

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.

IPR2023-00292 (Patent 6,298,829 B1)
IPR2023-00293 (Patent 6,575,138 B2)

Record of Oral Hearing
Held: November 14, 2024

Before NEIL T. POWELL, CARL M. DEFRANCO, and
FRANCES L. IPPOLITO, *Administrative Patent Judges*.

IPR2023-00292 (Patent 6,298,829 B1)

IPR2023-00293 (Patent 6,575,138 B2)

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The above-entitled matter came on for hearing on Thursday, November 14, 2024, commencing at 1:00 p.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia.

1 P R O C E E D I N G S

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3 JUDGE IPPOLITO: Hello, good afternoon and welcome to the
4 Board. This is a consolidated hearing for two cases IPR2023-00292 and
5 IPR2023-00293. I'm Judge Ippolito and I'm joined on our Webex with
6 fellow Panel members, Judges Powell and DeFranco. I always like to begin
7 with the appearances from Counsel and just make sure that everyone can
8 hear everybody. Petitioners can go ahead. Make your appearance.

9 MR. HERMAN: Good afternoon, Your Honor. This is Patrick
10 Herman from Orrick, Herrington & Sutcliffe here on behalf of Petitioners.

11 JUDGE IPPOLITO: Welcome. And Patent Owner, are you here as
12 well?

13 MR. HIGER: Yes. Good afternoon, Your Honors. Can you hear us?

14 JUDGE IPPOLITO: Yes, I can hear you.

15 MR. HIGER: I'm Dave Higer. I'm here for Winstead on behalf of
16 Patent Owner Westport Fuel Systems Canada, Inc. Along with me here is
17 Miranda Jones, Nikki B. Kraft (phonetic), and on the line also is Mr. Larry
18 Kyle (phonetic) of Patent Owner.

19 JUDGE IPPOLITO: Great. Thank you and welcome. So, as we set
20 forth in the trial hearing order, each side is going to have up to 75 minutes of
21 argument time. Petitioner bears the burden of showing unpatentability and
22 will argue their case first and may reserve rebuttal time. Patent Owner will
23 then argue their opposition to Petitioners' case and may reserve rebuttal time.
24 In between the initial presentation, we may have a short break, depending on
25 where we are. Usually that's about 5 to 10 minutes just to kind of have a
26 moment to stretch or to transition.

1 There are a couple housekeeping items I always mention because we
2 are doing this virtually. If you experience any technical difficulties that
3 prevent you from representing your client or arguing your case, please
4 contact us immediately. Sometimes we have the audio drop. Sometimes
5 something else happens. We've got to go back a little bit in the time and
6 kind of fill in the record. Just let us know as soon as you know, and we'll let
7 you know if there's something happening where we can't hear you or there's
8 a break in the quality of the transmission.

9 The Panel has the entire record before us, including your
10 demonstratives. But when you are referring to a slide, please identify it
11 clearly for the record and for the transcript of our hearing today. If you
12 identify other parts of the record, do the same. Let us know what the paper
13 number is or the exhibit number for whatever you're referencing.

14 And we don't have a clock here, but I will be keeping account of your
15 argument time as well as one of our Panel members. But I also know that
16 you should keep track of your own time as well on your end, just so that you
17 know where you are in your argument. I will try to provide you with
18 reminders during your presentation for the time remaining. But sometimes
19 we're going to get into question and answer sessions, and that might not
20 happen. So, it's good for you keep your own time as well.

21 Lastly, when you're not speaking, make sure to mute yourself to cut
22 down some of our audio feedback issues that might happen. And with that
23 said, Petitioner, you can begin. I would just say, because we do have two
24 cases, you can present it how you would like to present for those two cases.
25 The way that the slides and the demonstrative appeared to us is that it would
26 be together because of the overlapping issues. But I don't want to assume

1 that that's how you're going to proceed, so I'll let you present it the way
2 you'd like to do.

3 Okay. All right. With that, Petitioner, would you like to reserve any
4 time for rebuttal today?

5 MR. HERMAN: Yes, Your Honor, about 20 minutes, please.

6 JUDGE IPPOLITO: Okay. And whatever time you don't end up
7 using, we just roll into your rebuttal. Or if you need more time, you can take
8 it from the rebuttal time if you need that. So, there's some adjustments that
9 can be done during your presentation as well. So, whenever you're ready,
10 Petitioner, please go ahead and begin.

11 MR. HERMAN: Thank you. Thank you, Your Honor. And as you
12 noted, because the issues are similar across both of the IPRs, I will be
13 discussing them together. So, we're here today to talk about the '829 and the
14 '138 Patents. And I'll begin by providing a brief introduction to the patents,
15 the prior art, and the grounds that are at issue in an effort to provide some
16 context for the rest of the discussion.

17 If you could turn to slide 3 of Petitioners' demonstrative. Now, both
18 of the patents at issue here have filing dates from the 1999 to 2000
19 timeframe. And what are the patents directed to? As shown on slide 3, they
20 both relate to directly actuated injection valves that use what the patents call
21 a hydraulic link assembly. Now, by directly actuated, the patents mean that
22 the actuator pushes the injector's needle and that itself opens the valve into
23 the vehicle's combustion chamber. So, this can be contrasted with an
24 indirectly actuated injector, where the actuator opens an intermediate valve,
25 which in turn causes a needle to move, opening another different valve into
26 the combustion chamber. The patents here again are directed to a directly

1 actuated injection valve. The patents' hydraulic link is simply an
2 intermediate layer of hydraulic fluid through which the actuation force is
3 generated by the injector pass.

4 Now turning to slide 4. Slide 4 reproduces claim 1 of the '829 Patent.
5 And as shown, the claim is directed to an injection valve for injecting fuel
6 into a combustion chamber of an internal combustion engine. The claim
7 then begins by referencing a number of standard injector components,
8 including a fuel inlet, an interior chamber, a nozzle, a valve needle, a needle
9 spring, and an actuator. Now, those types of components are routinely found
10 in fuel injectors, and there is no dispute that they're taught by the prior art
11 here. So, the parties dispute focuses on the final limitation (e) of claim 1 of
12 the '829 Patent. And there's almost identical limitation in the claims of the
13 '138 Patent. And this limitation requires that the injector include what the
14 claim calls a passive hydraulic link. And per the claim, this passive
15 hydraulic link must have a hydraulic fluid thickness through which opening
16 and closing forces are transmitted.

17 And the claim requires that the link must behave differently, in two
18 different ways, at two different times. And that's shown by the yellow and
19 red highlighting on the slide. As shown in yellow, when the injector is
20 activated, the link's hydraulic fluid must act substantially as a solid with a
21 substantially constant thickness. And as shown in red, when the injector is
22 not activated, the thickness of the link must be adjustable to account for
23 component dimensional relationship changes and maintain needle lift.

24 So, moving on to slide 5. Slide 5 includes a summary of the grounds
25 that are asserted across the two petitions. And as shown, the petitions in
26 both proceedings begin by arguing that the majority of the claims are

1 obvious over a combination of a prior art reference to Wirbeleit and another
2 reference to Klügl. Then both petitions explain why one of the dependent
3 claims in the patents requiring the use of certain types of materials that's
4 claim 20 in the '829 and claim 28 in the '138 would have been obvious when
5 another reference's teachings that's a reference to Newcomb are also
6 considered.

7 Finally, both petitions end with another set of grounds applying Patent
8 Owner's erroneous district court interpretation of the claims. So, in district
9 court, Patent Owner argued that the claims do not require directly actuated
10 injectors and can instead extend to indirectly actuated injectors. So, while
11 Petitioner submits this is wrong, if the claims are given the scope Patent
12 Owner apparently believes they're entitled to, then the claims are also
13 obvious over the combination of Klügl and Hayes and that's the subject of
14 grounds 3 and 4.

15 So, slide 6 includes an overview of the Wirbeleit prior art reference.
16 What does Wirbeleit teach? It teaches a fuel injection system for a diesel
17 engine. You see that in the top excerpt from Wirbeleit on the left-hand side
18 of the slide and as shown in the middle excerpt, Wirbeleit, like all injectors,
19 includes a movable injection needle and that needle is highlighted in green
20 in the figure from Wirbeleit on the right. And this needle's movement is
21 controlled by an actuator which is shown in purple in the figure. And
22 finally, as shown by the final text excerpt on the left of the slide, Wirbeleit
23 also includes a hydraulic transmission element 22, and that's shown in pink
24 in the figure. And force from the actuator in Wirbeleit is passed through the
25 needle or is passed to the needle through this hydraulic element 22. And

1 Wirbeleit also notes that while this element is present, its structure is not
2 shown in detail.

3 So, slide 7 provides an overview of the Klügl reference. Klügl
4 explains that it relates to a power transmission device that transmits actuator
5 movement to an injector valve. This petition relies on Klügl, one of Klügl
6 embodiments, in particular that shown in figure 1, which is shown to the
7 right on slide 7. Shown in the second excerpt, the textual excerpt on the
8 slide, Klügl explains that this embodiment operates quote without stroke
9 translation, and Klügl's device employs what it calls a transmission module
10 2. And this module was highlighted in light purple in figure 1 on the right.
11 And as explained in the third excerpt from Klügl on the left, when Klügl's
12 actuator, which is shown in darker purple, is activated, it exerts force on the
13 transmission module 2 and this force is then passed on by the module to
14 Klügl's piston 3, which is shown in green via hydraulic transmission
15 medium, which is held in chamber 5 by membrane 6.

16 Now, the hydraulic transmission medium is highlighted in pink in the
17 figure. Now, while force is just passed on by the transmission module
18 during actuation, as shown in the bottom excerpt, the module is also
19 designed to allow for adjustments in the case of thermal expansion or wear,
20 and according to Klügl, this is because during periods of rest, fluid can flow
21 into or out of that pink chamber to make sure that the components stay in
22 contact.

23 So, moving to slide 8. Slide 8 provides an overview of how and why
24 a person having ordinary skill in the art with combined Wirbeleit and Klügl.
25 As articulated in the petition and as shown on the left in the petition,
26 Wirbeleit's hydraulic transmission element 22 has simply been replaced by

1 Klügl's transmission module 2. Now, why would a person having ordinary
2 skill have done this? First, because Wirbeleit does not detail how its
3 element 22 is structured, and Klügl provides this missing detail. It
4 essentially fills in the blanks that Wirbeleit left. Second, a person having
5 ordinary skill would have understood that Klügl's module provides the very
6 functionality that Wirbeleit needs. It passes force from an actuator along to
7 a needle via hydraulic elements. Third, Klügl's module improves Wirbeleit.
8 Not only does the module transmit force from one place to another, but it
9 allows for slight automatic adjustment of component alignment to account
10 for wear, temperature changes, and manufacturing issues. Finally, as shown
11 by the last bullet from this slide, Klügl's module is easy to assemble, allows
12 for many adjustments, and would be considered a straightforward design
13 choice when implementing Wirbeleit.

14 JUDGE IPPOLITO: Counsel, let me stop you there and ask
15 questions. So, on your slide 7, transmission module 2 includes everything in
16 that light purple. What are all the components in the entire transmission
17 module 2 that would be put into element 22? What are you modifying
18 Wirbeleit with?

19 MR. HERMAN: So, the elements that have been moved over to
20 Wirbeleit, it includes what's shown in purple here. So, the transmission
21 module 2. It also includes the membrane, the membrane 6, that's holding the
22 fluid in place. The fluid. And the fluid, as you can see, is in both chambers
23 5 on one side of that transmission module 2, and on the other side of the
24 transmission module 2. So, in the compensation chamber 7. So it includes
25 all that structure. And then for completeness purposes, there's a pair of, kind
26 of, circumferential springs that are being used for preloading purposes. And

1 Petitioners' expert Dr. Quinlan explains that that would also be useful to
2 include in Wirbeleit. So, we were including those preloading springs, the
3 transmission module, and all of its parts, the membrane, the chambers, and
4 the fluid.

5 JUDGE IPPOLITO: And your position is that would be something
6 that provides the detail needed in element 22 of Wirbeleit?

7 MR. HERMAN: Yes.

8 JUDGE IPPOLITO: In that dark pink space?

9 MR. HERMAN: Yes. That's right, Your Honor. So, instead of just
10 being a generic box, which is what Wirbeleit provides, it is now a complete
11 structure that includes a hydraulic element that passes force from the
12 actuator along to a needle and then provides other benefits that are
13 articulated in Klügl.

14 JUDGE IPPOLITO: So, in that instance of your modification, how
15 would that membrane or how would that element 6 of Klügl behave when
16 you put it into Wirbeleit? Is it going to behave the same way that it is in the
17 figure 1 embodiment of Klügl?

18 MR. HERMAN: Yes, Your Honor. Its function would remain
19 exactly the same. It would hold the fluid in place, and prevent it from
20 flowing where it's not supposed to flow, and essentially would contribute to
21 the pushing of Wirbeleit needle in the appropriate way at the appropriate
22 time. So, yes, the membrane would continue behaving in the same way it's
23 behaving in Klügl when it's included in Wirbeleit.

24 JUDGE IPPOLITO: Thank you.

25 MR. HERMAN: So, moving on to slide 9. Slide 9 shows what
26 Newcomb adds to the combination. As a reminder, Newcomb first appears

1 in ground 2, which relates to only one dependent claim. And as shown here,
2 Newcomb teaches that when making an injector valve, one should try to
3 choose materials with matching thermal expansion coefficients.

4 Slide 10 provides a very brief overview of the Hayes reference.
5 Again, this comes up only in grounds 3 and 4, which apply Patent Owner's
6 erroneous interpretations of the claims. So, what does Hayes add? Grounds
7 3 and 4 start with Klügl instead of Wirbeleit. So, while Klügl does not limit
8 its teachings to just this, Klügl does provide examples in the context of an
9 indirectly actuated injector. But it only shows half of this indirectly actuated
10 injector in its figures. So, the petition cited Hayes to provide an example of
11 how a person having ordinary skill in the art would have understood the
12 other half of Klügl's injector to be structured.

13 So, with that introduction out of the way, I'm going to move on to
14 discuss the party's disputes. The first of these has to do with Petitioner's
15 translation of the Klügl reference. So, while Petitioner submits that there's
16 no merit to Patent Owner's argument, Patent Owner started both its response
17 and its sur-reply by arguing that the translation is unreliable; it should be
18 ignored by the Board. It's also filed a motion to exclude asking the Board to
19 completely throw out the translation. So, I'm going to argue this argument
20 today.

21 Patent Owner's sole reason for contesting the translation is that it uses
22 some different synonyms when translating one term in Klügl, and that's the
23 German word Hubübersetzung. As I go through why this is wrong, I believe
24 two Things should be apparent. First, there is no error or inaccuracy with
25 Petitioner's translation. There are a variety of ways to correctly translate the
26 German word Hubübersetzung, and all of these effectively mean the same

1 thing. Second, there is universal agreement, or at least agreement between
2 everyone other than Patent Owner that the term means exactly what
3 Petitioner's translation and the petition itself says it means, stroke translation
4 or application of a stroke ratio that changes the amount of movement
5 between components and a fuel injector.

