

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GENERAC POWER SYSTEMS, INC.,

Petitioner,

v.

CHAMPION POWER EQUIPMENT, INC.,

Patent Owner.

IPR2025-01457
Patent 11,143,145

Deposition of

MAHDI SHAHBAKHTI, Ph.D, P.Eng.

Friday, May 22, 2026

9:04 a.m.

Reporter: Barbara J. Carey, RPR
Job Number: 00185500

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I N D E X

EXAMINATION OF MAHDI SHAHBAKHTI, Ph.D, P.Eng.:

By Mr. Finch - Page 4

PREVIOUSLY MARKED EXHIBITS:

Number	Description	Page
Exhibit 1003.....	MWE INVESTMENTS, LLC, HARBOR FREIGHT TOOLS USA, INC., and GENERAC POWER SYSTEMS, INC. V. CHAMPION POWER EQUIPMENT, INC., U.S. Patent No. 11,143,145 Title: BATTERYLESS DUAL FUEL ENGINE WITH LIQUID FUEL CUT-OFF DECLARATION OF MAHDI SHAHBAKHTI Page 1-161 and Page 496-547	6
Exhibit 1005.....	Patent Application Publication (A) S61-283734 GASOLINE-LPG COMBINED ENGINE Page 1-12	24
Exhibit 1008.....	Oct. 24, 1933 G. L. HOLZAPFEL 1,931,698 FUEL SYSTEM FOR INTERNAL CUMBUSTION ENGINES, Filed March 30, 1931 Page 1-4	54
Exhibit 1009.....	WSM WORKSHOP MANUAL GASOLINE, LPG, NATURAL GAS ENGINE WG972-E2, DF972-E2, DG972-E2 KUBOTA Page 1-153	88

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1 DEPOSITION OF MAHDI SHAHBAKHTI, Ph.D,
2 P.Eng., held pursuant to Notice of Taking Deposition
3 and held at Merchant & Gould P.C., 150 South Fifth
4 Street, Suite 2200, Minneapolis, Minnesota 55402,
5 before Barbara J. Carey, Registered Professional
6 Reporter.

7 WHEREUPON, the following proceedings
8 were duly had:

9 THE REPORTER: Raise your right hand
10 and I will swear you in.

11 MAHDI SHAHBAKHTI, Ph.D, P.Eng.,
12 After having been first duly sworn, was called as a
13 witness and testified as follows:

14 THE REPORTER: Thank you.
15 You may begin.

16 EXAMINATION

17 BY MR. FINCH:

18 Q. Good morning, Dr. Shahbakhti. Will you
19 please state your full name and current address for the
20 record?

21 A. Good morning. Mahdi Shahbakhti.

22 Q. What is your current address?

23 A. 1613 Hudson Court Northwest, in Edmonton,
24 Alberta.

25 (Reporter clarification.)

1 A. 1613 Hudson Court Northwest, in Edmonton,
2 Alberta.

3 BY MR. FINCH:

4 Q. Okay. We met earlier, but again, my name
5 is Tom Finch, and I represent Champion in connection
6 with IPR 2025-01457, which relates to U.S. Patent
7 Number 11,143,145.

8 And to confirm, you submitted a declaration
9 in connection with this IPR; correct?

10 A. I do.

11 Q. And you understand that you're here to
12 testify in connection with that declaration?

13 A. I do.

14 Q. And just so you're comfortable with the
15 process today, I'd like to go over a couple guidelines
16 before we get started that will help things run a
17 little more smoothly today.

18 First, do you understand you're under oath?

19 A. I do.

20 Q. Okay. Any reason that you cannot give full,
21 accurate, and truthful testimony today?

22 A. No.

23 Q. We have a court reporter present today who
24 is recording your testimony. Because of that, please
25 do your best to respond verbally to my questions. So

1 "yes" or "no" answers or verbal answers and not nods or
2 head shakes or "huh-hums," things of that nature.

3 Does that make sense?

4 A. Yes, it does.

5 Q. Okay. And from the start, let's agree to
6 not talk over each other. So if I have a question,
7 please wait until I finish my question, and if you're
8 answering a question, I'll wait until your answer is
9 finished as well.

10 Is that fair?

11 A. Yes, that's fair.

12 Q. Okay. And if you don't understand a
13 question I ask, please let me know, and I will try and
14 rephrase it so that it makes sense.

15 A. Sure, I will do.

16 Q. And if you need a break or if anyone needs a
17 break at any point in time, just let me know, and I'll
18 just ask that we finish the question or series of
19 questions we're on, and then we can take a break.

20 A. Thank you.

21 Q. Of course.

22 Dr. Shahbakhti, I'm going to hand you a
23 document previously marked as Exhibit 1003.

24 (Whereupon, Deposition Exhibit 1003
25 was introduced.)

1 BY MR. FINCH:

2 Q. For the record this is excerpts from that
3 exhibit.

4 Do you recognize this document?

5 A. Yes, I do.

6 Q. What is this document?

7 A. It's my CV.

8 Q. And was this CV prepared for this matter, or
9 is this a CV that you use across the board?

10 A. The first page, "Summary and Highlights," I
11 put the content that was more relevant to this case,
12 some of the contents, and the other portions, more or
13 less the same.

14 Q. So the first page of this, the "Summary and
15 Highlight" section is information that you feel is more
16 relevant to this IPR?

17 A. Yes, I do.

18 Q. Okay. Turn to the third page of this
19 document, it says, "Academic Appointments."

20 Do you see that?

21 A. Yes, I can see that.

22 Q. And below that it says, "Education."

23 Do you see that?

24 A. Yes, I can see it.

25 Q. It says you have a Bachelor's of Science in

1 Mechanical Engineering; is that correct?

2 A. That is correct.

3 Q. And then a Master's Degree in Mechanical
4 Engineering as well?

5 A. That is correct.

6 Q. Okay. And a Ph.D., also, in mechanical
7 engineering; is that correct?

8 A. That is correct.

9 Q. Okay. What is mechanical engineering?

10 A. It's the field that is trying to connect to
11 the science for applications that refers to the
12 mechanical systems.

13 Q. When you say "mechanical systems," what does
14 that mean?

15 A. It can be systems that -- it's broad. It
16 can be related to the systems that is referred to
17 thermodynamics, it can be system relates to dynamics,
18 it can be systems that is referring to the solid
19 mechanics. These are some examples of the mechanical
20 engineering systems.

21 Q. Will you turn back to the "Summary
22 Highlights" page. The first page states under the
23 "Internal Combustion Engine Experience," there are
24 several bullet points, and one of them states that you
25 have "Studied engines running with a variety of fuels,

1 including but not limited to gasoline, diesel, ethanol,
2 n-heptane, iso-octane, gaseous fuels (natural gas,
3 butane, and hydrogen), and biofuels."

4 Do you see that?

5 A. Yes, I can see.

6 Q. Have you ever studied engines running on
7 propane before?

8 MR. STEMLER: Objection to form.

9 A. We have studied before the ones that it was
10 running on, like, gaseous feels, and you can see
11 examples of them here, like natural gas, butane and
12 hydrogen, and also propane, and also blends of these
13 fuels.

14 BY MR. FINCH:

15 Q. Even though it doesn't list propane here,
16 you have studied engines running on propane before?

17 A. Yes, even propane -- sometimes blends
18 included, not 100 percent propane.

19 Q. When you say "blends including propane,"
20 what does that mean?

21 A. Maybe I should correct that.

22 When it says "propane," we mean C₃H₈ for
23 that case is pure, but then when sometimes you get the
24 fuel in a cylinder, it would be, let's say, propane,
25 but then it can also have some small amounts of other

1 gases. It depends on the purity of the gas you
2 receive.

3 Q. And when you say you get the fuel in a
4 cylinder, what were you referring to there?

5 A. In that example that I mentioned, let's say
6 if you are testing an engine in the research lab.

7 Q. And my question was a little bit different.

8 When you refer to propane in a cylinder,
9 what are you referring to there?

10 MR. STEMLER: Objection; form.

11 A. The way that you receive gases at the, let's
12 say, university labs, you will get them inside
13 cylinders, and those cylinders, depending on the type
14 of the gas you have request, so you will receive them
15 in a cylinder.

16 BY MR. FINCH:

17 Q. You mentioned that cylinder could contain
18 propane but also some small amounts of other gases.

19 Is there a term that you would use to
20 describe propane with some small other amounts of
21 gases?

22 MR. STEMLER: Objection; form.

23 A. Propane is C3H8.

24 BY MR. FINCH:

25 Q. Are you familiar with the abbreviation

1 "LPG"?

2 MR. STEMLER: Objection; form.

3 A. That stands for "liquified petroleum gas."

4 BY MR. FINCH:

5 Q. What is liquefied petroleum gas?

6 A. LPG is mostly referred to examples that we
7 see in the literature that it include propane with a
8 blend of some other gases, but is mostly propane, but
9 this is an example of the LPG.

10 Q. You testified that "LPG" stands for
11 "liquified petroleum gas."

12 Is that correct?

13 A. That is correct.

14 Q. Is that found in a gaseous state or a liquid
15 state?

16 MR. STEMLER: Objection; form.

17 A. It's says, "liquified petroleum gas." Just
18 depends on the temperature and pressure conditions that
19 you have.

20 BY MR. FINCH:

21 Q. Have you studied an engine running on LPG
22 before?

23 MR. STEMLER: Objection; form.

24 A. You asked before for propane, and I
25 mentioned propane is an example of LPG.

1 BY MR. FINCH:

2 Q. So to confirm, you have studied an engine
3 running on LPG before?

4 MR. STEMLER: Objection; form.

5 A. Running LPG -- LPG and also other gases.

6 (Reporter clarification.)

7 A. And other gases.

8 BY MR. FINCH:

9 Q. What was the context in which you studied an
10 engine running on LPG before?

11 MR. STEMLER: Objection; form.

12 A. It depends on the type because there are
13 different metrics in the engine operations that we care
14 about. An example of that one would be efficiency of
15 the system.

