured to achieve rate command heading/heading hold in yaw, so that the aircraft will achieve a commanded yaw rate and will hold a specified yaw angle in flight.” DJI-1013, ¶0091. Again, Petitioner identifies no material differences between the disclosures in Piasecki and Gold as it relates to this limitation of Claim 1.

Most notably, the Petition relies on this same disclosure in Gold—that the aircraft yaws while maintaining a constant flight path—as allegedly disclosing “wherein the aircraft continuously moves in a yaw direction while maintaining the

constant vector heading.” Petition, 35-36. This is substantially the same as the disclosure in Piasecki regarding achieving a commanded yaw rate and holding a specified yaw angle in flight. DJI-1013, ¶0091. But, as reflected by the notice of allowance issued after this limitation was added by amendment, the Examiner concluded that maintaining a yaw angle while in flight, as described in Piasecki and Gold, is insufficient to teach “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as claimed.

Petitioner fails to identify any material difference between the disclosures in Piasecki and Gold that would justify revisiting the Examiner’s determination. Rather, the Petition asserts in conclusory fashion that this limitation “encompasses an aircraft continuously moving in a yaw direction until a commanded (desired) yaw angle is achieved by the aircraft while the aircraft maintains its constant ground track.” Petition, 35-36. But nowhere does the Petition explain why that allegedly is the case or address the Examiner’s determination that such teachings are insufficient to disclose or otherwise render obvious “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as recited in Claims 1 and 11.

Thus, *Becton*, *Dickinson* factors (a) and (b) weigh in favor of a finding that Gold is substantially the same as, and cumulative of, Piasecki. As shown above, there are substantial similarities between the relied-upon disclosures in Gold and the

disclosures in Piasecki, and the Petition identifies no material differences between the two. Thus, Gold is cumulative of Piasecki. And, with respect to *Becton, Dickinson* factor (d), there is significant overlap between the examiner's arguments based on Piasecki and the manner in which Petitioner relies on Gold. Both the Examiner and Petitioner relied upon lateral (roll in Gold) and longitudinal (pitch in Gold) control modules and their use together with directional/yaw control to achieve a commanded yaw rate and maintain a yaw angle in flight. Accordingly, the first part of the *Advanced Bionics* framework is satisfied.

3. The Petition has not shown material error.

The second prong of the *Advanced Bionics* analysis favors the Board exercising its discretion to deny institution. This analysis concerns *Becton, Dickinson* factors (c), (e), and (f). *Gator Bio, Inc.*, IPR2023-00215, Paper 19 at 8. Each factor weighs in favor of denying institution. With respect to factor (c), the extent to which the asserted art was evaluated during examination, the Examiner expressly relied on Piasecki to reject the as-filed claims. DJI-1002, 38-39. Despite being well aware that Piasecki was the only reference applied in a rejection during prosecution (Petition, 14-15), the Petition does not address the *Advanced Bionics* framework in its discretionary denial analysis. Petition, 91-92. At most, with respect to the “continuously moves” limitation that was added immediately prior to allowance, the Petition argues that “the concept of an aircraft continuously moving

in a yaw direction while maintaining a constant ground track was known and disclosed by Gold[.]” Petition, 91. But the Petition fails to explain why Gold’s disclosure that an aircraft yaws while maintaining a constant flight path (DJI-1005, 2:60-64) is materially different from Piasecki’s disclosure that its control system is configured to achieve rate command heading/heading hold in yaw, so that the aircraft will achieve a commanded yaw rate and will hold a specified yaw angle in flight (DJI-1013, ¶0091). The Petition also fails to identify any error in the Examiner’s determination that such disclosure fails to teach “the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as recited in Claims 1 and 11. Thus, *Becton, Dickinson* factor (e) also weighs in favor of denying institution.

The Petition fails to present additional evidence or facts that warrant revisiting the validity of the challenged claims based on substantially the same disclosures that the Examiner found insufficient to render the challenged claims obvious during prosecution. Ground 1 is a single-reference obviousness combination based on Gold. Grounds 2-3 add additional secondary references, but none is relied-upon for the limitations of the independent claims. The declaration of Petitioner’s expert, Dr. Singhose, merely parrots the Petition’s analysis for the independent claims. Thus, *Becton, Dickinson* factor (f) also favors exercising discretion to deny institution.

Accordingly, because Petitioner has not shown material error in the Examiner's determination to allow the claims over Piasecki, there is no reason to revisit the validity of the challenged claims in view of the substantially similar and cumulative disclosures in Gold. The Board should therefore exercise its discretion to deny institution.

IV. CLAIM CONSTRUCTION

The Board should deny institution because Petitioner has not met its burden under 37 C.F.R. § 42.104(b)(3)-(4) to set forth “how the challenged claim is to be construed” and “how the construed claim is unpatentable[.]” The Petition states that “Petitioner does not believe any claims require construction” and purports to apply “the plain and ordinary meaning for each term in the challenged claims.” Petition, 17. In the district court litigation, however, Petitioner proposes constructions for multiple claim terms that it failed to even raise in the Petition, let alone apply those constructions to the prior art relied upon in Grounds 1-3.¹ EX2010, 9-11. Moreover, Petitioner purports to apply one “plain and ordinary meaning” interpretation for certain terms in this proceeding, while advancing a materially different “plain and

¹ Patent Owner's citation of Petitioner's district court claim constructions and related expert testimony does not mean that Patent Owner agrees with Petitioner's positions.

ordinary meaning” interpretation in the district court to argue certain claims are indefinite.

It was Petitioner’s burden, however, to articulate *in the Petition* not only how the challenged claims should be construed, but also how the prior art renders the construed claims unpatentable. *See* 37 C.F.R. § 42.104(b)(3)-(4). Moreover, patent claims should be construed consistently for purposes of validity and infringement. *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) (“A patent may not, like a ‘nose of wax,’ be twisted one way to avoid anticipation and another to find infringement.”). The Board should not countenance Petitioner’s attempt to broadly interpret claim terms in this proceeding while at the same time advancing narrowing constructions and materially different “plain and ordinary meaning” interpretations in the district court in an attempt to avoid infringement or support its indefiniteness arguments. Petitioner’s conduct is particularly egregious given that the claim construction standards are the same in both proceedings. *See* 37 C.F.R. § 42.100(b).

As discussed further below and in the context of responding to the Petition’s obviousness grounds, the constructions Petitioner proposes in the district court materially impact the theories of unpatentability presented in the Petition. Because Petitioner fails to show how the challenged claims are unpatentable under its district court constructions, the Board should deny institution.

A. “continuously moves in a yaw direction while maintaining the constant vector heading”

In the district court litigation, Petitioner originally argued that the phrase “continuously moves in a yaw direction,” which appears in independent Claims 1 and 11, should be construed to mean “rotates around the yaw axis without stopping until it reaches a predetermined yaw angle.” EX2010, 10. The parties have since agreed that the plain and ordinary meaning of the phrase is “rotates around the yaw axis ... until it reaches a desired yaw angle.” Nevertheless, Petitioner maintains that, in the district court, the phrase should be construed as “rotates around the yaw axis *without stopping* until it reaches a desired yaw angle.” The Petition did not identify this phrase for construction or, as discussed in detail below, articulate how Gold, relied upon in Ground 1 as allegedly rendering Claims 1 and 11 obvious, teaches the limitation under Petitioner’s proposed construction. Petition, 35-36.

