

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 ROBERT BOSCH LLC and MERCEDES-BENZ USA, LLC,

6 Petitioners,

7 v.

8 WESTPORT FUEL SYSTEMS CANADA, INC.,

9 Patent Owner.

10
11 IPR2023-00292, IPR2023-00293

12 U.S. Patent No. 6,298,829 B1

13
14 Deposition of DR. CHRISTOPHER ATKINSON

15 Conducted virtually via Zoom

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21 Reported by: THERESA A. VORKAPIC,

22 CSR, RMR, CRR, RPR

1 Deposition of Dr. Christopher Atkinson,
2 conducted virtually via Zoom, pursuant to notice
3 before Theresa A. Vorkapic, a Certified Shorthand
4 Reporter, Registered Merit Reporter, Certified
5 Realtime Reporter, Registered Professional
6 Reporter and a Notary Public in and for the State
7 of Illinois.

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C O N T E N T S

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E X H I B I T S

(Retained by counsel.)

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

2 THE REPORTER: Would you raise your right
3 hand, please.

4 (The witness was duly sworn.)

5 MR. HERMAN: Good morning. This is
6 Patrick Herman from Orrick Herrington & Sutcliffe
7 here on behalf of petitioner in two IPR
8 proceedings, IPR2023-00292 and IPR2023-00293.

9 Both of those are captioned Robert Bosch, LLC,
10 et al. versus Westport Fuel Systems Canada, Inc.

11 MR. HIGER: Good morning. David Higer,
12 Winstead PC on behalf Westport Fuel Systems
13 Canada, Inc. and the witness for today's
14 deposition. Also with me from my firm is Miranda
15 Jones.

16 Also, Patrick I wanted to let you know as
17 a heads-up kind of like what we did earlier this
18 week, the witness has binders of paper copies of
19 it should be all the exhibits as well as an index
20 to try to make it a little bit easier for him to
21 find stuff in there for efficiency today, but
22 obviously if you're going to drop stuff in

1 electronically, we can use that as backup or look
2 at it as the witness sees fit, but I want to let
3 you know he's got those materials here.

4 MR. HERMAN: Thank you.

5 DR. CHRISTOPHER ATKINSON,
6 called as a witness herein, having been first duly
7 sworn, was examined and testified as follows:

8 EXAMINATION

9 BY MR. HERMAN:

10 Q Good morning, Dr. Atkinson.

11 Do you mind stating your name for the
12 record, please.

13 A Certainly. My name is Christopher Mark
14 Atkinson.

15 Q Have you been deposed before?

16 A Yes.

17 Q How many times would you say?

18 A Five or six, I would say.

19 Q So even though you've done this many times
20 before, I'm going to go through a few basic ground
21 rules in the hopes that things will go smoothly
22 today.

1 The first is that as you see there is a
2 court reporter here so it's important that you
3 respond verbally so that they can record your
4 testimony.

5 Is that okay?

6 A Yes.

7 Q It's also important that we not talk over
8 each other so that there's a clear record. So
9 I'll do my best to wait for you to finish
10 answering before asking another question, and I
11 also ask that you wait until I'm done with my
12 question before answering and also pause to allow
13 your attorney time to object if he sees that to be
14 appropriate.

15 Is that okay?

16 A Yes.

17 Q Next you're entitled to a question you
18 understand. If anything I ask is unclear, please
19 let me know. Otherwise I will assume that we're
20 on the same page.

21 Is that okay?

22 A Yes.

1 Q Now, I understand you have paper copies of
2 your declarations and the exhibits with you; is
3 that correct?

4 A That is correct.

5 Q And are all of those unmarked clean copies
6 of those materials?

7 A They are all unmarked clean copies, yes.

8 Q So you're free to look at those over the
9 course of the deposition today, but I do ask that
10 if you are looking at a particular exhibit, a
11 paper copy of an exhibit, that you let me know on
12 the record. Is that okay?

13 A Yes.

14 Q Next I ask that you don't have any side
15 conversations with your attorneys while questions
16 are pending.

17 Is that okay?

18 A I understand, yes.

19 MR. HIGER: I'm just going to -- I object
20 to that to the extent we need to have a privileged
21 conversation during a break.

22 MR. HERMAN: Of course.

1 BY MR. HERMAN:

2 Q So is there anything that would prevent or
3 interfere with your ability to testify today?

4 A No.

5 Q So I while I understand you have paper
6 copies of these exhibits, I'm going to put
7 electronic copies of two exhibits into the chat
8 and if you just give me a moment. And those are
9 Exhibit 2022 in IPR2023-00292 and Exhibit 2022 in
10 IPR2023-00293. If you let me know when you have
11 those.

12 THE REPORTER: Counsel, are these
13 previously marked or new exhibits?

14 MR. HERMAN: Previously marked.
15 Everything today will be previously marked.

16 BY THE WITNESS:

17 A I have both of them. Should I open them?

18 BY MR. HERMAN:

19 Q Let's start with Exhibit 2022 in
20 IPR2023-00292.

21 Can you take a look at that exhibit,
22 either electronically or in paper is fine.

1 A I beg your pardon, 2023-00292?

2 Q Yes.

3 A The first.

4 Q And I believe that's your declaration
5 relating to the '829 patent; is that right?

6 A That's correct.

7 Q It's a declaration you authored in
8 connection with the 292 proceeding; is that
9 correct?

10 A That's correct. That's correct.

11 Q That declaration relates to US Patent
12 No. 6,298,829?

13 A Correct.

14 Q Is it okay if I refer to that today as the
15 '829 patent?

16 A Yes.

17 Q Is it also okay if I refer to this
18 declaration as your '829 patent declaration?

19 A Yes.

20 Q If you take a look at the other
21 Exhibit 2022, that's in the 293 proceeding.

22 A Yes.

1 Q And you recognize that document?

2 A Yes.

3 Q And this is a declaration that you
4 authored relating to US Patent No. 6,575,138; is
5 that right?

6 A That's correct, yes.

7 Q Is it okay if I refer to that patent as
8 the '138 patent today?

9 A Yes.

10 Q Is it also okay if I refer to that
11 particular declaration as your '138 patent
12 declaration?

13 A Yes.

14 Q I'd like you to get Exhibit 2022, your
15 '829 patent declaration in front of you and,
16 again, either the electronic or the paper version
17 is fine. Whichever you prefer.

18 A I have the paper version of the '829
19 declaration in front of me.

20 Q I'd like you to turn to Paragraph 59
21 of that declaration which I believe is on Page
22 21.

1 A Yes.

2 Q This is a part of a section of your
3 declaration regarding the structure and operation
4 of a device that's described in the German patent
5 application DE 197 08 304 A1 to Klügl; is that
6 right?

7 MR. HIGER: Objection. Form.

8 BY THE WITNESS:

9 A Yes, that's correct.

10 BY MR. HERMAN:

11 Q Is it okay if I refer to that reference as
12 Klügl today?

13 A Yes.

14 Q You understand that there's also a
15 translation that petitioner had has filed of
16 Klügl; is that correct?

17 A Yes.

18 Q Is it okay if I refer to that as the Klügl
19 translation?

20 A Yes.

21 Q If you look at Paragraph 59, Paragraph 59
22 says: "POSITA would understand that Claim 1

1 covers the device depicted in Figure 2 at least
2 because it claims means 20, 21 and 22 which appear
3 only in Figure 2."

4 Do you see that?

5 A Yes.

6 Q That's referring to Figure 2 of Klügl,
7 correct?

8 A Yes, but to be specific, I'm referring to
9 the translation of Klügl.

10 Q So Figure 2 of the translation of Klügl,
11 correct?

12 A Indeed.

13 Q And Claim 1 of the translation of Klügl?

14 A Yes.

15 Q Do you speak German, Doctor?

16 A I do not.

17 Q So your review and your opinions here
18 relate to the translation of Klügl, not the German
19 version of Klügl; is that correct?

20 MR. HIGER: Objection. Form.

21 BY THE WITNESS:

22 A That's correct. When I refer to Klügl,

1 I'm referring solely to the English translation of
2 Klügl, of the original Klügl patent, yes.

3 BY MR. HERMAN:

4 Q So for the rest of my questions today,
5 I'll do the same thing.

6 Every time I refer to Klügl I'll be
7 referring to the English translation of Klügl that
8 you reviewed; is that okay?

9 A Yes.

10 Q Going back to Paragraph 59, you conclude
11 that paragraph by saying: "Accordingly, a POSITA
12 would not understand Claim 1 to covers Figures 1
13 or 3."

14 Do you see that?

15 A Yes.

16 Q So the opinion you're expressing there is
17 that in your opinion Claim 1 of Klügl does not
18 cover what's shown in Figures 1 or 3 of Klügl,
19 correct?

20 A As I said, accordingly, a POSITA would not
21 understand Claim 1 to cover Figures 1 or 3.

22 Q I'm going to put Exhibit 1006 which is the

1 Klügl translation in the chat, and, again, you're
2 welcome to look at either the electronic version
3 that I've just provided or the paper copy that you
4 brought with you.

5 A Yes, and I'm presuming that my paper copy
6 is identical to the one you put in the chat. It
7 has the same exhibit number, for example.

8 Q Yes, I would hope they are the same.

9 A So, in other words, yes, I'm referring to
10 the paper copy throughout and I'll let you know if
11 you refer to any of the electronic versions.

12 Q Sure. If you could turn to Claim 1 in
13 Exhibit 1006 and I believe that's in Column 7.

14 A Yes.

15 Q And Claim 1 parts in Column 7 at about
16 Line 65; is that right?

17 A Yes.

18 Q And the claim starts by explaining that
19 it's directed to: "A device for transmitting a
20 movement..."

21 Is that right?

22 A My translation starts with device for

1 transmitting a movement.

2 Q It says device for transmitting a
3 movement, correct?

4 A That's correct.

5 Q And then the claim continues on to
6 Column 8.

7 A Yes.

8 Q And there is a bolded phrase in Column 8
9 that reads: "Characterized in that..."

10 Do you see that?

11 A Yes.

12 Q After that bolded phrase, characterized in
13 that, the claim provides that the pressure chamber
14 five and the compensation chamber seven are
15 incorporated into a transmission module two and
16 that the compensation chamber seven is operatively
17 connected to means 8, 20, 21, 22 which specify the
18 pressure in the compensation chamber seven and the
19 volume of the compensation chamber seven.

