

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND**

PAICE LLC, et al.,

BMW,

v.

**BAYERISCHE MOTOREN WERKE, A.G.,
et al.,**

Paice.

Civil Case No. SAG-19-3348

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MEMORANDUM OPINION

Paice LLC (“Paice”) and The Abell Foundation, Inc. (“Abell”) (collectively, “Paice”) sued Bayerische Motoren Werke, A.G. and BMW of North America, LLC (collectively, “BMW”) for patent infringement. Pending is claim construction for the disputed terms of U.S. Patent Nos. 7,104,347 (“the ’347 patent”); 7,237,634 (“the ’634 patent”); and 8,630,761 (“the ’761 patent”) (collectively, the “Asserted Patents”). On October 15, 2020, the Court held a claim construction hearing. For the following reasons, the claim constructions adopted by the Court will govern this litigation.

I. BACKGROUND

Paice is a Delaware limited liability company with its principal place of business in Maryland. ECF 1 at 3. Established in 1992 by Doctor Alex J. Severinsky, the company “develops and promotes innovative hybrid electric vehicle technology that improves fuel efficiency and lowers emissions, while maintaining superior driving performance.” *Id.* Abell, a Maryland corporation, is a nonprofit charitable organization whose objectives include increasing energy

efficiency and producing alternative energy. *Id.* BMW, meanwhile, is an automaker that manufactures, markets, and sells luxury cars worldwide, including hybrid electric vehicles.

Paice and Abell are co-owners by assignment of the entire right, title, and interest in and to U.S. Patent Nos. 7,104,347; 7,237,634; and 8,630,761. *Id.* at 6. The '347, '634, '761 patents are part of a family of patents related to U.S. Patent No. 6,209,672. *Id.* at 7. The patents involve hybrid vehicle technologies, and per Paice's description involve "hybrid topologies and methods of control to optimize vehicle performance, fuel economy, and emissions efficiency." *Id.* More specifically, since a hybrid vehicle uses two power sources—an electric motor (powered by a battery) and an internal combustion engine (powered by gasoline)—the vehicle requires a way to switch between the two power supplies. The patents claim control strategies for coordinating these two power sources.

On August 7, 2020, the parties submitted a Joint Claim Construction statement. ECF No. 71. On that same day, BMW submitted their opening claim construction brief. ECF No. 73, as did Paice, ECF No. 72. On September 8, 2020, BMW filed their responsive claim construction brief, ECF 82, as did Paice, ECF 81. A claim construction hearing was held on October 15, 2020.

II. LEGAL STANDARD

Claim construction is a question of law, to be determined by the Court. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 384 (1996). Specifically, "[c]laim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy." Therefore, "district courts are not ... required to construe every limitation present in a patent's asserted claims." *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). For instance, terms that are

“commonplace” or that “a juror can easily use [] in her infringement fact-finding without further direction from the court” need not be construed because they “are neither unfamiliar to the jury, confusing to the jury, nor affected by the specification or prosecution history.”

“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal quotation marks omitted), cert. denied, 546 U.S. 1170 (2006). Thus, unsurprisingly, “the claim construction analysis must begin and remain centered on the claim language itself.” *Id.* A court should give the term’s words their “ordinary and customary meaning” as would be understood by “a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “A determination that a claim term . . . has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” *O2 Micro*, 521 F.3d at 1361.

In addition to the plain language of the claim itself, “the claim should be read within the context of the entire patent, including the specification.” *Pulse Med. Instruments, Inc. v. Drug Impairment Detection Servs., Inc.*, 2009 WL 6898404, at *1 (D. Md. Mar. 20, 2009). The specification “is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Yet, in other Federal Circuit decisions, the specification’s use has been limited to circumstances in which either “a patentee sets out a definition and acts as his own lexicographer,” or “when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1358 (Fed. Cir. 2016). To this end, the Federal Circuit has “acknowledge[d] the difficulty in drawing the fine line between construing the claims in light of the specification and

improperly importing a limitation from the specification into the claims.” *Cont’l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 797 (Fed. Cir. 2019), cert. denied, 140 S. Ct. 648 (2019). Through close review of the specification, “[m]uch of the time . . . it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive.” *Phillips*, 415 F.3d 1323. To that end, for the specification language to restrict the scope of claim term, it must “rise to the level of ‘a clear and unmistakable disclaimer.’” *Cont’l Circuits*, 915 F.3d at 797 (quoting *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1367 (Fed. Cir. 2012)).