Moreover, Petitioner has proposed two materially *different* plain and ordinary meaning interpretations for the phrase “continuously moves in a yaw direction while maintaining the constant vector heading” in this proceeding and the district court. In this proceeding, the Petition argues that “the ‘*constant vector heading across a ground surface*’ is the straight-line track or course of the aircraft and an ‘*aircraft maintain[ing] a constant vector heading across a ground surface*’ means the aircraft flies over the ground in a particular straight-line direction (i.e., the ground

track or course) at a constant speed.” Petition, 29. In the district court, however, Petitioner relies on expert testimony arguing that “a ‘constant vector heading,’ under its plain and ordinary meaning, would refer to the movement of an aircraft at a constant heading, *which is in the direction the nose is pointed*, and at a constant groundspeed.” EX2012, ¶42 (emphases added). As detailed below, Petitioner’s differing interpretations of the “plain and ordinary meaning” of these terms materially impacts the theories of unpatentability in the Petition because Petitioner would not have been able to rely on Gold as teaching this limitation had the Petition applied its district court plain and ordinary meaning interpretation in this IPR. *Infra*, §V.B.2.

B. “flat yaw movement of the aircraft” / “constant vector flat turn”

Claim 11 recites “selectively controlling **flat yaw movement of the aircraft** while maintaining a **constant vector flat turn** relative to a ground surface.” DJI-1001, 9:20-22. Petitioner offered no construction for the above-emphasized terms in this proceeding. Petition, 17. In the related litigation, however, Petitioner proposes that “flat yaw movement of the aircraft” should be construed as “rotation around the yaw axis *without pitching or rolling*” and “constant vector flat turn” should be construed as “movement along a flight path with a fixed speed and fixed direction while rotating around the yaw axis *without pitching or rolling*.” EX2010, 10-11. As explained below, Petitioner’s different interpretations materially impact

the Petition’s theory of unpatentability because the Petition concedes that the yaw movement relied upon in Gold as allegedly disclosing this limitation is not performed “without pitching and rolling.” Petition, 42.

V. THE PETITION FAILS TO SHOW A REASONABLE LIKELIHOOD THAT ANY OF THE CHALLENGED CLAIMS ARE UNPATENTABLE

The two independent claims, Claims 1 and 11, are challenged in Ground 1 as allegedly obvious over Gold. Institution should be denied because the Petition fails to show that Gold discloses or otherwise renders obvious every element of independent Claims 1 and 11. As discussed above, Petitioner has offered narrowing constructions for elements of Claims 1 and 11 in the related district court proceeding, but the Petition fails to identify how Gold allegedly discloses these limitations under Petitioner’s proposed constructions. Moreover, the Petition obfuscates deficiencies in Gold’s disclosure by essentially rewriting the claim language in its analysis. Accordingly, the Board should deny institution because Petitioner fails to show a reasonable likelihood that any of the challenged claims are unpatentable.

A. Overview of Cited Art

1. Overview of *Gold*

Gold is titled “Inertial Velocity Command System.” DJI-1005, Title. Gold describes “a velocity command system having an inertial reference which allows a pilot to yaw the aircraft during operation in a velocity stabilization mode without changing the flight path of the aircraft with respect to the inertial reference.” DJI-

1005, 1:9-14. Gold purports to have improved upon existing designs for velocity stabilization (velocity hold) modes. According to Gold, with existing systems “the automatic flight control system maintains the aircraft’s body referenced velocities constant during operation in the velocity hold mode.” DJI-1005, 1:17-21. “However, during operation in an aircraft body referenced velocity hold mode, the aircraft flight path will change in response to a pilot yaw input.” DJI-1005, 1:31-34.

Gold purports to provide “an improved aircraft velocity command system having an inertial frame of reference.” DJI-1005, 1:48-50. In Gold, “operation in the velocity stabilization mode is provided in response to the manual activation of the velocity stabilization mode by the pilot[.]” DJI-1005, 2:3-8. In response to a yaw command by a pilot during operation in the velocity stabilization mode, the aircraft yaws while maintaining a constant flight path reference velocity with respect to an inertial frame of reference. DJI-1005, 2:58-64.

B. Petitioner fails to show independent Claim 1 would have been obvious in view of Gold.

At least because the Petition fails to consistently construe the claims and has not shown that Gold discloses every element of independent Claim 1, the Petition has not established a reasonable likelihood of success on the merits.

1. The Petition fails to show that Gold discloses or otherwise renders obvious controlling yaw movement as recited in limitation [1C].

The Petition has not shown that Gold discloses or otherwise renders obvious “wherein the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface” as recited in limitation [1C] of Claim 1.² Accordingly, the Petition has not established a reasonable likelihood of success in demonstrating that Claim 1 is unpatentable over Gold. *See CFMT, Inc. v. Yieldup Int’l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (“obviousness requires a suggestion of all limitations in a claim”) (citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974)).

As an initial matter, the thrust of Petitioner’s argument for limitation [1C] is one of written description, not obviousness. The Petition does not actually allege that Gold discloses limitation [1C]. Rather, the Petition includes a conclusory assertion that “the ’505 patent provides no support for utilizing the lateral and longitudinal control architectures to control yaw movement of the aircraft.” Petition, 29. Then, based on one sentence in the specification, Petitioner rewrites the claim

² Consistent with the Petition’s notations, Patent Owner refers to this element of Claim 1 as “limitation [1C].” Petition, 29-30.

language as allegedly encompassing “the interworking between the yaw (directional) control architecture and the lateral and longitudinal control architectures to accomplish the functions of (1) performing a yaw maneuver and (2) maintaining a constant straight-line track at a specific speed during the yaw maneuver.” Petition, 29-30 (citing DJI-1001, 7:2-3). The Petition then purports to show how Gold allegedly discloses limitation [1C] as it has been rewritten by Petitioner. Petition, 30-34. This is insufficient to show a reasonable likelihood of success on the merits.

Petitioner’s thinly veiled §112 argument based on alleged lack of written description is improper. Theories of unpatentability based on lack of written description cannot be raised in an IPR. *See, e.g.*, 35 U.S.C. § 311(b) (permitting only grounds “that could be raised under section 102 or 103”); *Dexcowin Global, Inc. v. Aribex, Inc.*, IPR2016-00436, Paper 12 at 5 (P.T.A.B. July 7, 2016) (petitioners are “not permitted to assert a ground of unpatentability under 35 U.S.C. § 112.”). To the extent Petitioner contends the ’505 Patent lacks written description support for the control system utilizing the lateral and longitudinal control architectures to control yaw movement, that is an argument for the district court. It is not a license to rewrite the claim language to suit Petitioner’s art.

Moreover, the Petition fails to support its assertion that limitation [1C] should be interpreted as “encompass[ing] the interworking between the yaw (directional)

control architecture and the lateral and longitudinal control architectures to accomplish the functions of (1) performing a yaw maneuver and (2) maintaining a constant straight-line track at a specific speed during the yaw maneuver” as alleged. Petition, 30. The Petition does not propose a construction for limitation [1C]. Rather, the Petition purports to apply the “plain and ordinary meaning” (Petition, 17) but never attempts to explain how the redefined scope the Petition proposes is the plain and ordinary meaning of the language in limitation [1C].

The Petition also fails to explain how the intrinsic record supports its interpretation. The Petition quotes a single sentence of the specification stating that “the control laws will maintain a constant ground vector by using the Long_SPD 605 and the Lat_SPD 707 loops,” but provides no argument or explanation as to why this lone statement justifies interpreting limitation [1C] in a manner other than according to its plain language. Petition, 29-30. Rather, the Petition simply assumes that because the lateral and longitudinal control architectures are involved in “maintaining a constant vector track” then “[a]ccordingly” limitation [1C] encompasses what the Petition alleges. Petition, 30.