20 Did I get that right?

21 A Yes.

22 Q So you noted in your declaration in

1 Paragraph 59 that elements 20, 21 and 22 are only
2 part of the embodiment of Figure 2 of Klügl; is
3 that right?

4 A Yes.

5 Q Does Figure 2 include an Element 8?

6 A In the version of Figure 2 that I have,
7 that's a somewhat quick and cursory look and it
8 might just be me, but I do not see eight called
9 out in Figure 2.

10 Q But there is a Figure 8 in Elements 1 and
11 3, correct?

12 A I see an Element 8 called out in Figure 1
13 and I see an Element 8 called out in Figure 3.

14 Q Doesn't that mean then that the means
15 which specify the pressure and compensation
16 Chamber 7 and the volume of compensation Chamber 7
17 in Klügl's Claim 1 request be either the Element 8
18 shown in Figures 1 and 3 or the Elements 20, 21
19 and 22 shown in Figure 2?

20 MR. HIGER: Objection. Form.

21 BY THE WITNESS:

22 A No.

1 BY MR. HERMAN:

2 Q Why is that your opinion?

3 A Because the claim makes no such
4 distinction at my reading of it.

5 Q So the claim does reference Element 8,
6 true?

7 A The claim does reference Element 8, yes.

8 Q And Element 8 only present from Figures 1
9 and 3, correct?

10 A I would have to read Klügl more closely in
11 order to be able to give you an honest answer to
12 your question.

13 Q So sitting here today, you don't have an
14 opinion one way or the other as to the import of
15 the mention of Element 8 in Claim 1; is that true?

16 A I have an opinion on the inclusion of
17 Element 8 in Claim 1 insofar as it is in Claim 1,
18 yes.

19 Q So you see that the element is there in
20 Claim 1, true?

21 A Yes.

22 Q So look at dependent Claim 4 of Klügl?

1 Let me know when you're there.

2 A Yes.

3 Q So Claim 4 depends on claim is, correct?

4 A It states advanced according to Claim 1.

5 Q So it depends on Claim 1, true?

6 MR. HIGER: Objection. Scope.

7 BY THE WITNESS:

8 A There is a reference to Claim 1 and
9 Claim 4.

10 BY MR. HERMAN:

11 Q So Claim 4 specifies that it's limited
12 according to device according to
13 claim characterized in that a flexible membrane
14 eight is provided as a means which at least
15 partially delimits the compensation Chamber 7 and
16 which adjusts the pressure in the compensation
17 Chamber 7 and the volume of the compensation
18 Chamber 7.

19 Do you see that?

20 MR. HIGER: Objection. Scope.

21 BY THE WITNESS:

22 A Yes.

1 BY MR. HERMAN:

2 Q That flexible membrane eight, that
3 partially delimits the compensation Chamber 7 and
4 which adjusts the pressure in the compensation
5 Chamber 7 and the volume of the compensation
6 Chamber 7 that is only part of embodiments one and
7 embodiments three or the embodiments shown in
8 Figures 1 and 3 of Klügl, correct?

9 MR. HIGER: Objection. Scope, form.

10 BY THE WITNESS:

11 A Without further reading and analysis, I
12 would have to investigate further the embodiments
13 represented in Figure 2.

14 BY MR. HERMAN:

15 Q Now -- sorry. I didn't mean to interrupt.

16 A No, no interruption.

17 Q Were you done with your answer?

18 A Yes.

19 Q Now, in arriving at your opinion in
20 Paragraph 59 that a POSITA would not understand
21 Claim 1 to cover figures one or three, did you
22 account for the fact that Claim 1 mentions Element

1 8 which is present only in figures one or three?

2 MR. HIGER: Objection. Form.

3 BY THE WITNESS:

4 A Paragraph 59 states a POSITA would
5 understand that Claim 1 covers the device depicted
6 in Figure 2 at least because of claims means 20,
7 21, and 22, which appear only in Figure 2.

8 BY MR. HERMAN:

9 Q So I'm asking about second part of that
10 paragraph.

11 You opined that a POSITA would not
12 understand Claim 1 to cover Figures 1 or 3. And
13 I'm asking you in arriving at that opinion whether
14 you accounted for the fact that Claim 1 references
15 Element 8 which is present only in Figures 1
16 and 3?

17 MR. HIGER: Objection. Form.

18 BY THE WITNESS:

19 A Paragraph 59 stands on its own. I
20 reference means 20, 21 and 22, which appear only
21 in Figure 2. I have made no reference to means
22 eight.

1 BY MR. HERMAN:

2 Q But you did opine that a POSITA would not
3 understand Claim 1 to cover Figures 1 or 3,
4 correct?

5 A That is correct.

6 Q So what is the basis for that opinion
7 given, No. 1, that Claim 1 references Element 8
8 and dependent Claim 4 limits Claim 1 to only
9 structures that include flexible membrane eight
10 which is present only in Figures 1 or 3?

11 MR. HIGER: Objection. Form, foundation.

12 BY THE WITNESS:

13 A There's many reasons but one notable
14 reason is that Claim 4 also refers to compensation
15 Chamber 7 which occurs in Figure 1, Figure 2, and
16 Figure 3 by my initial inspection.

17 BY MR. HERMAN:

18 Q So my question is, though, flexible
19 membrane eight, that appears only in Figures 1 and
20 Figures 3 but not in Figure 2, correct?

21 MR. HIGER: Objection. Foundation, form.

22 BY THE WITNESS:

1 A As I said earlier, I'm unable to find this
2 Element 8 in Figure 2.

3 BY MR. HERMAN:

4 Q Does it continue to be your opinion that
5 Claim 1 covers only Figure 2 and not Figures 1 and
6 Figures 3?

7 A Yes.

8 Q That's despite the fact that Claim 1
9 references elements that are present only in
10 Figures 1 and Figures 3, correct?

11 MR. HIGER: Objection. Foundation.

12 BY THE WITNESS:

13 A Paragraph 59 refers to means, 20, 21 and
14 22 which appear only in Figure 2.

15 BY MR. HERMAN:

16 Q So in arriving at your opinions, you
17 believe you can reference only portions of Claim 1
18 but not its entirety; is that correct?

19 MR. HIGER: Objection. Form.

20 BY THE WITNESS:

21 A I believe that my Paragraph 59 stands on
22 its own.

1 BY MR. HERMAN:

2 Q Now, Claim 1 does not impose a limit on
3 the amount of actuator movement that's transmitted
4 to piston three, correct?

5 MR. HIGER: Objection. Scope.

6 BY THE WITNESS:

7 A Claim 1? Sorry. Could you repeat your
8 question.

9 BY MR. HERMAN:

10 Q Claim 1 does not impose a limit of the
11 amount of actuator movement that is transmitted to
12 piston three, correct?

13 MR. HIGER: Objection. Scope.

14 BY THE WITNESS:

15 A I'm looking at my declaration to see if
16 I've addressed that issue. I think that your
17 question would require signals.

18 BY MR. HERMAN:

19 Q That's not something you've done already?
20 You have not considered whether Claim 1 imposes a
21 limit on the amount of actuator movement
22 transmitted to piston three?

1 A Claim 1 is described as device for
2 transmitting a movement. It doesn't specify the
3 extent or in your words limit a description of
4 movement. It requires more analysis than I could
5 give it at this point.

6 Q So if you look at Paragraph 60 of your
7 declaration, Paragraph 60 of your declaration
8 refers to Claim 6 of Klügl; is that correct?

9 A Yes.

10 Q And Claim 6 uses the term partially
11 transmitted; is that correct?

12 A It uses the term at least partially
13 transmitted.

14 Q So those words at least partially
15 transmitted, those do not appear in Claim 1,
16 correct?

17 MR. HIGER: Objection. Scope.

18 BY THE WITNESS:

19 A I do not see the words "at least partially
20 transmitted" in clam Claim 1 of Klügl.

21 BY MR. HERMAN:

22 Q To summarize, sitting here today, you

1 don't have an opinion regarding whether or not the
2 reference to Element 8 in Claim 1, the reference
3 to flexible membrane eight in Claim 4, whether
4 those two things mean that Claim 1 embraces the
5 embodiment shown in Figure 1 and Figure 3; is that
6 correct?

7 MR. HIGER: Objection. Form, scope,
8 foundation.

9 BY THE WITNESS:

10 A As I said in Paragraph 59, accordingly a
11 POSITA would not understand Claim 1 to cover
12 Figures 1 or 3.

13 BY MR. HERMAN:

14 Q But you don't reference the fact that
15 Claim 1 or dependent Claim 4 specifically
16 reference Element 8 in that Paragraph 59, true?

17 A I make no reference to Claim 4 in my
18 analysis of Klügl as far as I know.

19 Q You also don't reference in Paragraph 59
20 that Claim 1 references not only Elements 20, 21
21 and 22 but also Element 8, correct?

22 A I make no reference to Element 8 in

1 Paragraph 59.

2 Q Now if you could turn down to Paragraph 59
3 of your '829 patent declaration.

4 A Yes.

5 Q So had here you're discussing how in your
6 view Figure 1 of Klügl will operate during
7 actuation; is that correct?

8 A I'm referring to an annotated version of
9 Figure 1.

10 Q And that annotated version of Figure 1 is
11 meant to represent how you believe that figure's
12 device will operate during actuation, correct?

13 A Yes.

14 Q Now, in about the middle of Paragraph 79,
15 you explain that due to the inherent flexibility
16 and pliability of flexible membrane six, the
17 membrane will tend to deform longitudinally upward
18 where it contacts the drive piston and bulge
19 outward where it's unconstrained in the angular
20 area.

21 Do you see that?

22 A Yes.

1 Q So this is talking about how membrane six
2 in Figure 1 behaves in your view during actuation,
3 correct?

4 A That's correct.

5 Q Now in membrane six behaves the way that
6 you're describing it here, that will cause Klügl's
7 piston three to move by an amount that is less
8 than the actuator movement, correct?

9 A Yes.

10 Q So, in other words, a ratio of one to
11 something less than one has been effectively
12 applied to the actuator movement as it's passed on
13 to the piston, correct?