6 So, moving to slide 12, to begin, I'd like to highlight the lopsided
7 nature of the evidence that confronts the Board. So, Petitioner backs its
8 arguments with evidence. Patent Owner, however, offers little besides
9 evolved conclusions and noise. So, what has Petitioner done in this case?
10 First, and most importantly, it is the only party who submitted a certified
11 translation and the required document declaration for Klügl. Next,
12 Petitioner's expert explains that that translation makes sense when it's read in
13 its entirety. Petitioner also deposed the translator Patent Owner retained.
14 Moreover, Petitioner determined that Patent Owner's translator, before
15 offering her opinion, queried other translators on the Internet regarding the
16 meaning of Hubübersetzung. And Petitioner also filed both dictionary
17 definitions and example translations from other industry player patents.

18 So, what did Patent Owner do? Well, it elected not to take the
19 deposition of Petitioner's translator. Next, while it filed a translator
20 declaration, this declaration just boldly states that Petitioner's translation
21 contains an error. Patent Owner's translator did not translate any part of
22 Klügl and did not explain or offer an opinion regarding what the term
23 Hubübersetzung in Klügl means. And the translator did not mention in her
24 declaration that she had gathered definitions of the terms both from her own
25 research and from her translator colleagues. And I'll explain each of these
26 points in a bit more detail on the following slides.

1 So, slide 13 reproduces the passage in Klügl that used the German
2 term Hubübersetzung. The German, of course, is on the left, and the
3 translation from Exhibit 1006 is on the right. The first usage appears in
4 Klügl's description of the figures. So, here Klügl notes that figure 1 shows a
5 transmission device without Hubübersetzung, while figure 3 shows a device
6 with Hubübersetzung. Petitioners' certified translation replaced the German
7 word here when comparing the two devices with the term stroke translation,
8 the term again, appears again in column 7. So, here Hubübersetzung is used
9 to reference a difference between the deflection of the actuator and the
10 piston in Klügl. In the translation used the term stroke ratio and stroke
11 transmission to reflect this concept of a difference between the amount of
12 movement or component deflection.

13 JUDGE DEFRANCO: Mr. Herman, this is Judge DeFranco. What
14 does Patent Owner say, just for context here, what does Patent Owner say
15 that that term means, Hubübersetzung?

16 MR. HERMAN: Hubübersetzung. It does not appear that they say
17 anything at all about what it means. My impression of their argument is they
18 would like to read the word entirely out of the reference and ignore that it's
19 there.

20 JUDGE DEFRANCO: They don't agree that it means one of those
21 definitions that are on the right there, stroke translation, stroke ratio, or
22 stroke transmission?

23 MR. HERMAN: They do not appear to take a position.

24 JUDGE DEFRANCO: Okay.

25 MR. HERMAN: All of those words effectively mean the same thing,
26 right? They're referring to the same concept, right? A difference in the

1 amount of movement between the actuator and the piston or the valve
2 needle. But my view of Petitioners' or Patent Owner's argument is that they
3 are not taking a position as to which of those definitions are correct. That
4 their view appears to be that the translation should just be thrown out
5 because it used three different words instead of the same word every time
6 Hubübersetzung appears in the reference.

7 JUDGE DEFRANCO: Mm-hmm.

8 MR. HERMAN: So, moving on to slide 14. Slide 14 includes an
9 excerpt from Dr. Quinlan's deposition taken by Patent Owner's counsel.
10 And what did Dr. Quinlan say? He explained that despite using different
11 words, he believed the translation of Klügl was understandable, sufficiently
12 consistent and accurate. He also explained that in his view, the reference as
13 translated was plainly trying to convey that across Klügl's different
14 embodiments there are differences in the relationship between the movement
15 of the actuator and the movement of the piston. In figure 1, the movement is
16 the same. In figure 3 it is different. And you see that in the passage to the
17 right.

18 So, moving on to slide 15, the rest of the evidence of record simply
19 confirms what should be apparent from the translation of Klügl itself and Dr.
20 Quinlan's testimony. This slide includes an excerpt from a dictionary that
21 Patent Owner itself relies on. So, how does the dictionary define
22 Hubübersetzung? Well, it says that hub means stroke and übersetzung
23 means gear, ratio, or transmission. So, Hubübersetzung is a ratio applied to
24 or gear like transmission for a stroke.

25 So, slides 16, 17 and 18 provide examples of how various industry
26 players themselves translated Hubübersetzung in their own patent filings.

1 For each of these players, the slides include a passage from a German
2 language patent filing and then the same passage in the English language
3 equivalent that was filed with the USPTO. There are examples from Robert
4 Bosch, Siemens, Continental, and Daimler (phonetic) on these slides.

5 And how is the term being translated? On slide 16 the term is
6 translated as stroke boost or stroke step-up. On slide 17 that's translated as
7 stroke boosting action or stroke transmission ratio. And on slide 18,
8 Hubübersetzung is translated as transmitting or stepping up strokes. What
9 do the dictionaries and these patents show? They show that there are
10 numerous English words that can be interchangeably used in
11 Hubübersetzung. And in all cases, regardless of the English words being
12 used, the term is meant to convey the very same concept, a change or a ratio
13 applied to the amount of movement passed through a fuel injector.

14 So, slide 19 includes the totality of Patent Owner's evidence to
15 directed to the translation of Klügl. All the Patent Owner's translator does is
16 note that the translation uses different words when translating
17 Hubübersetzung. She then concludes that this constitutes the translation
18 error. So, what does Patent Owner's translator not do? If you turn to slide
19 20, as can be seen from the deposition testimony on this slide, she neither
20 translated Klügl nor took a position on the meaning of Hubübersetzung. All
21 the translator did was opine that it was error and error to use different words
22 when translating Hubübersetzung.

23 So, turning to slide 21, Petitioner submits that this opinion is simply
24 not credible. As I've shown, dictionaries and industry players use different
25 but interchangeable words when translating Hubübersetzung. Indeed, Patent
26 Owner's translator was told this before she filed her declaration. Slide 21

1 reproduces an excerpt from Exhibit 1025, which is an Internet post made to
2 a translator's forum by Patent Owner's translator about a month before she
3 filed her declaration. The post is entitled Hubübersetzung and reproduces
4 the passage from column 7 of the German version of Klügl at the top. The
5 translator then notes that she was aware of multiple translations from her
6 own investigation, including stroke translation, stroke step-up, and stroke
7 ratio. She provides citations for two of those translations. Then, in
8 response, she was provided with still further translations from her
9 colleagues, including amplified actuation, stroke transformation,
10 amplification ratio, and stroke transmission or transfer.

11 But despite the wealth of different translations using different words,
12 she nonetheless opined in this proceeding that it was an error for Petitioner's
13 translator to use various words when translating Hubübersetzung. It was
14 not. The translator's own work, that of her colleagues, and the dictionaries
15 and patents I have summarized before, confirm that there's nothing wrong
16 with Exhibit 1006, which is Petitioner's translation in this proceeding.

17 So, moving to slide 22, the party's next dispute --

18 JUDGE DEFRANCO: Mr. Herman, why didn't you move to exclude
19 her opinion or her declaration, just based on this one slide here, slide 21,
20 where she seems to have sought out other experts or other translators for her
21 findings, her supposed findings?

22 MR. HERMAN: So, Your Honor, I believe that a more direct
23 approach is essentially just to address the substance for opinions or the lack
24 thereof as opposed to creating additional briefing and additional issues to
25 rule on. So, yes, I agree that her opinions are borderline irrelevant. But in

1 my view, that that goes to the weight or the lack thereof that should be
2 afforded her opinions as opposed to their admissibility.

3 JUDGE DEFRANCO: How do you deal with Patent Owner's
4 arguments, that this is all hearsay?

5 MR. HERMAN: So, it -- I disagree with that, Your Honor, because,
6 for a number of reasons. Primary is that it impeaches her opinion. Right. It
7 shows that she was informed and was told that there were various different
8 opinions or various different translations that gives the term
9 Hubübersetzung, and then she arrived at the opposite conclusion in her
10 declaration. So, it's directly contrary and valid impeachment evidence. And
11 the fact that she was told that is not a hearsay use. Right. Showing that
12 people told her that various definitions could be applied to the word as a
13 non-hearsay use, in Petitioners' view, Your Honor.

14 JUDGE DEFRANCO: So, you're not relying on it for any of those
15 translations that are indicated?

16 MR. HERMAN: No, Your Honor, other people. Yeah. In
17 Petitioner's view, the evidence regarding the meaning of Hubübersetzung,
18 the evidence that applies to that is Petitioners' certified translation of the
19 reference. But the dictionary definitions that we pointed to and the publicly
20 filed patent documents, those themselves, standing alone, are more than
21 sufficient evidence to show what the term means.

22 JUDGE DEFRANCO: Mm-hmm.

23 MR. HERMAN: Does that answer your question, Your Honor?

24 JUDGE DEFRANCO: Yes. Those other documents, you know, I
25 understand they're patents or publications -- can we accept those as certified
26 translations of the term?

1 MR. HERMAN: As certified translations, Your Honor?

2 JUDGE DEFRANCO: Yeah, because I believe our rules require any
3 foreign document, foreign language documents be certified as to what the
4 English translation is.

5 MR. HERMAN: So, Petitioners' understanding of Your Honor's rule
6 is that Petitioners relying on a foreign language document such as a foreign
7 language prior art reference that yes, it's necessary to submit a certified
8 translation and a declaration. But here we are not relying on the foreign
9 language documents, we're relying on how industry players in the past have
10 themselves translated those documents in making their U.S. English-
11 language patent filing. And in fact, filing a certified translation here would
12 be irrelevant and would defeat the purpose of our reliance on the documents.
13 We're relying on documents for how they have already been translated not
14 on how a paid translator would translate those today. So, it's Petitioners'
15 view that the irrelevant evidence would have been a further translation,
16 because the relevant evidence in this case is how those particular documents
17 have already been translated. But if Your Honors do believe that there was a
18 need to file a certified translation, it is within your abilities to waive that
19 particular requirement. And Petitioner submits that it will be appropriate to
20 waive it here, given that a certified translation would have been entirely
21 irrelevant to the issue.

22 JUDGE DEFRANCO: Okay, I understand what you're saying.

23 MR. HERMAN: So, moving on to slide 22. The party's next dispute
24 focuses on whether the prior art teaches the type of passive hydraulic link
25 the claims require. As I'll explain it does.

1 JUDGE IPPOLITO: Counsel, I'm sorry, I wanted you to be able to
2 say your sentence before I ask you a question about what you just talked
3 about. I just want to make sure I understand. Is there anything in the record
4 about how the English versions of those documents were translated? I think
5 there's some mention that there's translations. There is an English version,
6 but is there anything in the record that provides information on how the
7 translation happened? You said it was a translation by the industry. I don't
8 know what that means.

9 MR. HERMAN: So, each of those documents, they are related.
10 Right. So, we filed both the U.S. Patent version and the German Patent
11 version. And you can look at the covers of the two documents. And you
12 can see that the application numbers are the same, that the assignees are the
13 same. So, if you look at the cover of the U.S. Patent number or the U.S.
14 Patent documents, you'll see reference the same German applications that
15 Petitioner also filed. So, there is a visual correlation between the English
16 language equivalent and the foreign language equivalent. You just have to
17 look at the covers of the documents. And there's no dispute here. Patent
18 Owner is not arguing that we pointed to the wrong English-language
19 equivalent. Right. There's no dispute that the documents are in fact related,
20 that they do in fact claim primarily priority back to the same German
21 applications and are in fact publications of the same patent applications.
22 Does that answer Your Honor's question?

23 JUDGE IPPOLITO: I think it does. I just wanted to make sure that I
24 was clear that when you asked for a waiver of our rules, it's not that the
25 translations should be treated as certified, because we don't really know how
26 these translations occurred. There is an English version, but it's not clear

1 from the record how that English version came about. Was it machine
2 translated? Was it -- you know, what, how was it done?

3 MR. HERMAN: Well, given that these are U.S. Patent filings, they
4 would not have been machine translated because the U.S. Patent Office's
5 rules do not permit that. Right. There are requirements when it comes to
6 translations when making U.S. Patent filings.

7 JUDGE IPPOLITO: Judge DeFranco, you might be muted.

8 JUDGE DEFRANCO: Yes. Let me ask Mr. Herman. I see that all
9 the English versions or the English counterparts to those foreign documents,
10 they're all PCT related. Are you aware, and I am not, and I don't know, you
11 know, how PCT works exactly. I don't know the actual aspects of filing a
12 PCT, but is there some requirement that the applicant certify that it's an
13 accurate translation of whatever the foreign counterpart is? I would think
14 that there would be, but I'm not positive.

15 MR. HERMAN: Unfortunately, Your Honor, I am also not positive
16 of the answer to that question. I have done prosecution in the past, and I
17 know there are translation requirements. So, for instance, I know that you
18 cannot file a machine translation, but beyond that, I don't have anything
19 meaningful to add, unfortunately.

20 JUDGE DEFRANCO: Okay.

21 MR. HERMAN: But putting that aside, while I believe those patent
22 applications and the German and the English versions are helpful to confirm
23 what Petitioner's translation already says, I believe it's just supplemental
24 evidence. And I believe that the translation standing by itself is clear
25 enough, particularly when viewed in connection with the dictionary
26 definition that Petitioner has submitted that no one has disputed is

1 admissible in this particular procedure. So, those patent filings are nice to
2 have, and confirmatory, and kind of help illuminate the issue, but they are
3 not fundamental to it.

4 So, moving back to slide 22. So, the party's next dispute focuses on
5 whether the prior art teaches the type of passive hydraulic link that claims
6 here require. And as I'll explain, explained it does. Patent Owner's response
7 is to attempt to rewrite Klügl. So, rather than giving meaning to Klügl's
8 explanation that figure 1 operates without stroke translation, it construes the
9 figure as operating in the opposite manner with stroke translation. And in
10 arriving at this conclusion, rather than focusing on the totality of the art
11 teaching, Patent Owner relies on only single words in Klügl taken out of
12 context.

13 So, moving to slide 23, I'd like to begin the discussion here by
14 reminding the Board that the petition relies on the combinations of Wirbeleit
15 and Klügl. And Wirbeleit is not entirely silent when it comes to the claims'
16 passive hydraulic link. Instead, as shown in the reproduced figure for
17 Wirbeleit, it includes a hydraulic transmission element 22, which is
18 highlighted in pink, that transmits force from the actuator to the valve
19 needle.

20 Now, Dr. Quinlan also explained that a POSITA would have drawn
21 two important conclusions about Wirbeleit's teaching regarding this element.
22 And you see that in the reproduced testimony on the left. The first
23 conclusion is that the element is simply a pathway for transmitting force.
24 Per Wirbeleit, force simply passes through the element; it's not amplified or
25 damped. That's why Wirbeleit refers to it as a transmission element. The
26 second conclusion is the element is located in an enclosed space between the

1 actuator and the needle that's basically cylindrical. So, no fluid enters or
2 leaves, meaning that there can be no amplification or damping. Because of
3 this, the link is designed to maintain the same thickness during actuation, so
4 there's no stroke ratio that's applied. So, this is the functionality that one of
5 skill would have been looking for in a reference like Klügl.

6 But turning on to slide 24, what does Klügl add to this? Again --

7 JUDGE DEFRANCO: Before you leave that slide 23, Mr. Herman,
8 when you modify Wirbeleit with Klügl, would that enclosed space be
9 maintained?