“In addition to consulting the specification ... a court should also consider the patent’s prosecution history, if it is in evidence.” *Phillips*, 415 F.3d at 1317 (internal quotation marks omitted). “The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.” *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995), cert. denied, 516 U.S. 987 (1995). “Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Phillips*, 415 F.3d at 1317. Relatedly, “statements made by a patent owner during an IPR proceeding can be considered during claim construction and relied upon to support a finding of prosecution disclaimer.” *Asylus Networks, Inc. v. Apple, Inc.*, 856 F.3d 1353, 1361 (Fed. Cir. 2017).

“In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.” *Vitronics*, 90 F.3d at 1583. Extrinsic evidence, including expert and inventor testimony, dictionaries, and learned treatises, may be helpful to explain scientific principles, the meaning of

technical terms, and terms of art that appear in the patent and prosecution history. Extrinsic evidence may demonstrate the state of the prior art at the time of the invention. It is useful to show what was then old, to distinguish what was new, and to aid the court in the construction of the patent. *Markman*, 52 F.3d 967, 980 (Fed. Cir. 1995) (internal quotation marks omitted), *aff'd*, 517 U.S. 370 (1996). “In sum, extrinsic evidence may be useful to the court, but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Phillips*, 415 F.3d at 1319.

III. ANALYSIS OF THE DISPUTED TERMS

a. Term 1

| Claim Term | Paice’s proposed construction | BMW’s proposed construction |
|--|-------------------------------|--|
| “shafts may be connected by a non-slipping clutch” | Plain and ordinary meaning | “shafts are connected by a non-slipping clutch, a non-conventional automotive friction clutch that does not allow for extensive relative slipping before the shafts are engaged” |

The core of the dispute over construction of this term is the parties’ disagreement over whether Paice’s use of the permissive phrase “may be connected” should be replaced with the mandatory phrase “are connected,” at BMW’s urging. Paice argues that the word “may” is not ambiguous and is optional on its face. ECF 73 at 12-13. Paice also notes that BMW failed to identify this claim term for construction and stated that it “accord[ed] the plain and ordinary meaning to the remaining terms” in its recent *inter partes* review (IPR) petition. *Id.* at 12, citing ECF 73-5 at 8. BMW responds with a contextual argument grounded in the specification, arguing that it argues limits the claim to the use of a non-slipping clutch and in doing so resolves ambiguity in the meaning of the term “may.” ECF 72 at 16-18.

BMW's transformation of the word "may" is unwarranted, as the term has a clear plain meaning indicating that the use of a non-slipping clutch is optional. Contrary to BMW's concerns that every clause must do something to restrict the scope of the claim, ECF 72 at 18, the Federal Circuit has held that there is nothing inherently problematic with the use of an open-ended phrase like "may" in a claim. *See In re Johnston*, 435 F.3d 1381, 1384 (Fed. Cir. 2006) ("Optional elements do not narrow the claim because they can always be omitted."); *see also Prolitec, Inc. v. Scentair Techs., Inc.*, 807 F.3d 1353, 1358 (Fed. Cir. 2015) ("[T]he use of 'may' signifies that the inventors did not intend to limit the patent.") (reversed on other grounds). Moreover, nothing in the specification provides the sort of "clear, limited definition of the term being construed" such that it could overcome the plain meaning of the word "may." *Road Science, LLC v. Telfer Oil Co.*, 2012 WL 1739817, at *5 (E.D. Cal. May 15, 2012). While the specification does discuss the use of non-slipping clutches, it does so in a permissive fashion similar to the word "may" in the disputed claim at issue. ECF 73-1 at 26:33-40 (stating that the clutch "need not *necessarily* be an ordinary automotive friction clutch") (emphasis added). Accordingly, the Court will adopt the plain and ordinary meaning construction proposed by Paice.¹

b. Term 2

| Claim Term | Paice's proposed construction | BMW's proposed construction |
|---|-------------------------------|--|
| "operating the turbocharger . . . when desired" | Plain and ordinary meaning | "operating the turbocharger when the road load has exceeded the engine's maximum torque output for a specified period of time" |

¹ As the Court construes this term to be optional, it declines to further construe the phrase "non-slipping clutch," which is sufficiently defined by its plain and ordinary meaning.

