UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROBERT BOSCH LLC, and
MERCEDES-BENZ USA, LLC,
Petitioner,

v.

WESTPORT FUEL SYSTEMS CANADA INC.,
Patent Owner

Inter Partes Review No. IPR2023-00293
Patent No. 6,575,138

PATENT OWNER'S SUR-REPLY TO PETITIONERS' REPLY

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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Report of Dr. J. Matt Quinlan (December 2, 2022)
2002	Deposition Transcript of Dr. J. Matt Quinlan (January 12, 2023)
2003	CV of Dr. Christopher Atkinson
2004	Declaration of Dr. Christopher Atkinson
2005	DE 199 42 816 A1 ("Klenk")
2006	DE 199 42 816 A1 - Translation
2007	DE 198 56 617 A1 ("Klügl2")
2008	DE 198 56 617 A1 - Translation
2009	DE 199 46 732 B4 ("Schmutzler")
2010	DE 199 46 732 B4 – Translation
2011	DE 199 62 177 A1 ("Gottlieb")
2012	DE 199 62 177 A1 – Translation
2013	U.S. Patent No. 6,513,487
2014	Bosch Motion to Stay Pending IPR
2015	Order Denying Bosch Motion to Stay Pending IPR
2016	GB 2 321 278 A
2017	U.S. Patent No. 4,803,393
2018	U.S. Patent No. 5,031,841
2019	U.S. Patent No. 5,875,764
2020	U.S. Patent No. 6,062,533

Exhibit	Description
2021	Bosch Declaratory Judgment Complaint
2022	Declaration of Dr. Christopher Atkinson in Support of the Patent Owners' Response
2023	Deposition Transcript of Dr. J. Matthew Quinlan (March 1, 2024)
2024	Quinlan Dep. (March 1, 2024) Exhibit 2
2025	Deposition Transcript of Dr. J. Matt Quinlan (April 19, 2024)
2026	Declaration of Heike Holthaus
2027	German-English Automotive Engineering Dictionary
2028	Delmar's Automotive Dictionary
2029	Lane's Complete Dictionary of Automotive Terms
2030	Dictionary of Mechanical Engineering
2031	Westport Innovations Inc. Annual Report 2015 (Excerpts)
2032	Quinlan Dep. (April 19, 2024) Exhibit 13
2033	Westport Fuel Systems Corporate Presentation March 2023
2034	Oct. 26, 2001 News Release, WFS369772-73
2035	Nov. 9, 2001 News Release, WFS369782
2036	Oct. 28, 2023 News Release, WFS370088-93
2037	Oct. 27, 2024 News Release, WFS370207-08
2038	Updated CV of Dr. Christopher Atkinson

Exhibit	Description
2039	Westport's Technology Tutorial, Case No. 2:23-cv-00038-JRG-RSP (E.D. Tex.)
2040	IPR Dep. Exhibit 6

Klügl is the only reference Petitioners contend discloses the passive hydraulic link of Claim 1(e), and is required by all challenged claims. Westport's Response ("POR") (Paper 19) demonstrated numerous failings with Petitioners' contention.

Petitioners' Reply (Paper 23) and related technical declaration provide no new competent evidence, and do not seriously address the litany of failings. Instead the Reply primarily attempts to salvage the fatally unreliable Klügl translation. Notably, despite this focus, Petitioners proffer no admissible evidence, such as testimony from a competent German translator. Without such evidence, Petitioners attempt to backfill the identified deficiencies with (i) unsupported attorney argument and "interpretations" of untranslated German documents (Reply, 3-5), (ii) new and allegedly routine—but unidentified—design modifications that would magically make Petitioners' inoperable combinations operable and cure other deficiencies (*id.*, 10-11, 13, 19, 21-24), (iii) a fictional membrane that is "substantially inflexible" but nonetheless flexes only when Petitioners claim (*id.*, 2, 12-13,17-18); and (iv) improper attempts to shift Petitioners' burden to prove unpatentability onto Westport (*id.*, 3-5, 10).

No amount of deflection or hand waving can change the fact that the only competent evidence shows Petitioners' Klügl translation is unreliable (Ex. 2026; Ex. 1026 33:13-34:3) and should be excluded based on Westport's forthcoming motion. Beyond its inadmissibility, none of Petitioners' speculative arguments carry their

burden to show Klügl disclosed or taught the passive hydraulic link (and the many other limitations detailed in the POR). These failings are fatal.