14 A You mentioned the term ratio. Can you
15 describe that ratio?

16 Q So the ratio would be the movement of the
17 actuator to the movement of the piston?

18 A The movement of the actuator to the
19 movement of the piston, yes.

20 Q And that ratio in your understanding would
21 be one to something less than one, correct?

22 A As I said in Paragraph 78, a POSITA would

1 understand that the innate flexibility of flexible
2 membrane six means that a specific movement of the
3 actuator one would be "partially transmitted" to
4 the drive piston three and never "always fully
5 transmitted".

6 Q So if I were to express the movement of
7 the actuator to the movement of the piston in a
8 ratio form it would be one to something less than
9 one, correct?

10 A You used the term movement.

11 What do you define as the movement of the
12 actuator?

13 Q So it's expanded from having some length
14 to having some greater length, correct?

15 A During actuation?

16 Q Yes.

17 A So you're referring to the expansion of
18 the actuator during actuation?

19 Q Yes.

20 A Okay. And then the movement of the drive
21 piston?

22 Q It will be in some initial position and

1 then it's going to be pushed to some other
2 different position.

3 A Right. Sorry. The question again,
4 please?

5 Q So if I were to express the movement of
6 the actuator and the movement of the piston in the
7 form of a ratio, it would be one to something less
8 than one, correct?

9 A As I said in paragraph -- elsewhere in
10 Paragraph 78, the partial transmission of movement
11 is consistent with how the device depicted in
12 Figure 1 would work.

13 Q Sorry. Go ahead.

14 A You're attempting to define a ratio which
15 would describe that. I would prefer to resort to
16 my -- the words as I have them in my declaration.

17 Q But I think you'll agree that the piston
18 is moving by less than the actuator, correct?
19 That's what you mean by partially transmitted?

20 A In my Paragraph 78, I refer to partial
21 transmission of movement, yes.

22 Q Now, in Paragraph 79, you also note that

1 there will be "pressure differences created within
2 the transmission fluid". That's at the very end
3 of that paragraph.

4 A Right, yes.

5 Q Paragraph 80 you note that there will be
6 higher pressure in the area of the piston and
7 lower pressure in the annular areas of the
8 membrane; is that correct?

9 A Yes.

10 Q You also note in Paragraph 80 that these
11 pressure differences will cause the transmission
12 fluid to flow; is that right?

13 A Yes.

14 Q So to summarize, as you interpret Figure 1
15 of Klügl during actuation, there are, No. 1,
16 pressure differences in the chamber five; No. 2,
17 fluid flow from one place to another; No. 3,
18 membrane deflection; and, No. 4, differences in
19 the amount of movement between the actuator and
20 the piston; is that correct?

21 MR. HIGER: Objection. Form.

22 BY THE WITNESS:

1 A I think we should go through each of those
2 individually. I don't know. You've asked me a
3 compound question that's difficult to keep track
4 of.

5 BY MR. HERMAN:

6 Q Sure. So let's do them one at a time.

7 So as you interpret Figure 1 during
8 actuation, there are first pressure differences in
9 chamber five, correct?

10 A Not necessarily first pressure
11 differences, no.

12 Q So as you interpret Figure 1, during
13 actuation there are in fact pressure differences
14 in chamber five, correct?

15 A You've used the term pressure difference
16 which carries with it significant technical
17 connotations. I do not use the term pressure
18 difference.

19 Q In fact, you do. You actually use the
20 term pressure differences in Paragraph 79. Those
21 are your words, sir.

22 A Yes. Sorry. I thought you were referring

1 to Paragraph 80. I beg your pardon.

2 Yes, in Paragraph 79 it ends: The
3 pressure difference is created within the
4 transmission fluid.

5 Q So let's start again.

6 As you interpret Figure 1, during
7 actuation there are pressure differences in
8 chamber five, correct?

9 A During actuation, pressure differences
10 occur in pressure chamber five.

11 Q As you interpret Figure 1, there is fluid
12 flow from one place to another in chamber five,
13 correct?

14 A During actuation, as I said, in
15 Paragraph 80, as a result of transmission fluid
16 will flow outward and cause a thinning of the
17 transmission fluid layer in pressure chamber five
18 above drive piston three, yes.

19 Q As you interpret Figure 1, there is also
20 membrane deformation, correct, during actuation?

21 A Yes.

22 Q Now, if you could look at Exhibit 1006,

1 the Klügl translation?

2 A Yes.

3 Q Now, the Klügl translation does, in fact,
4 include a description of how Klügl believes the
5 device of Figure 1 operates during actuation of
6 the actuator, correct?

7 A Can you point me to that specific portion?

8 Q Sure. If you turn to Column 3, beginning
9 at about Line 23, there's a paragraph that begins:
10 "If the piezoelectric actuator one is now
11 controlled..."

12 A Yes.

13 Q So that's a portion of the Klügl
14 translation that's referring to how in Klügl's
15 view the device of Figure 1 operates when the
16 piezoelectric electric actuator one is controlled,
17 correct?

18 A It refers to Figure 1, yes, and the
19 actuation of the -- I call it the piezoelectric
20 translator, but we'll agree to disagree.

21 Q In that discussion of what happens when
22 the actuator one is controlled continues down

1 until about Line 38, correct?

2 A Yes.

3 Q Now, is there any mention in Column 3 from
4 lines 23 to 38 of there being any pressure
5 differences in chamber five?

6 A Between 23 and 38, the term pressure
7 difference does not appear.

8 Q In Column 3 at lines 23 to 38, is there
9 any mention of there being any fluid flow?

10 A I do not see the term fluid flow in that
11 section.

12 Q In that same portion of Klügl, is there
13 any mention of membrane deformation or deflection?

14 A I don't see the term membrane deflection
15 or deformation in that section.

16 Q Now, Klügl also discusses how Figure 3
17 operates; is that right?

18 A Yes.

19 Q And if you look at Column 5 starting at
20 about Line 51, there's a paragraph that talks
21 about what occurs when actuator one is now
22 controlled in connection with Figure 3; is that

1 right?

2 A Yes.

3 Q And that continues on until about Line 67,
4 that discussion of what occurs when actuator one
5 is now controlled in Figure 3, correct?

6 A Line 59 says the arrangements according to
7 figure three works as follows, there is no
8 reference to any other figure before the end of
9 that a column, yes.

10 Q So in about the middle of the paragraph
11 that spans lines 51 through 67, Klügl states that:
12 "A third membrane 26 is pushed downwards by the
13 die 29 with the circular plunger surface 28
14 causing the transmission medium located in the
15 second pressure chamber 28 to be pushed into the
16 pressure chamber five via the lines 25."

17 Do you see that?

18 A Yes.

19 Q So this is discussing the flow of
20 transmission fluid from one place to another,
21 correct?

22 A It says causing the transmission medium

1 located in the second pressure chamber 28 to be
2 pushed into the pressure chamber five via the
3 lines 25, yes.

4 Q So that's a discussion of the transmission
5 fluid being pushed from one place to another
6 during actuation, correct?

7 A Yes.

8 Q Now, the same paragraph states that this
9 deflects first membrane six in the direction of
10 the first drive piston three.

11 Do you see that?

12 MR. HIGER: Objection. Form.

13 BY THE WITNESS:

14 A I see the words this deflects first
15 membrane six in the direction of the drive piston
16 three.

17 BY MR. HERMAN:

18 Q So in connection with Figure 3, Klügl does
19 say that membrane six is deflected during
20 actuation, correct?

21 A I think that that's paragraphs in Column 5
22 prefaced by the arrangements according to Figure 3

1 works as follows: I think it mentions
2 transmission medium pushed via Line 25, yes.

3 Q So this paragraph both that transmission
4 medium is pushed and that the membrane six is
5 deflected, correct?

6 A This deflects first membrane six, yes.

7 Q So the words deflects and pushed appear in
8 Column 5 when discussing the operation of Figure 3
9 during actuation, correct?

10 MR. HIGER: Objection. Form.

11 BY THE WITNESS:

12 A Yes.

13 BY MR. HERMAN:

14 Q But Klügl did not say that Figure 1
15 operates with either the fluid being pushed or the
16 membrane being deflected, correct?

17 MR. HIGER: Objection. Form.

18 BY THE WITNESS:

19 A It would require a further rereading of
20 the entirety of Klügl for me to come to that
21 conclusion.

22 BY MR. HERMAN:

1 Q So that's not something sitting here today
2 that you've already considered?

3 A The elements that I've considered, the
4 concepts that I've considered with respect to
5 Klügl are fully described and designated in my
6 declaration.

7 Q But you'll agree with me that the portion
8 of Klügl that's found in Column 5 spanning lines
9 51 through 67 uses both the words pushed and
10 deflects, correct?

11 A In 51 through 67, I see the terms pushed
12 and deflects, yes.

13 Q And the word pushed is used to refer to
14 what happens to the transmission fluid, correct?

15 A Well, yes and no. I also see the
16 description as a result -- this is Line 57. As a
17 result, the third membrane 26 is pushed downwards.
18 So I see pushed appearing multiple times.

19 Q So one of the ways that the words
20 pushed -- the word pushed is used in Paragraph 57
21 or, sorry, in the paragraphs spanning lines 51
22 through 67 in Column 5 is to describe what happens

1 to the transmission fluid, correct?

2 A I also see in Line 47 the drive piston
3 three is pushed with the circular piston surface.

4 Q So my question is about usage of that word
5 in connection with the transmission fluid. This
6 paragraph that we're talking about uses the word
7 pushed to describe what happens to the
8 transmission fluid, correct?

9 MR. HIGER: Objection. Form.

10 BY THE WITNESS:

11 A If that word pushed is restricted solely
12 to that concept, but I find the word pushed used
13 elsewhere. If you're asking me does the word
14 pushed occur in conjunction with various terms,
15 please can you repeat the terms that you wish me
16 to agree to?

17 BY MR. HERMAN:

18 Q So one of the ways that the word pushed is
19 used in Column 5 from lines 51 through 67 is to
20 describe what happens to the transmission fluid
21 during actuation, correct?

22 MR. HIGER: Objection. Form, foundation.

1 BY THE WITNESS:

2 A I see the phrase causing the transmission
3 medium located in the second pressure chamber 25
4 to be pushed. I do see that phrase.

5 BY MR. HERMAN:

6 Q This same passage of Klügl also uses the
7 word deflects to describe what happens to the
8 first membrane six during actuation in Figure 3,
9 correct?