10 MR. HERMAN: So, it would, Your Honor. But now the fluid is not
11 filling the entirety of the space. Now the transmission module is filling the
12 space, and the fluid is now limited to the area defined by the membrane 6.
13 So, the structure that is forming the hydraulic link 22 is still not going to be
14 changing shape during actuation, because that's the way Klügl's transmission
15 module 2 is designed to operate.

16 JUDGE DEFRANCO: Once we get to Klügl, perhaps you can take
17 me through it a little bit more.

18 MR. HERMAN: Sure. So, turning on the slide 24, so what does
19 Klügl add? So, again, the petition relies on the embodiment shown in figure
20 1 of Klügl. And as shown, Klügl explains that this embodiment operates
21 without stroke translation. But that is not all that Klügl says. And as shown
22 in the lower left, Klügl also discusses in detail how figure 1 is intended to
23 operate. And here it explains that during actuation, the force of the actuator
24 causes the transmission module 2 to move, which in turn exerts force on the
25 piston 3 via the hydraulic transmission that's in chamber 5. So, the actuator
26 expands, the transmission module moves, and the hydraulic fluid in that

1 transmission module pushes the piston. There is no discussion of any fluid
2 flow, membrane flexing, or application of a ratio in the form of movement,
3 amplification, or damping. In fact, as shown on the right at the bottom right
4 of the slide, Klügl explains that this embodiment is designed so that fluid
5 does not flow during actuation.

6 So, slide 25. Klügl's discussion of figure 1 can be contrasted with
7 what it says about figure 3. Figure 3 is a different embodiment in Klügl that
8 operates with stroke translation. Not only that, Klügl explains under figure 3
9 the transmission medium, that's the hydraulic fluid, flows or is pushed from
10 one place to another. Klügl also explains that in this embodiment, in figure
11 3, the membrane deflects. And it says that pressure increases in certain
12 places and that a stroke ratio is applied to the movement of the piston
13 relative to the actuator.

14 So, Klügl, of course, did not say any of this when describing figure 1.
15 In the discussion of that figure, there is no mention of fluid flow, membrane
16 deflection, pressure increases, or the application of a stroke ratio. That's
17 because none of that happens in figure 1. Force simply passes through the
18 transmission module 2 in figure 1. The embodiment of figure 1 is meant to
19 operate without stroke translation. And importantly, slides 24 and 25 show
20 that when Klügl characterizes figure 1 and figure 3 as operating either with
21 or without stroke translation, it is not simply referring to the type of power
22 transmission. It's referring to the effect the different embodiments in figures
23 1 and 3 have on the movement of the piston. In figure 1, the piston moves
24 by the same amount as the actuator, while in figure 3, a ratio is applied.

25 So, turning to slide 26. Slide 26 includes a demonstrative explaining
26 the import of Klügl's teaching that figure 1 operates with stroke translation.

1 And the top figures are showing how that transmission module 2 would
2 operate when it's incorporated into Wirbeleit. And as shown by the top
3 figures, a transmission module with hydraulic fluid, that's the blue and
4 demonstrative, is shown operating, again, without stroke translation in those
5 top figures. And as shown, upon actuation, the actuator moves by an
6 amount X. And the force then is simply passed through the transmission
7 module in the blue fluid and the piston, that's the green, moves by the same
8 amount X. There is no membrane flexing, fluid flow, or pressure changes.
9 The hydraulic fluid maintains the same thickness throughout the process as
10 is necessary for there to be no change or translation of the stroke. And
11 because it works without stroke translation, the injector includes the very
12 type of hydraulic link that the '829 and the '138 Patents' claims require. One
13 with fluid that acts substantially as a solid and maintains a substantially
14 constant thickness during actuation. The bottom figures show Patent
15 Owner's erroneous interpretation of figure 1 of Klügl. And as shown during
16 actuation, Patent Owner posits that fluid flows around inside of that chamber
17 5. They posit that the membrane then deflects and that pressure will vary
18 from one place to another. The end result of this is that the piston moves by
19 less than the actuator. The stroke has been translated or changed from one
20 amount to another, lesser amount, a ratio has been applied to the movement.

21 This, however, is the opposite of how Klügl says figure 1 operates.
22 Figure 1 operates without stroke translation. And while Klügl plainly knows
23 how to explain when an embodiment works with membrane deflection, with
24 fluid flow, and with the application of a ratio, because it says figure 3 has all
25 these things, it never says that figure 1 does. So, Patent Owner is ignoring
26 what Klügl does say and is trying to rewrite Klügl in a way that not only isn't

1 supported by any reasonable analysis of Klügl's actual teachings, but turns
2 those teachings on their head.

3 So, moving on to slide 27. While Petitioner submits that Klügl is
4 clear enough, it says that figure 1 is without stroke translation and does not
5 apply a stroke ratio. Other art of record confirms that this is the case. There
6 are three examples of this on the slide here, all of which were interjected into
7 this proceeding by Patent Owner. And These are Exhibits 2008, 2010, and
8 2012. And as shown, all three of these prior art references refer to DE 197
9 08 304 A1. That's Klügl. And all three explain that the movement of the
10 actuator is passed essentially unchanged, virtually unchanged, or virtually
11 undamped to the piston. That, of course, would only happen if membrane 6
12 in Klügl is not deflecting and the fluid in chamber 5 is not flowing in the
13 way the Patent Owner argues. For the movement of the actuator to be
14 passed unchanged to the piston, as these prior art references are expressing it
15 does in Klügl, the membrane and the fluid it contains must maintain the
16 same shape and thickness during actuation. So, here Patent Owner is
17 offering the Board with an interpretation that is not only contrary to Klügl
18 itself, but is contradicted by multiple others in the art who assessed and
19 commented on Klügl's disclosure long before this proceeding.

20 So, moving on to slide 28. The party's next dispute focuses on
21 whether a person having ordinary skill would have been motivated to apply
22 Klügl teachings to Wirbeleit. So, turning to slide 29, the answer to this is
23 plainly yes. As shown in the excerpt on the top of this slide, while
24 Wirbeleit's injector includes a hydraulic transmission element 22 that is
25 meant to be passive and transmit force from its actuator to its piston, it states
26 that this element is not shown in detail. So, a person having ordinary skill in

1 the art would have recognized that it is necessary to consult another
2 reference to fill in these missing details when implementing Wirbeleit. And
3 as shown on the bottom, Klügl provides the very missing details that
4 Wirbeleit requires. Like Wirbeleit, it teaches the transmitter transmission
5 element that is hydraulic and is designed to pass force from an actuator to a
6 piston. And at least in figure 1 in Klügl, this transmission element does so
7 passively. And unlike Wirbeleit, Klügl provides structural detail regarding
8 its transmission element. It describes its component parts, how those parts
9 fit within its housing, and how the element is intended to operate.

10 So, moving on to slide 30. Not only does Klügl provide the detail that
11 Wirbeleit omits, but there are other reasons why a person having ordinary
12 skill would have been motivated to apply his teachings, and you see those
13 shown on the slide here. For instance, Klügl explains that this hydraulic
14 transmission element is designed such that it can make small automatic
15 adjustments to account for wear and thermal changes. This of course, would
16 supplement and improve Wirbeleit. Not only would it adjust for engine
17 operation, but it would also be able to account for component separation
18 problems caused by wear and thermal changes.

19 Next, Klügl explains that its transmission element is relatively
20 compact and easy to assemble, so it's providing another benefit.
21 Additionally, as shown in the final passage, Klügl's element and associated
22 structure allows for various types of injector pre-adjustment during
23 manufacture, and all of that would have further motivated combination.

24 So, moving on to slide 31. Patent Owner makes a number of counter
25 arguments in an effort to show that Wirbeleit and Klügl would not be
26 combined. All of these, however, lack merit. For instance, it tries to argue

1 that applying Klügl adds needless complexity to Wirbeleit. But application
2 of Klügl is not needless. In fact, it is required because Wirbeleit does not
3 say how its hydraulic transmission element 22 is structured.

4 Next, Patent Owner makes a number of arguments regarding supposed
5 inefficiencies and design problems as identified with the combination. After
6 a visual inspection, on Patent Owner's part, of the demonstrative figures and
7 the petition. But this entirely ignores that those figures are demonstrative.
8 They're not manufacturing schematics for a fuel injector. A person having
9 ordinary skill would of course be able to make routine design tweaks to
10 avoid common injector issues like fluid lock and the like when
11 implementing an injector. And there is no requirement, of course, that a
12 petition includes drawings that are detailed enough to start up a
13 manufacturing line. The only requirement is to show obviousness, which is
14 what the petition did here.

15 Finally, Patent Owner argues that there are supposed disadvantages
16 with fuel injectors employing membranes in the prior art. That, however,
17 merely highlights that other references took other different approaches when
18 designing their injectors. But the availability of alternatives does not show
19 non-obviousness. Klügl is still in the prior art and still provides benefits that
20 a person of ordinary skill in the arts would have obviously applied to
21 Wirbeleit.

22 So, moving on to slide 32. In addition to the limitations in the '829
23 and the '138 Patents requiring a passive hydraulic link, that is, that acts
24 substantially as a solid with a substantially constant thickness, Patent Owner
25 also argues that a handful of other limits are not taught by the prior art. And
26 I'll walk through those briefly now.

1 So, slide 33. First, Patent Owner's distribution disputes that the art
2 teaching of the transmission of both injector opening and closing forces is
3 present in the prior art. And I've highlighted the limitations in claim 1 of the
4 '829 Patent requiring that, on slide 33.

5 So, moving on to slide 34. Why does the art teach this? So, starting
6 with Wirbeleit and I'll get to Klügl in a moment, Wirbeleit teaches the
7 passive enclosed hydraulic transmission element. As shown in the figures to
8 the left and the passage from the petition on the right, during valve opening
9 the actuator expands, that's the red highlighting, transmitting force through
10 the hydraulic transmission elements to the needle to open the valve. During
11 valve closing the spring expands, that's the blue highlighting, exerting force
12 back through the hydraulic transmission elements to return the injector to a
13 starting closed state. So, Wirbeleit is designed such that force passes
14 through the hydraulic element 22 in both directions.

15 So, slide 35. Why does the combination of Wirbeleit and Klügl then
16 teach what this claim requires? Because the petition explains that in the
17 combination a person having ordinary skill in the art would have simply
18 replaced Wirbeleit's hydraulic transmission element 22 with Klügl's more
19 specific transmission module 2. Wirbeleit's injector would continue to
20 operate in the same way as before. Opening forces would continue to pass
21 from the actuator through the module 2 to the needle, and closing forces
22 would continue to pass from the spring through the module 2 and back to the
23 actuator. This is all that the claims here require.

24 So, turning to slide 36, Patent Owner next disputes whether the prior
25 art teaches the type of adjustable hydraulic link that the claims require.
26 Again, as shown on slide 36, claim 1 of the '829 Patent requires the

1 hydraulic link to behave in two different ways at two different times.
2 During activation, the link fluid must act substantially as a solid with
3 substantially constant thickness. You see that in yellow. But when not
4 activated, the link's fluid must have an adjustable thickness to compensate
5 for component dimensional changes for purposes of maintaining needle lift.
6 That's the red.

7 It's also important to note here that the claim does not specify which
8 components have changing dimensional relationships. So, accounting for
9 the changes in dimension of any components is sufficient for purposes of the
10 claim, so long as doing so impacts needle lift. The '138 Patent also includes
11 the same limitations, even though this slide reproduces claim 1 of the '829
12 Patent.

13 So, slide 37. Why does the prior art teach this? As shown on this
14 slide, Klügl explains that its transmission module 2 behaves differently
15 during periods of actuation and periods of rest. As shown on the left, during
16 actuation, forces simply pass through the fluid in the transmission module.
17 The fluid is not flowing in or out of that chamber 5 in that transmission
18 module 2. But as shown on the right, during periods of rest, long-lasting
19 pressure differences cause fluid to move around inside the module 2, in
20 particular between chamber 5 and another compensation chamber 7 to
21 account for thermal expansion and wear.

22 Turning to slide 38. Dr. Quinlan also explained why this functionality
23 is important to Klügl. As shown on this slide, if these adjustments were not
24 made, needle lifts would be impacted. Klügl explains that thermal effects of
25 aging can result in change in the actuator size, and if the actuator changes
26 size, this would move the transmission module 2 and the fluid and

1 membrane it contains out of position such that it was no longer properly
2 contacting that piston 3. Dr. Quinlan explains that this in turn would cause
3 the needle to be pushed either too little or too much during actuation because
4 the components are moved out of alignment. So, Klügl accounts for this
5 change in actuator size by moving fluid in or out of that chamber 5.

6 Now, slide 39 includes the portions of Klügl underlying Dr. Quinlan's
7 opinions from the previous slide and as shown, Klügl explains that his
8 transmission module 2 moves fluid around during periods of rest to account
9 for changes in actuator size and to ensure that its components properly stay
10 in contact so that they can engage in the correct opening and closing
11 operations for the injector.

12 JUDGE IPPOLITO: Counsel?

13 MR. HERMAN: Yes.

14 JUDGE IPPOLITO: I'm just going to let you know that you have
15 about five minutes of what you set aside.

16 MR. HERMAN: Okay. Thank you, your Honor. This, of course, is
17 exactly what the claims of the '829 and the '138 Patent require. Adjustment
18 of fluid thickness to account for component size changes, in this case the
19 change in size of the actuator, for purposes of maintaining the right amount
20 of needle lift during actuation. The Patent Owner never addresses this. So,
21 rather than discussing how Klügl is designed and what it does to address
22 actuator size changes, Patent Owner argues that there is some other different
23 design flaw in Klügl and Wirbeleit. Per Patent Owner, these references are
24 unable to account for changes in the needle size. But that has nothing to do
25 with Klügl and Wirbeleit. The references are concerned with changes in size
26 of the actuator, not the needle, due to thermal expansion and wear, and their

1 system is designed to maintain needle lift despite changes to that component,
2 the actuator. This also has nothing to do with the claims. The claims simply
3 require adjustment to account for changes in component dimensional
4 relationships. There is nothing about the claims that say that the
5 component's changing in size must be the needle and cannot be the actuator.

6 Moving on to slide 40. Patent Owner also argues that the Petition's
7 argument that Klügl membrane does not deform during actuation, but does
8 deform during periods of rest is somehow internally inconsistent. It is not.
9 As Dr. Quinlan explained, there are differences between actuation and rest.
10 In particular, during rest there are long-lasting pressure differences that are
11 present and are imposed on the membrane that are simply not there during
12 actuation. It is these differences that cause the membrane to behave
13 differently at different times. So, no, the membrane in Klügl does not
14 substantially flex during actuation. It is specifically designed in figure 1 not
15 to do that. And yes, the membrane does flex during periods of rest due to
16 the presence of the long-lasting pressure differences that do not have an
17 impact during the shorter periods of actuation. There is nothing inconsistent
18 about this. Instead, it merely reflects the physical reality. Doing different
19 things to the membrane at different times causes it to behave differently.