Petitioners and their proffered expert do not contest the vast majority of the technical distinctions and similarities between Klügl's Figure 1 ("without stroke translation") and Figure 3 ("with stroke translation") Westport's expert identified (Ex. 2022, ¶72), or that Klügl's claim 6 is directed to Figure 1—not Figure 3—and requires only that "the movement of the actuator (1) is at least ***partially transmitted*** to the control element (3)." (Ex. 1006, 8:66-68; Ex. 2022, ¶¶60, 77.) Instead, contrary to their prior insistence that institution turned on the differences between Figure 1 and Figure 3, Petitioners now repeatedly implore the Board ***not*** to limit the grounds to what is shown in Klügl's figures. *Compare* Paper 9, 1-2 (criticizing Westport for allegedly failing to "account for [Klügl's] two separate embodiments") *with* Reply, 11, 21 ("These figures are only 'schematic[s]'" and "no concrete dimensions can be derived"). Petitioners also urge departures from the language of Klügl's disclosure, conceding that their own expert "repeatedly testified that ***the precise words used by Klügl***—and ***formal definition*** applied to those words—***do not matter***. . . .[the] ***particular definition*** of 'stroke translation' and 'stroke ratio' [is] ***not pertinent.***)" (Reply, 5 (emphasis added).)

Petitioners now ask the Board to disregard Klügl's ***actual*** disclosures (both in figures and language) and ***imagine*** a different, undisclosed embodiment that "a

POSITA would readily be able to design." This imaginary embodiment—which was never raised in the Petition—cannot carry Petitioners' burden to prove unpatentability.

In the end, Petitioners are left with a fatally flawed translation and other—largely uncontested—failings applicable to each asserted ground. As Westport detailed at length in the POR, all the challenged claims are patentable over Petitioners' asserted grounds.

I. PETITIONERS DO NOT PROFFER ANY EVIDENCE TO CURE THE UNRELIABILITY OF THE KLÜGL TRANSLATION

Petitioners have failed to support their fatally unreliable translation of the German Klügl reference. Despite the Klügl translation's central importance to all of Petitioners' grounds, in reply Petitioners declined to provide any supporting declaration from a translator providing a correction or an explanation of why translating "Hubübersetzung" in three different ways (*i.e.*, "stroke translation," "stroke transmission," and "stroke ratio,") within the same document was proper. Thus, no competent evidence rebuts the evidence such translation was improper and unreliable. (POR, 26-27; Ex. 2025 ¶¶5-7; Ex. 1026, 33:13-34:3.)

Instead, Petitioners resort to attorney argument that the three English translations are effectively synonyms and have no import, amounting to "non-substantive quibbling over word usage." (Reply, 3.) Petitioners' contention that their strategic variations of word choice in their English translation are non-substantive,

however, is belied by their emphasis on the word "ratio" in both their Request for Reconsideration (Paper 9, 1-2) and Reply (Reply, 2, 5, 7-8). Indeed, the Board appeared to rely on these differences when reversing its original non-institution decision. (Paper 10, 7-8.)

If "stroke ratio" was replaced with "stroke translation," Petitioners would have no basis to argue that the actuator in Figure 1 ***must*** move ***the same amount*** as the piston. Put another way, nothing about "stroke translation" or "stroke transmission" (or any other disclosure within Klügl) supports Petitioners' incorrect argument. In fact, the alleged "synonym" on which Petitioners' arguments rely (*i.e.*, stroke ratio) appears only once in the unreliable translation. Given the importance placed on each word in a patent disclosure, inexplicably replacing "Hubübersetzung" with three different English translations within the same document fatally undermines the trustworthiness of the translation. (Ex. 2026; Ex. 1026, 33:13-34:3.) Further, "Hubübersetzung" only appears ***four*** times in the original Klügl reference; it is unreliable to translate it differently three out of four times that it appears.

Beyond speculative attorney argument, in a further hand-waving exercise, Petitioners' Reply improperly injects numerous new and ***untranslated*** German references (*see* Exs. 1029, 1031, 1033, 1037). (37 C.F.R. §42.63(b) (requiring certified translations of non-English documents); Paper 24, 2-5.) Relying on attorney

argument alone, Petitioners also improperly purport to correlate portions of these untranslated German references to later-filed English applications. Not only are these applications not purported translations of the German references, but no evidence supports any claim that Petitioners' counsel correctly identified the purportedly corresponding English words. Additionally, assuming *arguendo* that the English applications contain a translation of Hubübersetzung, none translate the word as "stroke ratio." (Reply, 5.) Regardless, such attorney argument is not evidence and the evidence that the Klügl translation is fatally flawed stands unrebutted. (POR, 26-27; Ex. 2026 ¶¶5-7; Ex. 1026, 33:13-34:3.)

In an effort at deflection from this problem, the Reply criticizes Westport for not submitting its own translation. (Reply, 1.) However, Petitioners have the burden of proving unpatentability by a preponderance of the evidence; Westport need not submit any evidence to prove patentability. 35 U.S.C. §316(e). Where the only issue is what the (German) prior art discloses, the burden remains with the Petitioners. *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016). The established unreliability of Petitioners' translation takes on additional significance here, where the core of Petitioners' argument rises and falls with the inconsistencies in their translation.