16 BY MR. FINCH:

17 Q. So running an engine on LPG impacts the
18 efficiency of the engine?

19 MR. STEMLER: Objection; form.

20 A. Running the engines for every -- let's say,
21 for every engines that you run it the fuel, you're
22 always going to have deficiency, and by looking at the
23 variables that we have in the fueling and other metrics
24 that we have for engine, then it will have an impact on
25 the efficiency of the engine.

1 BY MR. FINCH:

2 Q. Variables and other metrics will have an
3 impact on the efficiency of the engine.

4 What variables and other metrics are you
5 referring to?

6 A. In an engine, there are -- maybe instead of
7 "metrics," I should have called "variables." The
8 variables could be related to the -- what's the ratio
9 of the air and fuel, the other one depending on the
10 combustion mode being used, that also be important,
11 let's say a spark type as an example.

12 Q. When you say, "combustion mode being used,"
13 what are you referring to?

14 A. The engine can run with different combustion
15 modes. We have spark ignition, compression ignitions,
16 and varieties of them. If you look at my CV highlights
17 on the first page, then I mention that there are some
18 of those example, like a spark ignition, compression
19 ignitions, lean burn, low-temperature combustion.
20 These are different type of combustion modes that you
21 can run an engine with.

22 Q. What is a spark ignition engine?

23 A. As the name says, it needs spark ignitions,
24 and for those engines, that will become a source of
25 initiations of combustion.

1 Q. Other than relying on a spark to initiate
2 combustion, are there other -- any other
3 characteristics of a spark ignition engine?

4 MR. STEMLER: Objection; form.

5 A. Your question is too general, and for
6 somebody knowing engines for about 26 years, it's very
7 much depending on what type of engine design is
8 available to us and then what type of variables is
9 available to the person to adjust engine performance.

10 BY MR. FINCH:

11 Q. So engine performance is impacted by the
12 type of engine design and the type of variables that
13 are available?

14 MR. STEMLER: Objection; form.

15 A. Engine performance will always be affected
16 by the type of the design and how variables are
17 adjusted for the performance of that engine.

18 BY MR. FINCH:

19 Q. Which variables impact engine performance?

20 A. You asked earlier. One of them is related
21 to the mixture of the air and fuel, and then if it's an
22 example of a spark ignition engines, then spark timing
23 would be another example that will have an impact.

24 Q. Okay. You said that engine performance will
25 always be affected by the type of design.

1 What does that mean?

2 MR. STEMLER: Objection; form.

3 A. You should take my course in the IC engines.
4 In that one, I will discuss a lot of these details. In
5 every elements of the engine, there are components that
6 their design will have an impact.

7 Give you an example, let's say the shape of
8 combustion chamber will be an example of the design
9 metric, but there are so many metrics in terms of the
10 design that will have an impact on the engine
11 performance.

12 BY MR. FINCH:

13 Q. What are some other design metrics that will
14 have an impact on engine performance?

15 MR. STEMLER: Objection; form.

16 A. Another example would be that -- how you mix
17 air and fuel.

18 (Reporter clarification.)

19 A. Air and fuel.

20 BY MR. FINCH:

21 Q. Sitting here today, can you think of any
22 other design metrics that will have an impact on engine
23 performance?

24 MR. STEMLER: Objection; form.

25 A. As I pointed out, there are many, many

1 metrics that have -- and will have an impact on the
2 performance of the engine. Engine is a technology that
3 has been there almost -- over one and a half centuries.
4 So as a result of that one, there are so many different
5 types of engines and for different applications, and
6 also depending on their designs, you will have the
7 choices of the parts that you can vary in order to
8 affect the performance.

9 BY MR. FINCH:

10 Q. In the "Summary Highlights" page of your CV,
11 you mentioned compression ignition.

12 What is the difference between spark
13 ignition and compression ignition?

14 A. As the name says, the source of ignition is
15 different from them. In the case of a spark ignition
16 engines, you will have the air and fuel that, let's
17 say, is compressed, and then the spark will become the
18 initiation of combustion. In the case of compression
19 ignitions, you will have at the higher compression
20 ratio so the compression is more significant, and then
21 you will inject fuel, and that fuel will become the
22 source of ignition, and that would be for some examples
23 of the compression ignitions. But there are varieties
24 of compression ignitions.

25 Q. What are some varieties of compression

1 ignitions?

2 MR. STEMLER: Objection; form.

3 A. If you look at the examples I mention here,
4 you see low-temperature combustions, you see I mention
5 HCCI, PPCI, RCCI.

6 (Reporter clarification.)

7 A. HCCI, PPCI, RCCI. If you notice, all of
8 them ends with "CI," so "CI" stands for "compression
9 ignitions."

10 BY MR. FINCH:

11 Q. What does "HCCI" stand for?

12 A. Homogeneous charge compression ignition.

13 Q. And what does "PPCI" stand for?

14 A. That's partially premixed compression
15 ignition.

16 Q. And what does "RCCI" stand for?

17 A. Reactivity controlled compression ignition.

18 Q. And what is the difference between an HCCI,
19 PPCI, and RCCI engine?

20 MR. STEMLER: Objection; form.

21 A. This is very different than the topic of my
22 declarations. Do you really want to know the
23 difference between ACCI, PPCI, and RCCI?

24 BY MR. FINCH:

25 Q. Dr. Shahbakhti, you testified earlier that

1 you thought the theme material on the "Summary
2 Highlights" section of your resume was relevant to your
3 declaration today; is that correct?

4 A. That is correct.

5 Q. Is your experience with low-temperature
6 combustion engines, including HCCI, PPCI, and RCCI
7 engines, relevant to your declaration today?

8 A. I would say, given the generators, the key
9 elements is engine, and then there are varieties of
10 engines that have been used for the generator, then
11 yes, it's applicable.

12 Q. What is the difference between HCCI, PPCI,
13 and RCCI engines?

14 MR. STEMLER: Objection; form.

15 A. So in the case of HCCI, in that case, we
16 will have the case that is based on the auto ignition.
17 That means you will have air and fuel get mixed, and
18 then when it gets to the temperature and pressure that
19 is right, then you can have auto ignition.

20 BY MR. FINCH:

21 Q. How is that different from the other two
22 types of engines listed?

23 A. In the case of, let's say, RCCI, in that
24 case, you will use a blend of the fuel, and with that
25 blend of the fuel, you create reactivity gradient, and

1 then with that reactivity gradient, you will control
2 combustion rate.

3 Q. I didn't see anything on the "Summary
4 Highlights" section of your resume referring to
5 generators.

6 Have you worked on any projects or research
7 involving an engine in a generator?

8 MR. STEMLER: Objection; form.

9 A. I would say when we are studying engine,
10 especially from the research perspective, that trying
11 to optimize, let's say, performance, then engine can be
12 used for different applications, but the other type of
13 the engines that I have worked, they are gensets, and
14 those gensets are the ones that are used for the engine
15 generator that can be used.

16 BY MR. FINCH:

17 Q. When you say that -- strike that.

18 There's a bullet point under, "Internal
19 Combustion Engine Experience." It says you "Have
20 tested various dual fuel engines for different
21 applications."

22 Do you see that?

23 A. Yes, I can see.

24 Q. How does the application and engine that's
25 being used for impact engine design?

1 MR. STEMLER: Objection; form.

2 A. I will give you an example. Let's say the
3 amount of the onboard fuel that you have, that will
4 have an impact on the type of the preparations that you
5 consider for the engine. Let's say if -- if it's going
6 to be used for racing, then the metric that you will
7 use for the engine design is different than the case
8 that you will say if it's automotive applications or is
9 a generator in that particular use.

10 BY MR. FINCH:

11 Q. That same bullet point says that, "These
12 include small, less than half liter, to large scale
13 engines (e.g. 15 liter)."

14 Do you see that?

15 A. Yes, I can see.

16 Q. What does "half a liter" refer to in this
17 context?

18 A. In this case, was the research engine that
19 we have capability to test it in all varieties of the
20 operating modes.

21 Q. The question was a little bit different.

22 What is the 0.5 liter measurement referring
23 to in this case? What is it a measurement of?

24 MR. STEMLER: Objection; form.

25 A. When we say, in this case, half a liter,

1 that is referring what we call a "displacement volume."

2 BY MR. FINCH:

3 Q. What is displacement volume?

4 A. If you are familiar with engines, we have a
5 piston that moves from the top dead center to the
6 bottom dead centers, and that will occupy volume. That
7 would be a volume for one cylinder. Depending how many
8 cylinders you have, you multiply them together, and
9 then that can become the total displacement volume of
10 an engine.

11 Q. When you say small engines are less than
12 half a liter, are you referring to the total
13 displacement volume of the engine or a particular
14 cylinder?

15 A. Total volume of the engine.

16 Q. And you say large-scale engines are, for
17 example, 15-liter displacement; is that correct?

18 A. If you pay attention, I mention depending on
19 how many cylinders you have. Then, let's say if I have
20 15-liter engine, then I got 6 of the cylinders, so each
21 of the cylinders would be 15 divided by 6.

22 Q. What is the difference between -- strike
23 that.

24 Are there any differences other than the
25 displacement size between a small and large-scale

1 engine?

2 MR. STEMLER: Objection; form.

3 A. Of course, there are differences between
4 them. An example of that would be the engine RPM that
5 they need to operate with.

6 BY MR. FINCH:

7 Q. What does "RPM" refer to?

8 A. Revolution per minute.

9 Q. What impact does RPM have on engine
10 performance?

11 A. RPM will determine how much time we have for
12 the combustion duration. At higher RPM, then you have
13 less time for combustion duration. At low RPM, you
14 have more time for the combustion to occur.

15 Q. Is the RPM of an engine significant when
16 determining what application the engine will be used
17 for?

18 MR. STEMLER: Objection; form.

19 A. I would say the applications will determine
20 the range of the RPM that you will be dealing with. An
21 example of the low RPM engines could be, like, Marion
22 engines. The example that high RPM engines could be
23 like a race engines, like Formula 1 engines.