The Petition’s conclusory and underdeveloped analysis regarding how limitation [1C] should be interpreted is insufficient to meet its burden under 37 C.F.R. §§ 42.104(b)(3)-(4). Petitioner has an obligation to explain, in the Petition, “[h]ow the challenged claim is to be construed” and “[h]ow the construed claim is

unpatentable.” 37 C.F.R. §§ 42.104(b)(3)-(4). Here, Petitioner purports to apply the plain and ordinary meaning of the claim language while at the same time effectively rewriting that language to support its obviousness analysis. Regardless of how one views the Petition’s analysis, it is deficient. On the one hand, and as discussed further below, the Petition’s analysis fails to show that Gold’s control system utilizes its alleged lateral and longitudinal control architectures “to control yaw movement” according to the plain language of Claim 1. On the other hand, the Petition fails to adequately support its apparent position that limitation [1C] should be interpreted in a way that does not require Petitioner to show that Gold’s control system utilizes its alleged lateral and longitudinal control architectures “to control yaw movement.”

The Petition’s contention that “the ’505 patent provides no support for utilizing the lateral and longitudinal control architecture to control yaw movement of the aircraft” also strains credulity. Petition, 29. The Petition identifies the ’505 Patent’s disclosure that “the control laws will maintain a constant ground vector by using the Long_SPD 605 and the Lat_SPD 707 loops.” Petition, 29-30 (citing DJI-1001, 7:2-3). The Petition omits, however, that the immediately preceding portion of the specification provides an example of how the control system utilizes the lateral and longitudinal control architectures to control yaw movement. *See* DJI-1001, 6:63-7:2. Specifically, the ’505 Patent describes:

In the absence of lateral or directional control inputs while operating in either the GCBT or CVFT envelopes, the directional axis will hold heading through the Dir_HDG 805 loop. **If the pilot moves the directional controller out of detent in the CVFT envelope with both the lateral and longitudinal controllers in detent, the directional control laws will command a yaw rate through the Dir_RATE 803 loop.** In this case, the control laws will maintain a constant ground vector by using the Long_SPD 605 and the Lat_SPD 707 loops.

DJI-1001, 6:63-7:4. In other words, whether the directional control laws will command a yaw rate (i.e., control yaw movement) depends on whether the lateral and longitudinal controllers are in detent. DJI-1001, 6:63-7:4. This information—whether the lateral and longitudinal controllers are in detent—comes from the lateral and longitudinal control architectures, respectively.

Embodiments disclosed in the '505 Patent teach that the lateral and longitudinal controllers are part of the lateral and longitudinal control architectures, respectively. For example, Figure 6 below depicts “architecture 601 of the CVFT control system operably associated with one or more longitudinal control laws[.]” DJI-1001, 4:45-47. Architecture 601 includes “a longitudinal command 613 generated in the control laws by referencing the pilot’s cockpit control input in each axis. The input to the control laws is the difference between the controller’s present position and the centered, no force position, which is also referred to as the ‘detent’ position.” DJI-1001, 5:20-25.

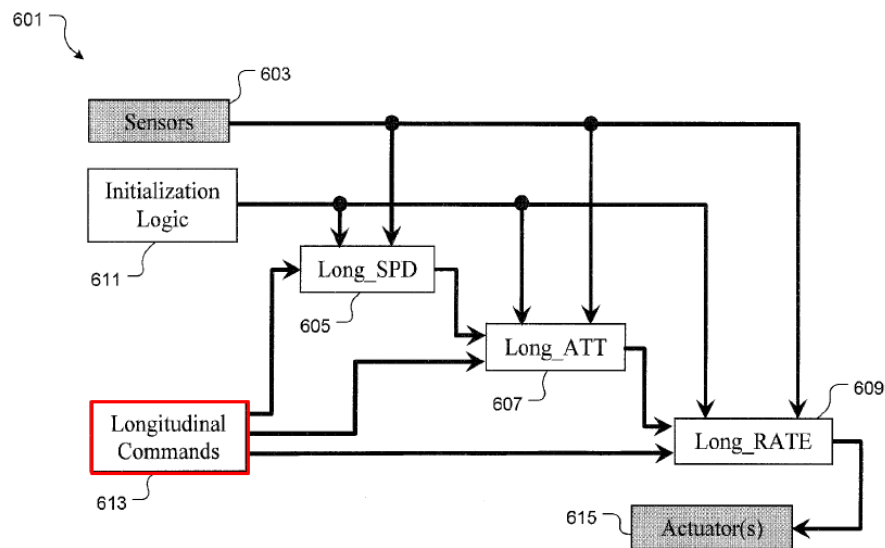


FIG. 6

DJI-1001, Figure 6 (annotated); *see also* DJI-1001, 9:1-3 (“the longitudinal control architecture further comprising: a longitudinal controller”).

Figure 7, meanwhile, “shows architecture 701 of the CVFT control system operably associated with one or more lateral control laws[.]” DJI-1001, 4:47-49. The lateral control architecture similarly comprises “lateral commands 702” generated in the control laws by referencing the pilot’s cockpit control input in the lateral axis. DJI-1001, 5:20-25, 5:53-56.

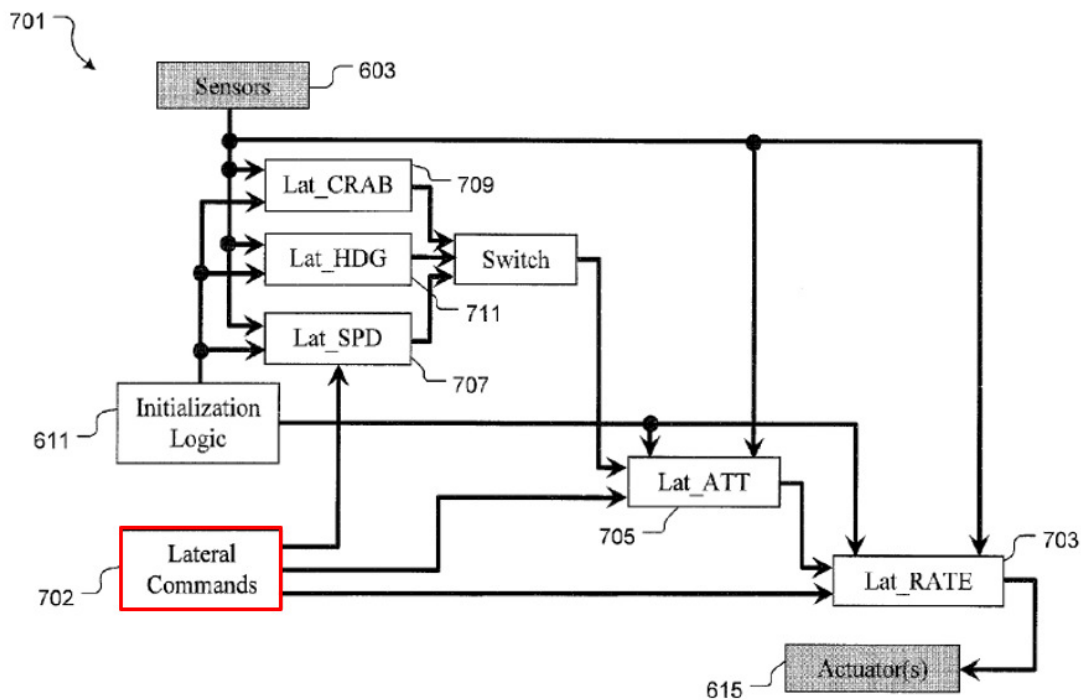


FIG. 7

DJI-1001, Figure 7 (annotated).