The Reply also misleadingly attack Ms. Holthaus. (Reply, 1.) Specifically, Petitioners incorrectly claim Ms. Holthaus did not know the meaning of

"Hubübersetzung." In reality, she testified that when reviewing Klügl she thought "spontaneously … of stroke translation." (Ex. 1026, 17:1-3, 29:17-30:15.) Petitioners' criticism of Ms. Holthaus stems from her efforts to undertake peer research, verifying her initial opinion of the meaning. (Ex. 1025.) The statements from the translation forum are undeniably hearsay. Even so, the proffered translations were for "übertragung" and not "Hubübersetzung," the word at issue here. (Ex. 1026, 24:12-20, 32:22-33:12; Ex. 1025 (asking "What does 'Übertragung' mean here?") Even as to that word, not a single peer agreed "stroke ratio" was an appropriate interpretation. (Ex. 1025.)

In sum, despite Petitioners' attempt to deflect from the evidence, the undisputed evidence remains that the Klügl translation is flawed and unreliable. (POR, 26-27; Ex. 2025 ¶¶5-7; Ex. 1026, 33:13-34:3.)

II. THE BOARD'S PRELIMINARY FINDINGS CANNOT CURE THE PETITION'S DEFICIENCIES

Petitioners argue that Westport "repeats the argument that the Board already addressed and rejected in its institution decision" as a purported remedy to the Petition's fatal deficiencies. (Paper 23, 2.) Not only are such findings necessarily preliminary (Paper 10, 11), the Board's institution decision did not have the benefit of Westport's detailed POR arguments and additional evidence (including Ms. Holthaus' testimony), and also was based on Petitioners' arguments regarding the flawed translation. Petitioners sought reversal of the Board's original non-institution

decision based entirely on the argument that the original decision was "in clear contradiction to Klügl" ***because*** deformation of the flexible membrane 6 could only occur if a negative (de-amplifying) "stroke ratio" was applied to Figure 1 contrary to the description that Figure 1 is "without stroke translation," meaning ***only*** a 1:1 ratio. (Paper 9, 1.) Westport did not have a chance to contest Petitioners' reconsideration arguments that hinge on their improper translation. Since institution, however, the record now reflects a more detailed technical analysis of Klügl's disclosures and the fatal and inexplicable translation flaws these German-based Petitioners have asked the Board to accept. The record reflects that Petitioners, at best, inadvertently misled the Board with their arguments and inaccurate translation. (POR, 2-3.)

But, even without Westport's largely unchallenged, post-institution evidence and analysis regarding what "with" and "without" properly means in Klügl, "[t]he Board is free to change its view of the merits after further development of the record, and ***should do so*** if convinced its initial inclinations were wrong." *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (emphasis added). "[T]here is a significant difference between a petitioner's burden to establish a 'reasonable likelihood of success' at institution, and actually proving invalidity by a preponderance of the evidence at trial." *Id.* (comparing 35 U.S.C. §314(a) (standard for institution) with 35 U.S.C. §316(e) (burden of proving invalidity after

institution)). In fact, similar arguments have been rejected as unpersuasive for precisely this reason, with prior panels concluding that "we are not persuaded by [the] argument that [Patent Owner] has not presented anything new to rebut our previous analysis and conclusion because we now must evaluate the evidence of record against a different, and higher, standard." *Samsung Elecs. Co., Ltd. v. Infobridge Pte. Ltd.*, IPR2017-00100, Paper 30 at 15 (PTAB Apr. 23, 2018). In sum, contrary to Petitioners' argument, the Board's preliminary findings have no binding effect when rendering the final written decision.

III. PETITIONERS HAVE NOT SHOWN THAT "STROKE RATIO" IS AN ACCEPTED TRANSLATION OF "HUBÜBERSETZUNG"

Petitioners contend—without citation—that "stroke translation," "stroke ratio," and "stroke transmission" are "all accepted translations of 'Hubübersetzung.'" (Reply, 3.) Yet Petitioners do not provide any competent evidence supporting their assertion that "stroke ratio" is an accepted translation. Petitioners rely on "amplification ratio," citing the hearsay forum post answering a question about a different term, übertragung (Ex. 1025); "gear ratio," citing a dictionary translation of "übersetzung" (Ex. 1028); and "stroke transmission ratio," which in context is further modified, *i.e.*, "stroke transmission ratio ***of 1:6***… [i.e., amplification]" (Ex. 1036 ¶0007 (providing key context for its discussion of ratios that Petitioners selectively quote: "[a]n increase in the stroke of an actuator..."). In the apparent recognition that none of their cited references interpret

"Hubübersetzung" to mean "stroke ratio," Petitioners also contend that translation is a word soup where all the variations are input and any combination of the words within the soup are appropriate synonyms. (Reply, 4-5.) In fact, Petitioners concede that Dr. Quinlan "**repeatedly testified** that **the precise words used by Klügl**—and **formal definition** applied to those words—**do not matter**." (*Id.*, 5 (emphasis added).) Contrary to Petitioners' assertion, when translating a document—and when offering opinions about what a reference teaches to invalidate a patent—words matter, as do the "formal definitions" of those words. In fact, the Board requires certification of a translation in recognition that accuracy is important. 37 C.F.R. §42.63(b). And these words in particular matter to this dispute.