This second disputed term once again involves Paice arguing for a plain meaning, while BMW seeks to import alleged limitations from the specification. Paice argues that the meaning of “when desired” is plain on its face, in that the turbocharger can be controlled to broadly operate when desired to “maximize efficient operation of the engine” (in contrast with a conventional turbocharger which either operates or does not operate based on gas engine output alone). ECF 73 at 14. Paice emphasizes that “the claims are intentionally silent on when the turbocharger must be operated,” in stark contrast to BMW’s construction. ECF 81 at 8. Paice also highlights the fact that BMW did not dispute this particular claim term in its previous IPR brief construing ’634, where it stated, “[p]etitioners ... accord the plain and ordinary meaning to the remaining terms.” ECF 73-6 at 10. BMW, meanwhile, argues that the term “when desired” is ambiguous. BMW thus turns to the specification for greater detail, which it alleges provides the relevant language specifying when the turbocharger operates for the purposes of the claim. ECF 72 at 14-15. It also argues that the specification disclaims operation of a conventional turbocharger. ECF 72 at 15.

BMW’s narrow definition of when the turbocharger operates falls short. While the Court agrees that “when desired” is less than clear in its meaning, as will be discussed below, there is no support for inserting the “road load > MTO” language as the sole situation in which the turbocharger operates. This is supported by the principle of “claim differentiation,” an analysis that revolves around claims 47, 103, and 136, where Paice *did* use the “road load > MTO” language BMW attempts to insert here. The fact that Paice used this limiting language elsewhere, but excluded it here, suggests an intentional choice not to limit the term “when desired” to that particular circumstance. *Clearstream Wastewater Sys., Inc. v. Hydro-Action, Inc.*, 206 F.3d 1440, 1446 (Fed. Cir. 2000) (“Under the doctrine of claim differentiation, it is presumed that different words used in different claims result in a difference in meaning and scope for each of the claims.”).

While the specification does include language suggesting that the “the turbocharger is employed only when the vehicle’s torque requirements, the ‘road load’ as above, exceeds the engine’s normally-aspirated maximum torque capacity for a relatively extended period T of time,” the surrounding language suggests that this description was meant to be exemplary. ECF 73-2 at 44:59-65. In fact, the defining feature of the claimed turbocharger was its “additional flexibility” that allowed it to be operated “when useful in further improving vehicle efficiency and drivability and not at other times.” *Id.* at 44:52-57. Ultimately, this mix of language does not rise to the level of “clear disavowal” required to overcome the plain meaning of “when desired.” *See Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1335 (Fed. Cir. 2009) (quoting *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002)).²

While BMW’s overly-narrow definition may not be supported by the open-ended claim language or other intrinsic evidence, it is also true that “when desired” does not have the sort of unambiguous plain meaning that Paice argues it does. In the context of machines like the turbocharger and the controller operating it, the term “desired” and the personification it entails provides little clarity as to what is being desired or what, even, is doing the “desiring.” Setting aside such semantics, the “when desired” language would not be helpful to a jury seeking to determine questions of infringement. Whereas the other open-ended terms at issue here have some well-defined boundaries upon which a jury could rely (e.g. a “pattern of vehicle operation” is

² BMW argues that the specification disclaims operation of a conventional turbocharger, a viewpoint that has compelling support in the text. *See* ’634 patent, 46:14-19. However, even if it were true that the specification disclaims a conventional turbocharger, that fact alone does not provide support for its overly narrow construction put forward here, which goes many steps further and articulates one single case in which the novel turbocharger can operate. Moreover, Paice appears to concede that a conventional turbocharger is not covered by its proposed plain meaning of “when desired” in the first place, even without a disclaimer. ECF 81 at 9. To the extent that BMW is concerned Paice will seek to include operation of a conventional turbocharger in this claim at trial, that avenue is foreclosed by Paice’s own arguments here.

necessarily limited to operation of said vehicle, even if it leaves open how exactly the pattern is derived), “operating the turbocharger . . . when desired” has no such limits—“when desired” could mean almost anything. Such boundless scope is not only of little use in determining infringement, but is also belied by the specification, which *does* limit the claim term, just not in the way BMW suggests. As noted above, the turbocharger is meant to be operated “when useful in further improving vehicle efficiency and drivability and not at other times.” ECF 73-2 at 44:52-57. This language delineates a clear outer bound for the claim, while also staying true to the flexible nature of the original “when desired” language. The Court will thus adopt its own construction: “operating the turbocharger . . . when useful in further improving vehicle efficiency and drivability and not at other times.”