10 A I see the phrase -- at Line 62 I see the
11 phrase this deflects first membrane, yes.

12 Q But those same words pushed and deflects
13 are not used in Column 3 at lines 23 through 38
14 when describing Figure 1, correct?

15 MR. HIGER: Objection. Form.

16 BY THE WITNESS:

17 A Column 3, lines -- sorry. Can you repeat
18 the lines, please?

19 BY MR. HERMAN:

20 Q 23 through 38.

21 A 23 to 38. I also see the term -- 11 are
22 pushed by the disk spring 14 online 41 of

1 Column 3 -- at Line 41, I see the phrase the guide
2 sleeve 11 are pushed by the disk spring 14.

3 I also see Line 42 the drive piston three
4 is pushed away from the closing element. I see
5 the use of the term pushed, I see the use of the
6 term deflect deflected and deflection in multiple
7 places in these areas that you approach of Klügl.

8 Q You pointed me to lines 41, right, and
9 that talks about the guide sleeve 11 being pushed,
10 correct?

11 A Yes.

12 Q You pointed me to Line 44 which talks
13 about the closing element four being pushed,
14 correct?

15 A I did.

16 Q But what you did not point me to was any
17 mention of the transmission fluid being pushed,
18 correct?

19 A I would need to read that full column in
20 order to determine whether that term appeared or
21 not.

22 Q Go ahead. I'd like you to do that. Is

1 that not something you've done already?

2 A I don't know that I did the analysis of
3 determining whether the word pushed appeared in a
4 particular column or not. I don't know that I can
5 truthfully attest to that.

6 Q So sitting here today, you don't know
7 whether you assessed whether or not the discussion
8 of Figure 1 of Klügl has any mention of the
9 transmission fluid being pushed; is that true?

10 A It has a mention of transmission fluid.

11 Q But sitting here today, you don't know one
12 way or the other whether there is any mention of
13 the transmission fluid being pushed; is that true?

14 A Transmission fluid being pushed, are you
15 referring to that as a particular phrase?

16 Q Yes.

17 A I do not know whether the term
18 transmission fluid being pushed appears in
19 Column 3, no, I don't.

20 Q Do you know whether the phrase or the use
21 of the term deflection in connection with membrane
22 six is discussed anywhere in Column 3?

1 A The end of Column 3, I see the phrase so
2 that the first membrane six is moved in the
3 direction of the drive piston three.

4 Q So that portion of Klügl is discussing
5 what occurs not during actuation but during times
6 of rest; is that correct?

7 A That paragraph begins: If the
8 piezoelectric one shortens in the rest position,
9 yes.

10 Q SO that paragraph is describing not what
11 occurs during actuation, but what occurs during
12 periods of rest, correct?

13 A Yes.

14 Q So the portion of Column 3 that describes
15 what occurs during actuation there's no reference
16 to membrane deflection in that portion of
17 Column 3, correct?

18 A No. I dispute that. For example, in
19 Line 56, 57, 58, the drive piston three is
20 prestressed against the first membrane six. The
21 use of the term prestressed implies the potential
22 at least for deformation of one element with

1 respect to another.

2 Q But the term deflects does not actually
3 appear in that paragraph, correct?

4 A The term deflects does not appear in that
5 paragraph.

6 MR. HERMAN: Now is probably a good time
7 for a short break. Do you want to take five, ten
8 minutes or so?

9 MR. HIGER: Yes, let's go ten, Patrick.

10 (A recess was had.)

11 BY MR. HERMAN:

12 Q Doctor, if you could turn back to
13 Paragraph 67 of your '829 patent declaration.

14 A Yes.

15 Q About the middle of that paragraph, you
16 explain that even a small deflection or
17 deformation of the pliable flexible membrane will
18 be critical as the lift commonly generated in
19 these applications is very small.

20 Do you see that?

21 A Yes.

22 Q Now, do you quantify anywhere in your

1 declaration the amount of deformation that you
2 allege will occur in Klügl's membrane during
3 actuation?

4 A You mean quantify in terms of absolute
5 measurable units?

6 Q Yes.

7 A By my recollection, I beg your pardon, by
8 my recollection, I don't believe that I do that.

9 Q Now, does the thickness of membrane 6 play
10 a role in how much it will deform when subject to
11 a given amount of force?

12 A The nature of flexibility of the membrane
13 will depend on a number of its properties
14 including the thickness of the membrane itself,
15 yes.

16 Q So assuming that all other things are
17 equal, will a thicker membrane deform less than a
18 thinner membrane?

19 MR. HIGER: Objection. Form, scope.

20 BY THE WITNESS:

21 A I would need more information in order to
22 be able to determine. It depends on the

1 particular type of material considered, the
2 geometry, the manner in which it is deformed.
3 There is a whole host of issues at bay that I
4 can't give a simple or simplistic answer to your
5 question.

6 BY MR. HERMAN:

7 Q So my question is whether all of those
8 things are equal, but if the geometry is the same,
9 the material is the same, the force applied is the
10 same, if all of those things are the same will a
11 thicker membrane deform less than a thinner
12 membrane?

13 MR. HIGER: Objection to scope.

14 BY THE WITNESS:

15 A If all of those are the same, it depends
16 on the specific material of the membranes amongst
17 other things, but that would be the first thing
18 that would spring to mind.

19 BY MR. HERMAN:

20 Q My question is if the material of the
21 membrane is the same between the thicker and
22 thinner membrane, if the material is the same and

1 the only difference is the thickness, will the
2 thicker membrane deform less than a thinner
3 membrane?

4 MR. HIGER: Objection. Scope.

5 BY THE WITNESS:

6 A I'm referring to the specific material.
7 There are -- different materials in membranes
8 behave differently all else being the same.
9 That's the point I'm attempting to make.

10 BY MR. HERMAN:

11 Q So I'm not sure I understand your answer.

12 So assuming I make the membrane out of the
13 same material and just make it thicker, will the
14 thicker membrane deform less than the thinner
15 membrane made out of the same material?

16 MR. HIGER: Objection. Scope.

17 BY THE WITNESS:

18 A I hear your question and I believe I
19 understand it. I believe it's beyond the opinions
20 that I was engaged to provide, but having said
21 that, what I'm referring to is that the potential
22 exists for the same material to behave in an

1 unexpected fashion. If you do not specify what
2 that same material is, I'm unable to determine
3 what its behavior might be between the two
4 instances that you specify.

5 BY MR. HERMAN:

6 Q So you don't have an opinion one way or
7 the other as to whether a membrane made out of the
8 same material would deform less if made thicker;
9 is that correct?

10 A I would say that the type of material that
11 you referred to, and I understand the material is
12 the same, the type of material you refer to is a
13 critically important consideration in making that
14 analysis.

15 Q Now, will the amount of overlap between
16 the piston three and the membrane six play a role
17 in how much membrane six will deform when
18 subjected to a given amount of force?

19 A Can you refer to me to a specific part of
20 Klügl or my declaration that refers to that?

21 Q Sure. So if you look at Figure 1 of
22 Klügl, Figure 1 depicts membrane six touching

1 piston three, correct?

2 A Figure 1 depicts membrane six touching
3 piston three, yes.

4 Q But membrane six there are places where it
5 is not touching piston three, essentially to the
6 left and the right of piston three as shown in the
7 view provided in Figure 1, correct?

8 A In this figure as shown, yes.

9 Q And you refer to those areas where
10 membrane six is not touching piston three as it's
11 the annular areas of membrane six in your
12 declaration, correct?

13 A I do use the term annular.

14 Are you able to point me to a specific
15 location in mind? Yes. I see in Paragraph 79,
16 for example, I use the term annular area, yes.

17 Q Now, does the size of that annular area
18 play a role in the amount of deformation there
19 will be in membrane six?

20 A Specifically what do you mean by signs?

21 Q So, for instance, if I increased the
22 amount of overlap between piston three and

1 membrane six, would that reduce the amount of
2 deformation in membrane six during actuation?

3 MR. HIGER: Objection. Form.

4 BY THE WITNESS:

5 A Again, that's very difficult to determine
6 a priori. I would have to understand the specific
7 material and I know we're talking about a single
8 instance now, a specific material, the specific
9 way in which the forces are arranged, the specific
10 geometry. I would need to know significantly more
11 details about those specific parameters and
12 variables before I could conjecture an answer to
13 your question.

14 BY MR. HERMAN:

15 Q So this is not an issue that you have
16 considered already whether the amount of overlap
17 between the piston three and the membrane six
18 would have an impact on the amount of deformation;
19 is that true?

20 A I have looked at and considered the
21 various figures in Klügl. I have read Klügl's
22 narrative. I have read Klügl's claims in the

1 translation at least and I have come to the
2 conclusion in my declaration including the
3 conclusions in 79 and including the demonstrative
4 on Page 39.

5 Q So my question is whether you have
6 considered the impact that increasing the amount
7 of overlap between piston three and membrane six
8 would have on the amount of deformation of
9 membrane six.

10 Have you considered that already?

11 MR. HIGER: Objection. Scope.

12 BY THE WITNESS:

13 A As I said to you, I considered all of the
14 aspects of the Klügl translation including the
15 figures in coming up with the conclusions in my
16 demonstrative on Page 39.

17 BY MR. HERMAN:

18 Q What is a flexural modulus?

19 A Do you mean generically?

20 Q Yes.

21 A Are you able to refer me to the use of
22 that term in my declaration?

1 Q No.

2 A Are you able to refer me to the term in
3 the Klügl translation?

4 Q No.

5 A The term flexural modulus pertains to
6 material properties.

7 Q Do different materials have different
8 flexural moduli?

9 A Not necessarily.

10 Q But there are materials with different
11 flexural moduli, correct?

12 MR. HIGER: Objection. Scope.

13 BY THE WITNESS:

14 A There are materials that would demonstrate
15 different flexural moduli, yes, I believe --

16 Q Sorry. Keep going.

17 A I said I believe they exist, yes.

18 Q So would the amount of deformation of
19 membrane six be less in a material with a greater
20 flexural moduli was used?

21 MR. HIGER: Objection. Scope.

22 BY THE WITNESS:

1 A You would have to show me the manner in
2 which flexural modulus is defined for me to come
3 up with that conclusion. I don't know that there
4 is a single definition of the term flexural
5 modulus.