24 BY MR. FINCH:

25 Q. You also state that you've "Worked with

1 engines with a carburetor, throttle-body injection,
2 port-fuel injection, direct injection systems, and
3 mixer systems for gaseous fuels."

4 Do you see that?

5 A. Yes.

6 Q. At a high level, what are the differences
7 between the different types of injection systems or
8 mixer systems discussed here?

9 MR. STEMLER: Objection; form.

10 A. It will affect the -- how the mixing of the
11 air and fuel will happen, and also, how precise will be
12 the control of the air/fuel ratio.

13 BY MR. FINCH:

14 Q. What is a mixer system for gaseous fuels?

15 MR. STEMLER: Objection; form.

16 Objection; relevance.

17 A. Do you want me to answer in the context of
18 this patent application, or general, you want to know
19 about the mixing system, what mixer system, what it is?

20 BY MR. FINCH:

21 Q. As a person of ordinary skill in the art,
22 what is your understanding of what a mixer system for
23 gaseous fuels is?

24 A. As the name says, as the place that, let's
25 say, gaseous fuels will come and get mixed with the

1 air.

2 Q. Let's put your resume to the side for now.

3 Show you another document previously marked

4 Exhibit 1005.

5 (Whereupon, Deposition Exhibit 1005
6 was introduced.)

7 A. I'm ready.

8 BY MR. FINCH:

9 Q. Dr. Shahbakhti, you have a binder in front
10 of you; is that correct?

11 A. That is correct.

12 Q. What is in that binder?

13 A. It includes the exhibits of my declaration.

14 Q. Does it include anything other than the
15 exhibits of your declaration?

16 A. No.

17 Q. Are there any notes or notations on the
18 copies of the exhibits from your declaration in your
19 binder?

20 A. I do not see any notes here.

21 Q. You removed several pages from that binder
22 when I handed you Exhibit 1005.

23 What did you remove?

24 A. My declaration.

25 Q. Anything else?

1 A. That's all. And also, these exhibits that
2 you asked me, I took that one out because this one is
3 not stapled so I can easily flip around.

4 Q. Have you seen Exhibit 1005 before?

5 A. Yes, I have seen it before.

6 Q. And what is this document?

7 A. This one is Japanese translations of the
8 exhibits that I called Nakafushi.

9 (Reporter clarification.)

10 A. Nakafushi.

11 BY MR. FINCH:

12 Q. You mentioned that it was a translation from
13 Nakafushi; is that correct?

14 A. That is correct.

15 Q. Did you review the original Japanese version
16 of the Nakafushi reference?

17 A. I looked at it.

18 Q. Do you speak Japanese?

19 A. No. The main things I could check, it was
20 more related to the figures.

21 Q. When you say that you checked that it was
22 more related to the figures, what do you mean?

23 A. I wanted to make sure that the context of
24 the figures are similar to what I had seen in the
25 translation.

1 Q. And were the context of the figures similar
2 to what you saw in the translation?

3 A. The schematics were the same.

4 Q. The title of the invention of Nakafushi is,
5 "Gasoline-LPG Combined Engine."

6 Do you see that?

7 A. Yes, I can see.

8 Q. And what does that mean to you?

9 MR. STEMLER: Objection; form.

10 A. It means if the engine, that it can run with
11 gasoline, and it can also run with the LPG.

12 BY MR. FINCH:

13 Q. Does Nakafushi disclose an application for
14 the engine, the gasoline-LPG combined engine?

15 MR. STEMLER: Objection; form.

16 A. Nakafushi mostly explained the process and
17 the structure of this engine, how it operates. It does
18 not specifically mention application, but from my IC
19 engine background, I can see this engine can be used in
20 a variety of applications.

21 BY MR. FINCH:

22 Q. What are the variety of applications you
23 could see this engine being used in?

24 MR. STEMLER: Objection; form.

25 A. I would say the applications that you will

1 require to -- or have availability of gasoline and LPG,
2 and this engine can run with them.

3 BY MR. FINCH:

4 Q. So it's your testimony that any application
5 that requires gasoline and LPG, the Nakafushi engine
6 would be applicable for it?

7 MR. STEMLER: Objection; form.

8 A. Working in the world of engines for 26
9 years, maybe when we use the word "in all
10 applications," it's hard because we need to be specific
11 kind of knowing exactly if it will be applicable or
12 not. But then for any -- for engine applications that
13 you would require to run with gasoline and LPG, you can
14 use this engine to run it.

15 BY MR. FINCH:

16 Q. Your answer seemed to say two things. I'm
17 going to ask my question again.

18 Is it your testimony that any application
19 that requires gasoline and LPG, the Nakafushi engine
20 would be appropriate for?

21 MR. STEMLER: Objection; form.

22 A. It definitely needs much more information to
23 decide if this is the best -- best engine design for
24 application, so in this case, is using the carburetor
25 system.

1 Going back to what I mentioned earlier, you
2 have a carburetor system, you have a fuel injection
3 system, then it depends on the applications you will
4 decide if this one would be the optimum choice in terms
5 of the budget you have. Those would be the factors
6 that you will consider.

7 BY MR. FINCH:

8 Q. You say you need much more information to
9 decide if this is the best engine design.

10 What more information would you need?

11 MR. STEMLER: Objection; form.

12 A. Going back to what I mentioned earlier,
13 let's say engine RPM as an example that would be a
14 factor.

15 BY MR. FINCH:

16 Q. Are you aware of any other factors that
17 would determine whether or not the engine design
18 disclosed in Nakafushi is appropriate for a particular
19 application?

20 MR. STEMLER: Objection; form.

21 A. It depends on the efficiency level that you
22 are targeting for. That would be another factor.

23 BY MR. FINCH:

24 Q. Are you aware of any other factors?

25 MR. STEMLER: Objection; form.

1 A. Emission factors.

2 BY MR. FINCH:

3 Q. Any other factors?

4 (Reporter clarification.)

5 A. Emission.

6 MR. STEMLER: Objection; form.

7 A. It depends for your application what is
8 important for you. Let's say, if noise is important
9 for you, that's another factor.

10 BY MR. FINCH:

11 Q. Does Nakafushi disclose -- try that
12 again.

13 Does Nakafushi disclose the displacement of
14 the engine described therein?

15 MR. STEMLER: Objection; form.

16 A. I could not find the place that Nakafushi
17 mentions the size of engine, but from my engine
18 background, these configurations can be used on a
19 variety of engine sizes.

20 BY MR. FINCH:

21 Q. Can you turn to page 10 of Exhibit 1005,
22 Figure 1?

23 Do you see Figure 1?

24 A. Yes, I can see it.

25 Q. Is it your opinion that Nakafushi discloses

1 an engine that is operable on gasoline?

2 A. Nakafushi discloses an engine that can
3 operate with gasoline.

4 Q. Using Figure 1 as a guide, if you wanted to
5 operate the engine disclosed by Nakafushi on gasoline,
6 what would you do?

7 MR. STEMLER: Objection; form.

8 A. When you said, "what would you do," you are
9 putting me at what position? What do you mean exactly,
10 what I will do?

11 BY MR. FINCH:

12 Q. You testified earlier that Nakafushi
13 discloses an engine that can operate on gasoline;
14 correct?

15 A. Nakafushi discloses the engines that
16 operates with gasoline, yeah.

17 Q. How would an operator of the engine
18 disclosed in Figure 1 of Nakafushi operate the engine
19 on gasoline?

20 MR. STEMLER: Objection; form.

21 A. Nakafushi does not disclose that -- what the
22 operator is going to do, but from seeing that there is
23 a fuel switches -- switch, at minimum, you expect that
24 the operator will select the fuel type that would like
25 to run the engine.

1 BY MR. FINCH:

2 Q. When you say, "Select the fuel type that
3 would like to run the engine," what does that mean?

4 A. Nakafushi discloses an engine that operate
5 with gasoline and LPG, so in that case, if the person
6 would like to run it with gasoline versus running it
7 with LPG.

8 Q. What position would they have to put the
9 switch in to run it with gasoline?

10 A. In this case, in the schematics of this, we
11 are seeing it in Figure 9, specifically Element 19, it
12 says, "Fuel Switching Switch," and then there you
13 notice that it's mentioned LPG and gasoline, so the
14 selection of these will trigger different parts of the
15 system, so it depends on the -- how the manual switch
16 that's available to the operator connects to this.

17 Q. And what is triggered when the Fuel
18 Switching Switch 19 is in the gasoline position?

19 MR. STEMLER: Objection to form.

20 A. We need to recognize that here, it's
21 including certain aspects of the engine, so in the real
22 engines, what other factors come into place, those
23 are -- would be depending on the POSA's understanding.

24 But here we can notice that, let's say, if
25 it's selecting a switch from 19 to the LPG, then in

1 this example, it's affecting the operation of the case
2 Gasoline Cut Valve 17, but it's disclosing a portion of
3 that operation and the things that need to be done.

4 BY MR. FINCH:

5 Q. I don't think that answered my question at
6 all.

7 My question was, what elements of Nakafushi
8 are triggered when the Fuel Selecting Switch 19 is in
9 the gasoline position?

10 MR. STEMLER: Objection; form.

11 A. From what -- from the -- looking at
12 Figure 1, so the positions of the -- or the selection
13 of the switch will have an impact on these LPG valve
14 and the gasoline valve, and those are the valves that
15 controlling the fuel flow to the carburetor.

16 BY MR. FINCH:

17 Q. Are there any other valves or elements that
18 are impacted?

19 MR. STEMLER: Objection; form.

20 A. The other example would be Valve 23 because
21 we can see it's also connected to the Valve 23.

22 BY MR. FINCH:

23 Q. What is the impact on the gasoline valve
24 when Fuel Switching Switch 19 is in the gasoline
25 position?

1 MR. STEMLER: Objection; form.

2 A. Can you repeat the question again?

3 BY MR. FINCH:

4 Q. You testified earlier that the selection of
5 the switch will have an impact on the LPG valve and the
6 gasoline valve.