From the above-cited references, taken together with other references that do not use the word "ratio" at all, Petitioners repeatedly assert that each of Klügl's uses of "Hubübersetzung" "refer to" the "same concept." (Reply, 4, 5.) But "application of ***a ratio***" is not the "same concept" as "***amplification***." Not only are the cited untranslated references and hearsay forum post not competent evidence—and certainly not part of Petitioners' grounds—but the references also do not support Petitioners' conclusion. Petitioners blatantly read out any concept of amplification to contend that "Hubübersetzung" means application of ***any*** ratio, even de-amplification of a stroke. (Reply, 6; *see also* Paper 9, 6-7 (contending that Westport's position is incorrect only based on their inaccurate translation: "a '***stroke***

ratio ***would be applied*** because drive piston 3 would move ***less than*** actuator 1 as a result of a reduction in the thickness of the fluid in pressure chamber 5.").)

In short, what started as "'without stroke translation' means 'without amplification'" has evolved into a requirement that the components in Figure 1 "mov[e] by the same amount." (Reply, 7.) This is an unsupportable interpretation and should not be countenanced. Klügl simply does not teach that the actuator and piston in Figure 1 would move by "the same amount." To the contrary, because Petitioners fail to contest that Claim 6 of Klügl is directed to Figure 1, and Claim 6 expressly requires only the ***partial transmission*** of the movement of the actuator, Petitioners concede Figure 1 cannot be limited to movement by the same amount. (Ex. 1006, Claim 6; Ex. 2022, ¶¶60, 77; POR, 30-31.) That alone should be the end of the argument that Klügl discloses Claim 1(e).

IV. EVEN IF PETITIONERS' TRANSLATION IS ADMISSIBLE, THE TRANSLATION DOES NOT COMPEL THE CONCLUSION THAT PETITIONERS IMPLY

Even if the Board accepts Petitioners' unreliable translation, which it should not, Klügl's disclosure expressly describes the difference between Figure 1 and Figure 3 as relating to a difference in power transmission. Figure 1 shows a ***moveable*** transmission module (having a stroke), while Figure 3 shows a ***fixed*** transmission module (which would have no stroke such that the stroke must be translated or

transmitted through the fixed transmission element). Westport has explained this distinction at length. (POR, 18-25; Ex. 2022, ¶¶71, 73.)

Even if the Board concludes that amplification could result from Figure 3's use of membranes with different cross-sectional areas as compared to Figure 1's use of a single membrane, this does not demand the conclusion that amplification in Figure 3 means ***only*** a 1:1 ratio of movement occurs in Figure 1. ***Nothing*** about "without amplification" alone would mean that the piston and actuator must move by the ***same*** amount; it merely would indicate that Figure 1's piston would not move ***more than*** the actuator. (POR, 30-31.) As previously noted, the undisputed evidence is that Figure 1 teaches less than 1:1 movement, i.e., de-amplification. (*Id.*; Ex. 1006, Claim 6; Ex. 2022, ¶¶60, 77.) Petitioners' only response is circular: ignoring the flexible membrane and partial transmission of movement teachings, Petitioners' expert would not answer whether a flexible membrane would deform or deflect when actuated (e.g., Ex. 2025, 49:4-13, 63:3-8, 63:13-17, 63:24-64:2; 64:8-10, 65:20-66:2). Petitioners cannot answer the flexible membrane question because if the membrane is flexible, it will deform or deflect during actuation.

Indeed, Petitioners now concede that Klügl teaches the movement between the actuator and piston in Figure 1 would ***not*** be equal, such that there is ***at least some difference***. (Reply, 11-12.) Because this dooms the Petition's grounds, the Reply embarks in a new direction. Petitioners raise the new argument—based on yet

other new references—that the admitted movement is "virtually undampened," "virtually unchanged," or "essentially unchanged." (Reply, 11-12.) The evidence reflects that Petitioners' characterization of such difference is flawed because even a small difference is significant in view of the miniscule movement at issue in Klügl (and fuel injectors generally). (Ex. 2022, ¶67; POR, 33-36.)

Even if the without/with "stroke translation" refers to amplification (resulting from Figure 3's use of membranes with different cross-sectional areas as compared to Figure 1's use of a single membrane), a POSITA would not be motivated to choose a membrane that was substantially inflexible, as Petitioners now suggest. To the contrary, Klügl specifically teaches the use of a flexible membrane in connection with Figure 1. (POR, 31-41.) Klügl expressly teaches the membrane must be capable of flexing during actuation because the membrane flexes ("is moved in the direction of the drive piston 3" (i.e., outwardly flexes) or is "pushed in" (i.e., inwardly flexes)) to maintain contact with piston 3 ***at all times***. (Ex. 1006, 4:9-10; Ex. 2025, 139:2-17 (agreeing that "chamber 5 change[s] dimension over time" and that "membrane 6 stays in contact with member 3".) Thus, Klügl must provide for *some* flexing during periods of rapid actuation to ensure that membrane 6 is always in contact with drive piston 3. (Ex. 2022, ¶87; POR, 30-41.).