6 BY MR. HERMAN:

7 Q Is that something you have not already
8 considered when using material with a different
9 flexural moduli and how that would impact the
10 amount of deformation of membrane six?

11 A You used the term material with request a
12 with a different flexural moduli. That implies
13 plural. I'm not sure of the nature of your -- are
14 you implying that a single material has multiple
15 flexural moduli?

16 Q I'm asking whether you took into account
17 the effect of using different materials with
18 different flexural moduli would have on the
19 deformation of membrane six?

20 A The flexibility and the material
21 properties of the membrane are important, yes.

22 Q You would agree depending upon the

1 flexibility and the material properties of the
2 material used for membrane six, there could be
3 different amounts of deformation, correct?

4 MR. HIGER: Objection. Scope.

5 BY THE WITNESS:

6 A It depends on a number of different
7 parameters and variables. Without doing a more
8 fulsome analysis, I can't give you a concise
9 answer in that reflect.

10 BY MR. HERMAN:

11 Q The parameters you're referring to do
12 those parameters include things such as the
13 geometry of membrane six, the thickness of
14 membrane six and the material properties of
15 membrane six among other things?

16 A Among other things it includes those.

17 Q And changing the geometry of membrane six,
18 the thickness of membrane 6 and the material
19 properties of membrane six could, in fact, have an
20 impact on the amount of deformation, true?

21 MR. HIGER: Objection. Form, scope.

22 BY THE WITNESS:

1 A There are other considerations that need
2 to be taken into account, for example, just as an
3 example, the manner in which the membrane is
4 constrained, the manner in which the membrane is
5 exercised, the number of forces acting thereon, a
6 whole host of issues. It can't be determined in a
7 simplistic fashion as you present.

8 BY MR. HERMAN:

9 Q So I think you've pointed me to additional
10 factors that could also bear on the amount of
11 deformation of membrane six; is that correct?

12 A As I said, in Paragraph 89, for example,
13 it also bears noting at the time a POSITA would
14 expect the membrane disclosed in the translated
15 version of Klügl -- sorry, my screen is doing
16 something strange -- to be susceptible to failure
17 including pulling away from points of attachment,
18 leakage and rupture.

19 There are a host of issues that need to be
20 taken into account to determine what you're
21 attempting to enunciate.

22 Q Now, in your view would a person having

1 ordinary skill in the art be generally aware of
2 the parameters and the issues that you mentioned
3 in your answer?

4 A A person of ordinary skill in the art in
5 fuel injectors would have knowledge of potentially
6 all of those issues, some of those issues, or
7 issues beyond those I've mentioned. It's
8 difficult for me to think back to 1999 as I sit
9 here in front of you to think exactly what a
10 POSITA in the area of fuel injection would have
11 known, the depth of knowledge they would have had
12 about membranes and/or diaphragms and their
13 behavior. That's difficult for me to assess here.

14 Q But they would have at least some
15 knowledge about membranes, their behavior and the
16 impact that the parameters and issues you talked
17 about would have on deformation, correct?

18 A I'm not sure that they would have had all
19 of that insight at that time. And keep in mind
20 we're talking about a POSITA, a person of ordinary
21 skill in the art. Again, I cannot assess sitting
22 here before you exactly what level of knowledge

1 they would have had about the more detailed
2 aspects of the behaviors of membranes and
3 diaphragm.

4 Q Now, as we discussed, in your view in
5 Figure 1 of Klügl, there will be a change in the
6 amount of movement of the actuator that is passed
7 on to the piston three; is that right?

8 A So as I said in Paragraph 77, towards the
9 end of the paragraph, Exhibit 1006 teaches that in
10 Figure 1 when the actuator is controlled the
11 amount of its movement must only be "at least
12 partially transmitted" to the drive piston three
13 by the movement of the transmission module two.

14 Q You used that same phrase partially
15 transmitted in Paragraph 78; is that right?

16 A I use the term partially transmitted in
17 Paragraph 78, yes.

18 Q So, in other words, in your view the
19 actuator and the piston will not move by
20 essentially or virtual the same amount during
21 actuation, is that correct?

22 MR. HIGER: Objection. Form.

1 BY THE WITNESS:

2 A As I said in Paragraph 78: "A POSITA
3 would understand that the innate flexibility of
4 flexible membrane six means that a specific
5 movement of the act one would be 'partially
6 transmitted' to the drive piston three and never;
7 always fully transmitted'".

8 BY MR. HERMAN:

9 Q So would you not use the phrase
10 essentially unchanged to describe the amount of
11 actuator movement that's passed on to the piston;
12 is that right?

13 A I'm not sure that I would use the term
14 essentially unchanged when talking about two
15 distinctly different elements of a configuration
16 such as that denoted in Figure 1.

17 Q I'm talking about the amount of movement.
18 You would not use the word essentially unchanged
19 to describe the amount of movement between the
20 actuator and the piston, correct?

21 A As I said, the movement of actuator one
22 would be partially transmitted and never fully --

1 never always fully transmitted.

2 Q So the amount of movement has changed,
3 it's not essentially unchanged in your view,
4 correct?

5 A The amount of movement of the actuator is
6 different to the amount of movement of the drive
7 piston three.

8 Q So could you use the word changed to refer
9 to the amount of amount, the amount of movement
10 has been changed?

11 A Do you mean changed in time, changed
12 deliberately, changed --

13 Q In magnitude, changed in magnitude.

14 A Changed in magnitude.

15 The movement of actuator one -- could you
16 rephrase the phrase with -- essentially unchanged,
17 please.

18 Q Maybe a quantum. I'm referring to the
19 quantum of movement.

20 The quantum of movement in your view has
21 change between the actuator and the piston,
22 correct?

1 A Changed, I'm still hung up on the term
2 changed.

3 I would say the movement of drive piston
4 three is different to the movement of actuator
5 one.

6 Q You believe that the quantum of movement,
7 the amount of the piston moves is different from
8 the amount that the actuator moves, there's been a
9 change in the amount of movement, correct?

10 A Yes.

11 Q So I'd like you to take a look at Exhibit
12 2012.

13 A It's an separate binder.

14 MR. HIGER: Anywhere particular between
15 the two proceedings?

16 BY MR. HERMAN:

17 Q The one I'm looking at is in the 292
18 proceeding.

19 A 292 proceeding, 2012. I'm just struggling
20 with the binder.

21 In my version that is -- what is it that I
22 should be looking at.

1 Q It's a translation of a German patent that
2 ends in the numbers 177 that names Gottlieb as the
3 first inventor.

4 A Yes.

5 Q So this Exhibit 2012, that's one of the
6 references you reviewed in arriving at your
7 opinions?

8 MR. HIGER: Objection. Scope.

9 BY THE WITNESS:

10 A Yes, it is amongst the list of documents
11 considered, yes.

12 BY MR. HERMAN:

13 Q And this particular patent reference bears
14 a date that is well before the IPR petition and
15 your declarations were filed in this case,
16 correct?

17 MR. HIGER: Objection. Scope, form.

18 BY THE WITNESS:

19 A Sorry. Which specific dates are you
20 referring to?

21 BY MR. HERMAN:

22 Q Any of the dates in the cover, there's a

1 1999, 2001 that was both filed and appears to have
2 published long before the IPR petition was filed
3 in this case, correct?

4 A The filing date of 12/22/1999 and a
5 disclosure date of 07/12/2001.

6 Q So more than 20 years before the IPR
7 petition was filed in this case?

8 A Yes.

9 Q Now, if you turn to Column 1 starting at
10 about Line 49, there's a paragraph that references
11 DE 187 08 304 A1.

12 Do you see that?

13 A I see DE, yes.

14 Q So DE 107 08 304 A1 is the Klügl reference
15 we've been talking about, correct?

16 A No, I believe you said 107.

17 Q 197 08 304 A1?

18 A I'm seeing 197 08 301. I believe you said
19 107.

20 Q Maybe I misread the number, but the number
21 that's referenced in Column 1 at Line 50 is DE 197
22 08 304 A1 and that is in fact the Klügl reference

1 we've been talking about today, correct?

2 A I'm looking back to Klügl translation and
3 I see DE 197 08 304 A1.

4 Q Starting at about Column 1, Line 72,
5 Exhibit 2012 states that: "When the actuator is
6 actuated the deflection of this actuator is
7 transmitted via the transmission element
8 essentially unchanged to the drive plunger of the
9 servo valve for the guide shaft of the valve
10 needle."

11 Does do you see that?

12 A I do see those words.

13 Q That's describing how this particular
14 inventor believes Klügl to be operating, correct?

15 MR. HIGER: Objection. Form foundation.
16 BY THE WITNESS:

17 A No, I can't come to that conclusion. I
18 think it requires a more detailed look. I
19 don't -- in Klügl, for example, the term guide
20 shaft I don't believe exists. That's just by my
21 recollection. I'm now looking back at Klügl.

22 I see the term guide sleeve 11 in

1 Column 2, Line 19. I would need to reread Klügl
2 in its entirety.

3 Do you wish me to do that?

4 BY MR. HERMAN:

5 Q Sitting here today, you don't have an
6 opinion one way or the other regarding whether
7 this particular passage found in Column 1 of
8 Exhibit 2012 is discussing the operation of Klügl;
9 is that correct?

10 MR. HIGER: Objection. Form, scope.

11 BY THE WITNESS:

12 A I would have to analyze it further. As an
13 immediate issue, I don't believe that the term
14 guide shaft exists in the Klügl translation as I
15 have it.

16 BY MR. HERMAN:

17 Q So before today and arriving at your
18 opinions in your declaration, you did not consider
19 what this reference says about Klügl's operation;
20 is that correct?

21 A I read and analyzed Gottlieb, but I'm
22 still perplexed by it purporting to refer to

1 elements that don't exist in Klügl.

2 Q I'm going to point you to another exhibit.

3 This is Exhibit 2008 in the 292 proceeding.

4 A Yes, I see it.

5 Q This is another translation of a German

6 patent, this one ending in the No. 617.

7 Do you see that?

8 A Yes.

9 Q And the first named inventor is Klügl, do

10 you see that?

11 A Yes.

12 Q And that's the same Klügl that is an

13 inventor in the Klügl that we've been talking

14 about previously, correct?

15 MR. HIGER: Objection. Foundation, scope.

16 BY THE WITNESS:

17 A I don't know that unequivocally. I see

18 they have the same name, same address, so unless

19 there's two people living at the same address with

20 exactly the same name, these two references are

21 talking about the same inventor, correct?