7 What impact does Fuel Switching Switch 19
8 have on the gasoline valve when it is in the gasoline
9 position?

10 MR. STEMLER: Objection; form.

11 A. Here is an example that when the LPG is
12 selected, then we would like that gasoline fuel line to
13 be stopped, so in this example, then what it needs to
14 do, it will stop the operations, which means that
15 Valve 17 will block the flow. This would be an
16 example.

17 BY MR. FINCH:

18 Q. What impact does Fuel Switching Switch 19
19 have on the gasoline valve when it is in the gasoline
20 position?

21 MR. STEMLER: Objection; form.

22 A. Here are examples of the actions that will
23 happen by looking at the Switch 19. So when it is in
24 the gasoline positions, we can see that the Valve 23
25 will be activated, which means that it will open to let

1 the fuel go to the carburetor, and also, we see it's
2 connected to the LPG Cut Valve 18, so that valve will
3 be blocked, which means that it will not let the LPG
4 gas to go through because gasoline has been selected.

5 BY MR. FINCH:

6 Q. When Fuel Switching Switch 19 is placed in
7 the gasoline position 19a, it's your understanding that
8 LPG Cut Valve 18 will be closed?

9 MR. STEMLER: Objection; form.

10 A. I expect when the -- for the Fuel Switching
11 19, if it is selected 19a, which is gasoline, that
12 should close LPG Cut Valve 18.

13 BY MR. FINCH:

14 Q. What term would you use to describe the
15 schematic representation of Fuel Switching Switch 19?

16 MR. STEMLER: Objection; form.

17 A. Can you elaborate more? What do you mean by
18 what term?

19 BY MR. FINCH:

20 Q. Would you consider that a diagram or a
21 schematic or an electrical diagram? How would you
22 describe the way that Fuel Switching Switch 19 is
23 presented in Figure 1?

24 MR. STEMLER: Objection; form.

25 A. I would say it presents the elements that

1 goes with what is described in the patent, in this case
2 here. It's trying to illustrate the operations that is
3 done, whether this is, let's say, perfect electric
4 circuit or is a very rough schematic, I would say it
5 serves for what has been mentioned in the actual body
6 of the patent.

7 BY MR. FINCH:

8 Q. When Fuel Switching Switch 19 is in gasoline
9 position 19a, which elements of Figure 1 are receiving
10 power?

11 MR. STEMLER: Objection; form.

12 A. Based on what is shown over here, you expect
13 that when 19a is selected, Valve 23 and Valve 18 will
14 receive power.

15 BY MR. FINCH:

16 Q. Which elements will receive power when Fuel
17 Switching Switch 19 is in LPG position 19b?

18 MR. STEMLER: Objection; form.

19 A. At least when 19 -- when 19b is selected,
20 then at minimum, 17 will receive power.

21 MR. STEMLER: Thomas, whenever you get
22 a second I'd like a short break, too.

23 BY MR. FINCH:

24 Q. Other than Gasoline Cut Valve 17, will any
25 other elements receive power when Fuel Switching

1 Switch 19 is in LPG position 19b?

2 MR. STEMLER: Objection; form.

3 A. This drawing does not disclose other
4 information. What I can see is that when 19b is
5 selected, it will do 17. Whether it will do --
6 (indiscernible) to others from this --

7 (Reporter clarification.)

8 A. Whether there would be other elements, this
9 drawing does not disclose.

10 BY MR. FINCH:

11 Q. Based on the disclosure of Nakafushi as a
12 whole and your understanding as a person of ordinary
13 skill in the art, do you have any understanding of any
14 other elements that would be impacted when Fuel
15 Switching Switch 19 is in LPG position 19b?

16 MR. STEMLER: Objection; form.

17 A. I would say putting myself in the position
18 of the POSA, given this is representing a portion of
19 the engine operation, depending on the design and
20 applications, you will -- a POSA might try to use that
21 one for other elements as well, but the part that is
22 disclosed here is that showing that 19b will give the
23 power to 17.

24 BY MR. FINCH:

25 Q. What other elements might a POSA try to use

1 that switch for?

2 MR. STEMLER: Objection; form.

3 A. It very much depends on the design of the
4 engine and what else is available. Let's say if the
5 engine has ECU, electronic control unit, you can use
6 the signal and then -- because it will affect the modes
7 of operation. So this can also go to the electronic
8 control unit, and the electronic control unit can also
9 control other elements in the system.

10 MR. FINCH: Let's take a short break.

11 (Whereupon, a recess was taken from
12 9:57 a.m. to 10:08 a.m.)

13 BY MR. FINCH:

14 Q. Welcome back, Dr. Shahbakhti.

15 Before we get started, I just -- for the
16 sake of the court reporter, I'm going to do my best to
17 speak a little slower and louder and clearer and ask
18 that you slow down a little bit and enunciate a little
19 bit more as well, hopefully make the day go a little
20 easier for everyone involved.

21 A. Sure.

22 (Discussion off the record.)

23 BY MR. FINCH:

24 Q. Dr. Shahbakhti, turning back to Figure 1 of
25 the Nakafushi reference, there's a label, "Gasoline

1 Tank 11."

2 Do you see that?

3 A. Yes, I can see it.

4 Q. What is your understanding of what Gasoline
5 Tank 11 is referring to?

6 A. As the name says, it's a tank that includes
7 gasoline.

8 Q. When you say "includes gasoline," does it
9 include anything else?

10 MR. STEMLER: Objection; form.

11 A. If it's the engine, it's expected to be
12 gasoline inside, but there are -- I don't know if there
13 are other dust or any other things inside, that part I
14 cannot say, but if it says gasoline tanks, which would
15 be a tank that contains gasoline.

16 BY MR. FINCH:

17 Q. Relevant to our discussion today, you
18 wouldn't expect anything else to be in Gasoline
19 Tank 11?

20 MR. STEMLER: Objection; form.

21 A. In the normal situations, you expect
22 that gasoline tank will contain gasoline. If there
23 would be, I don't know, oil or any other things that
24 is not intended to be there, that's a separate
25 topic.

1 BY MR. FINCH:

2 Q. On the diagram on Figure 1, there are two
3 lines coming up from Gasoline Tank 11.

4 Do you see that?

5 A. Yes, I can see.

6 Q. What is your understanding of what those
7 lines indicate?

8 A. I expect there to be a fuel line.

9 Q. And that fuel line connects to a filter
10 labeled 10.

11 Do you see that?

12 A. Yes, I can see.

13 Q. And then the other side of the filter, is
14 the same fuel line?

15 MR. STEMLER: Objection; form.

16 A. Here, on the other side of the Filter 10, it
17 shows 9, which is fuel pump.

18 BY MR. FINCH:

19 Q. And there's a fuel line connecting Filter 10
20 and Pump 9; correct?

21 MR. STEMLER: Objection; form.

22 A. In this schematic, it shows that the filter
23 is connected to fuel pump.

24 BY MR. FINCH:

25 Q. Is that directly connected, or is there a

1 line in-between?

2 MR. STEMLER: Objection; form.

3 A. In this schematic, there is a space between
4 them, and that shows on there, but this is going back
5 to the question you asked the other time. These are a
6 high-level drawing, but from here, this schematic shows
7 filter is connected to fuel pump.

8 BY MR. FINCH:

9 Q. As a person of ordinary skill in the art,
10 when you look at this figure, would you expect the
11 filter to be directly connected to the fuel pump or
12 would you expect there to be a fuel line in-between
13 them?

14 MR. STEMLER: Objection; form.

15 A. I would say it could be both. You can have
16 some designs that is on the pump, you can have the
17 cases that it's separate.

18 BY MR. FINCH:

19 Q. Based off of Figure 1, you can't tell
20 from the figure which of those cases would be
21 accurate?

22 MR. STEMLER: Objection; form.

23 A. From this high-level image, we cannot -- we
24 can just say that pump is connected to the filter,
25 nothing further.

1 BY MR. FINCH:

2 Q. Figure 1 shows a pump connected to Gasoline
3 Cut Valve 17 as well.

4 Do you see that?

5 A. Yes, I can see that.

6 Q. Can you tell from the image whether there is
7 a fuel line in-between Pump 9 and Gasoline Cut
8 Valve 17?

9 MR. STEMLER: Objection; form.

10 A. It shows they are connected, so the same
11 discussions that we had before. It can be fully
12 connected, or it can be a space between them. All of
13 it is a matter of the design, but they are connected.

14 BY MR. FINCH:

15 Q. But you can't tell from the image whether
16 there's a line or not?

17 MR. STEMLER: Objection; form.

18 A. From the image, I can see that there's a
19 line between the pump to Gasoline Cut Valve 17.

20 BY MR. FINCH:

21 Q. So Figure 1 does disclose a line between
22 Pump 9 and Gasoline Cut Valve 17?

23 MR. STEMLER: Objection; form.

24 A. Figure 1 shows that there are lines going
25 from the fuel pump to Gasoline Cut Valve 17.

1 BY MR. FINCH:

2 Q. When you say "lines," are you referring to
3 actual lines on the drawing, or are you referring to a
4 fuel line between Pump 9 and Gasoline Cut Valve 17?

5 MR. STEMLER: Objection; form.

6 A. Looking at the patent, it doesn't go to the
7 details that when it says a single line or double line,
8 what it means, but a POSA will understand that because
9 it's carrying fuel, so it should be a fuel line going
10 from pump to Gasoline Cut Valve 17.

11 BY MR. FINCH:

12 Q. So what is it about the figure that tells
13 you that that there's a fuel line going from Pump 9 to
14 Gasoline Cut Valve 17, but you don't know if there's a
15 fuel line going from Filter 10 to Pump 9?

16 MR. STEMLER: Objection; form.

17 A. I would say for both of them, we can see
18 that there is -- it is showing the schematics because
19 in this schematic, we can see they are connected.
20 Whether you will have a fuel line or whether they are
21 connected, that would be a matter of the design.