20 So, Patent Owner also makes a handful of arguments regarding
21 dependent claims and I'll very briefly discuss some of those. So, on slide 41,
22 I've reproduced claim 6 of the '829 Patent. And this claim requires the use
23 of either a magnetostrictive member or a piezoelectric stack. And this is
24 plainly taught by the prior art. As shown, Wirbeleit contemplates the use of
25 either type of actuator.

1 So, slide 42 includes claim 11. This claim requires controls injector
2 lifts to a value between 10 and 100 percent of maximum lift. So, why did
3 the art teach this? As shown, Wirbeleit teaches an injector with adjustable
4 and controllable lifts. Different signals are sent to the actuator to achieve
5 different lifts. So, while Wirbeleit does not mention the specific claim
6 range, it nonetheless overlaps that range and teaches the same concepts that
7 different lifts can be achieved by moving the injector needle by different
8 amounts.

9 So, slide 43 includes claim 14. Patent Owner here appears to argue
10 that a person having ordinary skill of the art would only employ the slower
11 preferred actuation times in Klügl and not the alternate fast injection times.
12 But that's just not how the prior art is assessed. Everything the art teaches
13 must be considered. And while Klügl does label the slower actuation time to
14 teach it as preferred, it also identifies fast times overlapping the claimed
15 range in claim 14 as acceptable for use.

16 So, with that, Your Honor, unless there's further questions, I'd like to
17 reserve the rest of my time for rebuttal.

18 JUDGE IPPOLITO: Thank you. And you had about 30 seconds
19 more, but I think it probably will be fine. All right. I think that we can
20 continue on with Patent Owner unless anyone needs a 5- minute break for
21 the transition. I shall ask Patent Owner, are you ready to begin or would you
22 like to have a break right now before you start? You're muted.

23 MR. HIGER: Can you hear me now?

24 JUDGE IPPOLITO: Yes.

1 MR. HIGER: We're happy to begin if the Panel is ready to go, but if
2 anybody on the Panel would like a break, then we're happy to do that as
3 well. Whatever the Panel prefers.

4 JUDGE IPPOLITO: I think we're ready to go ahead. So, let me start
5 by asking how much time you'd like to reserve or if any time for your sur-
6 rebuttal?

7 MR. HIGER: We'd like to reserve 10 minutes for sur-rebuttal, please.

8 JUDGE IPPOLITO: Give me a moment to set the clock. All right.
9 You can begin when you're ready.

10 MR. HIGER: Good afternoon, my name is Dave Higer and I'm here
11 on behalf of Patent Owner Westport Fuel Systems, Canada, Inc., to explain
12 why all the challenge claims in both these IPRs are patentable over
13 Petitioner's prior art. Before I get into, sort of, my opening statement, I did
14 want to address a few questions that the Panel had asked of the Petitioners,
15 to make sure that we're all on the same page. First, Judge Ippolito, you had
16 asked what elements get added into the transmission module, what gets
17 imported from Klügl into Wirbeleit when they do their modification. And if
18 we can pull up slide, our demonstratives, slide 82, please. Is the Panel able
19 to see the slides?

20 JUDGE IPPOLITO: I can.

21 MR. HIGER: Okay, if you look at slide 82. You look at 82, this is
22 just a graphical side by side of Wirbeleit on the left and the modified version
23 that Petitioners' proffer is a combination of Wirbeleit and Klügl. This is not
24 a simple modification. This is not a simple drop and drag sort of activity. In
25 fact, what gets added for a single element 22 is not only a replacement of 22,
26 it's replacing the magnetostrictive operating device 21 and applying an

1 actuator one, which is the top yellow cylinder, as well as elements 5, 6, 7, 8,
2 9, 10, 11, 14, 30, 45, and 46 from Klügl. It's a highly complex variable
3 problem that's been introduced. And we'll get into later why that
4 significantly undercuts the motivation to combine. But you'd asked that
5 question, Judge Ippolito. I wanted to make sure that you had the full list of
6 elements that they were added. Again, I'm not quite sure that you captured
7 all that from the Petitioner. I also want to jump in if we can go to slide --

8 JUDGE DEFRANCO: Mr. Higer, before you leave slide 82. My
9 understanding was the Petitioner was just replacing element 22 in Wirbeleit
10 with what you have in your slide 82 as being cross-hatched in yellow as well
11 as maybe the solid yellow between the cross-hatching. I didn't think they
12 were replacing the actuator 21, too.

13 MR. HIGER: No, they pulled in the actuator 1 from Klügl. If you
14 look at this demonstrative that we have, it shows the actuator 1 from Klügl.
15 If you look at the Klügl figures, as opposed to the magnetostrictive device
16 21 on the left from Wirbeleit. They don't own up to that. And we pointed
17 out that that causes other problems with the operation of the proposed
18 combination. But yeah, they're doing more than a simple drop and drag
19 here. This is, frankly, all of their combinations are a bit of a mess and we'll
20 get into that. That's why they're all inoperable and really a byproduct of
21 really hindsight bias that is not allowed.

22 JUDGE DEFRANCO: Okay, maybe Petitioner can clarify the
23 position when they get up on rebuttal. Go ahead.

24 MR. HIGER: Okay. I want to go to now to the questions that were
25 asked about the translation issue. If we can go to page 8 of our slide, please.
26 All right, I'll take it from here. Okay. If you look at the issue with Exhibit

1 1006 is not at all what Patent Owner claims -- or, sorry, what Petitioner
2 claims. What Petitioner claims is that we're taking issue with the fact that
3 there are different words that Hubübersetzung could have been translated to,
4 from German to English, and all of these other references for all kinds of
5 various translations for those. That is not the criticism. The criticism is that
6 they used three different words to translate the same word in the same
7 document without sufficient context for making different translations of the
8 same word. So, the point that they're making is very different. And I will
9 point out to you, it's interesting.

10 Let's go to the first, the next slide, which is slide 10.

11 JUDGE DEFRANCO: But Mr. Higer, even your own translator
12 admits that context is important when translating words and that you could
13 have different translations depending on the context in the same document. I
14 believe that your translator's made that admission.

15 MR. HIGER: Well, she did make that point. But if you look at slide
16 10, Your Honor, they say that this is just a fair declaration without any
17 explanation though. Ms. Holthaus specifically says there is no context,
18 which gives Hubübersetzung a different meaning between its use in column
19 1 and column 7. That's the problem.

20 JUDGE DEFRANCO: Yeah, but she doesn't explain why. That's a
21 conclusion. She needs to explain why it doesn't give context, and deal with
22 each of those passages in their context. She never does that. She just makes
23 a conclusion. I think that's where I'm having a problem.

24 MR. HIGER: Sure. Let's look at the translation in the slide that, slide
25 13, Petitioners' slide 13. If we look at our slide 9, you see Hubübersetzung
26 is translated where it shows up as stroke translation. The same for where it

1 shows up addressed in figure 1 and figure 3. In Petitioners' slide 13, they
2 highlighted the phrase eine Hubübersetzung zwischen, both for the second
3 translation and the third translation. Yes, that exact same phrase is
4 translated in one instance stroke ratio and another instance stroke
5 transmission. That is the kind of where is the context. There is no context
6 that dictates a different translation for the exact same now three-letter phrase
7 in the exact same reference.

8 Okay. And so, the fundamental point here is the translator reviewed
9 the document, found that there was no context that said that there was any
10 reason to translate it differently. She did not offer her own proposed
11 interpretation. But when asked that, her initial reaction was stroke
12 translation. Probably, but she would need to do additional work to confirm
13 that.

14 JUDGE DEFRANCO: I think that's your problem right there. She
15 didn't do the additional work. You know, she could have offered her own
16 translation. I mean, well, Patent Owner's could have offered their own
17 translation, whether it was with Ms. Holthaus or somebody else. There's no
18 rebuttal translation here. You're absolutely silent on what this document
19 says or how it should be translated in its entirety, taking into account the
20 context of those words. I think that's where you have a problem, Mr. Higer.

21 MR. HIGER: Understood, Your Honor. And our position is it's not
22 Patent Owner's burden to provide admissible evidence. It is Petitioner's
23 burden to provide a proper, reliable translation. And we pointed out why
24 that's not the case. And ultimately the Board will have to find --

25 JUDGE DEFRANCO: Well, I think you have to hold on. It is your
26 burden of production. So, there's burdens of persuasion and burdens of

1 production. And Petitioner offered their own certified translation. The
2 burden then switched to you to produce evidence that would persuade us
3 otherwise. The way I'm looking at it, I'm not seeing that evidence on your
4 part.

5 MR. HIGER: All right, well, let's go and set aside the translation
6 issues, unless there's a particular question by anybody else from the Panel.
7 Because ultimately, even though we believe that Exhibit 1006 should be
8 excluded for the reasons that we said, the disclosures in Klügl are frankly
9 fatal to the Petitioner's challenges anyway.

10 JUDGE DEFRANCO: Okay.

11 MR. HIGER: We can go back to slide 1. Petitioners' efforts
12 throughout this trial to deflect and distract from Klügl's teachings have
13 continued into this hearing. No matter the efforts to misdirect or muddy the
14 record, the inescapable reality is Klügl's disclosures are fatal to Petitioners'
15 challenges, all of which depend on Klügl. Petitioners' challenges are based
16 on three fundamentally false premises. Petitioners' first false premise is that
17 Klügl's without stroke translation and with stroke translation, distinction
18 between figures 1 and 3, is about the amount drive piston 3 moves relative to
19 the actuator. As we will show, this with and without distinction is not about
20 that at all. The distinction is about differences in the type of power
21 transmission between the (inaudible).

22 Petitioners' second false premise is that Klügl's transmission medium
23 does not flow during actuation. To the contrary, we will show that Klügl's
24 flexible transmission medium must flow during actuation. Petitioners' third
25 false premise is that Klügl's flexible membrane 6 does not flex during
26 actuation, only when at rest. To the contrary, we will show Klügl's flexible

1 membrane 6 must flex during actuation. Because transmission medium
2 flows and flexible membrane 6 flexes, figure 1's actuator movement will
3 only be partially transmitted to drive piston 3. Stated in terms of the
4 challenged claims, Klügl does not teach a transmission medium that is
5 substantially solid or substantially constant thickness during actuation. For
6 these reasons alone, all of the challenge plans are passed.

7 If we can, we can jump right into the first point at slide 12, please.
8 Let's talk a little bit about what Klügl actually teaches. Slide 14. If you look
9 on slide 14, you will see that there is some familiar language here. You can
10 see on the left where it says figure 1 shows the device for power
11 transmission without stroke translation. And figure 3 on the right shows a
12 device for power transmission with stroke translation. The boxes in the
13 center of both figure 1 and figure 3 are around the transmission module.

14 Slide 15, please. Klügl tells us exactly what the difference is between
15 figures 1 and 3. You look at slide 15 in the highlighted text in yellow it says
16 the injection valve shown in figure 3 differs from the injection valves in
17 figure 2 and 1 in the type of power transmission from the piezoelectric
18 actuator 1 to the drive piston 3.

19 Turning to slide 16, you can see this. You actually heard some of this
20 from Petitioner already. Figure 1's transmission module is movable. The
21 disclosure at the top of 16 you can see says that the transmission module 2
22 and the guide sleeve 11 are arranged to be movable. And down below that
23 you can see we've highlighted the portion of the figure in green and yellow.
24 So, you can see the green portion at the top. Let's see if I can do this here.
25 That's the actuator that you can see the green ball at the top. This is part of

1 the transmission module in yellow in the middle, on the side of the guide
2 sleeve. And then the green rectangular section below is the drive system.

3 We turn to the next slide. See the description that is provided or the
4 testimony provided on how transmission modules movable. You can see the
5 red arrows in our depiction on the left that talk about this. In figure 1,
6 transmission module 2 moves up and down within guide sleeve 11. The
7 movable components are green so that when the actuator actuates, it pushes
8 down on the yellow portion which is then going to cause a push down on the
9 guide sleeve in response. It's going to be on top of the disk springs 14 on the
10 bottom, left and right. There's also going to be a contact between the bottom
11 of the flexible membrane 6 and the top of drive piston. But all of this
12 movement is in the longitudinal direction. There is no translation of the
13 force exerted by the piezoelectric actuator at all. All in the exact same
14 direction. Because transmission module, the transmission module, figure 1,
15 is movable.

16 By comparison, if we go to slide 18 please, figure 3, transmission
17 module is fixed. It cannot move. You can see that in the gray highlighted
18 box. By the way, I forgot to mention this. A gray highlight around the box
19 means it's a citation to the record that is like an exhibit like this; blue means
20 it's a citation to Patent Owner's papers; and, red means it's a citation to
21 Petitioners' papers. But in Klügl itself it says the transmission module 2 is
22 fixed in position. You can see that in the depiction below that we've got
23 some color code. We go to figure 19. You can see some more of the
24 discussion about this. Where transmission module 2 is fixed in place by
25 screw 42, which is red, and that forms a lower stop. The disk springs get
26 moved up above. We saw the disk spring before. And that means that the

1 transmission module, the yellow portion, cannot move when the actuator
2 actually is actuated.

3 What if you have a force pathway? The way that this has to work,
4 you need to go to slide 20. As compared to figure 1 where the force was all
5 in the longitudinal direction. When the actuator here moves, it's going to be
6 in the longitudinal direction. And then it's going to hit element 29. Which is
7 going to push down on the top membrane. It's at line 29 on the top
8 membrane, which is then going to cause the force to be translated to the side,
9 down, and around the immovable transmission module. And then it's only
10 going to be brought back into the longitudinal direction by the deflection of
11 flexible membrane 6, in the flow of the transmission media that causes it to
12 bulge out. And it's not going to be a perfect bulge because there's going to
13 be deflection into the open spaces on the annular portions of the disk, just
14 like there will be in figure 1. But that is what with and without stroke
15 translation means in the context of Klügl. Has nothing to do with the
16 amount. Has everything to do with, as Klügl itself says, the type of power
17 transmission.

18 So, let's go to the next set of slides. To slide 22, talk about the
19 passive hydraulic linkage. We go to slide 24. You can see we've
20 highlighted it's claim element 1(e). This is an element that Petitioner already
21 focused on. And you can see that if we go to slide 24, claim element 1(e)
22 can be broken down into various components. Now, I do want to take a
23 moment to address at this point, one point that Petitioner, I think I heard
24 Petitioner say that all that matters for this claim limitation is that there's
25 some adjustment of components, nothing else. And that is just flat wrong.

1 What claim element 1(e) of both of these patents require is yes, there
2 does need to be, if you look at the Roman 3 for both of them, there is a
3 thickness of said hydraulic link that is adjustable while said actuator
4 assembly is not actuated. So, it requires an adjustment of the thickness of
5 the hydraulic link. That adjustment has to be in response to changes in the
6 dimensional relationship between components of said injection valve. To do
7 what? To maintain a desired valve needle lift. It doesn't matter if there's just
8 simply changes somewhere in the mechanism if those changes in the
9 mechanism do not lead to a maintenance of desired valve needle lift.

10 That is the problem with the combination that we'll get into later, is
11 that Klügl does not do anything to maintain desired valve needle lift. It may
12 maintain contact between the top of the actuator piston and the bottom of the
13 flexible membrane 6. But there's a flaw that there's going to be a gap B
14 that's going to open up where the valve needle lift is going to occur and it's
15 not going to allow the valve needle lift to be maintained. So, hold that
16 thought. I wanted to address the point that Petitioner made that is just
17 wrong. The claims do require a specific connection between what has
18 changed and what that change must do.