c. Term 3

| Claim Term | Paice’s proposed construction | BMW’s proposed construction |
|--|------------------------------------|---|
| “a predicted near-term pattern of operation” and “anticipated patterns of vehicle operation” | “an expected pattern of operation” | “a pattern of operation of the vehicle expected based on monitoring the driver’s repeated driving operations over time” |

The core of the parties’ disagreement here centers on how the vehicle controller derives the “pattern of operation” it uses to vary and optimize hybrid control. BMW seeks to limit how the controller derives this pattern, basing it solely on the driver’s repeated driving operations, whereas Paice suggests that the question of how the pattern is derived was left open-ended by the claim language and covers vehicle operation in general. In support of its position, BMW relies heavily on arguments Paice made in distinguishing its invention from others during the patent application process, as well alleged limiting language in the specification. ECF 72 at 8-10. BMW also points out that Paice has construed related phrases in the ’347 patent to mean “monitoring a

driver's repeated driving operations over time" in a prior IPR proceeding. *Id.* at 11. Paice, meanwhile, points to the fact that the plain language of the claim contains no reference to how the pattern is derived, and argues that the specification and prosecution history actually supports, rather than disclaims, a more open-ended reading. ECF 73 at 17; ECF 81 at 11-12. Paice also looks to the '761 independent and dependent claims as contextual evidence that BMW's construction improperly limits the way the pattern is derived. ECF 73 at 18.

Once again, BMW's narrow construction fails to overcome the unambiguously broad language of the claim, which Paice accurately notes does not include any limitation as to how the pattern is derived. The various intrinsic sources upon which BMW relies do not go so far as to disclaim the broad scope of the claim term or support its narrow definition of what criteria might be used for prediction. The patent application history, for one, says nothing about restricting derivation of the relevant pattern from driver behavior alone. ECF 72-1 at 58-59. It merely suggests that, in contrast with the '970 patent, the invention will not make determinations *strictly* in real time, and that the determinations will be based on vehicle-specific operation patterns. *Id.* The language BMW cites, in which Paice distinguished the '970 patent, uses language describing monitoring of vehicle operation generally, rather than driver operation specifically. *Id.* (noting that the claimed invention would "anticipate a pattern of operation of the vehicle" and "monitor[] operation of the particular vehicle"). The portions of the specification cited by BMW, meanwhile, describe predicting a pattern based on driving operations, but do so framed in the language of examples, rather than as the outer bounds of the claim. *See, e.g.*, ECF 73-3 at 39:48-67 (noting that it is "within the scope" of the invention to monitor the vehicle's operation over time and to specifically monitor repetitive driving patterns, but not articulating that this is the *only* way to monitor vehicle operation).

BMW makes the compelling point that Paice has argued for a more limited construction (that closely tracks BMW’s construction here) of a near-identical phrase in the context of the ’347 patent. ECF 72 at 11. Yet such evidence—from a different patent, litigated in a separate case not involving BMW, in which the parties were focused on a different interpretive issue—falls short of limiting the plainly open-ended language of the claim itself, especially where the specification and the prosecution history contain the same unrestricted language. It is also worth noting that Paice, whether in the specification or at oral argument, has provided few examples of other factors that might play into the expected pattern of operation. It seems apparent that driving operations will be the most central factor in ascertaining the pattern of operation. Nevertheless, the plain language does not rule out other inputs. Thus, because Paice’s construction hews most closely to the broad plain language of the claim, the Court will adopt it: “an expected pattern of operation.”

d. Term 4

| Claim Term | Paice’s proposed construction | BMW’s proposed construction |
|---|-------------------------------|---|
| “monitoring operation of said hybrid vehicle” | Plain and ordinary meaning | “monitoring a driver’s repeated driving operations over time” |