22 MR. HIGER: Objection. Form scope.

1 BY THE WITNESS:

2 A I really can't necessarily come to that
3 conclusion. It doesn't give the full address and,
4 of course, as you know there might be people with
5 the same name residing at the same address.

6 BY MR. HERMAN:

7 Q All right. So if you look at Column 1 of
8 Exhibit 2008 at line ten, there's reference to DE
9 197 08 304 A1.

10 Do you see that?

11 A I see that.

12 Q And, again be, that's the Klügl reference
13 we've been discussing today, correct?

14 A Yes.

15 Q If you look down to about Line 29 in
16 Column 1, there's a paragraph that begins: "The
17 element for transmitting of movement known from
18 the publication mentioned at the outset."

19 Do you see that?

20 A Yes.

21 Q The only publication mentioned at the
22 outset is Klügl, correct?

1 A The only publication mentioned before
2 Line 19 that I can see in the description I would
3 take to be the German patent that we know as the
4 original Klügl patent application.

5 Q Okay. So this paragraph that begins at
6 Line 29 goes on to discuss the structure of that
7 element for transmitting of movement that's
8 referenced in the Klügl publication, correct?

9 MR. HIGER: Objection. Scope, foundation.
10 BY THE WITNESS:

11 A I would have to read this in some detail
12 to come to that conclusion.

13 BY MR. HERMAN:

14 Q So that's not an exercise that you've done
15 already?

16 A I did consider this as it occurs in the
17 list of documents that I considered. I don't
18 believe that I referenced this particular patent
19 in my declaration. It would require more
20 analysis. For example, just as an example, I
21 don't see it referring specifically to figures 1,
22 2 or 3 of the original 304 Klügl application so it

1 would require further analysis for me to determine
2 exactly what this is referring to.

3 Q So sitting here today, you don't have a
4 preexisting opinion as to whether Exhibit 2008 is
5 discussing the structure and operation of the
6 injector shown in Figure 1 of Klügl; is that
7 correct?

8 MR. HIGER: Objection. Scope.

9 BY THE WITNESS:

10 A Without further analysis and reading, I'm
11 not able to come to that conclusion.

12 BY MR. HERMAN:

13 Q Sitting here today, you don't have a
14 preexisting opinion about whether or not
15 Exhibit 2008 provides any insight into how
16 Figure 1 of Klügl is designed to and, in fact,
17 operates; is that correct?

18 MR. HIGER: Objection. Scope.

19 BY THE WITNESS:

20 A I'm sorry. Can you repeat that? I know
21 it was a long question.

22 BY MR. HERMAN:

1 Q Sure. So sitting here today, you don't
2 have a preexisting opinion as to whether
3 Exhibit 2008 provides any insight into how
4 Figure 1 of Klügl is designed and operates?

5 MR. HIGER: Objection. Scope.

6 BY THE WITNESS:

7 A I don't see Figure 1 mentioned, and I have
8 not done a full analysis and reading of the 617
9 document.

10 BY MR. HERMAN:

11 Q Now, let's turn back to Paragraph 68 of
12 your declaration?

13 A Yes.

14 Q In this paragraph you reference: "Flaw in
15 Klügl's design that you believe prevents it from
16 maintain a desired valve needle lift in response
17 to changes in the dimensional relationship of
18 components within the valve."

19 Do you see that?

20 A Yes.

21 Q Now, at the end of this paragraph which
22 goes on to the next page of your declaration, you

1 note that the distance A from the lower stop 16 to
2 the end of the valve needle 32 is fixed in Klügl
3 and thus could not be changed; is that right?

4 A I said when addressed the distance A from
5 the lower stop 16 to the end of the valve needle
6 32 is fixed, yes.

7 Q So that means you can't change that
8 distance A in Klügl; is that right?

9 A It certainly could be changed by design,
10 it could be changed by manufacture, it could be
11 changed by assembly, it could be changed due to
12 wear, it could be changed due to thermal effect.

13 Q Okay. So you have an annotated version of
14 Klügl following that statement that shows the stop
15 16 highlighted in red and the check ring 17
16 highlighted in yellow; is that right?

17 A Yes.

18 Q And that check ring 17 is essentially
19 resting on the bottom of the stop 16; is that
20 right?

21 A That's correct.

22 Q And it's the check ring and the stop that

1 together prevent distance A from being adjusted;
2 is that right?

3 A It prevents distance A from undergoing
4 "any automatic adjustments" provided by the
5 flexible membrane.

6 Q So, for instance, if the piston three
7 expands because of thermal effects, lifting the
8 ball four off its seat, you can't adjust by moving
9 the piston three upwards because the stop 16 and
10 the check ring 17 prevent movement in that
11 direction.

12 Did I get that right?

13 A That's one of the considerations, yes.

14 Q Now, if you could turn back to Klügl for
15 me, so Klügl is Exhibit 1006 in the 292
16 proceeding.

17 A Yes.

18 Q If you turn to Column 3 of Klügl?

19 A Yes.

20 Q All the way at the bottom of Column 3 at
21 about Line 63, Klügl references a circumstance in
22 which "actuator 1 shortens in the rest position

1 without being actuated due to thermal influences
2 or signs of aging".

3 Do you see that?

4 A Yes.

5 Q So Klügl here is referring to a situation
6 where the actuator itself shortens due to thermal
7 influences or signs of aging, correct?

8 A Yes.

9 Q And because the actuator shortens, there
10 will be an increase in the distance between the
11 actuator and the piston, correct?

12 A Are we still referring to Figure 1?

13 Q Yes.

14 A If the actuator one shortens at rest, that
15 will necessarily increase the distance between the
16 end of actuator one and the top of drive piston
17 three all else being constant.

18 Q Now, the actuator one is a component of
19 Klügl's device, correct?

20 A Yes.

21 Q And the piston is also a component of
22 Klügl's device, correct?

1 A Yes.

2 Q And could you refer to that distance
3 between the actuator and piston as a dimensional
4 relationship?

5 A A dimensional relationship. Do you mean a
6 distance?

7 Q Yes.

8 A So referring to the distance between the
9 end of the actuator and the top of the drive
10 piston as denoted in Figure 1.

11 Q That's right.

12 A Okay.

13 Q So there is, in fact, a dimensional
14 relationship between the actuator and the end of
15 piston three, correct?

16 MR. HIGER: Objection. Form.

17 BY THE WITNESS:

18 A I'm not sure exactly what you mean by
19 dimensional relationship.

20 BY MR. HERMAN:

21 Q So what do you understand that term to
22 mean?

1 A A relationship would imply some
2 relationship between the two. I think that those
3 particular elements have physical features that
4 are unrelated to each other, in other words, they
5 could change independently. So I don't see what
6 the relationship is.

7 Q So they're spaced apart by the given
8 distance when the device is manufactured,
9 correct?

10 A Yes.

11 Q And that distance could change over time
12 due to thermal influences and aging, correct?

13 A And other issues, yes.

14 Q Now, Klügl then goes on to say that when
15 the actuator shortens, spring plate eight pushes
16 the transmission medium from the compensation
17 Chamber 7 via the throttle ten into the pressure
18 chamber five so that the first membrane six is
19 moved in the direction of the drive piston three
20 and as a result the drive piston three bears
21 against the first membrane six despite the
22 shortening of the piezoelectric actuator one.

1 Do you see that spanning columns three and
2 four of Klügl?

3 A I do see that.

4 Q So there Klügl is referring to an
5 adjustment of the amount of fluid in chamber five
6 that ensures that the membrane six stays in
7 contact with the piston three even though the
8 actuator is shortened, correct?

9 A In brief, yes.

10 Q So the design flaw that you refer to in
11 your declaration has no bearing on Klügl's ability
12 to make this particular adjustment, correct?

13 A The design flaw that I mentioned in
14 Paragraph 68 refers to despite discussing
15 automatic adjustment, the POSITA would understand
16 that Klügl has a flaw its in design which prevents
17 it from maintaining a desired valve needle lift in
18 response to changes in the dimensional
19 relationship of components within the valve.

20 Q So my question was whether or not that
21 design flaw has any bearing on Klügl's ability to
22 make this particular adjustment discussed in

1 columns three and four?

2 A No. I don't come to that conclusion.

3 Q So the flaw does not, in fact, impact
4 Klügl's ability to make this adjustment discussed
5 in columns three and four, correct?

6 A No. I'm saying that there are greater
7 issues to be considered than the ones that you
8 have considered, for example, for example, I think
9 the assumption is that 17 is always held against
10 the stop. I don't think we can necessarily come
11 to that conclusion even in the resting position.
12 There is a host of issues that need to be taken
13 into account which you have not considered in your
14 particular demonstrative that require further
15 analysis. I don't think I can give a succinct and
16 glib answer.

17 Q So in Column 3 starting at Line 63, and
18 continuing on to Column 4, Line 3, the only
19 component whose size is changed due to thermal
20 influences and aging is actuator one, correct?

21 A It's the only one that's mentioned.

22 Q So there's no mention of any other

1 component changing in size besides actuator one,
2 correct?

3 A Changing in size? Again, I'm not sure
4 what you mean, because pressure chamber five, for
5 example, if first membrane six changes its
6 orientation, changes its position, that will
7 change dimensional relationships within pressure
8 chamber five so I'm at a loss to understand
9 exactly what you mean.

10 Q So Klügl haste itself if the piezoelectric
11 actuator itself shortens, do you see that
12 reference in Klügl?

13 A Yes.

14 Q That's referring to a change in size of
15 the piezoelectric actuator one, correct?

16 A Yes.

17 Q And nowhere in this portion of columns
18 three and Column 4 does Klügl say that piston
19 three changes in size, correct?

20 A It makes no mention of drive piston three
21 changing in size.

22 Q But your opinion relating to the design

1 flaw is entirely and exclusively premised on only
2 piston three changing in size, correct?

3 MR. HIGER: Objection. Form.

4 BY THE WITNESS:

5 A No, I don't believe so.

6 BY MR. HERMAN:

7 Q So your opinion does not --

8 MR. HIGER: Counsel, you keep cutting off
9 the witness on his answers. If you would please
10 let him answer the questions you asked.