Undeterred by these disclosures, and ***without citation to Klügl***, Petitioners raise the new argument that Klügl "fairly suggests" a teaching that "membrane

material and dimensions substantially limit any flexing," i.e., is inflexible. (Reply, 11-12.) Petitioners rely on Dr. Quinlan's opinion that "a POSITA would readily be able to design Klügl's injector such that any flexing of membrane 6 is immaterial during actuation." (Reply, 10.) However, Dr. Quinlan provides no description of what modifications a POSITA would make to ensure "any flexing" is immaterial. (Ex. 1040, ¶33) ("choosing the correct (less flexible) membrane material and dimensioning it appropriately.") During his deposition, he knew of no such "less flexible" material or dimensions. (Ex. 2025, 140:20-25, 142:5-15.) Moreover, that a POSITA allegedly would "readily be able to design" is an admission that Klügl itself does not teach using an inflexible membrane that limits flexing during actuation.

Relatedly, Petitioners also incorrectly assert that "in Figure 1, fluid ***does not*** flow ... during actuation." (Reply, 17 (emphasis in original).) Their reliance on a discussion about selecting throttle dimensions is misplaced. (Ex. 1006, 4:11-15.) Contrary to Petitioners' assertion, Klügl expressly teaches that fluid ***does flow*** during actuation, just not into the throttle. (*Id.*) A necessary consequence of the throttle being dimensioned this way and using a fluid with "low compressibility" is, as Westport has shown, that fluid flows outwardly and causes flexible membrane 6 to flex during actuation because it cannot flow through the throttle. (Ex. 2022, ¶¶81-82; POR, 39-40, 46; Ex. 2025, 125:1-4 (admitting the membrane may not "hold the fluid in place during actuation in Figure 1 of Klügl"), 127:7-128:6.)

V. PETITIONERS' REPLY IMPROPERLY INTERJECTS NEW, VAGUE, AND UNEXPLAINED MODIFICATIONS

As Westport explained at length, Klügl's Figure 1 teaches a flexible membrane. (POR, 31-41.) Petitioners do not dispute this detailed explanation. Instead, Petitioners now assert a new argument, contending "Patent Owner Improperly Assumes that All 'Flexible' Materials Substantially Flex." (Reply, TOC.) Generally, flexible materials are in fact understood to "substantially flex." It would render the word "flexible" meaningless to describe materials that only "insubstantially" flex as "flexible" rather than "inflexible." Nonetheless, and with no citations or explanation, Petitioners argue "[w]hen Klügl's teachings are considered in their entirety, it is ***apparent*** that in the injector of Figure 1, membrane 6 ***does not substantially flex during actuation***." (Reply, 6.) In so arguing, Petitioners appear to finally concede (at least implicitly) that membrane 6 is flexible, recasting the dispute now as whether Klügl's flexible membrane 6 "substantially flexes" during actuation. A conclusion that it does is compelled by Klügl's disclosure. (POR, 31-41.) Petitioners argue Westport "does not attempt to quantify ***how much membrane flexing*** purportedly occurs when Klügl is actuated." (Reply, 10.) But the burden is on Petitioners to prove Klügl meets the claimed limitations—not on Westport to prove that the challenged claims are patentable.

In fact, Petitioners and Dr. Quinlan refused to acknowledge that membrane 6 is flexible ***at all*** prior to their Reply. At his deposition, Dr. Quinlan could not identify

any materials that would have been a suitable for choice for a membrane. (Ex. 2025, 48:14-21.) But now, in reply—presumably because Petitioners have finally conceded that membrane 6 flexes—Dr. Quinlan offers entirely new opinions about "whether membrane 6 meaningfully flexes during injector actuation" (Ex. 1040, ¶¶28, 31) and purported selection and modification of membranes (*id*., ¶¶32-33). Neither the Petition nor Dr. Quinlan's declaration in support of the Petition contend that a POSITA would have modified Klügl's flexible membrane to make it substantially inflexible.

Petitioners attempt to backfill these new opinions into Dr. Quinlan's deposition testimony, but during his deposition, Dr. Quinlan repeatedly proclaimed that he was not expressing an opinion related to the flexibility of membrane 6:

- "Q. What's your understanding [of] what flexible means in the context of the Klügl reference? …. A. Again, I haven't been asked to offer a formal opinion of what flexible means in light of this." (Ex. 2025, 47:14-18.)
- "Again, I haven't offered formal opinions on what flexible means and whether it can deform or not." (*Id.*, 49:7-8.)
- "So, without picking the design detail so what 6 really means, what its –its conditions are, its thickness, its material, the loading on it***, I can't tell you what that shape is yet***. Again that would be something we did during the design process." (*Id.*, 127:12-129:17 (emphasis added).)