22 BY MR. FINCH:

23 Q. So you can't tell from the figure whether or
24 not there's a fuel line going from Pump 9 to Gasoline
25 Cut Valve 17?

1 MR. STEMLER: Objection; form.

2 A. If I break your questions so then maybe the
3 simple way for your question is asking that, are those
4 two parallel lines connecting, let's say, 10 to 9 or
5 from 9 to 17, are those fuel lines or not? I guess
6 this is your question.

7 I would say from these drawings, it intended
8 to show that they are connected, and if it's the fuel
9 line between them and then -- or if they are directly
10 connected, these parallel lines that they are shown
11 between 9 and 17, it does serve that purpose that shows
12 that they are connected.

13 BY MR. FINCH:

14 Q. And, Dr. Shahbakhti, I'm not trying to ask
15 you a trick question here. I'm just trying to get your
16 understanding of what it is that's taught by Figure 1,
17 and yes-or-no question:

18 Based on the disclosures of Figure 1, does
19 Figure 1 show a fuel line between Filter 10 and Pump 9?

20 MR. STEMLER: Objection; form, asked
21 and answered.

22 A. I believe I answered it. So these lines
23 that we are seeing between these components, they show
24 they are connected, and those can represent fuel lines
25 between them and if it's intended to show that they are

1 connected so they can be on top of each other.

2 BY MR. FINCH:

3 Q. Okay. Figure 1 does not contain enough
4 detail to determine whether or not there is a fuel line
5 connecting Filter 10 and Pump 9; is that correct?

6 MR. STEMLER: Objection; form.

7 A. This figure shows that they are all
8 connected. That filter is connected to the pump and
9 the pump connected to the gasoline cut valve, and then
10 because it's carrying gasoline, so if there's a pipe
11 between them, so it will be considered a fuel line or
12 the gasoline line. If there would be no space, that
13 means they have been connected to each other.

14 BY MR. FINCH:

15 Q. And you can't tell, based off of Figure 1,
16 whether or not there is a pipe between Filter 10 and
17 Pump 9; correct?

18 MR. STEMLER: Objection; form.

19 A. It goes back to what I mentioned. It shows
20 that they are connected, and if you see in the
21 transcript, I said there could be a fuel line between
22 them, or it could be they're just connected to each
23 other.

24 BY MR. FINCH:

25 Q. And based off the disclosures in Figure 1,

1 you don't know which one -- whether which one of those
2 is correct?

3 MR. STEMLER: Objection; form.

4 A. It needs more details in particular saying
5 that -- because there is no disclosure saying that
6 these parallel lines, what exactly -- if they are
7 representing the pipes between them, that disclosure is
8 not in the patent.

9 BY MR. FINCH:

10 Q. What is the purpose of Pump 9?

11 MR. STEMLER: Objection; form.

12 A. The POSA will understand this should be for
13 making sure that the gasoline will go all the way
14 through the pass to go to the -- that has been shown
15 over here, so that means having the right pressure in
16 the -- in this line so the fuel can be transported.

17 BY MR. FINCH:

18 Q. Nakafushi has a structure labeled, "5 Float
19 Chamber."

20 Do you see that?

21 A. Yes, I can see.

22 Q. What is the purpose of a float chamber?

23 MR. STEMLER: Objection; form.

24 A. Referring to Nakafushi patent, paragraph 12,
25 I think it mentions that the "Float chamber 5 is

1 communicated with the gasoline tank 11 by gasoline
2 supply passage 8 via a pump and a filter 10, thereby
3 constituting a gasoline supply means 12" --

4 (Reporter clarification.)

5 A. -- "thereby constituting a gasoline supply
6 means 12 configured to supply the gasoline in the
7 gasoline tank to the carburetor 1 via the float
8 chamber."

9 This is the portion that has been disclosed
10 in this patent for the Float Chamber 5 for the task
11 that is serving -- at least part of the task that is
12 serving.

13 BY MR. FINCH:

14 Q. So your understanding is that the purpose of
15 a float chamber is to communicate with the gasoline
16 tank?

17 MR. STEMLER: Objection; form.

18 A. It will provide gasoline supply to this
19 passage 6 that will be controlled by the 23 valve in
20 order to send it to the carburetor.

21 BY MR. FINCH:

22 Q. Do you have any opinions regarding the
23 purpose of Chamber 5 other than the text of the
24 Nakafushi patent?

25 MR. STEMLER: Objection; form.

1 A. Going back to what I mentioned that this is
2 a very, say to some extent, general schematic, what I
3 can understand putting myself in the position of the
4 POSA, you would like to make sure that there is enough
5 fuel in these Float Chamber 5 so then when we are
6 switching to gasoline operating mode, so then by
7 Valve 23, we can control the supply of gasoline to it,
8 by which I mean to the carburetor.

9 BY MR. FINCH:

10 Q. You mentioned Valve 23.

11 What is the purpose of Control Valve 23?

12 MR. STEMLER: Objection; form.

13 A. Reading from the patent, it says, "Control
14 valve 23 is connected to a gasoline contact point 19a
15 of the fuel switching switch 19, so that when the fuel
16 switching switch 19 is switched to the gasoline
17 contact point 19a side, the control valve 23 is
18 turned ON by outputting a cut signal to open the air
19 bleed passage 25 to supply air to the fuel flow
20 passage 6 to allow gasoline to be sucked from the
21 float chamber 5 to Venturi portions 2a and 2b,
22 whereas when fuel switching switch 19 is switched to
23 the LPG contact from 19b side, the control valve 23 is
24 turned OFF to close the air bleed passage 25 by
25 stopping the output of the cut signal to block supply

1 of the air to the fuel outflow passage 6 to block
2 gasoline from being sucked out of the gasoline
3 chamber 5 to the Venturi portions 2a and 2b."

4 BY MR. FINCH:

5 Q. Do you have any other opinions regarding the
6 purpose of Control Valve 23?

7 MR. STEMLER: Objection; form.

8 A. I did not investigate it from that
9 perspective to provide other opinions rather than
10 seeing what this patent is trying to show.

11 BY MR. FINCH:

12 Q. Yes or no, other than the passage from the
13 patent that you read previously, do you have any other
14 opinions regarding the purpose of Control Valve 23?

15 MR. STEMLER: Objection; form, asked
16 and answered.

17 A. I would say Valve 23, it serves the purpose
18 that it mentions over here. Whether a POSA can use
19 this valve for other cases, it can come as part of the
20 design and also the -- what would be important for that
21 POSA to look into.

22 BY MR. FINCH:

23 Q. Sitting here today, do you have any other
24 opinions regarding the purpose of Control Valve 23?

25 A. I have not formed any other --

1 MR. STEMLER: Objection; form, asked
2 and answered.

3 BY MR. FINCH:

4 Q. Do you have an understanding of the
5 structure of Control Valve 23?

6 MR. STEMLER: Objection; form.

7 A. So to repeat your question, you want to know
8 about my opinion about the structure of the Valve 23.

9 Is that the question?

10 BY MR. FINCH:

11 Q. Let me -- let me restate the question.

12 Does Nakafushi disclose the structure of
13 Control Valve 23?

14 MR. STEMLER: Objection; form.

15 A. Nakafushi doesn't go to the details of
16 explaining the structure of the Valve 23 in the text,
17 but as a POSA, when you are looking at this high-level
18 schematic, you have the understanding that it's the
19 electrically controlled mechanical valve, and it will
20 have this mechanical portions that it will go and then
21 stop the flow passage from 6 to the Venturi 2a and b --

22 (Reporter clarification.)

23 A. To the Venturi 2a and 2b, so from here, you
24 can see that it has -- if we call it plunger that it
25 mechanically moves forward and backward, and I also see

1 that there are these electrical coil, and that is
2 connected electrically to the Switch 19. So from that,
3 I can think of this valve being the solenoid valve,
4 which means that you have these coil that is
5 electrically controlled, and then you have this
6 mechanical movement that is caused by that plunger.
7 This is what I can conclude from looking at the -- this
8 schematic.

9 BY MR. FINCH:

10 Q. When you say "electrical coil," what are you
11 referring to?

12 MR. STEMLER: Objection; form.

13 A. Do you see those crosses (showing)? There
14 are -- and then, the one like this (indicating), those
15 are typically how we show it for the coils.

16 BY MR. FINCH:

17 Q. Can you describe verbally what you're
18 referring to, please?

19 A. Sure. To make it easier for you to notice,
20 if you look at the Olmr patent and then if you see
21 there are two parts over here that is showing with the
22 cross, this ones here (indicating). We have exactly
23 the same structure here and a POA will understand
24 these are these coils that we use typically in the
25 solenoid valves.

1 Q. So you understand that Control Valve 23 is a
2 solenoid valve because it depicts a schematic that is
3 similar to that shown in the Olmr patent; is that
4 correct?

5 MR. STEMLER: Objection; form.

6 A. I would say, yeah, using my own knowledge as
7 a POSA, I have seen it in many cases whenever we want
8 to show the solenoid valves, I have seen this similar
9 schematic being shown.

10 BY MR. FINCH:

11 Q. Is there anything else about Control
12 Valve 23 as depicted on Figure 1 that provides you with
13 knowledge regarding the structure of Control Valve 23?

14 MR. STEMLER: Objection; form.

15 A. The other thing that I can think of,
16 because it's connected to the -- these panels that it
17 should have the structure so it can be attached to
18 this structure.

19 (Reporter clarification.)