11 BY MR. HERMAN:

12 Q Go ahead.

13 A I was about to say it's not simply the
14 size as you quoted of drive piston three, it's
15 also its position.

16 Q So please point me to the portion of your
17 declaration where you discuss the impact of only
18 piezoelectric actuator one short engine in the
19 rest position.

20 A In Paragraph 66 I say the translated
21 version of Klügl submitted as Exhibit 1006
22 describes the "automatic adjustment" of the

1 transmission module two. "If the piezoelectric
2 actuator one shortens in the rest position,
3 without being actuated due to thermal influences
4 or signs of aging in relation to the housing 12,
5 the spring plate eight pushes the transmission
6 medium from the compensation Chamber 7 via the
7 throttle ten into the pressure chamber five so
8 that the first membrane six is moved in the
9 direction of the drive piston three and as a
10 result drive piston three bears against the first
11 membrane six despite the short engine of the
12 piezoelectric actuator one."

13 Exhibit 1006, Column three, 63 to Column 4
14 Line 3: "In such a circumstance the POSITA would
15 understand that the first membrane six can only
16 move in the direction of drive piston three if it
17 deforms or bows downward in the orientation of
18 Figure 1."

19 That's the point I am attempting to make
20 is I don't know that we can strictly look at the
21 change in the length of actuator one and a change
22 in the length of drive piston three in determining

1 the distance between the top of drive piston three
2 and the bottom of actuator one in the orientation
3 of Figure 1. That's the point I've been
4 attempting to make.

5 Q So moving back, though, to Klügl in
6 Column 3, starting at Line 63?

7 A Yes.

8 Q The only thing that Klügl says occurs due
9 to thermal influences or signs of aging is that
10 the piezoelectric actuator shortens. That's all
11 that Klügl references there, correct?

12 MR. HIGER: Objection. Form, foundation.
13 BY THE WITNESS:

14 A Klügl mentions that the transmission is
15 pushed from compensation Chamber 7 by the throttle
16 ten into the pressure chamber five so that the
17 first membrane six is moved in the direction of
18 drive piston three. I'm showing movements and
19 changes in dimensional relationships beyond that
20 simply of the piezoelectric actuator one
21 shortening in the rest position. I'm seeing that
22 description and designation at the end of

1 Column 3.

2 Q You don't read Column 3 Line 63 and
3 continuing on as discussing a cause and an effect.
4 The cause being the actuator one shortening and
5 the effect being that transmission medium is being
6 pushed out of Chamber 7, that's not how you read
7 that portion of Klügl?

8 MR. HIGER: Objection. Form.

9 BY THE WITNESS:

10 A I wasn't referring to that in my answer.
11 I was merely referring to the fact that there are
12 a multitude, there are a host. There are a
13 plurality of dimensional relationships in this
14 particular scenario as enunciated by Klügl. That
15 was the point I was attempting to make.

16 BY MR. HERMAN:

17 Q My question, then, is nothing about the
18 flaw that you've identified prevents this from
19 happening, what's discussed in Column 3, lines 63
20 and onwards; is that correct?

21 A In Paragraph 68, I say despite discussing
22 "automatic adjustment" a POSITA would understand

1 that Klügl has a flaw in its design that prevents
2 it from maintaining a desired valve needle lift in
3 result to changes of the dimensional relationship
4 of components within the valve.

5 Q So how in your view does that flaw prevent
6 fluid from flowing from compensation Chamber 7
7 into pressure chamber five in circumstances in
8 which the piezoelectric actuator one shortens?

9 MR. HIGER: Objection.

10 BY THE WITNESS:

11 A I don't believe that I've made that
12 assertion in my opinion.

13 BY MR. HERMAN:

14 Q Does it? Does that flaw prevent fluid
15 from flowing from compensation Chamber 7 into
16 pressure chamber five in circumstances in which
17 the piezoelectric actuator one shortens?

18 MR. HIGER: Objection. Form.

19 BY THE WITNESS:

20 A It requires further analysis because there
21 are multiple number of effects that are occurring
22 that occur that I don't believe can be taken in

1 isolation.

2 BY MR. HERMAN:

3 Q So you have not considered whether that
4 design flaw that's discussed in your declaration
5 prevents fluid from flowing from compensation
6 chamber -- in circumstances in which the
7 piezoelectric actuator one shortens; is that
8 correct?

9 MR. HIGER: Objection. Form.

10 BY THE WITNESS:

11 A My discussion of the flaw is encapsulated
12 in Paragraphs 66, 67, 68, 69, 70, and 70 of my
13 declaration.

14 BY MR. HERMAN:

15 Q So in Paragraphs 68, 69 and 70, I see no
16 discussion about circumstances in which actuator
17 one shortens.

18 Am I missing something?

19 A In 68, 69 and 70, I do not use the term
20 short shortening of the piezoelectric actuator,
21 however, I have said that Klügl has a flaw in its
22 design that prevents it from maintaining a desired

1 valve needle lift in response to changes in the
2 dimensional relationship of components within the
3 valve.

4 Q So you do talk about components in
5 Paragraphs 68, 69 and 70 but none of those
6 components are actuator one, correct?

7 A I have not claimed that they either
8 include nor exclude actuator one.

9 Q So if you look at the Exhibit 1001, that's
10 the '829 patent?

11 A 1001, the '829 patent, yes.

12 Q In the 292 proceeding.

13 A Yes.

14 Q I'll give you an electronic copy of that.

15 A I'm referring to the paper copy.

16 Q That's fine and if you could turn to Claim
17 1 which is in Column 17?

18 A Yes.

19 Q The claim is directed to an injection
20 valve.

21 Do you see that?

22 A Yes.

1 Q If you look all the way down to limitation
2 E, which is the final limitation of the claim?

3 A Yes.

4 Q About halfway through that limitation
5 states: "Said hydraulic link is adjustable while
6 said actuator is not activated in response to
7 changes in the dimensional relationship between
8 components of said injection valve to maintain the
9 desired needle lift upon activation of said
10 actuator assembly".

11 Do you see that?

12 A Yes, it says valve needle lift, but, yes.

13 Q It also refers to between components of
14 said injection valve, correct?

15 A Yes.

16 Q Do you interpret that as requiring the
17 hydraulic link to be able to account for changes
18 in dimensional relationship of all possible
19 injection valve components?

20 MR. HIGER: Objection. Scope, form,
21 foundation.

22 BY THE WITNESS:

1 A All possible components? Sorry, can you
2 rephrase -- can you repeat the question?

3 BY MR. HERMAN:

4 Q Do you interpret Limitation E as requiring
5 that the hydraulic link be able to account for
6 changes in the dimensional relationship of all
7 possible injection valve components?

8 MR. HIGER: Scope. Foundation.

9 BY THE WITNESS:

10 A I don't see the term all possible
11 components.

12 BY MR. HERMAN:

13 Q So in your view, is it enough for the
14 hydraulic link to be able to account for changes
15 in the dimensional relationship of just some
16 components of the injection valve?

17 MR. HIGER: Objection. Scope, foundation.

18 BY THE WITNESS:

19 A It's very difficult for me to consider
20 that question in isolation. It depends on the
21 particular configuration of the injection valve,
22 it depends on the particular components that you

1 are referring to, it depends on a host of issues.
2 Within an injector there are an a multiplicity of
3 components.

4 BY MR. HERMAN:

5 Q Does the claim specify which components
6 and which dimensional relationship?

7 A The claim uses the term changes in the
8 dimensional relationship between components of
9 said injection valve.

10 Q But it does not reference any specific
11 components, correct?

12 MR. HIGER: Objection. Foundation,
13 scope.

14 BY THE WITNESS:

15 A The claim element 1-E uses the term
16 between components of said injection valve.

17 BY MR. HERMAN:

18 Q It uses the word components generically,
19 right, without referencing or identifying had any
20 specific components, true?

21 MR. HIGER: Objection. Foundation, scope.

22 BY THE WITNESS:

1 A It uses the term components.

2 MR. HERMAN: I think it's been about an
3 another hour so maybe it now is a good time for
4 another break.

5 MR. HIGER: Yes. Another ten?

6 MR. HERMAN: Sounds good.

7 (A recess was had.)

8 BY MR. HERMAN:

9 Q Doctor, if you could look back at Klügl,
10 that's Exhibit 1006, and in particular Column 4 at
11 about Line 25.

12 A Yes.

13 Q There Klügl says: "However, if there are
14 long lasting pressure differences between the
15 pressure chamber five and the compensation Chamber
16 7 lasting from one second to minutes the
17 transmission medium is exchanged between the
18 compensation Chamber 7 and the pressure chamber
19 five via the throttle ten."

20 Do you see that?

21 A Yes.

22 Q The long lasting pressure differences that

1 Klügl is referring to there, those are present at
2 times of rest, correct?

3 A The pressure that's lasting from one
4 second to minutes. No, I'm not sure that I agree
5 with you, the actuation times are small, the
6 actuation times are in the times of milliseconds
7 as Klügl states in the previous paragraph Line 23
8 or so, but that particular paragraph of Klügl
9 doesn't specify whether the long lasting pressure
10 differences occur during time of rest or in time
11 of actuation and rest.

12 Q Now, as you noted the actuation time is
13 preferably between 0 milliseconds and ten
14 milliseconds; is that right?

15 A Yes, according to Line 23 or so, yes.

16 Q And that is a much shorter period of time
17 than seconds to minutes, correct?

18 A It is much shorter than seconds to
19 minutes.

20 Q So there is no long lasting pressure
21 difference lasting seconds to minutes during
22 actuation, correct?

1 A There can be no long lasting pressure
2 differences lasting from seconds to minutes within
3 the time allowable for actuation, no.

4 Q So that can only occur during periods of
5 rest that are at least seconds to minutes long,
6 correct?

7 A What I was saying was without further
8 analysis, it's not clear that what is meant is
9 that during the periods of long lasting pressure
10 differences that actuation does not occur. In
11 other words, actuation might be arranged to occur
12 during these one second to minute-long periods of
13 time. That's not clear from the record.

14 Q So I think what you're saying is that
15 there could be a very short period of actuation
16 within the middle of a very long period of rest;
17 is that true?

18 A What I'm saying is during periods of
19 pressure differences, during periods in which
20 pressure differences occur, actuation might also
21 occur. Actuations plural might also occur.

22 Q So in your view are the forces that are

1 exerted on membrane six different during periods
2 of rest than periods of actuation?