Dr. Quinlan testified that he could not provide an answer without going through the design process and selecting the numerous parameters he described. (*Id.*, 135:11-13 ("We have to know the details of how those things interact to understand what happens to the fluid.").) Yet, without providing any "details of how those things interact," he now asserts—without explanation—that during actuation "[t]he membrane (purple) ***does not materially flex*** and . . . the piston and actuator move by the same amount (x)." (Ex. 1040, ¶28; *see also id.*, ¶32 ("[t]he amount of flexing (or lack thereof) will be primarily determined by the [still unidentified] applied forces and [still unidentified] structure/properties of the membrane itself").) The forces here are not a mystery: Dr. Quinlan also opined that Klügl related to a "power transmission device" to "transmit the movement of a piezoelectric actuator" for valve opening and closing in a fuel injector." (Ex. 1003, ¶¶119, 208.)

Dr. Quinlan refuses to identify the parameters that support his opinion because his theory presents a fatal dilemma. If a POSITA would select a ***flexible*** membrane in accordance with Klügl's express teaching, it would ***deform*** during actuation such that the hydraulic fluid will not act "substantially as a solid with said thickness being substantially constant while said actuator assembly is actuated," as Claim 1(e) requires. Or, if—under Petitioners' improper new theory—a POSITA would select an ***inflexible*** membrane (against the express teachings of Klügl), it would be ***unable to adjust*** "while said actuator assembly is not actuated in response to changes in the

dimensional relationship between components of said injection valve to maintain a desired valve lift upon actuation of said actuator assembly" as Claim 1(e) requires. Under either option, the Petition fails as to all asserted grounds.

Dr. Quinlan recognized this tension in his deposition: "there's two different functions here. One is during actuation and one is in the hydraulic link's ability to make up for things like wear and thermal expansion." (Ex. 2025, 66:10-13.) But Klügl must "make up for things like wear and thermal expansion" both during actuation ***and*** during rest. Nonetheless, Dr. Quinlan now attempts to circumvent this tension by arguing that the membrane's physical ***properties*** (i.e., flexibility) will not change when actuated as compared to when unactuated, but that its ***behavior*** will. (Ex. 1040, ¶52.) Specifically, Dr. Quinlan now contends that the membrane hypothetically could ***behave*** as a flexible membrane when unactuated but remain inflexible when actuated, opining that "long-lasting [pressure] differences—which are present only during much longer rest periods and not very short actuation periods—that ***cause the same membrane to behave differently*** during actuation and rest." (*Id.*, 52.) Tellingly, Dr. Quinlan identifies no inflexible material that behaves this way. (*Id.*; Ex. 2025, 47:21-49:19, 62:25-66:18, 115:3-18, 117:2-123:1, 140:23-25.) Instead, the only impact the long-lasting pressure differences have, as Dr. Quinlan acknowledge and Klügl explained, is that it allows the ***transmission medium*** to be "exchanged between the compensation chamber 7 and the pressure

chamber 5 via the throttle 10." (Ex. 1040, ¶51.) Whether the transmission medium flows through the throttle when not actuated has nothing to do with whether the membrane is or is not flexible and everything to do with the physical design of the throttle to prevent the movable transmission fluid from flowing up the throat during actuation.

Moreover, Dr. Quinlan's opinions are internally inconsistent. On one hand, Dr. Quinlan opines that the membrane's properties will be unchanged, but "long-lasting differences—which are present only during ***much longer*** rest periods and ***not very short actuation*** periods—[...] cause the same membrane to behave differently." (Ex. 1040, ¶52.) On the other hand, Dr. Quinlan opines that "***amount of flexing*** (or lack thereof) ***will be primarily determined*** by the applied forces and ***structure/properties of the membrane itself***, ***not*** the injector's '***actuation rate***.'" (Ex. 1040, ¶32.)

The Board should categorically reject each of these new arguments, vague suggested modifications, and conclusory statements that it would be routine to modify Klügl to function in an implausible way without any supporting explanation or identification of any material that could behave in the manner described.

VI. PETITIONERS DO NOT MEANINGFULLY REPLY TO WESTPORT'S OTHER ARGUMENTS

In their Reply, Petitioners failed to substantively engage with numerous arguments, and sometimes did not respond at all.

A. Klügl's Design Flaw Undermines Petitioners' Motivation to Combine in Grounds 1 and 2 and is Dispositive of Grounds 3 and 4 for All Challenged Claims.