19 If we go to slide 28. There we go, 28. We're going to talk now about
20 Klügl's transmission medium flowing during actuation. Slide 30, please.
21 Now you heard from Petitioner talking about well, transmission medium
22 doesn't flow and they pointed to this language that says the throttle 10
23 should preferably be dimensioned in relation to the transmission medium
24 such that during normal activation only so little of the transmission medium
25 flows into the compensation chamber. That is not at all talking about
26 whether there's flow or not. That's actually a recognition by Klügl that there

1 is going to be flow of the transmission medium in figure 1 during actuation.
2 The reason why throttle 10 has to be designed in the way that it is, is so that
3 only so little of that flow goes up during actuation.

4 And instead, now the question is where's the flow going to go if it
5 can't go up the throttle? We'll get into it more when we talk about it in a
6 little bit. But the flow is going to have to go to the lower pressure areas in
7 the design, which is the unsupported annular areas where there's going to be
8 a bulge.

9 If we go to the next slide, if we look at that figure 1, we go to figure --
10 should be up there. If we look at slide, at figure 3. Remember, there's this
11 distinction that the Petitioner keeps trying to make between figure 3 and
12 figure 1. Figure 3 may acknowledge at least that transmission medium has
13 to flow during actuation. And by the way, the transmission medium that
14 Klügl's disclosure is the same between figure 1 and figure 3. So, is flexible
15 membrane 6. Flexible membrane 6 is the same between figure 1 and figure
16 3. But if transmission media did not flow during actuation, figure 3 would
17 not work because remember, figure 3 has to have translation of the stroke
18 down to the side, around to the sides, down and under by the movement of
19 the transmission fluid. And that then causes a deflection of flexible
20 membrane 6 to move the piston. If the transmission medium didn't flow and
21 flexible membrane 6 gets flexed or deformed, figure 3 doesn't work.

22 So, just to go back to the disclosures here, further in Klügl, again the
23 throttle design for both figure 1. There's the discussion in figure 1 where
24 they claim there is no flow. And there's a similar discussion related to the
25 throttle in figure 3 where they admit there is flow. Talking about the very
26 same point. We just don't want too much transmission fluid flowing up the

1 throttle during actuation because it's got to go somewhere else. It's got to do
2 something else. That's what Klügl was taking (phonetic). But regardless,
3 it's beyond any reasonable dispute that transmission medium flows in both
4 figure 1 and figure 3 steering actuation.

5 Okay, so. Oh, we went one too far. If we look at slide 34. Dr.
6 Quinlan's inconsistent testimony on this point is entitled to no weight. In
7 support of the petition, he said, further, Klügl explains that fluid does not
8 flow. Yet later in his reply declaration, he now says there's no mention in
9 Klügl of fluid flow. Well, we just saw citations in Klügl that talk about fluid
10 flow. Talk about fluid flow, not too much fluid flow, up throttle 10. So, it
11 can't be right. And as Petitioner pointed out in the request for
12 reconsideration, not only is this entirely inconsistent, but because it's
13 contrary to Klügl's disclosures, it should be disregarded as a matter of law.

14 We jump to slide 35. We'll move in now to talk about, and we talked
15 about it a bit already, that figure 1 uses a flexible membrane. Slide 36. This
16 is some testimony on slide 36 from Dr. Atkinson. And his testimony is that
17 Exhibit 1006 expressly teaches that membrane 6 is flexible. But even if it
18 didn't, a POSITA would know that membranes are flexible and pliable
19 elements.

20 Go to slide 37. You see here is the express teaching in Klügl. One of
21 the places that Klügl expressly teaches membrane 6 in figure 1 is flexible,
22 according to figure 1 or 3, there highlighted in blue, with flexible membrane
23 6, 8, 26. Now, I expect that Petitioners are going to come back and say, as
24 they've already said, well, flexible membrane, fixed properties are going to
25 change between actuation and rest. They're these magical membranes have
26 different properties. Dr. Atkinson disagrees. He says it "will not have

1 different properties during actuation and while at rest". And even their
2 expert, Dr. Quinlan seems to agree. "I don't know how something has a state
3 of being flexible at one time and not being flexible at another time." That's
4 at the bottom of page 38.

5 And something surprisingly that the Petitioners had never talked
6 about. You didn't hear anything about it in their opening remarks. They
7 don't talk about the claims included. All those claims that address a
8 membrane 6 call it flexible. Claim 1, first flexible element 6. Claim 6, first
9 flexible membrane 6, or first flexible element 6. Claim 3, first flexible
10 element 6. Claim 7, first flexible membrane 6, first flexible element 6, first
11 flexible element 6.

12 And oh, by the way, this is in our papers and Petitioners have never
13 contested Klügl's claim 6 covers the figure 1 embodiment. On the left, you
14 can see in slide 40, paragraph 60, highlighted in yellow from Dr. Atkinson's
15 declaration, explaining why claim 6 covers the devices depicted in figures 1
16 and 2. Figure 1 is the one at issue here because the claim requires a movably
17 arranged transmission module, among other issues or among other reasons.

18 If we go to the next slide, you can see In Klügl's claim 6, it's talking
19 about the transmission module 2 is movably arranged. The transmission
20 module 2 was moved, like we've seen in figure 1. And if we continue down
21 in claim 6 into slide 42, first flexible membrane 6. If we go to the next slide,
22 slide 43. But I don't think there's an excuse that flexible membrane 6 has to
23 be flexible to maintain contact with piston 3. Discloses that for both figure 1
24 and for figure 3. And that's, you can see, Dr. Atkinson's testimony on the
25 left saying that. You can see citations to Klügl on the right on slide 43

1 saying that it's got to be flexible enough to maintain contact with piston 3 in
2 figure 1.

3 Dr. Quinlan, if we go to slide 44, he also agrees that membrane 6 in
4 figure 1 has to stay in contact with number 3. That requires some flexibility
5 for that membrane. Can't stay in contact if it's not flexible membrane. But
6 staying with Dr. Quinlan, if we go to slide 45, you can see in the text we --
7 well, on slide 45 on the left we have the highlighted yellow annular areas
8 around drive piston 3 highlighted in yellow, which was deposition Exhibit
9 13 in Dr. Quinlan's deposition. He was asked the question, "What's the
10 yellow portion of Exhibit 13?" Response, "I would generally consider it --
11 from the looks of it, it looks like it would be an open area."

12 Then he's asked a hypothetical question. Experts love hypotheticals.
13 "Let me give you an example. If I've got a plate that's solid on the top and a
14 plate that's got a hole in it on the bottom, and I've got a balloon in the middle
15 and I press those two plates together, where's the balloon going to go?" "It's
16 going to get spread out and pushed through the hole in this hypothetical."
17 Ah, it's going to go from high pressure to low pressure. Because he's asked,
18 "Why would it get pushed through?" "So, you're trying to balance the
19 tension in the balloon with the pressure inside of the balloon as you push
20 those plates together." Statistics, high pressure to low pressure. But
21 curiously, when you get around to ask, how much is there going to be flex
22 into the open areas in figure 1, Dr. Quinlan expresses confusion or lacks an
23 opinion because he says, "I don't know how large in diameter piston 3 is
24 versus the diameter inside of 11, which is the unsupported edge of the
25 membrane, so I don't know how big that gap is."

1 Question. "Flexible membrane 6 can flex into the yellow areas of
2 Exhibit 13, correct?" "I don't know how much the flex into that yellow area
3 is without doing the detailed design of the contact between membrane 6,
4 what the material membrane 6 is, what the thickness of material 6 is, what
5 the size of the volume of the yellow is, the diameter of piston 11, the inside
6 diameter of piston 13. I can't that analysis yet." And yet none of it prevents
7 him from contending that there is no flex at all.

8 He doesn't know any of that information to know how much it flexes,
9 but he can tell you it doesn't flex at all. With respect, that is just incredible.
10 And frankly, it's contrary to the laws of physics. Fluids go from high
11 pressure to low pressure. And as we see, and we will see, there is no support
12 in those open annular areas. This is going to cause a bulge. We'll come
13 back to that.

14 So, let's talk about, let's just skip ahead to 49, because again, the
15 comparison has been between figure 3 and figure 1. Well, figure 3 talks
16 about a deflecting first membrane 6. It deflects first membrane 6 in the
17 direction of the drive piston so that there's this during actuation, this is
18 during actuation. The same flexible membrane 6 flexes and deforms in
19 figure 3. And yet, Petitioners would have this Board believe that exact same
20 membrane will not flex or deform into the open annular spaces during
21 actuation to figure 1. That's not what Klügl teaches and that's not what
22 physics requires.

23 If we go to slide 50, Dr. Quinlan was asked, "So you would agree that
24 a membrane is either capable of being flexible or not capable of being
25 flexible?" You know, it's relative to the forces applied to it. So,
26 embodiment figure 3 shown that requires it to be flexible. Okay. And he

1 goes on to say in the highlighted text on the right, "Figure 3 of Klügl, the
2 membrane 6 relies on its flexibility to perform its job, right? It must have
3 some property of being flexible for this case, for figure 3." But when we ask
4 him, "Is that your complete opinion on the flexibility of item number 6 in
5 figures 1 and 3?" "I haven't formed a complete opinion on how 6
6 specifically is flexible or is not flexible." And yet Petitioners offer him up
7 as an expert to tell you that flexible membrane 6 isn't flexible. It's not
8 credible.

9 Go to the next slide. "What's your understanding what flexible means
10 in the context of the Klügl reference?" "I haven't been asked to offer a
11 formal opinion of what flexible means in light of this." "What is a flexible
12 membrane?" "Again, I haven't offered a formal opinion what a flexible
13 membrane is." Incredible.

14 Dr. Quinlan was asked, "Can you identify any exemplary membranes
15 versus what's a membrane?" "I haven't formed a formal opinion on it, but
16 it's usually a thin sheet of material." "Are you aware of any commercial fuel
17 injectors that use the flexible membrane?" "Not that I'm aware of." "What
18 about October '99?" "Not that I'm aware of." Testimony on the right,
19 "October of '99, what material were membranes made from in fuel
20 injectors?" "I could imagine that you could use many different materials for
21 that."

22 When asked, "Can you name three?" "I cannot." And then when he
23 asked about membrane 6 flexes over time and if it loses rigidity. "Haven't
24 done that design process to go through and decide what 6 is made out of and
25 what its material is. I don't know." And yet, Dr. Quinlan who had not done
26 the analysis, didn't know the technical details, couldn't give us any answers,

1 in reply now claims that, "While membrane 6 has the same structure and
2 physical properties at all times, doesn't mean that it behaves the same. It's
3 possible that the long-lasting differences are what caused the same
4 membrane to behave differently during actuation and rest."

5 Well, frankly, Dr. Quinlan's contention that now a person of ordinary
6 skill in the art could choose a less flexible membrane to minimize flexing
7 during actuation it's simply not credible. First off it's a flip flop. He went
8 from his deposition testimony in April 2024 I haven't formed a complete
9 opinion on how thick specifically is flexible or not flexible, to this opinion.

10 So, here's the nonsense point about what Dr. Quinlan's position is and
11 frankly what Petitioners' position is. Their position seems to be that the
12 flexible membrane 6 in figure 1 will flex when it rests but it will not flex
13 during actuation. The forces on that flexible membrane 6 are substantially
14 greater during actuation. If flexible membrane 6 will not deflect or flex
15 during those higher forces, it will not flex or deflect under lower forces. It's
16 just incongruous and simply wrong as a matter of physics and a matter of
17 disclosures of Klügl.

18 So, let's talk about, we've been talking about this a lot but let's
19 continue to go through and talk about the flexible membrane flexion during
20 actuation. This was Petitioners' argument to the Board during their request
21 for reconsideration. That our argument that membrane 6 will flex or deform
22 is directly contrary to what Klügl itself teaches. Well, I'm just showing you
23 why the Petitioner is flat wrong, but we'll talk about it a little bit.

24 We go to slide 58. See we've got a portion of figure 1 on the left of
25 slide 58 and then we've got a demonstrative of how the forces interact on the
26 right. Force comes down from the top. Remember we've got all

1 longitudinal direction force in figure 1. The contact area is going to be
2 between the top of flexible membrane 6 and drive piston 3. But nobody
3 disputes that there's open annular area on either side. That means that there's
4 going to be higher pressure where that contact point is and there's going to
5 be lower pressure on the side because transmission median flows. And
6 flexible membrane 6 is flexible. Transmission fluid is going to move out to
7 the annular areas and cause a deformation. That's what's depicted on slide
8 58 on the right.

9 Don't take my word for it, because attorney argument isn't entitled to
10 weight. Here's the testimony of Dr. Atkinson. It says on the left on slide 59,
11 the membrane will tend to deform longitudinally upward where it contacts
12 the drive piston and bulge outward where unconstrained in the annular area,
13 i.e., void space depicted in yellow, between the edge of the drive piston 3
14 and the wall of transmission module 2 and guide sleeve 11 in order to
15 accommodate the volume of transmission fluid contained therein and the
16 pressure differences created within the transmission fluid. Remember, we
17 all agree that transmission fluid is incompressible. So, it has to go
18 somewhere because it cannot be compressed. That somewhere is to the
19 sides. So, from high pressure, low pressure. This isn't just an opinion. This
20 is the law of physics.

21 JUDGE DEFRANCO: Mr. Higer, is the depiction that you have on
22 the right on slide 59, as well as what you showed on slide 58, is that the
23 figure 1 embodiment of Klügl, or is that the figure 3 embodiment of Klügl?

24 MR. HIGER: Figure 1, Your Honor.

25 JUDGE DEFRANCO: Okay, thank you.

1 MR. HIGER: The reason we didn't do figure 3 is everybody agrees
2 that it will, the membrane flexes and the dispute is Petitioners' claim that it's
3 not going to flex in figure 1. And we're showing exactly why, as a matter of
4 physics and common sense, that that's wrong. And the disclosure of Klügl.

5 JUDGE DEFRANCO: Got it. Thank you for that clarification.

6 MR. HIGER: We go to the next slide. More testimony from Dr.
7 Atkinson talking again about the bulging of the transmission fluid in the
8 annular area. Says that Klügl only ever specifies and describes membrane 6
9 as a flexible membrane or element. Acknowledging that this flexibility is a
10 necessary and desirable feature of its intended purpose and behavior. And
11 we walk through the evidence showing you the descriptions of flexibility in
12 the Klügl disclosure. And again, Dr. Quinlan's shifting opinion on this
13 should be given no weight.

14 In the request for reconsideration, I think you saw a similar figure to
15 this in Petitioner's argument. You see the figures in the bottom, bottom right
16 of page 61 asserting the Klügl doesn't bulge, in highlighting these figures.
17 But then when we deposed Dr. Quinlan, on whom they relied to make this
18 argument, he said he hadn't formed a complete opinion on how 6 specifically
19 is flexible or is not flexible. Well, that's not what they've represented to this
20 Board when asking for reconsideration. And then magically on reply he
21 came back to say the same thing. Somehow between these two filings have
22 forgotten his opinion and magically found his opinion. It's just not true.