3 A Different forces are likely to occur on
4 membrane six during actuation and during rest.

5 Q And as a general matter, would a person
6 having ordinary skill in the art understand
7 membrane six to behave differently if subjected to
8 different forces?

9 A In general the behavior of the membrane
10 depends as we've established on the number of
11 parameters and variables including the forces
12 exerted on that membrane.

13 Q Now, if you'll turn to Paragraph 102 of
14 your '829 patent declaration.

15 A Yes.

16 Q You state: "Further, given the
17 differences in the principle of operation, a
18 POSITA would not have been it motivated to combine
19 elements of an outwardly opening fuel injector
20 with an inwardly opening fuel injector."

21 Do you see that?

22 A Yes.

1 Q Now, the valve that's shown in Figure 1 of
2 Klügl is a servo valve; is that correct?

3 A The valve -- Figure 1 the device for
4 transmitting movement for an injection valve -- it
5 also -- sorry?

6 Q Go ahead.

7 A Klügl in Column 1, Line 47 says:
8 "Figure 1 shows schematically part of an injection
9 valve with a piezoelectric actuator one and a
10 servo valve four," which is -- offers some
11 confusion as to what it is.

12 Earlier in Column 1 in Line 7, Klügl says:
13 "A power transmission device is used, for example,
14 in automotive engineering to transmit the movement
15 a piezoelectric actuator in an injection valve to
16 a control element, control element operating a
17 servo valve, for example, which in turn controls
18 the opening and closing of an injection valve."

19 I think we would need to define exactly
20 what a servo valve is firstly. Secondly, we would
21 have to attempt to interpret what Klügl meant by a
22 servo valve noting that in Line 48, Klügl refers

1 to a servo valve four.

2 So what I'm attempting to say is that if
3 you are asking me whether Figure 1 designates a
4 servo valve and a servo valve only, component of a
5 servo valve, an injection valve, that would
6 require further analysis and discussion.

7 Q Now, if you look at Figure 1, is there a
8 portion of Figure 1 that you would characterize as
9 a valve?

10 A Figure 1 shows a valve mechanism, yes.

11 Q So what is the valve mechanism in
12 Figure 1?

13 A Well, it's the ultimate sealing mechanism
14 of the embodiment shown in Figure 1 is ball four
15 residing on a seat.

16 Q And can you characterize that valve
17 mechanism as an outwardly opening valve?

18 A The control needle three pushes circle
19 ball four off its seat on occasion.

20 Q And that makes it something you could call
21 an outwardly opening valve, correct?

22 A Well, in the particular orientation of

1 this figure, Figure 1, drive piston three moves
2 ball four off its seat in a downward direction in
3 Figure 1.

4 Q Would you be characterize that as an
5 inwardly opening or an outwardly opening valve?

6 A It's a valve that operates by moving a
7 ball off a seat.

8 Q Well, so in Paragraph 102, you used the
9 words outwardly opening and inwardly opening to
10 classify fuel injector valves.

11 So I'm asking whether Figure 1 would you
12 classify it as an outwardly opening valve or an
13 inwardly opening valve using whatever meaning you
14 used in Paragraph 102?

15 A In Paragraph 102, I mentioned an outwardly
16 operating fuel injector and an inwardly operating
17 fuel injector. I did not attempt to characterize
18 all fuel injectors as being all outwardly opening
19 or inwardly opening.

20 Q What did you mean when you used the word
21 outwardly opening in Paragraph 102?

22 A Well, there is a class of fuel injectors

1 that have sealing mechanisms that open outwardly
2 and there is a class of fuel injectors that have
3 sealing mechanisms that open inwardly.

4 Q Does the sealing mechanism shown in
5 Figure 1 open outwardly?

6 A Are we talking about Figure 1 as
7 representing a fuel injector --

8 Q Sorry. Figure 1 as shown, Figure 1
9 representing whatever it shows on the page.

10 Is that what's shown on the page opening
11 outwardly opening or not?

12 A It shows a ball moving away from a seat.
13 If you define the inward side of this particular
14 power transmission device to be let's call it the
15 center of all the components that we see, then you
16 could define this as an outwardly opening valve,
17 yes.

18 Q If you turn now to Paragraph 109 you note
19 that even a simple visual inspection of the
20 relevant portions of Wirbeleit's figure and
21 Dr. Quinlan's combination over the Wirbeleit and
22 Klügl embodiments demonstrates that the inserted

1 transmission module two and its related components
2 all take up significantly more space than
3 Wirbeleit's hydraulic transmission elements 22.

4 Do you see that?

5 A Yes.

6 Q Did you interpret Wirbeleit's figure as
7 being drawn to scale?

8 A Not necessarily drawn to scale.

9 Q Did you interpret Dr. Quinlan's
10 demonstrative as being drawn to scale?

11 A Not necessarily drawn to scale, but the
12 relative sizes of the components are important I
13 believe in the assessment of the potential
14 operation and function of a device such as this.

15 Q Now, in arriving at your opinions, did you
16 assume that a person having ordinary skill in the
17 art would only employ the exact relative component
18 sizing shown in Wirbeleit and Klügl's figures?

19 MR. HIGER: Objection. Scope.

20 BY THE WITNESS:

21 A As I said in my previous answer, it's not
22 simply the relative scale between Wirbeleit and

1 Klügl that is an issue, it's the scale of
2 components within this composite fuel injector as
3 presented.

4 Q Now looking at Paragraph 110, you note
5 that Dr. Quinlan's combination actually modified
6 the teachings of Klügl's transmission module two
7 and its related components, the combination of
8 changes the width of the drive piston to be same
9 dimension as flexible membrane six the in making
10 in change open areas below the annular areas below
11 the flexible membrane six were removed.

12 Do you see that?

13 A Yes.

14 Q In arriving at your opinions, did you
15 assume that a person having ordinary skill in the
16 art only would use only the exact component
17 dimensions shown it in Klügl's figures and nothing
18 else?

19 A I think that the demonstrative that
20 Dr. Quinlan presented in order to prove the
21 efficacy of a particular composite device should
22 have taken various considerations into

1 consideration which it appears from the
2 demonstrative that he did not, most notably making
3 the change of open areas below the annular areas
4 of flexible membrane six.

5 Q Your declaration does not include an
6 opinion regarding the appropriate width of the
7 drive piston when combining Wirbeleit and Klügl;
8 is that correct?

9 A Appropriate, you use the term
10 appropriate, what measure of appropriateness are
11 you bearing?

12 Q Can you point to anywhere in your
13 declaration where you've identified the width of a
14 drive piston where in your view would be
15 considered appropriate?

16 A No. But it's not up to me to attempt to
17 determine what errors -- how errors in
18 Dr. Quinlan's demonstrative can be rectified.

19 Q You also have not identified any issues in
20 the widths identified in Dr. Quinlan's
21 demonstrative, correct?

22 MR. HIGER: Objection. Form.

1 BY THE WITNESS:

2 A I believe that Dr. Quinlan's demonstrative
3 would not operate in the same way as it operated
4 in either the Klügl embodiment or in the original
5 Wirbeleit embodiment.

6 BY MR. HERMAN:

7 Q But all you say in Paragraph 110 is
8 that in making this change the opening areas
9 beneath below the annular areas of the flexible
10 membrane six were removed, that's all you say,
11 correct?

12 MR. HIGER: Objection. Form.

13 BY THE WITNESS:

14 A As I said at the beginning --
15 Dr. Quinlan's combination actually modified the
16 teaching of Klügl's transmission module two and
17 its related components.

18 BY MR. HERMAN:

19 Q And that's the extent of your opinion, the
20 two things were modified, correct?

21 MR. HIGER: Objection. Form.

22 BY THE WITNESS:

1 A My opinions on this particular combination
2 extend further, for example, Paragraph 110, I also
3 disagree that Dr. Quinlan's combination of
4 Wirbeleit and Klügl would "effectively eliminate
5 the possibilities of delays of motion transmission
6 from the actuator to control piston".

7 I've also disagreed with Dr. Quinlan's
8 opinions Paragraph 112 that a POSITA would have
9 been motivated to use Klügl's transmission module
10 two because it would allow for a simplified
11 manufacturing process.

12 I think that my opinions of Dr. Quinlan's
13 combination are several and varied and I presented
14 in my declaration.

15 MR. HERMAN: That's all the questions that
16 I have, so I pass the witness.

17 MR. HIGER: Let us take a short break and
18 see if we have any redirect.

19 (A recess was had.)

20 MR. HIGER: Thanks for the quick break.
21 We don't have any questions on redirect.

22 MR. HERMAN: Thank you very much,

1 Doctor.

2 MR. HIGER: Thank you, everybody.

3 THE WITNESS: Thank you everybody.

4 (Deposition concluded at 11:18 a.m. CST.)

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2 I, Theresa A. Vorkapic, Certified
3 Reporter and Notary Public within and for the
4 State of Illinois do hereby certify:

5 That Dr. Christopher Atkinson, the witness
6 whose deposition is hereinbefore set forth,

7 Was duly sworn by me before the
8 commencement of such deposition and that such
9 deposition was taken before me and is a true
10 record of the testimony given by such witness.

11 I further certify that the adverse
12 party, petitioner, was represented by counsel at
13 the deposition.

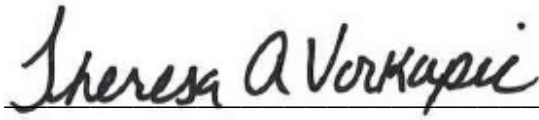
14 I further certify that the deposition of
15 Dr. Christopher Atkinson, occurred at the
16 virtually on Friday, July 19, 2024, commencing
17 at 8:38 a.m. to 11:18 a.m. CST

18 I further certify the inspection,
19 reading and signing of said deposition was
20 waived on the record by agreement of all parties.

21 I further certify that I am not related
22 to any of the parties to this action by blood

1 or marriage, I am not employed by or an attorney
2 to any of the parties to this action, and that I
3 am in no way interested, financially or otherwise,
4 in the outcome of this matter.

5 IN WITNESS WHEREOF, I have hereunto set
6 my hand this 21st day of July, 2024.

7
8 
9 _____

10 Theresa A. Vorkapic

11 My commission expires November 6, 2027.

12 NOTARY PUBLIC IN AND FOR THE STATE OF
13 ILLINOIS

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