Dr. Atkinson identified a design flaw in Klügl that prevents it from disclosing the claimed adjustment between components of said injection valve to maintain a desired valve needle lift. (Ex. 2022, ¶¶68-70; POR, 47-49.) Dr. Quinlan now concedes the design flaw, but attempts to limit the flaw as only pertaining to Grounds 3 and 4. (Ex. 1040, ¶38.) He also concedes that Klügl's "module 2 is meant to account for ***changes in the dimensions of the actuator*** ..., ***not the piston 3 or needle 32*** ...." (Ex. 1040, ¶40 (emphasis added).) Yet the changes in the dimension between other components such as piston 3 and needle 32 resulting from thermal effects will likely be more severe during engine operation than changes in the dimensions of the actuator because of the proximity of other components to the combustion chamber as compared to the actuator. (Ex. 2022, ¶25 (describing "the possibility of significant temperature or thermal gradients across a single injector.")) As such, desired valve needle lift will not be maintained. (Ex. 2022, ¶¶68-70; POR, 47-49.) Thus, Petitioners' contention that Klügl discloses this element of Claim 1 in Grounds 3 and 4 must be rejected and is alone dispositive of Grounds 3 and 4 for all challenged claims. (Pet., 68.) Dr. Quinlan also does not respond to Dr. Atkinson's detailed criticisms of Grounds 3 and 4's Klügl/Hayes combination, and Petitioners devote

barely two pages to repeat the same vague assertions which already have been addressed. (Reply, 22-24.)

For Grounds 1 and 2, Dr. Quinlan proposes making even further modifications to the Petition's Wirbeleit/Klügl combination; namely, he now proposes that "the combined injector would ***not include*** the same type of 'lower stop 15' [*sic*] and 'valve needle 32' as Klügl." (Ex. 1040, ¶38 (emphasis added).) In his first declaration, however, Dr. Quinlan relied on lower stop 16 as providing part of the motivation to combine, asserting "Klügl's injector includes an 'upper stop 13' and a 'lower stop 16' that are both attached via 'screw' connections and can be used to set the compression of the piezoelectric actuator … this would have further motivated application of Klügl to Wirbeleit." (Ex. 1003, ¶¶324-326.) Not only are Petitioners proposing a new, continuously-shifting combination of components and modifications, but their removal of these components (and failure to identify any replacement) eliminates one of the alleged reasons that a POSITA would be motivated to combine these references.

B. All Grounds Must Be Rejected Because Petitioners Fail to Describe How a POSITA Would Modify Their Inoperable Combinations To Be Operable.

Petitioners now contend that a POSITA could make their flawed and inoperable combinations operable using "routine design" modifications. Petitioners and Dr. Quinlan, however, do not attempt to identify what modifications would be

necessary for either Grounds 1 and 2 (Wirbeleit/Klügl (Pet., 40; Reply, 21)) or Grounds 3 and 4 (Klügl/Hayes (Pet., 60; Reply, 23)). Petitioners also contend that they "did not argue that a POSITA would have bodily grafted Klügl into Hayes" (Reply, 24), but that is ***precisely*** the combination presented in the Petition. (Pet., 60.) Petitioners also reject Westport's arguments that their proposed Wirbeleit/Klügl combination is inoperable because "Patent Owner's critique of the combination of Wirbeleit and Klügl appears to take the two references' drawings literally …. These figures are only 'schematics.'" (Reply, 21.) Moreover, Petitioners contend for the first time that a "POSITA would ***of course*** be able to tailor the dimensions of the combined structures to optimize the size and operation of the combined valve." (*Id.* (emphasis added).)

This is not an ***optimization*** problem, but an ***inoperability*** problem. Petitioners proposed an inoperable combination and now contend that a POSITA would be able to fix it without identifying how a POSITA would modify the teachings to make the combination operable. Indeed, having failed to design an operable combination, Dr. Quinlan now contends that a POSITA would have engaged in an allegedly "routine design exercise" to make vague and unidentified modifications "when implementing the combined injector of Wirbeleit and Klügl." (Ex. 1040, ¶34.) Reliance on vague and unexplained "routine design" modifications to the combination is improper. For example, in *DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367, 1377 (Fed. Cir.

2018), the Federal Circuit reversed the Board's obviousness finding because the Board "relied on ordinary creativity as a wholesale substitute for reasoned analysis and evidentiary support, and did so when dealing with a limitation missing from the prior art references specified." In the same vein, Dr. Quinlan now distances himself from the specificity of Klügl's figures on which Petitioners relied so heavily in seeking reconsideration. In place of a substantive response to the technical problems identified, he offers only a criticism for allegedly "limiting Klügl's teachings to the exact dimensions shown in its figures." (Ex. 1040, ¶30.) Dr. Quinlan then asserts that Klügl's "figures are only meant to 'schematically' show the features of injector .... The figures are not meant to be set-in-stone engineering drawings." (Ex. 1040, ¶35.) But if Petitioners are not relying on the "set-in-stone" embodiment in Klügl Figure 1, then they have failed to sufficiently identify the embodiment on which they are relying for their combination in Grounds 1 and 2. In fact, Petitioners have ***never*** proposed any specific modifications to Figure 1's embodiment (including identification of the imaginary inflexible membrane that flexes only when desired and dimensions that would correct the above-described flaw) to achieve the results that they assert are "apparent," "of course," to a POSITA. Nor have Petitioners identified such modifications in their grounds. "The need for specificity pervades [Federal Circuit] authority on the PTAB's findings on the motivation to combine." *In re Nuvasive*, 842 F.3d 1376, 1381-82 (Fed. Cir. 2016).