The control system of the '505 Patent monitors whether or not the longitudinal and lateral controllers (i.e., the source of the longitudinal and lateral commands 613, 702) are in detent. *See, e.g.*, DJI-1001, 5:45-47 (describing that “[w]hen flying with the longitudinal controller in detent outside of the Hover Hold/TRC region 105, depicted in FIG. 1, the Long_SPD 605 loop will be active.”); 6:17-20 (“If operating in the CVFT envelope, but not in the GCBT envelope, and the lateral and directional controllers are in detent, the control logic will hold sideward groundspeed constant with the Lat_SPD 707 loop.”). Thus, by describing a process for controlling yaw movement that “command[s] a yaw rate through the Dir_RATE 803 loop” if “both

the lateral and longitudinal controllers [are] in detent,” the ’505 Patent provides written description support for *utilizing* the lateral and longitudinal control architectures to control yaw movement of the aircraft.

The ’505 Patent also provides written description support for utilizing the lateral and longitudinal control architectures to control yaw movement *while the aircraft maintains a constant vector heading across a ground surface*. Figure 2 of the ’505 Patent, reproduced below, provides “an exemplary depiction of aircraft 201 turning 360 degrees while maintaining forward flight.” DJI-1001, 3:34-35. In the example of Figure 2, aircraft 201 is “traveling between 10 to 35 knots in a forward direction” (i.e., within the CVFT region of the flight envelope in Figure 1). DJI-1001, 3:1-4, 3:9-46. “Directional inputs turn aircraft 201 in a complete 360 degree yaw movement R1, stopping every 90 degrees, and without changing the speed and flight heading of aircraft 201, as represented with arrow D1.” DJI-1001, 3:12-15.

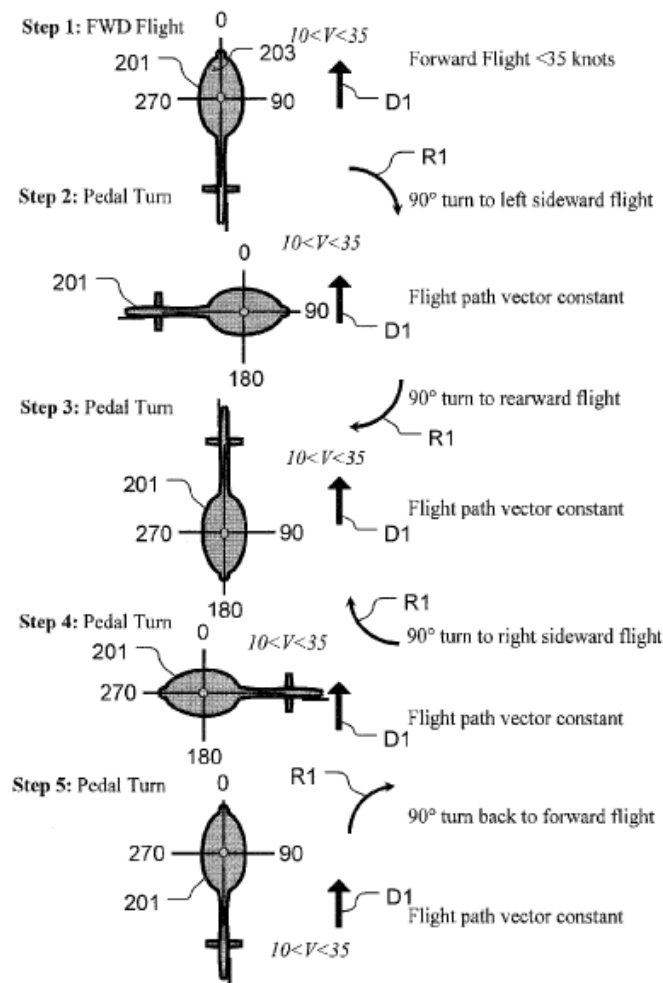


FIG. 2

DJI-1001, Figure 2.

More particularly, “Step 2 depicts the application of the control system, namely, the pilot utilizes the control system to rotate aircraft 201 in the clockwise direction approximately 90 degrees, as indicated by arrow R1.” DJI-1001, 3:37-41. In Figure 2, “each time the control system is utilized, aircraft 201 rotates 90 degrees while maintaining a constant forward heading.” DJI-1001, 3:43-46. As discussed

above, example embodiments of the '505 Patent disclose that the directional control laws command a yaw rate “[i]f the pilot moves the directional controller out of detent in the CVFT envelope with both the lateral and longitudinal controllers in detent[.]” DJI-1001, 6:66-7:2. Accordingly, the '505 Patent describes examples of how “the control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface” as recited in limitation [1C].

The Petition fails to address this disclosure of utilizing the lateral and longitudinal control architectures to control yaw movement in the '505 Patent and has not identified any corresponding disclosure in Gold. Moreover, even if the specification failed to provide written description support for limitation [1C]—which is incorrect for the reasons explained above—Petitioner fails to consider the fact that the claims of the '505 Patent were part of the as-filed claims in the application filed on December 11, 2012 that issued as the '505 Patent. DJI-1002, 168. The as-filed claims are self-supporting at least as of the December 11, 2012 filing date of the continuation application. *See, e.g., In re Gardner*, 480 F.2d 879, 879–80 (C.C.P.A. 1973) (“[W]e consider the original claim in itself adequate ‘written description’ of the claimed invention.”). In light of the above, there is no credible justification for Petitioner’s unilateral rewriting of the plain language of the claims to suit its obviousness challenge based on Gold.

It cannot reasonably be disputed that the Petition has not shown that Gold's control system utilizes lateral and longitudinal control architectures "to control yaw movement of the aircraft while the aircraft maintains a constant vector heading across a ground surface" as claimed. The Petition's analysis effectively concedes this point because it only addresses Petitioner's rewritten version of limitation [1C].

The Petition argues that Gold discloses Petitioner's rewritten version of limitation [1C] because "[i]n Gold, the command module for the yaw axis 'provides a desired yaw axis rate response, i.e., desired heading rate, on a line 145' to the lateral control module . . . and longitudinal control module . . . of the [velocity command system (VCS)]." Petition, 31. The Petition goes on to describe how the yaw axis rate response, along with desired attitude responses for the pitch and yaw axes, are purportedly used to develop centrifugal acceleration terms that are used by Gold's alleged longitudinal and lateral control architectures to "maintain constant speed and direction of the aircraft." Petition, 31-32. While the Petition identifies the use of a desired yaw axis rate response from the control module for controlling yaw, what is missing from the Petition is the identification of any disclosure or suggestion in Gold that its alleged lateral and longitudinal control architectures (the pitch and roll control modules, respectively) are utilized to control yaw movement of the aircraft. Indeed, the Petition concedes that, at best, "Gold teaches that when *the yaw control architecture is controlling yaw of the aircraft* and the aircraft is in

velocity stabilization mode, both *the longitudinal and lateral control architectures are used to maintain the constant flight path (track) at the specific speed.*”

Petition, 32 (emphases added).

Thus, at most, the Petition purports to establish that an output from Gold’s yaw control module (i.e., the desired yaw axis rate response) is used by the alleged longitudinal and lateral control architectures to maintain the constant flight path at the specific speed. This is confirmed by Petitioner’s expert, Dr. Singhose. DJI-1003, ¶111 (“That is, the yaw control module provides input to the lateral and longitudinal control modules of the VCS[.]”). But the Petition never even attempts to establish that Gold discloses what Claim 1 actually recites—which is “the control system utilizes the lateral control architecture and the longitudinal architecture to control yaw movement of the aircraft.” DJI-1001, 8:23-27.