20 A. To these intake passage.

21 BY MR. FINCH:

22 Q. Figure 1 also depicts LPG Cylinder 16.
23 Do you see that?

24 A. Yes, I can see.

25 Q. What is your understanding of what LPG

1 Cylinder 16 refers to?

2 A. It's similar to the discussion we had for
3 that gasoline tank. So this is a cylinder that
4 contains LPG.

5 Q. What is your understanding of what LPG is?

6 A. LPG stands for liquefied petroleum gas.

7 Q. I think you testified earlier that propane
8 was an example of LPG; is that correct?

9 A. That is correct.

10 Q. Are there other examples of LPG?

11 A. Typically, if you remember the discussions
12 we had earlier, I mentioned that it's not pure propane
13 when it comes to LPG. So you would have a high
14 percentage being propane, but then you can have other
15 gases, like butane or isobutane, and that would be --
16 this combination would be LPG.

17 Q. Is the combination always the same?

18 MR. STEMLER: Objection; form.

19 A. You don't expect the combination to be
20 exactly always the same. It depends on the
21 manufacturer, and then what you will be knowing that
22 your engine has been designed for.

23 So you will get the fuel, it says that how
24 much percentage is propane, how much percentage are
25 other gases.

1 BY MR. FINCH:

2 Q. Does LPG Cylinder 16 store liquid propane or
3 gaseous propane?

4 MR. STEMLER: Objection; form.

5 A. I would say it contains LPG, and LPG in the
6 cylinder would be two-phase. It will be in gas phase
7 and also liquid phase.

8 BY MR. FINCH:

9 Q. Figure 1 also depicts Vaporizer 14.
10 Do you see that?

11 A. Yes, I can see.

12 Q. What is your understanding as to the purpose
13 of Vaporizer 14?

14 A. I would say a POSA understanding here for
15 Vaporizer 14 will be that to make sure that what goes
16 beyond passing the vaporizer, it will be all in the
17 gaseous state. So if there is any, let's say, liquid
18 left through this passage before 14, so the idea about
19 14 vaporizer is that to make sure that after whatever
20 is now going to 13 is in the gaseous state.

21 Q. Is Vaporizer 14 -- do you have an
22 understanding based on the disclosure of Nakafushi as
23 to the structure of Vaporizer 14?

24 MR. STEMLER: Objection; form.

25 A. Nakafushi does not disclose details about

1 the structure of Vaporizer 14.

2 BY MR. FINCH:

3 Q. Do you have an understanding as to whether
4 Vaporizer 14 is a powered structure?

5 MR. STEMLER: Objection; form.

6 A. Going back to the discussions that we had
7 before, that this is a high-level image from this
8 schematic, there's not enough information to make that
9 call.

10 MR. FINCH: Turn to Exhibit 1008.

11 (Whereupon, Deposition Exhibit 1008
12 was introduced.)

13 A. I have the exhibit.

14 BY MR. FINCH:

15 Q. Have you seen this document before?

16 A. Yes.

17 Q. What is your understanding of what
18 Exhibit 1008 is?

19 A. As the title says, it is a fuel system for
20 internal combustion engines.

21 Q. Do you have an understanding of the exhibit
22 application for the engines disclosed in Exhibit 1008?

23 MR. STEMLER: Objection; form.

24 A. From reading these exhibits, it's intended
25 to be general, so it is intended for internal

1 combustion engine, and I can see, for example, in
2 line 30, on the first page, on the first column, it
3 says -- it's mentioned the objective -- "The object of
4 the invention is to provide the fuel system in which
5 the normal liquid fuel supply and carburetor therefor
6 is combined with a gaseous fuel supply and a mixer
7 therefor, the two fuel supplies being used in
8 alteration to each other."

9 And I also noticed it has -- not in the
10 claim language, but in the body of it, it mentions
11 about automobiles and the like, mentioned over there,
12 but a POSA will understand this is describing a fuel
13 system for a dual fuel engines, and then it can be used
14 for a variety of applications, even generator,
15 vehicles, and others.

16 BY MR. FINCH:

17 Q. What is it about the disclosure of
18 Exhibit 1008 that leads you to the understanding that
19 the fuel system is appropriate for use with the
20 generator?

21 MR. STEMLER: Objection; form.

22 A. I'm using my knowledge as a POSA, and then
23 knowing engines for many years, and then also
24 understanding the needs for the generator, I can see
25 here we have two fuel source, and then we have the

1 system to control that fuel passage that we have for
2 each of them, and it is a normal engine, so I have no
3 reason not to believe that this cannot be used for
4 generator.

5 BY MR. FINCH:

6 Q. So because it doesn't say it can't be used
7 for a generator, your opinion is that it could be?

8 MR. STEMLER: Objection; form.

9 A. As an expert in the IC engines, I would say
10 it can be used for the generator.

11 BY MR. FINCH:

12 Q. What is it specifically about the exhibit
13 that leads you to that understanding?

14 MR. STEMLER: Objection; form.

15 A. I would say the key element that I need,
16 it's there. I can see intake manifold, exhaust
17 manifold, I see carburetor, I see gasoline fuel tank, I
18 see the gaseous fuel tank, I see throttle.

19 Using my knowledge as a POSA familiar with
20 engines, having these elements I would say it will work
21 for a generator.

22 BY MR. FINCH:

23 Q. So any engine having those elements would
24 work for a generator?

25 MR. STEMLER: Objection; form.

1 A. I would say if I'm looking for a dual-fuel
2 engine, then these would be some of the elements that
3 it can making dual-fuel engines, but of course, here is
4 a high level, and then I will need other components to
5 make that engine work.

6 BY MR. FINCH:

7 Q. And those other components aren't disclosed
8 in Exhibit 1008?

9 MR. STEMLER: Objection; form.

10 A. Going back to what I mentioned earlier, this
11 is intended for only the fuelling system of the --
12 these IC engine, so for IC engines to operate, you have
13 so many other components that need to come together to
14 make IC engine work.

15 BY MR. FINCH:

16 Q. What other components are needed?

17 MR. STEMLER: Objection; form.

18 A. As an example, if it's a spark ignition
19 engines, you will need to have ignition system.

20 BY MR. FINCH:

21 Q. Is there any ignition system disclosed here?

22 A. Going back to what I mentioned, because the
23 purpose of this document is talking about the fueling
24 system. It doesn't discuss about how the combustion
25 happens.

1 Q. You see Numeral 15 on Figure 1 of
2 Exhibit 1008?

3 A. Yes, I can see.

4 Q. Do you have an understanding of what
5 Numeral 15 refers to?

6 A. It is the liquid fuel supply tank.

7 Q. Do you have an understanding of what the
8 liquid fuel supply tank is in Exhibit 1008?

9 MR. STEMLER: Objection; form.

10 A. So it's a liquid fuel supply that is
11 connecting to the pipes that it will supply a liquid
12 fuel to this engine.

13 BY MR. FINCH:

14 Q. Does Exhibit 1008 disclose what the liquid
15 fuel in Liquid Fuel Supply 15 is?

16 A. Looking at the patent on page 1, line 54, in
17 the first column says, "Figure 1 is the diagrammatic
18 view indicating the various elements of both the liquid
19 and gaseous fuel supplies in proper relation to an
20 automobile engine," and in this example that is
21 illustrated here, a POSA will understand the type of
22 fuels can be used for automobile engines. An example
23 can be gasoline as a liquid fuel.

24 Q. Does Exhibit 1008 disclose using gasoline as
25 a liquid fuel?

1 A. It mentioned fuel supplies in proper
2 relation to an automobile engine, so by itself, it
3 doesn't say exactly what's the liquid fuel, but a POA
4 will understand the type of fuel that can be run by
5 automobile engines can be gasoline, as an example.

6 Q. Are there other liquid fuels that could be
7 run by automobile engines?

8 MR. STEMLER: Objection; form.

9 A. Yes. If it's -- we are looking at the
10 liquid form, diesel fuel can also be used.

11 BY MR. FINCH:

12 Q. Are there other liquid fuels that can be run
13 by automobile engines?

14 MR. STEMLER: Objection; form.

15 A. I just mentioned you can use like a diesel
16 fuel as an another example.

17 BY MR. FINCH:

18 Q. Other than gasoline and diesel, are there
19 other liquid fuels that can be run by automobile
20 engines?

21 MR. STEMLER: Objection; form.

22 A. Other examples can be like a biodiesel
23 fuel.

24 (Reporter clarification.)

25 A. Biodiesel fuel.

1 BY MR. FINCH:

2 Q. Are you aware of any other liquid fuels that
3 can be used by an automobile engine?

4 MR. STEMLER: Objection; form.

5 A. I would say especially in the light-duty
6 sector, gasoline is the most prevalent, then diesel.
7 Other fuels, they are used in a very small portion of
8 the market, like the example I mentioned, like a
9 biodiesel.

10 Any other fuels, you can have blend of
11 gasoline and ethanol. That's also the other type of
12 fuels that can be used and can have a small percentage
13 of ethanol.

14 BY MR. FINCH:

15 Q. Exhibit 1008 was filed March 30, 1931;
16 correct?

17 MR. STEMLER: Objection; form.

18 A. On the first page, it says, "Application
19 March 30, 1931."

20 BY MR. FINCH:

21 Q. Do you have an understanding of what liquid
22 fuels were used for automobiles in 1931?

23 MR. STEMLER: Objection; form.

24 A. I would say a prime example would be
25 gasoline.

1 BY MR. FINCH:

2 Q. Are you aware of any other fuels that were
3 used for -- liquid fuels that were used for automobile
4 engines in 1931?

5 MR. STEMLER: Objection; form.

6 A. Diesel fuel.

7 BY MR. FINCH:

8 Q. What is the basis for your understanding of
9 fuel source usage in 1931?

10 MR. STEMLER: Objection; form.

11 A. You know, I teach IC engines, and in my
12 course at IC engines, we talk about the history of
13 engines as well, and this information is available. So
14 a POSA will know about this information.

15 BY MR. FINCH:

16 Q. Okay. So your understanding is that a
17 person of ordinary skill in the art would have had
18 knowledge of fuel source usage in 1931?

19 MR. STEMLER: Objection; form.

20 A. The information is available. If you
21 are looking at this case, let's say 2015, knowing
22 what was the type of engines, let's say, in 1931 and
23 the type of fuels being available, that information
24 is available -- should have been available to the
25 POSA.