Like Term 3 above, this dispute centers on a dispute over whether the monitoring of driving operation should be limited to a driver’s repeated driving operations. The parties largely incorporate their arguments from the preceding analysis, as the two claims are connected such that the parties agree they should be construed in conjunction with one another. ECF 82 at 3; ECF 73 at 19-20. Additionally, BMW asserts that Paice inappropriately relies on the “plain and ordinary meaning” here to avoid providing its own construction of the terms—BMW suggests that Paice’s strategy amounts to “non-construction.” ECF 72 at 12-13. However, as Paice points out, there is a long history of utilizing the “plain and ordinary” in the absence of ambiguity as to what the claim

term means. *See, e.g., InterDigital Commn'cs, LLC v. Int'l Trade Com'n*, 690 F.3d 1318, 132 (Fed. Cir. 2012) (“The plain meaning of claim language ordinarily controls.”); *ActiveVideo Networks, Inc. v. Verizon Commn'cs, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012) (finding the district court properly construed two terms as plain and ordinary meaning). Moreover, BMW did not identify this term as one requiring construction in its prior IPR filing regarding the '761 patent. In doing so, BMW lumped it together with the other non-construed terms it said should be given plain and ordinary meaning. ECF 81-1 at 10 (“Except as discussed below, the terms in the Challenged Claims should have their plain and ordinary meaning for purposes of this IPR proceeding.”).

Here, once again, there is no ambiguity in “monitoring operation of said hybrid vehicle.” While it is undoubtedly open-ended and may not provide the sort of restricted specificity that BMW would like, there is no evidence in the specification or elsewhere that Paice clearly disclaimed the open-ended plain meaning that leaves open the question of what, specifically, is being monitored about the vehicle’s operation. The Court will therefore adopt the plain and ordinary meaning of this term.

e. Term 5

| Claim Term | Paice’s proposed construction | BMW’s proposed construction |
|--|-------------------------------|---|
| “repetitive pattern of operation of said hybrid vehicle” | Plain and ordinary meaning | “a pattern of operation of the hybrid vehicle derived from monitoring the vehicle’s operation over a period of days or weeks” |

The parties here disagree regarding the period of time over which the repetitive pattern is gleaned, as well as (again) how the repetitive pattern is derived. BMW seeks to specify that the time period must be “a period of days or weeks,” while Paice argues that the claim is intentionally

open-ended in terms of the timeframe during which the relevant monitoring occurs. BMW suggests that the definition of “repetitive” necessarily requires a period of time in which it occurs, and points to the specification to provide that time period because it refers to a “period of days or weeks.” ECF 72 at 13-14. Paice, meanwhile, focuses on the allegedly problematic grammatical ramifications of BMW’s construction, suggesting that the plain language is sufficient to give meaning to the word “repetitive.” ECF 81 at 15-16. Paice also notes that BMW failed to contest the meaning of this term in the prior IPR. Instead, like in the examples above, BMW suggested that the term—together with any other term not specifically contested in its IPR brief—should be given its plain and ordinary meaning. *Id.* at 16.

Here, BMW’s proposed construction falls short. While it is undoubtedly true that “repetitive” necessarily implies that something repeats over a period of time, that does not mean that this time period must be specified in the claim in order for it to have a clear and unambiguous meaning. The unambiguous meaning is that “repetitive” means the pattern repeats over time, without limitation as to what the relevant time period might be. The specification does not say otherwise. Rather, it references “monitor[ing] the vehicle’s operation over a period of days or weeks” as “within the scope of the invention.” ECF 73-3 at 39:48-51. That something is “within the scope of the invention” does not mean that it is the *only* thing the invention covers, but rather that it is one possible embodiment within its scope. That is not the sort of clear disavowal needed to support BMW’s insertion of “days or weeks” into the claim term.

Setting the period of time aside, it is similarly unnecessary to alter the language of the claim to specify that the “pattern of operation” is derived from “monitoring the vehicle’s operation.” Paice accurately notes that this slight tweak in language fundamentally transforms the term from a description of a pattern into an explanation of how the pattern is derived. The impropriety of

this transformation is highlighted by claim 3, which provides its own definition of how the repetitive pattern is derived and thus would result in redundancy were BMW's construction inserted. Accordingly, the Court construes the term to have its plain and ordinary meaning.

IV. CONCLUSION

For the foregoing reasons, the five terms as construed by the Court are as follows:

| Term | Court's Construction |
|--|--|
| "shafts may be connected by a non-slipping clutch" | Plain and ordinary meaning |
| "operating the turbocharger . . . when desired" | "operating the turbocharger . . . when useful in further improving vehicle efficiency and drivability and not at other times." |
| "a predicted near-term pattern of operation" and "anticipated patterns of vehicle operation" | "an expected pattern of operation" |
| "monitoring operation of said hybrid vehicle" | Plain and ordinary meaning |
| "repetitive pattern of operation of said hybrid vehicle" | Plain and ordinary meaning |

Dated: October 26, 2020

/s/
Stephanie A. Gallagher
United States District Judge