The Petition’s contention that Patent Owner “acknowledged Gold discloses this limitation in the amendment made to the specification of the European companion patent summarizing the Gold reference” lacks support in the record. Petition, 34-35. The Petition merely excerpts a portion of the amendment, without any accompanying explanation, to support its conclusory assertion. Petition, 34-35 (quoting DJI-1012, 122-123). The excerpt relied upon in the Petition, however, contains no admission that Gold discloses its “control system utilizes the lateral control architecture and the longitudinal control architecture to control yaw

movement of the aircraft.” It merely acknowledges that in Gold “the flight path referenced velocities are held constant during pilot commanded yaw maneuvers so that the aircraft maintains a fixed inertial referenced flight path regardless of the pointing direction of the aircraft.” *Id.* For the reasons set forth above, this disclosure is insufficient to establish that Gold discloses limitation [1C] and, as such, the Petition has not established a reasonable likelihood of success on the merits.

2. The Petition fails to show that Gold discloses or otherwise renders obvious “the aircraft continuously moves in a yaw direction” as recited in limitation [1D].

The Petition also has not established that Gold discloses or otherwise renders obvious “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as recited in limitation [1D].³ First, the Petition fails to show that Gold discloses that its aircraft “continuously moves in a yaw direction while maintaining the constant vector heading” under Petitioner’s construction of “continuously moves in a yaw direction” proposed in the district court litigation. Second, the Petition’s assertion that limitation [1D] is met by Gold’s disclosure of an aircraft yawing in response to a pilot command fails to consider the

³ Consistent with the Petition’s notations, Patent Owner refers to this element of Claim 1 as “limitation [1D].” Petition, 35.

intrinsic record of the '505 Patent and is directly undermined by the testimony of another of Petitioner's experts in the district court.

a. The Petition fails to show that Gold discloses limitation [1D] under Petitioner's district court construction.

As discussed above, Petitioner has taken different claim interpretation positions in this proceeding and in the district court litigation. *Supra*, §IV. For purposes of this proceeding, "Petitioner does not believe that any claims require construction" and purports to apply "the plain and ordinary meaning for each term[.]" Petition, 17. With respect to limitation [1D] in particular, the Petition argues that "continuously moves in a yaw direction" should be interpreted broadly, alleging that "[l]imitation [1D] does not provide any limits (duration or yaw angle) for the term '*continuously moves*'[.]" Petition, 35. In the district court litigation, however, Petitioner argues that "continuously moves in a yaw direction" in limitation [1D] should be construed to mean "rotates around the yaw axis without stopping until it reaches a desired yaw angle." *Supra*, §IV.A.

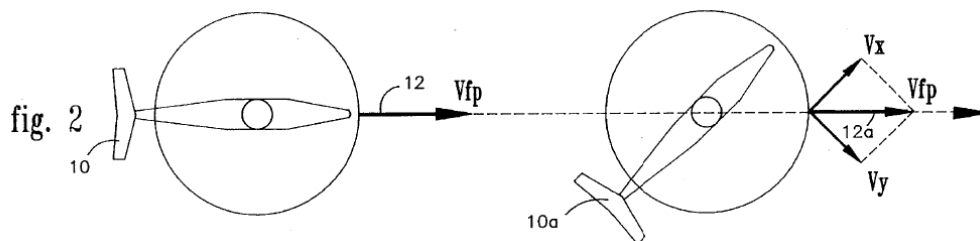
It is readily apparent that Petitioner does not believe its district court construction reflects the plain and ordinary meaning of "continuously moves in a yaw direction." In the district court, Petitioner rejected the "plain and ordinary meaning" interpretation proposed by Patent Owner and instead offers its own construction. EX2010, 10. Thus, while Petitioner argues in this proceeding that the

plain meaning of limitation [1D] “does not provide any limits (duration or yaw angle) for the term ‘*continuously moves,*’” (Petition, 35), Petitioner’s district court construction is properly viewed as narrowing because it introduces at least two additional requirements. First, that the rotation around the yaw axis must be performed “without stopping.” EX2010, 10. Second, that the rotation around the yaw axis must reach “a desired yaw angle.”

The Board should deny institution because Petitioner failed to meet its burden under 37 C.F.R. §§ 42.104(b)(3)-(4) to identify “[h]ow the challenged claim is to be construed” and “[h]ow the construed claim is unpatentable.” Petitioner’s attempt to have the claims interpreted broadly (i.e., without “any limits”) for purposes of determining validity in this proceeding while simultaneously pursuing a narrowing construction in the district court to avoid infringement cannot meet this burden. By failing to propose a consistent construction in this proceeding, the Petition cannot have shown how the claim—as Petitioner construes it in the district court—is unpatentable, and therefore has not established a reasonable likelihood of success in showing Claim 1 is unpatentable over Gold. *See Amazon.com*, 239 F.3d at 1351 (“A patent may not, like a ‘nose of wax,’ be twisted one way to avoid anticipation and another to find infringement.”).

The Petition fails to establish that Gold discloses or otherwise renders obvious limitation [1D] under Petitioner’s district court construction. The Petition’s analysis

for limitation [1D] is terse and undeveloped. Other than Petitioner's assertion regarding the scope of limitation [1D] (i.e., that it "does not provide any limits"), the Petition's analysis amounts to no more than a conclusory assertion that Gold discloses limitation 1[D] because Gold describes that "in response to a pilot's yaw command during operation in velocity stabilization mode, 'the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a with respect to an inertial frame of reference.'" Petition, 35-36 (citing DJI-1005, 2:60-64; *see also*, DJI-1005, Figure 2). The Petition, however, fails to address whether the relied-upon portions of Gold teach that Gold's aircraft rotates around the yaw axis *without stopping* until it reaches *a desired yaw angle*. Petition, 35-36. There is no indication in the cited portions of Gold that its aircraft rotates around the yaw axis without stopping until it reaches a desired yaw angle. The portion of Gold relied upon in the Petition for limitation [1D] relates to Gold's Figure 2, reproduced below:



DJI-1005, Figure 2. The description of Figure 2 in Gold, which includes the portion of Gold's specification relied upon in the Petition, merely states:

Referring to FIG. 2, an aircraft 10 is shown operating in a velocity stabilization mode having a fixed velocity along a selected flight path

as indicated by velocity vector 12. In response to a yaw command by a pilot during operation in a velocity stabilization mode, the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a with respect to an inertial frame of reference.

DJI-1005, 2:60-64.

Thus, nothing in the cited portions of Gold teaches that when “aircraft 10a yaws” it rotates around the yaw axis without stopping until it reaches a desired yaw angle as required by Petitioner’s district court construction. In particular, nothing in the cited portions of Gold discloses that the pilot’s “yaw command” is a command to reach a desired yaw angle. To the contrary, the Petition acknowledges that Gold’s yaw control module “provides a desired yaw axis rate response” to Gold’s lateral and longitudinal control modules. Petition, 31 (quoting DJI-1005, 5:9-13). The Petition makes no attempt to show that a “desired yaw axis rate response” indicates a desired yaw angle. Rather, yaw rate is merely the angular velocity around the aircraft’s vertical axis (e.g., in degrees or radians per second). *See also* DJI-1013, ¶0091 (distinguishing between “a commanded yaw rate” and “a specified yaw angle”).

In contrast to Gold, the ’505 Patent describes example embodiments in which a directional input from the pilot results in yaw movement to a particular desired angle (e.g., 90 degrees). DJI-1001, 3:9-46. For example, the ’505 Patent describes an embodiment in which the “control system is adapted to turn aircraft 201 at 90

degrees during each application” and discloses that “alternative embodiments could easily include a control system adapted to turn the aircraft at different angles, e.g., at 30 degrees in lieu of or in addition to 90 degrees.” DJI-1001, 3:24-30. The Petition points to no corresponding disclosure in Gold.