23 And we can go even further with Dr. Quinlan if we look at slide 64.
24 "Would you agree that a material that is flexible can deform?" "Haven't
25 offered formal opinions on what flexible means and whether it can deform
26 or not." Sorry, I was on the wrong slide there. Slide 64, up there now.

1 We go to slide 66; 66, right here, you can see, again, this is the
2 demonstrative on the right that shows the deformation and the flexing of the
3 membrane. The actuation movement is partially transmitted in figure 1
4 because of the deformation of the flexible membrane. On the left of slide 66
5 you can see testimony from Dr. Atkinson explaining this and that this partial
6 transmission of movement is consistent with how the device depicted in
7 figure 1 would work. And if you look down at the bottom of the paragraph
8 78, four from the bottom left of slide 66 you see that a POSITA would
9 understand that the innate flexibility of flexible membrane 6 means that a
10 specific movement of the actuator 1 would be partially transmitted to drive
11 piston 3 and never always fully transmitted. Because remember that's the
12 Petitioners' argument. Petitioners' argument was to this Board that the figure
13 1 demanded, required had to be a 1:1 translation. It had to be. If the
14 actuator moved 100 microns, then the drive piston had to move 100 microns.
15 And any variation off of that is just wrong. That's not what Klügl teaches.
16 That's their position until they recently tried to change it. But that was their
17 position throughout, until their reply. It's just wrong, because it's only
18 partially transmitted. And we'll show you why.

19 Slide 68, please. Remember that claim 6 of Klügl covers figure 1.
20 Again, Petitioners have never pointed you to the claim. We're looking at
21 slide 68, claim 6. Movement of the actuator 1 is at least partially transmitted
22 to the control element 3 via movement of the transmission module 2. Klügl
23 knows how to tell you if it's 1:1, and it says partial, partially transmitted.
24 What that means? It means never zero, but always partial by design and the
25 laws of physics that we've been talking about a fair amount, today. That is
26 claim 6 of Klügl.

1 JUDGE POWELL: Patent Owner how do you deal with the words “at
2 least”?

3 MR. HIGER: It means it's got to be nothing, it's got to be never zero.

4 JUDGE POWELL: At least partially. Doesn't that mean, wouldn't
5 that encompass fully?

6 MR. HIGER: No, not in the design of Klügl , because there's always
7 a deformation. At least partially means it's always got to be at least a partial
8 transmission. There's always got to be some transmission.

9 JUDGE POWELL: So, right. This, this particular argument sounds
10 circular to me. You're citing the claim as evidence that the structure shown
11 in the figure would always flex some. But the claim in and of itself seems to
12 say specifies a range of transmission that would seemingly cover 100
13 percent. So, I personally wouldn't see the claim as particularly helpful to
14 establish that the structure in the figure can never do a hundred percent
15 transmission of the motion. Because it's because of the scope of the
16 language it's at least partially transmitting, which covers seemingly anything
17 from just over zero to 100 percent. Help me understand why I'm reading
18 that wrong if I am.

19 MR. HIGER: Well, it's a combination of the disclosure of the figure
20 and this language. But here's the important point. Petitioners' position is
21 that figure 1 always and only is a 1:1. Claim 6 says that's wrong because it's
22 at least partially transmitted, which means, contrary to Petitioner's argument,
23 it's not one-to-one. Our position is that at least partially means never zero,
24 but it's always partial by design because there is going to be the flexing into
25 the annular areas that are unsupported.

1 And we can look at, just to try to put a finer point on why this matters
2 at the re-hearing stage, if you look at slide 69, Petitioners argued that if the
3 way that we've argued figure 1 worked, then there would be, piston 3 would
4 move less than actuator 1 as a result of a reduction in thickness of the fluid.
5 In other words, it would not be substantially constant thickness during
6 actuation. This is a concession by the Petitioners.

7 Now, this is the change that Petitioners have made. Petitioners went
8 from saying if we're right, that in the way Klügl operates, that it's not a
9 substantially constant thickness. Now in reply they suggest, well,
10 insubstantial changes don't matter. We don't quantify how much membrane
11 flexing reportedly occurs. Flexing has to be substantial, on slide 71, as
12 opposed to insubstantial change in thickness. Frankly, it's Petitioner's
13 burden to show that Klügl teaches a substantially constant thickness. We've
14 shown why it's not. But we've also got down in the, you can see the claim
15 language in the bottom is, thickness being substantially constant.

16 But Dr. Atkinson, if we slide go to slide 72 specifically talks about
17 that the thickness is not substantially constant and explains specifically why
18 if you look at the box on the right that says, "Even a small deflection or
19 deformation of the pliable, flexible membrane will be critical as the lift
20 commonly generated in these applications is very small, usually less than
21 100 microns, about the thickness of a piece of paper."

22 All right, so now let's go and talk about, let's go to, sorry, slide 81. Go
23 back to 73. So, I didn't hear much about a stroke amplification argument
24 from Petitioners in their opening arguments, but they did make a stroke
25 amplification argument throughout the course of this, to suggest that if
26 figure 3 has stroke amplification, which there are some testimonies that

1 figure 3 may not actually have stroke amplification, it may be 1:1, it could
2 be greater. But that even in a figure 3 has stroke amplification, that doesn't
3 mean that figure 1 has to be a 1:1 translation of the motion of the actuator to
4 drive piston, for the reasons that we talked about.

5 So, pointing out the potential of amplification figure 3, which they did
6 argue about a little bit in a couple of the translations of Klügl talking about a
7 stroke ratio or whatever being generated. That does not give the answer to
8 what happens in figure 1. The answer for what happens in figure 1 is the
9 citations and evidence that we've been talking on.

10 Now we can go to slide 82 here. Talk about the combination of
11 Wirbeleit and Klügl and their failure to teach some other limitations. As we
12 cited in our POR or discussed in our POR, the Petitioners do not explain
13 how closing forces are transmitted through a hydraulic fluid thickness after
14 the substitution of Wirbeleit's magnetostrictive actuator for Klügl's
15 piezoelectric actuator. And then we talked about earlier. It wasn't just the
16 substitution of element 22, it was a replacement of 21 as well. Wirbeleit
17 itself includes no details that supplement Klügl's disclosure as to a passive
18 hydraulic link. I think there was some suggestion that Patent Owner
19 suggested that Wirbeleit talked a lot about or provided some detail about its
20 element 22. The totality of Wirbeleit on 22 says by way of a hydraulic
21 transmission element 22. This is Exhibit 1004 around about lines, column 2,
22 line 63 by way of a hydraulic transmission element 22, which is not shown
23 in detail. It goes on to say instead of the magnetostrictive actuator,
24 piezoelectric actuator may be used, fine, but also a translucent one with
25 elastomer or one with mechanical force transmission can be utilized.

1 So, what Wirbeleit's actually saying is that the transmission element
2 22 is not really consequential to the purpose of the injection claimed in
3 Wirbeleit because whether it's a transmission element 22 that's hydraulic or
4 whether it's elastomer or mechanical force transmission, it's not going to
5 matter. That undercuts part of the Petitioners' argument for a motivation to
6 combine.

7 That also goes to point three on slide 82 here, where it says Wirbeleit
8 does not describe that element 22 is sealed within its housing. Just read you
9 what Wirbeleit says. That it is not connected to a separate fluid supply;
10 doesn't say that. Or that it provides a direct simple force pathway, as
11 Petitioners argue; doesn't say that either. Item four on slide 82, Klügl also
12 does not disclose adjustments in response to changes in the dimensional
13 relationship between components of the injection valve to maintain a desired
14 valve needle lift.

15 So, this is coming back to that point before and I'll show you some
16 schematics to show why it does not make, why Klügl doesn't maintain a
17 desired valve needle lift, but Wirbeleit doesn't cure this problem. Why?
18 Wirbeleit describes a system where needle lift is adjusted by electronic
19 means, not mechanical means. Wirbeleit uses the needle lift or position
20 sensor to determine how much needle lift it's getting and then uses an
21 electronic control unit to send additional or less voltage to the actuator to
22 maintain the appropriate needle lift. That's how it maintains needle lift. It
23 has nothing to do with any of the reasons why there'd be a combination and
24 the combination doesn't change that. Wirbeleit still is going to adjust needle
25 lift based on a position sensor and the use of an electronic control unit in
26 combination with Klügl.

1 And that's going to this slide. This is responsive forces that I talked
2 about before, the maintaining a desired valve needle lift on slide 83. If we
3 go to Petitioners' arguments here, Petitioners admit that Klügl is intended to
4 fill a gap with Wirbeleit's disclosure. We talked about that gap because
5 Wirbeleit doesn't talk about what would be in element 22. But there's an
6 admission here in the bottom of Exhibit 84 of that. Klügl's meant to account
7 for changes in the dimensions of the actuator, not the piston or needle 32.
8 Well, it's not meant to account for the dimensions of the needle 32.

9 Then it's going to be hard for, if we go back to slide 83, for Klügl to
10 be responsible for making changes at rest to maintain a desired valve lift or
11 design valve needle lift. And the reality is the combination of piston 3,
12 transmission model 2 remaining in contact from Klügl with the electronic
13 control unit of Wirbeleit, the maintained needle lift added together does not
14 add the final limit claim element 1(e) of either patent, as you can see on page
15 85.

16 But here let's talk about, I mentioned this a few times, what the
17 problem is with Klügl and this is consistent with Petitioners' admission on
18 slide 84 that we just saw, that there's a red portion in the right figure that is
19 the lower stop 16. There's also a check ring 16 -- 17, as you can see.
20 Because of the lower stop 16, dimensional changes in the hydraulic piston
21 that occur down in the lower portion of Klügl, there can be a contraction or
22 an expansion that's going to create a gap B in the length of the drive piston A
23 which is either going to cause distance A to grow or it could actually, the
24 distance B is going to be opened up, or it's going to be actually going the
25 other way.

1 And then we can see in the discussion what happens if that's the case,
2 on slide 87, with testimony from Dr. Atkinson. That this creation of a gap B
3 between the end of valve needle 32 and ball 4, because Klügl's designs can't
4 address that because of the stop, then it's either not going to perform provide
5 sufficient needle lift or if the distance extends further down to contact the
6 ball or put the ball off the housing, then there's actually potentially going to
7 be a leak in the valve. Nothing in Klügl corrects for that portion of the
8 distance.

9 We go to slide 88 the combination of Wirbeleit and Klügl does not
10 keep the intended valve needle lift for the reasons that we just talked about.
11 Klügl doesn't do it and Wirbeleit does it in a different way through
12 electronic means not based on modification or adjustment of a hydraulic,
13 passive hydraulic element while at rests.

14 JUDGE IPPOLITO: Counsel, you have about nine minutes of what
15 you set aside.

16 MR. HIGER: Thank you. Now what's Petitioners' response to that?
17 Petitioner just argue that Wirbeleit doesn't itself solve this alignment from
18 aging and thermal effects. As I just told you or showed you, that's untrue.
19 Wirbeleit's mechanism for adjusting valve needle lift is a needle lift position
20 sensor 19 and an electronic control unit 20. The use of that position or use
21 of those adjustments is going to adjust for any variation that's going to
22 impact the lift of the valve as measured by the needle lift position sensor
23 using the electronic control.

24 And interestingly, as we talked about this combination of lower stop
25 16 in Klügl, Dr. Quinlan relies on lower stop 16 as part of the motivation to
26 combine Klügl with Wirbeleit. You can see that in slide 90. In the slide on

1 the left that paragraph 324 there's references lower stop 16. And then in
2 paragraph 326, "In my opinion, this would have further motivated
3 application of Klügl to Wirbeleit." But if we look at the next slide in reply,
4 Dr. Quinlan actually provided this opinion because of the admission about
5 the fact that Klügl does not adjust the piston or the needle to say that, in slide
6 92, he removes the lower stop for the combination of Klügl and Wirbeleit.
7 So, you see in the text on the right in the red box, "The rest of Wirbeleit's
8 injector would remain the same. Thus, the combined injector will not
9 include the same type of lower stop. That's the lower stop that Dr. Quinlan
10 used to argue there was a motivation to combine these elements and now
11 he's removing it.

12 So, let's talk about motivation to combine. There was some argument
13 that you heard about motivation combined from the Petitioner. The reality is
14 that the real motivation to combine here is hindsight bias. The purpose
15 driven hindsight the Petitioners had to try to comb together something,
16 anything, in an effort to try to prove the Patent Owner's claims are
17 unpatentable.

18 How do we know this? Well, Dr. Quinlan testified the counsel
19 supplied him with the prior art in this case, paper 19 and 71. He further
20 testified that he used the path file history and counsel selected our
21 (inaudible) and opinions, paper 19 and 71. The record also was replete with
22 additional evidence of hindsight, some of which we've shown you. Number
23 one, the proposed combinations are inoperable. We talked about that in
24 paper 19 at 56 to 57. And it's no answer, which is what Petitioners are
25 saying, that a person of ordinary skill in the art can figure out how to make it
26 work in combination. Dr. Quinlan certainly failed to do so. The proposed

1 combinations rely on generic similarities as motivation to combine. That's
2 not a proper basis or a sufficient basis for motivation to combine. The
3 proposed combinations remove or destroy inventive concept of the allegedly
4 improved base reference. You see that paper 19, at 68 to 69. And Dr.
5 Quinlan's lack of formal opinions on matters that should have been
6 considered when proposing combinations also is evidence of hindsight bias.

7 The reality is for Wirbeleit and Klügl, the proposed combination, is a
8 solution in need of a problem. Wirbeleit didn't need Klügl in order to
9 maintain valve needle lift. Wirbeleit was doing just fine on its own, not in
10 the same way that claimed in the Patent Owner's patent, but Wirbeleit had its
11 own mechanism in order to address the problem. It didn't need Klügl or all
12 the complications that Klügl injected.

13 And to talk a little bit more specifically here, as I said on slide 93,
14 Wirbeleit provides this electronic control of the conjunction needle lift. It
15 doesn't use the passive hydraulic link to play a role in the valve lift
16 adjustability. It just provides a flexible membrane. And Klügl provides the
17 membrane to adjust for changes to the dimensions of the actuator, not the
18 valve needle. In terms of operability, the proposed combination introduces
19 fluid into structures that were sealed in Klügl, which leads to the next bullet
20 point that makes the proposed combination likely inoperable because the
21 hydraulic fluid is going to end up generating hydro-lock (phonetic) and then
22 the valve will not work. You see citations to where that evidence is.

23 And frankly, a POSITA would not introduce flexible membranes with
24 their disadvantages into Wirbeleit's electronically controlled injector. It
25 would make it much harder for Wirbeleit to do the things that Wirbeleit was

1 already capable of doing on its own. Which again, this is all evidence of
2 hindsight.

3 Talk briefly about Klügl and Hayes. Klügl and Hayes failed to teach a
4 number of other limitations as well. Petitioners didn't spend that much time
5 talking about Klügl and Hayes. Do it really quickly here. Klügl does not
6 disclose a fuel inlet, port, nozzle, nozzle orifice, or any of the elements that
7 are required for all the claim elements of claim 1. What Petitioners identify
8 on as the valve needle for Klügl is point two on slide 95 isn't about needle at
9 all. They point to drive piston 3 controlling needle 32 and ball 4 but it's not
10 the valve needle because of this, the parts, the ball is separate. Item 3.
11 Petitioners' combination of Klügl and Hayes would have been --

12 JUDGE DEFRANCO: Mr. Higer.

13 MR. HIGER: Your Honor.

14 JUDGE DEFRANCO: Yes, Mr. Higer, if I could interrupt for a
15 moment. So, Patent Owner is relying on this ground Klügl and Hayes based
16 on what they perceived your claim construction is. Are you still maintaining
17 that claim construction that they perceived as erroneous?