1 BY MR. FINCH:

2 Q. When you say that information is available,
3 is it your understanding that a person of ordinary
4 skill in the art would have had knowledge of all
5 information that's available?

6 MR. STEMLER: Objection; form.

7 A. You changed my words to saying "all
8 information." I would say that knowing how the engines
9 in this example, let's say in 1930s, how it was
10 operating, that information was available to know how
11 that engine was operating.

12 BY MR. FINCH:

13 Q. Are you aware of any guides or reference
14 materials that list fuel types for automobiles in 1931?

15 MR. STEMLER: Objection; form.

16 A. At minimum, a POSA will have access to those
17 patents that was available, and IC engines is a very
18 mature technology, even in 1931, it's already past more
19 than 40 years -- more than 40 years of IC engine
20 invention. There was a lot of information through the
21 patents, at minimum, available for a POSA.

22 BY MR. FINCH:

23 Q. Are you aware of any patents that list or
24 identify fuel types for automobiles in 1931?

25 MR. STEMLER: Objection; form,

1 relevance.

2 A. Given I teach IC engines, then I have looked
3 into the material related to type of fuels being used
4 in -- even earlier than 1930s.

5 BY MR. FINCH:

6 Q. Sitting here today, can you identify any
7 patents that list or identify fuel types for
8 automobiles in 1931?

9 MR. STEMLER: Objection; form,
10 relevance.

11 A. I cannot say the exact number, but I have
12 reviewed them. Even there are books in that domain.

13 BY MR. FINCH:

14 Q. Sitting here today, can you identify a
15 single book, reference, guide, or patent that would
16 identify fuel types used in automobiles in 1931?

17 MR. STEMLER: Objection; form,
18 relevance.

19 A. I cannot say the exact date, but I think
20 even I use as one of the exhibits in the other IPR, a
21 book that was 1909, if I'm not making mistake. It was
22 one of the exhibits.

23 BY MR. FINCH:

24 Q. When you say "the other IPR," what are you
25 referring to?

1 A. My understanding is that there are -- there
2 were four IPRs that I was -- acquired as an expert, and
3 this is one of those four.

4 Q. When you say "four IPRs," you mean on behalf
5 of Generac?

6 A. Yes, in the cases that involve, it was -- I
7 was acquired by Ice Miller, and Ice Miller was
8 representing the Midwestern Equipment, so at that time,
9 I looked -- also have included one book as an example.

10 Q. It's your opinion that evidence from other
11 IPRs is relevant to this patent?

12 MR. STEMLER: Objection; form.

13 A. You asked me if there were informations
14 available prior to 1930s, and I said that those are
15 informations being available. I would say for this --
16 the purpose of this IPR, the exhibits that we have
17 included will address the needs.

18 BY MR. FINCH:

19 Q. Sitting here today, you're not able to
20 identify a single book, reference, guide, or patent
21 that would list fuel sources used in automobiles in
22 1931?

23 MR. STEMLER: Objection; form.

24 A. I believe I answered that one. I mentioned
25 that I have reviewed books related to that topic, even

1 I have mentioned a book as an exhibit before. I think
2 the book was called Internal Combustion Engines, so I
3 am definitely aware of those books that I mentioned.
4 But being -- if you mean knowing the exact titles and
5 then, let's say, who was the author, that type of
6 information, I don't have it off of my mind, no.

7 BY MR. FINCH:

8 Q. Turning back to Figure 1 of Exhibit 1008, do
9 you know what numeral 12 refers to?

10 MR. STEMLER: And Thomas, when you get
11 another good spot to break, if we could take a short
12 one, that will be great.

13 MR. FINCH: A few more minutes.

14 MR. STEMLER: Sounds good.

15 A. All right. It's a fuel line that is
16 connecting the fuel source -- Liquid Fuel Source 15 to
17 these -- I believe this is the -- it's going to get
18 connected to these Flow Chamber 8.

19 BY MR. FINCH:

20 Q. And what is the purpose of the fuel line
21 numbered 12?

22 A. It's to supply the liquid fuel all the way
23 going to -- as you see it in Figure 2, to supply the
24 liquid fuel going to the -- in this case it's showing
25 this Flow Chamber 8.

1 Q. And Exhibit 1008 disclose the structure of
2 Fuel Line 12?

3 MR. STEMLER: Objection; form.

4 A. It's a high-level image, and it does
5 not disclose that the -- what the structure of
6 that pipe, but we can see that there is a
7 connection at -- when it's connected to 15, and
8 there is also connection when it is connected, in
9 this case, to the body 11. So there is this feeding
10 to make sure that it can connect to the Fuel Source 15
11 and then, the other body that is shown in Figure 2 as
12 11.

13 BY MR. FINCH:

14 Q. And what does 11 refer to?

15 A. I would consider 11 as the entrance to the
16 carburetor for the liquid fuel.

17 Q. And what does Exhibit 1008 refer to 11 as?

18 A. I quickly looked into the text. I couldn't
19 see the exact number, 11, but a POSA will understand
20 that's this part of the fixture that 12 will get
21 connected, and then given this is where the fuel is
22 come, that's why I called it the entrance of the liquid
23 fuel to the carburetor.

24 MR. FINCH: Let's go ahead and take a
25 short break.

1 (Whereupon, a recess was taken
2 from 11:17 a.m. to 11:31 a.m.)

3 BY MR. FINCH:

4 Q. Welcome back.

5 A. Thank you.

6 Q. Looking again at Figure 1 of Exhibit 1008,
7 looking at Figure 2 of Exhibit 1008, numeral 8.

8 Does that refer to a float bowl or a float
9 chamber?

10 MR. STEMLER: Objection; form.

11 A. The patent uses the terminology Flow
12 Chamber 8.

13 BY MR. FINCH:

14 Q. And looking back at Figure 2, there's a
15 structure on the top of Float Chamber 8.

16 Do you have any understanding as to what
17 that structure is?

18 MR. STEMLER: Objection; form.

19 A. Are you referring to Number 9, or you are
20 referring general -- because you said in this Float
21 Chamber 8, on top of it -- are you referring to this
22 Number 9, or the whole picture?

23 BY MR. FINCH:

24 Q. There is an unlabeled structure depicted at
25 the top of Float Chamber 8.

1 Do you have any understanding as to what
2 that structure is?

3 MR. STEMLER: Objection; form.

4 A. I would say, at minimum, it includes the
5 Float Chamber 8, and it should also have elements that
6 should be relevant to the -- that Item Number 9.

7 BY MR. FINCH:

8 Q. When you say, "It should have elements that
9 should be relevant to the Item Number 9," what are you
10 referring to?

11 MR. STEMLER: Objection; form.

12 A. Reading from the patent on the first page,
13 Column 2, it's lines 94. It says that, "A float
14 chamber being provided with a float operated needle
15 valve 9 which obstruct the entrance of fuel into the
16 chamber 8 by closing off the passage 10 communicating
17 with an inlet 11 to which the fuel supply 12 may be
18 connected."

19 So if you notice in what I wrote -- sorry,
20 what I read, it says a float-operated needle valve.
21 So just because this one has been mentioned there,
22 so then my understanding would be that Number 9 is
23 a needle valve, and is float-operated. So there
24 should be some element to support that float
25 operation.

1 BY MR. FINCH:

2 Q. When you say "float-operated needle valve,"
3 what does that mean?

4 MR. STEMLER: Objection; form.

5 A. The patent doesn't disclose details of it,
6 but a POSA will understand that the operation of this 9
7 should be related to the float, that it would be inside
8 this bowl, and a typical understanding is that you
9 would like to ensure that there would be enough supply
10 of the fuel in this Bowl 8.

11 BY MR. FINCH:

12 Q. Is the term "float-operated needle valve"
13 commonly used in the combustion engine field?

14 MR. STEMLER: Objection; form.

15 A. I would say a POSA will have an
16 understanding that a float-operated valve, a general
17 understanding that how it would work, it should be
18 linked to the movement of the float.

19 BY MR. FINCH:

20 Q. Is the term "float-operated needle valve"
21 commonly used in the combustion engine field?

22 MR. STEMLER: Objection; form.

23 A. I'm not sure if this combination with all
24 elements in what you mentioned, "float-operated needle
25 valve," have been used, but I would expect that the

1 term "float-operated valve" is known in the IC engine
2 community, but then "needle valve" is mostly here -- is
3 specifying the type of the valve we have.

4 BY MR. FINCH:

5 Q. Prior to reviewing Exhibit 1008, had you
6 ever heard the term "float-operated needle valve"
7 before?

8 MR. STEMLER: Objection; form.

9 A. I read so many books and articles related to
10 the IC engines, it's hard for me to say that if I read
11 the same term with all these four words before or not,
12 but I would say a "float-operated valve," for sure, but
13 then "float-operated needle valve," that specific word
14 "needle," I cannot recall because it depends on what I
15 have read in many books, and also the articles and many
16 other things related to IC engine.

17 BY MR. FINCH:

18 Q. Can you recall an instance, specific
19 instance, where you've seen, used, heard, or read the
20 term "float-operated needle valve" prior to reviewing
21 Exhibit 1008?

22 MR. STEMLER: Objection; form.
23 Objection; relevance.

24 A. This is a memory test. Yeah, it's hard --
25 at this time, I cannot remember, but it's possible I

1 have seen it before, but at this time, because if you
2 wanted to then tell me, "Where did you see it," then I
3 don't remember those details.

4 BY MR. FINCH:

5 Q. What is a needle valve?

6 MR. STEMLER: Objection; form.

7 A. I would say it's a type of valve that it
8 includes the mechanical movement, and then you can have
9 a variety of them, but in this schematic, you can see
10 illustration of the tip of the -- an example of the
11 needle -- needle valve.

12 BY MR. FINCH:

13 Q. So your understanding of a needle valve is
14 that it's a type of valve that includes mechanical
15 movement; is that correct?