The testimony of Petitioner’s expert does not make up for these deficiencies. Dr. Singhose’s “analysis” of limitation [1D] merely parrots the language of the Petition. DJI-1003, ¶¶118-119. Dr. Singhose “does not cite to any additional supporting evidence or provide any technical reasoning to support his statement. Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (P.T.A.B. Aug. 24, 2022) (precedential). Accordingly, the Petition fails to show a reasonable likelihood that Claim 1 would have been obvious over Gold under Petitioner’s district court construction.

b. The Petition otherwise fails to establish that Gold’s disclosure of an aircraft yawing while maintaining a constant flight path reference velocity teaches that the aircraft “continuously moves in a yaw direction while maintaining the constant vector heading.”

The Board should not excuse the Petition’s failure to construe limitation [1D] or its failure to show how Gold teaches limitation [1D] under Petitioner’s district court construction. However, should the Board not hold Petitioner to its district

court construction, the Petition nevertheless fails to show that Gold’s aircraft “continuously moves in a yaw direction while maintaining the constant vector heading.”

The Petition maps limitation [1D] to Gold’s disclosure that “in response to a pilot’s yaw command during operation in velocity stabilization mode, ‘the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a with respect to an inertial frame of reference.’” Petition, 36 (citing DJI-1005, 2:60-64, Figure 2). The Petition’s argument that Gold’s disclosure of yawing in response to a pilot command satisfies limitation [1D] ignores the relevant prosecution history of the ’505 Patent and is directly contradicted by the testimony of another of Petitioner’s experts in the district court litigation.

As discussed above in the context of Patent Owner’s §325(d) discretionary denial argument (*supra*, §III.B.2-3), the Examiner considered substantially the same disclosure in Piasecki during prosecution and found that it failed to teach an aircraft that “continuously moves in a yaw direction while maintaining the constant vector heading.” DJI-1002, 39; DJI-1013, ¶¶0090-92, 0045. Specifically, the Examiner relied upon disclosure in Piasecki that its model and the control subsystem 74 also are configured to achieve rate command heading/heading hold in yaw, so that the aircraft will achieve a commanded yaw rate and will hold a yaw angle in flight as allegedly disclosing limitation [1C]. DJI-1013, ¶0091. After the applicant amended

the claims to recite “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading,” the rejection based on Piasecki was withdrawn and the Examiner allowed the claims. DJI-1002, 16. Because the Examiner allowed the claims it is reasonable to conclude that the Examiner found this amendment sufficient to overcome the rejection based on Piasecki. *See Sandoz Inc. v. Acerta Pharma B.V.*, IPR2023-00478, Paper 17 at 18 (P.T.A.B. Aug. 7, 2023) (“Because the Examiner allowed the claims it is reasonable to conclude that Examiner found this evidence sufficiently persuasive to overcome the rejection[.]”).

The Petition fails to explain how substantially the same disclosure in Gold (i.e., that, in response to a pilot’s yaw command, the aircraft yaws while maintaining a constant flight path) teaches limitation [1D] in view of the intrinsic record of the ’505 Patent. As noted above, the Petition proposes no construction for “continuously moves in a yaw direction” in this proceeding. Rather, the Petition makes conclusory assertions about what limitation [1D] purportedly “encompasses.” For this aspect of Claim 1, the Petition argues that “[l]imitation [1D] does not provide any limits (duration or yaw angle) for the term ‘*continuously moves*’ and therefore encompasses an aircraft continuously moving in a yaw direction until a commanded (desired) yaw angle is achieved by the aircraft while the aircraft maintains its constant ground track.” Petition, 35.

The Petition fails to adequately support its IPR position regarding how limitation [1D] should be interpreted, again running afoul of Petitioner's burden under 37 C.F.R. §§ 42.104(b)(3)-(4). Moreover, claims in an IPR are construed "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and **the prosecution history** pertaining to the patent." 37 C.F.R. § 42.100(b) (emphasis added). Petitioner purports to apply a plain and ordinary meaning interpretation here but fails to sufficiently explain how the plain and ordinary meaning of "continuously moving in a yaw direction," in view of the intrinsic record, encompasses an aircraft yawing in response to a pilot command as described in Gold. The Petition cites to nothing in the specification as directly supporting its interpretation. At most, the Petition refers back to its discussion of the term "constant vector heading" in its "analysis" of rewritten limitation [1C] but fails to explain the significance of that discussion to the interpretation of "continuously moves" in limitation [1D]. Petition, 35. And the Petition certainly makes no attempt to reconcile its interpretation of "continuously moves" with the Examiner's conclusions regarding Piasecki reflected in the prosecution history of the '505 Patent. Petition, 35.

The reason for Petitioner's inadequate explanation of how limitation [1D] should be interpreted is clear and set forth in the Petition. Doing so would impact Petitioner's ability "to challenge claim 1 under 35 U.S.C. §112 in another forum."

Petition, 35, n.3. Specifically, Petitioner argues in the district court litigation that the phrase “continuously moves in a yaw direction while maintaining the constant vector heading” is indefinite. EX2010, 10. As with limitation [1C] discussed above, the Board should not countenance Petitioner’s failure to adequately explain “[h]ow the challenged claim is to be construed” and “how the construed claim is unpatentable” (37 C.F.R. §§ 42.104(b)(3)-(4)) so that Petitioner can preserve arguments under §112 in a different forum.

Incredibly, the “plain and ordinary meaning” interpretation Petitioner purports to apply in this proceeding is materially different—and inconsistent with—the “plain and ordinary meaning” interpretation Petitioner advances in the district court to support its indefiniteness arguments. Limitation [1D] recites “the constant vector heading,” referring back to “a constant vector heading across a ground surface” in limitation [1C]. The Petition, relying on the testimony of Dr. Singhose, contends that the plain and ordinary meaning of “the ‘*constant vector heading across a ground surface*’ is the straight-line track or course of the aircraft and an ‘*aircraft maintain[ing] a constant vector heading across a ground surface*’ means the aircraft flies over the ground in a particular straight-line direction (i.e., the ground track or course) at a constant speed.” Petition, 29 (citing DJI-1003, ¶¶108-109). Tellingly, Petitioner’s IPR expert, Dr. Singhose, opines that the claim should be interpreted this way “[s]olely for purposes of this proceeding.” DJI-1003, ¶109.

In the district court litigation, however, Petitioner relies on the testimony of a different expert, Dr. Chung, to support its indefiniteness arguments. *See* EX2012. Dr. Chung’s testimony is fundamentally inconsistent with Dr. Singhose’s testimony and demonstrates that the Petition fails to establish a reasonable likelihood of success in showing that Claim 1 is unpatentable. Dr. Chung opines that:

A POSITA would understand a “constant vector” to refer to the state of having a constant direction and constant magnitude, and that a “heading” means the direction in which the longitudinal or X axis of an aircraft is pointed or, in other words, where the nose of the aircraft is pointed. Those are known terms of art.