18 MR. HIGER: They're wrong on the claim construction and our
19 positions in district court. So, no, I mean, we're not taking any inconsistent
20 positions or taking claim construction, but whatever they think that we're
21 doing that supports the combination of Klügl and Hayes. We just
22 fundamentally disagree with that. All of the evidence that's been submitted
23 that's relevant is before for the Board, so the Board can check me on that.
24 But we're not taking any inconsistent positions at all. If anything, it's
25 actually the Petitioner that's taking inconsistent positions between these
26 proceedings and the district court. And so, we're not asking for a claim

1 construction here. I don't think either side is asking for a claim construction.
2 But we're not behaving or taking any argument or making any arguments
3 here that are inconsistent from what we've done in district court.

4 JUDGE DEFRANCO: Well, they seem to be asserting this ground
5 simply as an alternative in the event that you make a claim construction,
6 making what they perceive would be an erroneous claim construction. So, if
7 you're not making any claim construction, do we need to get into this
8 ground?

9 MR. HIGER: I don't think so. I think you can pretty readily affirm
10 the patentability of the challenged claims based on this ground. They don't
11 really seem to put much force or weight behind it. But our discussion of this
12 issue is POR at page seven, if you want to see more discussion of that in the
13 record.

14 JUDGE DEFRANCO: Okay.

15 MR. HIGER: But yeah, I think the fight here is really over grounds 1
16 and 2, and the issues that we've been talking about for the most part. Not
17 Klügl and Hayes, I think that's kind of a throwaway for them.

18 JUDGE DEFRANCO: All right. Okay. Well, we'll see what
19 Petitioner says about that. All right. Thank you.

20 MR. HIGER: Yep. The last thing, I can't remember if I got out on
21 slide 95, Petitioners' combination of Klügl and Hayes would have been
22 inoperable because no pressure differential exists. And you can see on slide
23 95, where there's green highlighting and all the dizziness, the colors on the
24 left, that is what Hayes had. And you can see there's pressure relief valves
25 and relief lines and everything. When they dropped in Klügl on the right,

1 they took all of that out. That's why the pressure across this is going to be
2 the same.

3 JUDGE IPPOLITO: Counsel, you are starting --

4 MR. HIGER: Also --

5 JUDGE IPPOLITO: You are starting to go into the sur-rebuttal time.

6 MR. HIGER: Okay. Thank you.

7 JUDGE IPPOLITO: I just wanted to let you know that.

8 MR. HIGER: Thank you. The last one on this simply is their
9 combination also removes the inventive aspect of Hayes. Hayes has a
10 double piston design that is actually here in the top of Hayes. And that was
11 completely removed from their combination, which undercuts any
12 motivation to combine. I will save the balance of my time for sur-rebuttal.
13 Thank you.

14 JUDGE IPPOLITO: Thank you. And you have 9 minutes and 20
15 seconds.

16 MR. HIGER: Thank you.

17 JUDGE IPPOLITO: Well, I will have us take a 5-minute break just so
18 we can transition back. Let's say we're going to be back on the record at
19 around three -- let's say 3:12, gives us about six minutes to kind of reset.

20 (Recess.)

21 JUDGE IPPOLITO: It is 3:12 and we are going to go back on the
22 record. I'm going to do appearances again just so that we can be sure
23 everyone is here. Petitioners' Counsel, are you here?

24 MR. HERMAN: Yes, I'm here, Your Honor.

25 JUDGE IPPOLITO: Patent Owner's Counsel.

26 MR. HIGER: Yes, Your Honor, we're here.

1 JUDGE IPPOLITO: And I see that we have our court reporter as
2 well, who is the most important person here. Okay. All right. With that
3 Petitioner, I believe you had 20 minutes and some change, maybe 30
4 seconds more. You may begin whenever you are ready. And I'm going to
5 start the clock as soon as you start.

6 MR. HERMAN: Thank you, Your Honor. I'd like to begin by
7 addressing the point that Patent Owner made at the beginning of the
8 presentation. And Patent Owner argued that the petition is somehow overly
9 complicated or taking an overly complicated approach in combining Klügl
10 and Wirbeleit. And Petitioner again submits that this is not in fact the case.
11 As the petition explained, a person having ordinary skill in the art would
12 have considered it obvious to just replace the hydraulic transmission element
13 22 in Wirbeleit with the transmission module 2 from Klügl. So, yes, the
14 petition did include some associated structure from Klügl in the
15 combination, including those circumferential springs below the transmission
16 element and the actuator to module interface that's above the transmission
17 module, to show how that module 2 would actually fit within Wirbeleit's
18 housing. But those are the only elements from Klügl that are coming over,
19 the transmission module 2 and the associated interconnections that allow
20 that module 2 to fit inside of Wirbeleit's housing.

21 So, Petitioners', for instance, not proposing replacing Wirbeleit's
22 actuator. In fact, that's not something that even needs to be done. Wirbeleit
23 already teaches that its injector includes an actuator, and it explains that the
24 actuator it includes can be either a magnetostrictive or a piezoelectric
25 actuator. Either of those can be used in this device. And you can see that in
26 Wirbeleit. That's Exhibit 1004 in column two from lines 13 to 17 and the

1 same column from line 60 to 64. Wirbeleit also explains how that actuator
2 that it already teaches used to control this device. And the figures in the
3 Petition that combined Wirbeleit's and Klügl's teachings were simply meant
4 to imply that or show Wirbeleit's existing actuator in more detail and to
5 show how that existing actuator is interfaced with Klügl's transmission
6 module 2 and pushing it during actuation.

7 So, next I'd like to briefly address the grounds 3 and 4 issues that
8 came up at the end of Patent Owner's presentation. And it was unclear to me
9 during that discussion if Patent Owner is now arguing that the claims of the
10 '829 and the '138 Patents are required and are limited to just directly actuated
11 injectors and exclude indirectly actuated injectors. If that's what they are
12 arguing, that the claims are limited to just directly actuated injectors, then I
13 agree that all of the limitations that Patent Owner listed on slide 95 as
14 missing from the prior art like nozzles, and interior chambers, and needles
15 are not in fact in the combination of Klügl and Hayes. So, if that's what
16 they're arguing, that the claims are limited to directly actuated injectors, then
17 there would not be a need for the Board to move on to grounds 3 and 4. But
18 a necessary prerequisite to getting there is Patent Owner making clear their
19 view on the record that the claims do not in fact cover indirectly actuated
20 injectors. But if they are still contending today that the claims cover
21 indirectly actuated injectors, which is what the combination of Klügl and
22 Hayes is, then the arguments that they're making, and they made today about
23 the disclosure of Klügl and Hayes and what's purportedly missing just can't
24 be squared with what they're saying in district court.

25 Now, during his presentation, Patent Owner also argued at length that
26 the only difference between figure 1 and figure 3 of Klügl is the type of

1 power transmission. But that's simply not the case. It's not what Klügl says
2 and it's not what it discloses. Yes, there are several differences in the
3 structure and the operation between the embodiments of figure 1 and 3. In
4 particular, in figure 1, the transmission module moves, but the membrane
5 does not deflect. In figure 3, the module 2 is fixed, so movement is
6 transmitted by the membrane deflecting. But there is also a difference in the
7 results these embodiments achieved. And Klügl says this. For instance,
8 when discussing figure 3, Klügl explicitly says that there are differences,
9 quote, between the deflection of the piezoelectric actuator 1 and the
10 deflection of the dry piston, end quote. You see that in column seven of
11 Klügl. That's Exhibit 1006 from lines 9 to 14.

12 So, no such difference in movement is mentioned when discussing
13 figure 1 back in column three of Klügl. There's no difference discussed
14 between the movement of the actuator and the movement of the piston,
15 because there is no difference in that embodiment between how much the
16 actuator moves and how much the piston moves. So, when Klügl states that
17 figure 1 is without stroke translation and figure 3 is with stroke translation,
18 Klügl is plainly referring to the effect achieved by the different injectors. In
19 figure 1 there is no difference between actuator and piston movement or
20 deflection, so it is without stroke translation. While in figure 3 there is such
21 a difference, so it is with stroke translation. So, Klügl is referring to the
22 difference of a in effect, not just the difference in structure. So, Patent
23 Owner is trying to read all of this out of the reference and replace it with its
24 own rewriting of Klügl. But we don't change the prior art to suit our
25 purposes, like Patent Owner is trying to do here. It is what it is.

1 Now, Patent Owner also pointed the Board to Klügl's teaching that
2 during actuation of the injector in figure 1, only an insignificant amount of
3 transmission medium flows through the bore 10 in Klügl's transmission
4 module. The Patent Owner then leaped to the conclusion that this must
5 mean that there is flow. So, it must be right that substantial flexing of the
6 membrane is happening in figure 1. But there are layers of problems with
7 that.

8 First, the claims of the '829 and the '138 Patent do not require
9 perfection. They require only that the thickness of the hydraulic link
10 remains substantially constant during actuation. And this is exactly what
11 Klügl teaches. It says that there are insignificant changes to the amount of
12 fluid in chamber 5 during actuation. That's the very word that Klügl uses.
13 Insignificant. Second, the mere fact that single molecules of fluid,
14 insignificant amounts of fluid, may leak through that bore 10 during
15 actuation does not somehow show that membrane 6 is flexing all over the
16 place during actuation. The latter does not follow from the former.

17 JUDGE DEFRANCO: Mr. Herman, where does Klügl quantify the
18 amount of the flow?

19 MR. HERMAN: It uses the word insignificant. That's the word. The
20 word is in Klügl, and I'll point you, Your Honor, to where it says that.
21 Column four.

22 JUDGE DEFRANCO: I see it, I think. Line 19?

23 MR. HERMAN: Yes. Right. At line 19. That's right. It literally
24 uses the word insignificant to describe the quantum of fluid that's flowing
25 during actuation. Right. So, in its own words, an insignificant amount of
26 fluid is flowing during actuation.

1 JUDGE DEFRANCO: The claim also says substantially solid. If
2 there's flow, can something be solid?

3 MR. HERMAN: So, if there is insubstantial flow, the fluid in that
4 chamber is acting substantially as a solid. If there is substantial flow, I
5 would agree, Your Honor, that the fluid is acting as the fluid. But if there is
6 an insubstantial amount of flow, the fluid is acting substantially as a solid.
7 That's what the word insubstantial means, that there is no -- that the fluid is
8 acting substantially as a solid. It's maintaining its shape during actuation
9 and is not changing in any sort of meaningful way.

10 So, Patent Owner also pointed repeatedly to Klügl's use of the term
11 flexible or use of the term flexible. So, yes, I agree that Klügl does label
12 membrane 6 as flexible. But this does not end the analysis that Patent
13 Owner apparently believes. In an obviousness analysis, the totality of the
14 prior art must be considered. And here Klügl makes clear, because it says
15 so, that the embodiment of figure 1 operates without stroke translation. In
16 other words, the actuator and the piston move by the same amount. So, the
17 mere fact that Klügl uses the word flexible does not somehow justify
18 ignoring everything it says about how figure 1 is intended to operate. So,
19 that, however, is what Patent Owner appears to be doing.

20 In actuality, membrane 6 does not flex during actuation because Klügl
21 says it does not flex during actuation. Membrane 6 does flex during rest
22 because Klügl -- because that is what Klügl says it does. Additionally, the
23 entire premise of Patent Owner's arguments is wrong. What it is essentially
24 saying is that if you look at figure 1 of Klügl, you'll see big stretches of
25 unsupported membrane 6 off to the sides of piston 3. Then it posits, because
26 the membrane is flexible, the presence of those large gaps must mean that

1 the membrane balloons and does all sorts of flexing during actuation. But
2 again, this is not how you assess the prior art. Klügl's drawings are
3 schematics. Klügl says this much, says this explicitly in column one at line
4 46. It characterizes the drawings as schematics. They are drawn in an
5 exaggerated way for purposes of emphasis. A person having ordinary skill
6 in the art would of course know that when designing the injector, you do so
7 in a way that allows the injector to work, as Klügl says it's supposed to be
8 working.

9 So, Patent Owner essentially premises the entirety of its argument on
10 the literal interpretation of Klügl's figures. The figures, according to Patent
11 Owner, show unsupported membranes, ergo, there must be flexing because
12 the membranes are unsupported. But this is not how you assess the prior art.
13 The assessment must consider what the art teaches, not just what it literally
14 shows in its figures. And here Klügl says that figure 1 is meant and is
15 intended to operate without stroke translation.

16 So, Patent Owner also argued during its presentation that the
17 adjustments performed by Klügl do not impact needle lift. They do. So, Dr.
18 Quinlan explained why this is the case in his testimony that's shown on slide
19 38 of Petitioners' demonstratives. As shown, if the actuator expands because
20 of thermal effects or aging, the needle is either pushed too little or too much
21 during actuation. Needle lift refers to the amount that the needle moves. So,
22 in Klügl, the movement of fluid within transmission module 2 is meant to
23 ensure that this doesn't happen. Klügl ensures that the needle is always
24 pushed for the right amount.

25 Another argument that Patent Owner made was that because Wirbeleit
26 is able to control needle movement to match engine behavior, it also

1 somehow already accounts for thermal expansion and aging. It does not. As
2 I explained, what Klügl does is ensure that the components of an injector
3 remain in contact, i.e. that the piston and the transmission module 2 don't
4 become separated due to actuator aging or thermal effects. This is not
5 something that Wirbeleit already does. This is a contribution that Klügl
6 makes.

7 The Patent Owner also showed Your Honors claim 6 of Klügl and
8 pointed out that the claim notes that force on the actuator is partially
9 transmitted. So, yes, the claim says that, but the claim is of course not the
10 totality of the prior arts disclosure. What is important here is that Klügl's
11 description of figure 1 notes that it is intended to operate without stroke
12 translation. The mere fact that the applicant wanted broader claim coverage
13 says virtually nothing.

14 So, many of Patent Owner's slides seem to imply that Petitioners'
15 expert, Dr. Quinlan took different conflicting positions over the course of
16 this proceeding. That's simply not the case. Dr. Quinlan explained in his
17 opening declaration that Klügl's figure 1 embodiment is designed to operate
18 without stroke translation. That the actuator and the piston move by the
19 same amount and the thickness of the hydraulic fluid does not change.
20 That's how Klügl --

21 JUDGE DEFRANCO: Mr. Herman, you put a lot of weight on that
22 phrase without stroke translation. It seems like you're relying heavily on
23 that phrase in order to achieve, to make your case as to the claim limitations.
24 Translation of what?

25 MR. HERMAN: So, Your Honor, Petitioner is relying upon that
26 phrase, but that is only a portion of what we're relying on. We're also

1 relying on how Klügl describes the operations of the embodiments of figure
2 1 and figure 3. And it does that in detail. There's a --

3 JUDGE DEFRANCO: I'm just wondering if it could be, you know,
4 its stroke translation is referring to translation of the components, say,
5 number 2, you know, the transmission module, number 45, the baseplate, but
6 not necessarily the first membrane.