Because Petitioners did not identify proposed modifications, they must live with the shortcomings of the Petition's combinations. Petitioners should not be allowed to supplement missing elements with vague assertions of unidentified "routine design" modifications. Petitioners' argument that a POSITA would know how to render their inoperable combination operable—while their own purportedly qualified technical expert does not and cannot—should be the end of their combinations.

C. Grounds 3 and 4 Also Fail Because of Petitioners' Reliance on Inconsistent Elements.

Petitioners' Reply does not address why it is permissible to point to Klügl as disclosing certain elements in connection with some claim limitations, then Hayes as disclosing the same element in connection with other claim limitations. Moreover, Petitioners maintain that "Hayes does teach—at least when Patent Owner's erroneous interpretation of its claims is applied—these limitations" (Reply, 22), yet provide no explanation of what "erroneous interpretation of the claims" should be applied. As explained below, Petitioners—not Westport—seek the application of inconsistent constructions.

VII. PETITIONERS CONCEDE THEY SEEK INCONSISTENT CLAIM CONSTRUCTIONS

Petitioners admit they "proposed ***more specific*** [*i.e.*, narrow] constructions of the terms … in district court." (Reply, 13) (emphasis added). Petitioners seek to use broad interpretations of the terms before the PTAB to invalidate Westport's claims

but narrow constructions for purposes of infringement before the district court. Petitioners incorrectly argue that these constructions "do not bear on—or have any pertinence to—Grounds 1 and 2." (*Id.*) But the narrow constructions Petitioners seek for "lift," "valve needle," "interior chamber," and "passage" before the district court would pose serious challenges for their combination in this proceeding. To ensure the record is abundantly clear, Westport does not request application of Petitioners' narrow district court claim constructions for purposes of avoiding invalidity in this forum, and the Board has not been asked to apply those narrow constructions here. Westport has maintained a consistent approach to claim construction for purposes of this proceeding and the district court proceeding as it believes its proposed constructions reflect the proper scope of the challenged claims.

In fact, Petitioners contend that Grounds 3 and 4 apply Westport's allegedly "overbroad, district court claim interpretation." (*Id.*, 14.) But Petitioners have effectively abandoned those grounds. Dedicating little more than a page in their Reply to respond, Petitioners demonstrate that those interpretations are not as "overbroad" as Petitioners contend.

VIII. CONCLUSION

For the foregoing reasons together with those presented in Westport's POR, Westport respectfully requests a final written decision confirming the patentability of the challenged claims. To the extent that Westport has not addressed a specific

claim element in this sur-reply, it is not a concession that the element is disclosed in the prior art, but a reflection of the word count limitation.

Dated: September 6, 2024

Respectfully submitted,

/s/ David W. Higer

David Higer
Reg. No. 74,910
Miranda Jones
Reg No. 64,721
Winstead PC
2728 N. Harwood Street, Suite 500
Dallas, TX 75201
dhiger@winstead.com
mjones@winstead.com
Telephone: (214) 745-5400
Fax: (214) 745-5390

Counsel for Patent Owner

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), the undersigned certifies that on September 6, 2024, a complete and entire copy of Patent Owner's Sur-Reply to Petitioners' Response was served on Petitioners by email to the following email addresses:

K. Patrick Herman P52PTABDocket@orrick.com
Bas de Blank M2BPTABDocket@orrick.com
Celine Crowson celine.crowson@hoganlovells.com
Joseph Raffetto joseph.raffetto@hoganlovells.com

/s/ David W. Higer
David W. Higer (Reg. No. 74,910)
dhiger@winstead.com
WINSTEAD PC
2728 N. Harwood Street, Ste. 500
Dallas, Texas 75201
Telephone: (214) 745-5400
Fax: (214) 745-5390

Counsel for Patent Owner

CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing Patent Owner Response, exclusive of the parts exempted by 37 C.F.R. §42.24, contains 5,562 words, according to the word processing program used to prepare it, and therefore complies with the limitations of 37 C.F.R. §42.24.

September 6, 2024

/s/ David W. Higer

David W. Higer (Reg. No. 74,910)
dhiger@winstead.com
WINSTEAD PC
2728 N. Harwood Street, Ste. 500
Dallas, Texas 75201
Telephone: (214) 745-5400
Fax: (214) 745-5390

Counsel for Patent Owner