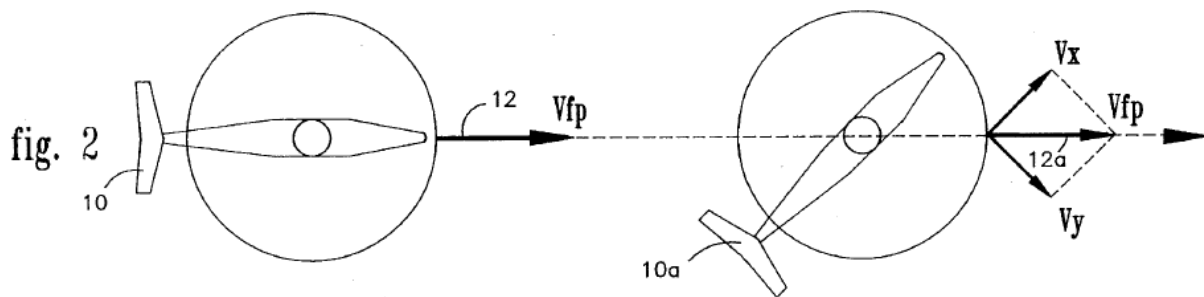
EX2012, ¶39 (discussing the language “maintaining a constant vector heading across a ground surface” recited in preamble of Claim 11 of related U.S. Patent No. 8,332,082 (the “’082 Patent”)); *see also* EX2012, ¶49 (relying on opinions for preamble of Claim 11 of ’082 Patent to support opinion that limitation [1D] of Claim 1 of ’505 Patent is indefinite). Thus, according to Petitioner’s expert Dr. Chung, “a ‘constant vector heading,’ under its plain and ordinary meaning, would refer to the movement of an aircraft at a constant heading, ***which is in the direction the nose is pointed***, and at a constant groundspeed.” EX2012, ¶42 (emphases added). This is inconsistent with Dr. Singhose’s testimony that a constant vector heading is the direction the aircraft flies relative to the ground, which is not necessarily the direction in which the nose of the aircraft is pointed. *See* DJI-1003, ¶109.

Thus, Petitioner proposes two materially different “plain and ordinary meaning” interpretations of the language of limitation [1D], one for this proceeding and a different one for the district court. The one advanced in this proceeding merely requires that “the aircraft flies over the ground in a particular straight-line direction (i.e., the track) at a constant speed” (DJI-1003, ¶109) while Petitioner’s district court interpretation requires “movement of an aircraft at a constant heading, ***which is in the direction the nose is pointed***, and at a constant groundspeed.” EX2012, ¶42 (emphases added).

The Board should not countenance Petitioner’s blatant attempt to apply two ***different*** alleged plain and ordinary meaning interpretations, one for purposes of validity in this proceeding and another to support its indefiniteness arguments in the district court. In doing so, Petitioner again runs afoul of the basic requirement that the Petition “must identify” “[h]ow the challenged claim is to be construed” and “[h]ow the construed claim is unpatentable[.]” 37 C.F.R. §§ 42.104(b)(3)-(4). Petitioner also violates the fundamental tenet that claims should be construed the same for purposes of assessing validity and infringement. *See Amazon.com*, 239 F.3d at 1351.

The differences in Petitioner’s proposed interpretations are material because the Petition and Dr. Singhose rely on Gold’s disclosure related to yawing the aircraft, which Petitioner’s district court expert, Dr. Chung, contends cannot also disclose

“maintain[ing] the constant vector heading.” EX2012, ¶¶43, 49. As discussed above, the Petition maps limitation [1D] to Gold’s disclosure that “in response to a pilot’s yaw command during operation in velocity stabilization mode, ‘the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a with respect to an inertial frame of reference.’” Petition, 36 (citing DJI-1005, 2:60-64, Figure 2). Figure 2 of Gold, relied upon in the Petition, illustrates an aircraft yawing in response to a pilot’s yaw command:



DJI-1005, Figure 2. Petitioner’s district court expert, Dr. Chung, contends that under Petitioner’s district court plain and ordinary meaning interpretation, an aircraft cannot “yaw” (as in Gold) and at the same time “maintain[] a constant vector heading” as recited in limitation [1D]. Specifically, Dr. Chung opines that “perform[ing] ‘yawing turns’ or rotat[ing] in the yaw direction” as described in Gold “cannot be physically achieved while also maintaining a constant vector heading because any rotation in the yaw direction necessarily rotates the nose of the aircraft in the yaw direction thereby changing the heading of the aircraft.” EX2012, ¶43.

Thus, the Petition's and Dr. Singhose's interpretation of Gold's disclosure as allegedly teaching "wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading" as recited in limitation [1D] is directly refuted by Petitioner's expert in the district court. The Petition fails to reconcile these different alleged plain and ordinary meaning interpretations, and therefore has not identified how the claims are to be construed, how the construed claims are unpatentable, or explained with the requisite particularity where each element of the claim is found in the relied upon art. *See* 37 C.F.R. §§ 42.104(b)(3)-(5). Accordingly, Petitioner has not established a reasonable likelihood that Claim 1 is unpatentable and the Board should deny institution.

C. The Petition fails to show that independent Claim 11 would have been obvious in view of Gold.

The Petition argues that Claim 11 would have been obvious over Gold. Petition, 36-44. Petitioner's theory of unpatentability for Claim 11, however, suffers from similar deficiencies as its theory for Claim 1. Again, the Petition fails to apply the narrowing constructions that Petitioner is advancing in the district court to the art in this proceeding. And, yet again, the Petition relies on thinly veiled written description arguments to make up for its inability to show how the art discloses or otherwise renders obvious the claim elements as written. For the reasons that follow, the Petition fails to show that Gold discloses or otherwise renders obvious at least

limitations [11C] and [11D] and therefore fails to establish a reasonable likelihood of success in showing that Claim 11 would have been obvious over Gold.

1. The Petition fails to show that Gold discloses or otherwise renders obvious “selectively controlling flat yaw movement” as recited in limitation [11C].

The Petition fails to establish that Gold discloses or otherwise renders obvious “selectively controlling flat yaw movement of the aircraft while maintaining a constant vector flat turn relative to a ground surface” as recited in limitation [11C].⁴ The Petition’s analysis is deficient because the Petition has not shown that Gold’s disclosure that an aircraft yaws while in velocity stabilization mode teaches “controlling **flat yaw movement** while maintaining a **constant vector flat turn**” under either the alleged plain and ordinary meaning applied in the Petition or Petitioner’s narrower district court construction.

a. The Petition fails to show that Gold discloses limitation [11C] under the Petition’s plain and ordinary meaning interpretation.

Limitation [11C] requires “selectively controlling *flat yaw movement* of the aircraft while maintaining *a constant vector flat turn* relative to a ground surface.” DJI-1001, 9:20-22. Regardless of whether limitation [11C] is evaluated under the

⁴ Consistent with the Petition’s notations, Patent Owner refers to this element of Claim 11 as “limitation [11C].” Petition, 42.

Petition's alleged "plain and ordinary meaning" interpretation or Petitioner's narrowing district court construction, the Petition's analysis for limitation [11C] is deficient. The Petition does not cite any express disclosure in Gold of a "flat yaw movement." Rather, the Petition relies exclusively on the testimony of its expert, Dr. Singhose, to fill in details missing from the reference. But Dr. Singhose's declaration provides no explanation or analysis to support his conclusory testimony, which therefore is entitled to no weight.

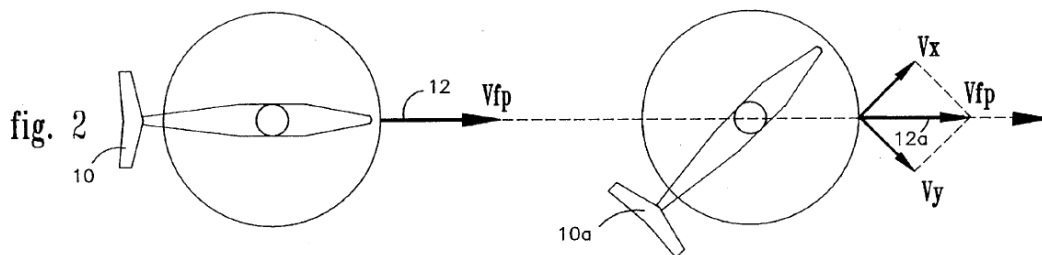
Turning first to the interpretation used in the Petition, the Petition's analysis of limitation [11C] begins by referring back to its analysis of limitation [1C]. Petition, 42. Petitioner's analysis for limitation [1C] identifies Gold's disclosure that "[i]n response to a yaw command while in velocity stabilization mode, 'the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a.'" Petition, 33 (citing DJI-1005, 2:60-64). In analyzing limitation [11C], the Petition asserts that:

The yaw movement controlled by Gold and illustrated in annotated Figure 2 is a '*flat yaw movement*' (bank angle is zero) which results in a '*flat turn*' because during the movement the aircraft rotates about its vertical axis (turning the nose of the aircraft) without pitching or rolling to any significant degree that would induce lateral or longitudinal motion and drive the aircraft off its constant velocity path.