7 MR. HERMAN: So --

8 JUDGE DEFRANCO: Meaning there could be movement there.

9 MR. HERMAN: So, respectfully, Your Honor, that that is not the
10 case. The only reasonable way to interpret without stroke translation and
11 with stroke translation is referring to the effect of these different
12 embodiments. So, in figure 1, there is no change in the amount of
13 movement from the actuator to the piston, whereas in figure 2, there is a
14 change in the amount from the actuator to the piston. And the reason I'm
15 saying that is not just because Klügl says figure 1 is without stroke
16 translation, and figure 3 is with stroke translation. I'm saying that because
17 Klügl explains how those two embodiments operate in great detail. And I
18 summarized that for Your Honors on slides 24 and 25.

19 On slide 24, Klügl explains how the embodiment in figure 1 is meant
20 to operate. And all that it says is that the actuator expands, the transmission
21 module is pushed, and the movement of the actuator is passed along to that
22 piston 3, through the fluid in chamber 5. That's what it says. But if you look
23 at how it describes the operation of figure 3, it says much, much, much more
24 than that. It does not just talk about the differences in structure. It also talks
25 about the differences, the different effects that those different structures
26 have.

1 So, what does Klügl say when it comes to figure 3? It says in figure
2 3 that the transmission medium flows, that it's pushed. It says that the
3 membrane deflects. And it says that because that membrane is deflecting,
4 and because the fluid is flowing, and because the transmission module in
5 figure 3 is structured in this completely different way, that figure 3 is able to
6 achieve a stroke ratio. And it says that when it's referring to a stroke ratio,
7 that is a difference in the amount of movement between the actuator and the
8 piston. So, it's not just that Klügl says, figure 1 operates with stroke
9 translation, and figure 3 operates -- well, I may have gotten that backwards.
10 The figure 1 operates without, and figure 3 operates with stroke translation.
11 But Klügl also explains exactly why that's the case. And it's the case
12 because there's a difference in the amount of movement between the actuator
13 and the piston. That's what Klügl states.

14 JUDGE DEFRANCO: It's the contrast with figure 3 that leads you to
15 make certain conclusions about what's described in figure 1?

16 MR. HERMAN: That's right. So, if you look at the discussion of
17 figure 1, figure 1 simply talks about passing force along. But when you get
18 to figure 3, Klügl says all sorts of stuff. It talks about --

19 JUDGE DEFRANCO: Right.

20 MR. HERMAN: -- the membrane deflecting. It talks about the fluid
21 flowing. It talks about application of a stroke ratio being implied. That
22 context is enormously important, Your Honors. Right. And that is why
23 Petitioner believes that when Klügl is referring to with stroke translation, it's
24 referring to differences in the amount of movement between the actuator and
25 the injector. And when it says without stroke translation, it's saying that's

1 not happening. There is no difference between the amount of movement
2 between the actuator and the injector.

3 JUDGE DEFRANCO: Okay, got it. Thank you.

4 MR. HERMAN: So, moving back to Dr. Quinlan, there's nothing
5 inconsistent about Dr. Quinlan's opinions. He explained in his opening
6 declaration that Klügl's figure 1 embodiment operates without stroke
7 translation. So, the actuator and the piston move by the same amount and
8 the thickness of the hydraulic fluid does not change. And he said the same
9 thing in reply. There is no change in opinion here.

10 So, Patent Owner also improperly implied via selective editing that
11 Dr. Quinlan has no opinion about a variety of topics. It argued that Dr.
12 Quinlan was confused about Patent Owner's hypothetical. But respectfully,
13 this was a misrepresentation of Dr. Quinlan's testimony. Dr. Quinlan made
14 it abundantly clear at his deposition that while he was not prepared to offer
15 comprehensive definitions of terms like flexible and membrane in the
16 abstract, discuss formal manufacturing schematics or how balloons behave,
17 or how Klügl would work if you designed it in some horrible, illogical way,
18 that Patent Owner is proposing. He knows exactly what Klügl actually
19 teaches and exactly how it is intended to operate. And that testimony is
20 summarized in Petitioners' reply.

21 And I submit that the Board can also readily identify the key parts of
22 Dr. Quinlan's testimony by using the index to his deposition testimony and
23 navigating to the pages where Patent Owner's Counsel interjected an
24 objection as non-responsive. So, every single time Dr. Quinlan tried to
25 explain what Klügl actually teaches, or explain why Patent Owner's
26 hypotheticals are irrelevant, or explain why the design exercise that Patent

1 Owner demanded that he engage in did not matter for purposes of the
2 claims, Patent Owner's Counsel interrupted and then objected to the very
3 testimony that they had just elicited. This happened almost 25 times.

4 So, Petitioner submits to tell the Board everything it needs to know
5 about how Patent Owner is treating not only Dr. Quinlan's testimony here,
6 but all the evidence. So, Patent Owner fails to grapple with what the
7 evidence says. Instead, it tries again and again to hide the ball and replace
8 the prior art teachings and Dr. Quinlan's testimony with its own
9 manufactured versions of things that have no evidentiary basis and are
10 essentially pulled out of thin air.

11 And with that I believe I've used all my time. But I'd be happy to
12 answer any questions that Your Honors have.

13 JUDGE IPPOLITO: I have no additional questions.

14 JUDGE DEFRANCO: I'm good. Thank you.

15 JUDGE POWELL: And none for me.

16 JUDGE IPPOLITO: All right. Thank you. And Patent Owner, you're
17 up. I believe you had about nine and a half minutes. You can begin
18 whenever you're ready.

19 MR. HIGER: Thank you. Let me start where Petitioners ended. I
20 invite the Board to read the totality of Exhibit 2025, which is Dr. Quinlan's
21 deposition testimony. You will find him incredibly evasive and non-
22 responsive. And we stand by all of the citations to his testimony, but you
23 will find a shocking amount of evasiveness and non-responsiveness in Dr.
24 Quinlan's testimony.

25 Now we can go to the slides. Slide 15. I want to start on slide 15 here
26 because I heard Petitioner's same response that Klügl does not say, and I'll

1 say this as we're getting to 15 here, Klügl does not say that the difference
2 between figures 3 and figures 2 and 1 is in the type of power transmission.
3 But --

4 JUDGE DEFRANCO: Patent Owner.

5 MR. HIGER: -- apparently we lost our slide. But if the Panel looks at
6 slide 15, you can see that we are directly quoting from Klügl. Klügl says the
7 injection valve shown in figure 3 differs from the injection valves in figure 2
8 and 1 in the type of power transmission from the piezoelectric actuator 1 the
9 drive piston 3. That is expressly what Klügl teaches. Instead, what
10 Petitioner is trying to do is trying to have the prior art teach by silence. And
11 that is not a teaching; that is silence. The fact that figure 1 is silent about
12 some issue does not mean that in some meaningful way it is different from
13 figure 3. And in fact, as the Board can appreciate, like elements between
14 different embodiments for different figures are the same. So, when we talk
15 about transmission media between figure 1 and figure 3 and the flowing-ness
16 that they admit of the transmission for figure 3, that same flowability exists
17 for figure 1. If we talked about the flexibility during actuation of flexible
18 membrane 6, that same flexibility is inherent in figure 1 as it is in figure 3.

19 JUDGE IPPOLITO: Counsel, I'm going stop.

20 MR. HIGER: Yes.

21 JUDGE IPPOLITO: I'm going to stop you there. Not because of a
22 question, but because I'm distracted by the shared screen. So, if you want to
23 take a moment and bring up the slides, that's great. If not, probably ask you
24 to un-share the screen because I'm trying to keep track --

25 MR. HIGER: Oh, yeah.

1 JUDGE IPPOLITO: -- of the slides.. Well, we can start again once
2 you're, whenever you're ready. And --

3 MS. JONES: Here we go.

4 JUDGE IPPOLITO: Okay.

5 MR. HIGER: All right, we're here. Thank you, Judge. I'm sorry.

6 JUDGE IPPOLITO: Okay, that's okay.

7 MR. HIGER: First slide up is slide 15. That says exactly what is the
8 direct quote from Klügl. Contrary to what Petitioner said, Klügl is about the
9 type of power transmission. That's the difference between figure 3 and
10 figure 2 and 1. And I walked through what that is. Longitudinal. That's that
11 type of power transmission in figure 1. Longitudinal, transverse, down, and
12 around. Because of the fixed transmission module in figure 3, then back to
13 longitudinal. That is the difference in the type of transmission. That is what
14 with and without means. Petitioners did not engage on that argument. They
15 just assumed that with and without means amount, and that because with and
16 without means amount, then that means that there has to be a substantially
17 constant thickness, and around we go in a circular argument. You don't
18 really engage other than to say that even though Klügl's figure 1 shows open
19 annular areas, that there's not going to be a bulge there, because that's not a
20 schematic or an engineering draw. It's just not correct.

21 And let's talk about the flow. So, let's go to slide 30. Slide 30.
22 Again, they brought up this flow point in response to a question. They say,
23 well, there's an insignificant amount of flow that goes up the throttle. That's
24 true. We don't disagree with that. Klügl is very clear that during actuation
25 an insignificant amount of flow is intended to flow up the throttle for either
26 figure 1 or figure 3. That doesn't mean that that's the only source of flow.

1 It's a matter of physics that a fluid is going to go from high pressure to low
2 pressure. The neck in throttle 10 creates a high pressure pinch point so that
3 only an insubstantial amount of the transmission medium flows. The
4 transmission medium has to flow somewhere if there's an unconstrained area
5 or an area that can generate low pressure.

6 The unsupported annular areas that you can see in the figure on page
7 30 are those low pressure areas as we talked about. That's where the bulge is
8 going to happen. And you can see that if we go to slide 58. That's the
9 depiction of what's going to happen. That's what Klügl teaches. That is
10 what's consistent with the claim requirement that this only has to show
11 partial transmission, partial movement. Okay.

12 Let's go to slide 82. Petitioners also said that when asked a question
13 about, well, you know, we're talking about whether 21 was substituted with
14 actuator 1 from Klügl or not, they said, no, we didn't that. Well, if you look
15 in slide 82, the figure on the left of the two figures, the one that's got the
16 yellow highlighted, that we added, that figure came from petition, the
17 petition at 40. That is Petitioners' proposed embodiment that very clearly
18 has proposed submitted -- substituting actuator 1 of Klügl or the
19 magnetostrictive actuator of Wirbeleit. So, that's an incorrect statement of
20 what their position is.

21 I also want to say that on the claim construction issue, the question
22 that was asked there, we have not taken any inconsistent positions. The
23 claims themselves, we go to page 112 or slide 112. This is just claim 1 of
24 the '829. Claim 1 of the '138 is similar. There is no mention or restriction or
25 requirement in claim 1 about any particular type of valve, whether it's
26 directly actuated, indirectly actuated, and anything else. There is no claim

1 construction issue here. The party that is trying to play fast and loose with
2 what the claim language is, is Petitioners. We highlighted that. We
3 highlighted all of the inconsistencies with Petitioners' positions. In the POR,
4 pages 5 to 7 is the full site for that, including all of the inconsistent positions
5 that Dr. Quinlan took in support of those different positions?

6 JUDGE DEFRANCO: Mr. Higer, I think the problem we have on the
7 claim construction issue is that Petitioner, they make an argument on claim
8 construction in their opening petition, and then in the response you say
9 nothing. So, it's like you're not disputing what they say, in your Patent
10 Owner response. I think you had one sentence in the Patent Owner response
11 about claim construction saying no claim construction is necessary.
12 Whereas Petitioner said, yeah, there is, based on the positions that Patent
13 Owner is taking in district court. So, right now there's no rebuttal to that
14 claim construction. So, it's almost like we should accept Petitioners'
15 argument because you were silent in your response and you waived any
16 arguments that were not made in the response. So, it's almost like we don't
17 even need to get into the alternative in grounds 3 and 4.

18 MR. HIGER: Well, so you don't need to get into ground 3 and 4
19 because effectively, as I said, it's a throwaway. But with respect, the
20 Petitioner does not ask this Board to issue any claim construction at all.
21 That's why we did not engage in the claim construction argument, because
22 they did not propose any terms for claim construction. So, if this Board is
23 going to apply claim construction, then we would need to be required -- or
24 need to be allowed to respond to that claim construction because there was
25 no claim construction issues introduced into this proceeding.

1 JUDGE DEFRANCO: I think you're probably -- I think you're
2 reading our rules wrong Mr. Higer. The problem is you were offered the
3 opportunity to respond and you did not respond. So, you had fair and
4 adequate opportunity to respond to what Petitioner said in their opening
5 petition, yet you were silent. That's where your problem lies.

6 MR. HIGER: I get --

7 JUDGE DEFRANCO: There's no APA violation here, if we go ahead
8 and accept Petitioners' construction.

9 MR. HIGER: I. I understand what you're saying, Your Honor. We
10 just fundamentally disagree that there was a proper claim construction that,
11 you know, ultimately it's not going to -- it should not matter because the
12 merits of the petition warrant the denial of each of the grounds, for the
13 reasons that we've talked about here. Namely, what we talked about, that the
14 with and without distinction is about the type of power transmission. Klügl's
15 transmission medium must flow in figure 1. Klügl's flexible membrane 6
16 must flex. And that means for all of those grounds, by any claim
17 construction position or otherwise, all of their grounds rely on Klügl and that
18 there be a exact 1:1 transfer of movement in figure 1, which there is not.

19 We prevail here at least because transmission medium flows and
20 flexible membrane 6 flexes in figure 1. And that means actuator 1's
21 movement will only be partially transmitted to drive piston 3, which in terms
22 of the challenge claims here means the transmission medium is not
23 substantially solid or substantially constant thickness. We don't need to get
24 into, the Board doesn't need to get into what it perceives as a claim
25 construction issue, which again, we did not see that issue being presented by
26 the petition. But I don't think we need to get there.

1 JUDGE IPPOLITO: I'll give you a couple seconds to finish up, but
2 you are out of time.

3 MR. HIGER: Thank you, Your Honor. Ultimately, this Panel, the
4 Board got it right with their initial denial of institutions. All of these claims
5 are patentable. We've shown why. And we ask that the Board affirm the
6 patentability of each claim with its final written decision for the reasons
7 we've argued and included in our paper. Thank you for your time today.

8 JUDGE IPPOLITO: Thank you to both parties for appearing today
9 and for answering our questions and for your excellent presentations. We
10 will take this case, these cases, under advisement, and issue our decisions in
11 due course. And with that, we are adjourned. But I do want to ask the
12 parties to remain afterwards to address any questions our court reporter may
13 have for the transcript.

14 MR. HERMAN: Thank you, Your Honor.

15 COURT REPORTER: I don't have any questions at this point. I
16 believe everything would have a question about is answered in the
17 demonstratives. Thank you very much.

18 MR. HIGER: Thank you.

19 (Whereupon, the proceedings at 3:46 p.m. were concluded.)

IPR2023-00292 (Patent 6,298,829 B1)

IPR2023-00293 (Patent 6,575,138 B2)

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