Petition, 42 (citing DJI-1003, ¶128). The Petition fails to support this assertion with any credible evidence.

The only alleged support identified in the Petition is Figure 2 of Gold and paragraph 128 of Dr. Singhose's declaration. Petition, 48. Neither Figure 2 of Gold nor its accompanying description expressly describes the yaw movement of Gold's aircraft as a flat yaw movement. And there is also no express disclosure in Gold that the yaw movement of the aircraft has a bank angle that is zero as alleged in the Petition. Indeed, Gold never uses the terms "flat" or "bank angle" anywhere in its description. *See generally* DJI-1005.

Rather, Gold states that Figure 2, reproduced below, depicts "a diagram showing the response of a vehicle to a pilot yaw command during operation in a velocity stabilization mode, the aircraft having an inertial referenced velocity command system of the present invention." DJI-1005, 2:34-37.



DJI-1005, Figure 2. In the description accompanying Figure 2, Gold merely states:

Referring to FIG. 2, an aircraft 10 is shown operating in a velocity stabilization mode having a fixed velocity along a selected flight path

as indicated by velocity vector 12. In response to a yaw command by a pilot during operation in a velocity stabilization mode, the aircraft 10a yaws while maintaining a constant flight path reference velocity 12a with respect to an inertial frame of reference.

DJI-1005, 2:58-64. Thus, the Petition fails to identify any express disclosure in Gold that the aircraft's yaw movement "is a '*flat yaw movement*'" as alleged in the Petition.

The Petition relies on an annotated version of Figure 2 that adds descriptors in red such as "Flat Turn" and "Flat Yaw Movement." Petition, 42. Those annotations appear to be derived entirely from Petitioner's expert, Dr. Singhose. *See* Petition, 42; DJI-1003, ¶128. The cited portion of Dr. Singhose's declaration, however, merely repeats the Petition's conclusory assertion about Gold's yaw movement verbatim. *Compare* Petition, 42 *with* DJI-1003, ¶128. Dr. Singhose "does not cite to any additional supporting evidence or provide any technical reasoning to support his statement. Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight." *Xerox*, IPR2022-00624, Paper 9 at 15 (precedential); *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."); *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) ("Lack of factual support for expert opinion going to factual determinations,

however, may render the testimony of little probative value in a validity determination.”). Moreover, the Petition’s and Dr. Singhose’s assumption that the turn described in Gold has “a bank angle of zero” is undermined by their later characterization of Gold’s turns as involving rotation around its vertical axis “without pitching or rolling to any significant degree,” which implies that there is some pitching and rolling (i.e., that the bank angle is not, in fact, zero as alleged). Petition, 42; DJI-1003, ¶128.

b. The Petition fails to show that Gold discloses limitation [11C] under Petitioner’s narrower district court construction.

The Petition’s analysis also fails under Petitioner’s district court construction. As discussed above, Petitioner argues in the district court that “flat yaw movement of the aircraft” should be construed to mean “rotation around the yaw axis without pitching or rolling” and that “constant vector flat turn” should be construed as “movement along a flight path with a fixed speed and fixed direction while rotating along the yaw axis without pitching and rolling.” EX2010, 10-11. Petitioner’s failure to apply those constructions here constitutes another failure to comply with 37 C.F.R. §§ 42.104(b)(3)-(4). Petitioner’s conduct is particularly egregious because had Petitioner proposed its construction in the Petition, it would not have been able to rely on Gold for this aspect of Claim 11.

Indeed, both the Petition and Dr. Singhose implicitly acknowledge that Gold does not teach this limitation under Petitioner’s district court construction. Petition, 42; DJI-1003, ¶128. Both characterize the yaw movement of Gold’s aircraft as involving rotation around its vertical axis “without pitching or rolling to any significant degree that would induce lateral or longitudinal motion and drive the aircraft off its constant velocity path.” Petition, 42; DJI-1003, ¶128. Thus, both the Petition and Dr. Singhose concede that the yaw movement of Gold’s aircraft involves some pitching or rolling, just not enough to drive the aircraft off its constant velocity path. *See, e.g.*, Petition, 43 (alleging that “[w]hen in velocity stabilization mode, Gold’s flight control system *automatically adjusts* pitch and roll attitude to keep the aircraft moving in the same direction at a constant speed”) (emphases added); DJI-1003, ¶130. That precludes Gold from meeting the “without pitching or rolling” aspects of Petitioner’s district court construction.

Accordingly, the Petition fails to show that Gold discloses or otherwise renders obvious limitation [11C], regardless of which of Petitioner’s different claim interpretations is applied.

2. The Petition fails to show that Gold discloses “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading” as recited in Claim 11.

Limitation [11D] recites “wherein the aircraft continuously moves in a yaw direction while maintaining the constant vector heading.” DJI-1001, 9:23-24.⁵ As the Petition acknowledges, limitation [11D] is identical to limitation [1D] of Claim 1. Petition, 44. The Petition’s analysis for limitation [11D] relies entirely on its analysis of limitation [1D]. *Id.* (alleging Gold discloses limitation [11D] “[f]or the same reasons discussed in §V.B.4”). Accordingly, the Petition’s analysis for limitation [11D] is deficient for the same reasons as discussed above for limitation [1D]. *Supra*, §V.B.2. Petitioner therefore has not established a reasonable likelihood of success in showing Claim 11 would have been obvious over Gold.

D. The Petition has not shown a reasonable likelihood that any of the dependent claims challenged in Grounds 1-3 are unpatentable.

For the reasons set forth above, the Petition has not demonstrated a reasonable likelihood that independent Claims 1 and 11 would have been obvious over Gold as proposed in Ground 1. *Supra*, §§V.B-C. Accordingly, the Petition also has not shown a reasonable likelihood that dependent Claims 2, 5-6, 8-9, 11-12, 15-16 and 18-19 challenged in Ground 1 would have been obvious because each depends,

⁵ Consistent with the Petition’s notations, Patent Owner refers to this element of Claim 11 as “limitation [11D].” Petition, 44.

directly or indirectly, from Claims 1 or 11. The Petition's Grounds 2 and 3 also fail. While Ground 2 adds U.S. 5,238,203 ("Skonieczny") to challenge dependent Claims 3-4 and 13-14, and Ground 3 adds U.S. 5,065,962 ("Adams") to challenge dependent Claims 7, 10, 17, and 20, the Petition does not rely on Skonieczny or Adams as allegedly disclosing the limitations of the independent claims that the Petition fails to show are disclosed or rendered obvious by Gold in Ground 1. Accordingly, the Petition has not established a reasonable likelihood that the challenged dependent claims would have been obvious.

VI. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board deny institution.

Respectfully submitted,

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Dated: December 18, 2023

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing **PATENT OWNER PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107** contains 13,999 words, excluding a table of contents, a table of authorities, mandatory notices under 37 C.F.R. § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing, as measured by the word-processing system used to prepare this paper.

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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on the 18th day of December, 2023, a complete and entire copy of the foregoing **PATENT OWNER PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107** was served on Petitioner via email to counsel of record for the Petitioner at the following addresses:

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