16 MR. STEMLER: Objection; form.

17 A. I'm looking at the needle valve that
18 illustrated in this Figure 2, then yes, is the type of
19 the valve that is obstructing the, you know, flow that
20 it would want to go through the passage.

21 BY MR. FINCH:

22 Q. A needle valve is a specific type of valve;
23 correct?

24 MR. STEMLER: Objection; form.

25 A. There are varieties of the valve, and needle

1 valve is a type of -- is one of those types, and my
2 understanding is that it should be relevant to the tip
3 of the valve. That's why the term "needle" is being
4 used.

5 BY MR. FINCH:

6 Q. What is your understanding of what the
7 characteristics of a needle valve are?

8 MR. STEMLER: Objection; form.

9 A. I have not investigated all those details
10 about, let's say, different elements of needle valves
11 and then where is the valve seat, what are the
12 different shapes you can have for the tip of it. I
13 have not really investigated that one in preparation
14 for here.

15 BY MR. FINCH:

16 Q. Sitting here today, what is your
17 understanding of the characteristics of a needle valve?

18 MR. STEMLER: Objection to form.

19 A. In the context of this patent, I would
20 consider is a valve that it's moving vertically up and
21 down, and it will stop or let the flow going through
22 the -- this Passage 10 that is depicted in Figure 2.

23 BY MR. FINCH:

24 Q. Do you have any other understanding of what
25 a needle valve is?

1 MR. STEMLER: Objection; form, asked
2 and answered.

3 A. From the image you can see, it has
4 definitely a stem, and it also have the tip, and then
5 it will also need to have an actuation system.

6 BY MR. FINCH:

7 Q. Do you have any other understanding of what
8 constitutes a needle valve?

9 MR. STEMLER: Objection; form.

10 A. I believe I answered that one before, that I
11 mentioned that for the details about the needle valve,
12 and all the elements, and I have not studied them in
13 preparation for this deposition.

14 BY MR. FINCH:

15 Q. Figure 1 also includes Numeral 16.

16 Do you have an understanding of what
17 Numeral 16 refers to?

18 A. So 16 is a fuel tank.

19 Q. Does Exhibit 1008 disclose what type of fuel
20 is in Fuel Tank 16?

21 A. So I read from the patent, page 2,
22 Column 1. It says, "This system comprising a fuel
23 supply tank 16 in which normally gaseous fuel is
24 compressed and thereby maintained in liquified
25 condition."

1 Q. What does "normally gaseous fuel" mean?

2 MR. STEMLER: Objection; form.

3 A. Here, it doesn't specify that, but a POSA
4 will understand should be -- when we are looking at
5 the, let's say, ambient temperature and the pressure,
6 it should be in a gas form.

7 BY MR. FINCH:

8 Q. When you say, "Ambient temperature and
9 pressure," what does that mean?

10 MR. STEMLER: Objection; form.

11 A. It means that the typical temperature you
12 have in the ambient and the typical pressure that you
13 have in the ambient, so it would be in the range of
14 atmospheric pressure and the typical range of ambient
15 temperature.

16 BY MR. FINCH:

17 Q. Do you have an understanding as to what
18 Exhibit 1008 was referring to as the typical ambient
19 pressure and typical ambient temperature?

20 MR. STEMLER: Objection; form.

21 A. I would say the closest I can see, you're
22 referring to, let's say, the air supply, so let's say
23 when that air that is supplied is representing the
24 conditions of the ambient in terms of temperature and
25 pressure --

1 (Reporter clarification.)

2 A. Pressure and temperature of the gas coming
3 to the engine.

4 BY MR. FINCH:

5 Q. So it's your understanding that when
6 Exhibit 1008 refers to a normally gaseous fuel, it's
7 referring to a fuel that is gaseous at the temperature
8 and pressure found in the air supply?

9 MR. STEMLER: Objection; form.

10 A. No, I didn't mean that one. Basically, when
11 it says -- my understanding is that when it says
12 "normally gas," which means that in the standard
13 ambient conditions, that can be represented by those
14 supply air, then if that gas goes in those temperature
15 and pressure, it will be in the state of gas. It
16 doesn't mean that this gas will not be in the state of
17 gas in other conditions, but at the conditions that is
18 related to the ambient temperature and pressure, it
19 will be in the form of gas.

20 BY MR. FINCH:

21 Q. As a person of ordinary skill in the art,
22 what temperature is ambient temperature?

23 MR. STEMLER: Objection; form.

24 A. Ambient temperature will be varying. It
25 can be the rate of temperature that exceeds, let's

1 say, an engine -- a generator will operate, it can
2 be 10 degrees heat, 20 degrees heat. Those are an
3 example of the ambient. As the name says, the ambient
4 temperatures. This is the typical temperature that we
5 can have in ambient depending on the season that will
6 be operating.

7 Typically, when we are referring to those,
8 how we will consider the standard conditions, and those
9 would be more like, let's say, 25 degrees heat and
10 1 atmospheric pressure.

11 BY MR. FINCH:

12 Q. So a fuel is a normally gaseous fuel if it's
13 gaseous at 25 degrees Celsius and 1 atmospheric
14 pressure?

15 MR. STEMLER: Objection; form.

16 A. This goes back to what I mentioned. In
17 order for that gas to be in the gaseous state, it
18 doesn't have to be in that, let's say, a standard
19 temperature and pressure I mentioned.

20 If it's in that standard temperature and
21 pressure, yes, of course, it would be gas, but then
22 when it goes to other states, we will need to look at
23 the -- what we call it property diagram of the gas in
24 order to see that at what temperature and pressure it
25 will stay in the state of gas.

1 BY MR. FINCH:

2 Q. 1008 discloses a system employing a normally
3 gaseous fuel; correct?

4 MR. STEMLER: Objection; form.

5 A. The system says that the fuel supply system
6 employing a normally gaseous fuel, which means that is
7 using the type of gas that at that normal discussions
8 that you and I had discussions about that one, in those
9 conditions, it would be gaseous.

10 BY MR. FINCH:

11 Q. And those conditions are 25 degrees Celsius
12 and 1 atmospheric pressure?

13 MR. STEMLER: Objection; form.

14 A. In that state to be specified, but I would
15 say as an example of the temperature and pressure, it
16 would be -- gaseous would be like 25 degrees C and
17 1 atmospheric pressure, but you can have a large range
18 of temperature and pressure that it will be all in the
19 state of gas.

20 BY MR. FINCH:

21 Q. I have a fuel source, and I'm trying to
22 determine whether or not it's a normally gaseous fuel
23 as contemplated by Exhibit 1008.

24 What is the test I should employ to
25 determine whether or not that fuel is a normally

1 gaseous fuel?

2 MR. STEMLER: Objection; form.

3 A. For you to know the state of the -- that gas
4 to be called "gaseous fuel," you need to look into the
5 property diagram of that gas to know if the fuel, let's
6 say in the Tank 16, is a gas or not. So then you would
7 look into the property table.

8 And then here, when it's describing the type
9 of the gas, it's saying that is a normally gaseous
10 fuel, which means that that fuel at the ambient or
11 those normal conditions will be gas.

12 BY MR. FINCH:

13 Q. And your testimony regarding normal
14 conditions or ambient conditions is that that is
15 25 degrees Celsius and 1 atmospheric pressure;
16 correct?

17 MR. STEMLER: Objection; form.

18 A. I will need to look into it to make sure
19 that it will be precise, but then I would expect at the
20 temperature of the 25 degrees C and 1 atmospheric
21 pressure, the type of the gases that we will be running
22 with this IC engine, it will be in the state of gas.

23 But I guess I repeat what I mentioned is
24 that there would be a large variety of conditions that
25 what we have in 16, it would be still in the state of

1 gas.

2 BY MR. FINCH:

3 Q. So if that was fuel at 1 atmospheric
4 pressure that was gaseous at 26 degrees Celsius but
5 liquid at 25 degrees Celsius, would that be a normally
6 gaseous fuel as contemplated by Exhibit 1008?

7 MR. STEMLER: Objection; form.

8 A. Can you repeat the question?

9 BY MR. FINCH:

10 Q. If you have a fuel where at 1 atmospheric
11 pressure it is gaseous at 26 degrees Celsius but liquid
12 at 25 degrees Celsius, would that be considered a
13 normally gaseous fuel as contemplated by Exhibit 1008?

14 A. Just make sure I understand it correctly.

15 So we have a fuel that we are talking about
16 all atmospheric conditions, and then one of them is
17 25 degrees C, the other one is 26 degrees C, and
18 you mentioning is that that hypothetical gas is at
19 25 degrees C is gas, at 26, it's not gas.

20 Is that what you mean?

21 Q. The question was, you have a hypothetical
22 fuel or at 1 atmospheric pressure at 25 degrees Celsius
23 it is a liquid fuel, but at 26 degrees Celsius, it is a
24 gaseous fuel.

25 My question is, is that fuel considered a

1 normally gaseous fuel by Exhibit 1008?

2 MR. STEMLER: Objection; form. And
3 also, objection; scope.

4 Counsel, we're here today to allow
5 Dr. Shahbakhti to testify regarding his declaration
6 that was submitted in this IPR. At no point in that
7 declaration did Dr. Shahbakhti discuss or consider any
8 fuel that he describes as being liquid at 25 degrees
9 Celsius and gaseous at 26 degrees Celsius.

10 I'd ask that you direct us to any portion of
11 Dr. Shahbakhti's declaration that this line of
12 questioning is relevant to.

13 MR. FINCH: And Counsel, I'd have to
14 ask you to not engage in speaking objections which are
15 prohibited under the Trial Practice Guide, and I am not
16 aware of any authority requiring me to identify a
17 specific portion of the declaration.

18 BY MR. FINCH:

19 Q. Regardless, Dr. Shahbakhti, do you believe
20 it is relevant whether or not a particular fuel is
21 normally gaseous fuel as contemplated by Exhibit 1008?

22 MR. STEMLER: Same objection.

23 A. I would say when I'm looking at this
24 Figure 1 in these exhibits, what is obvious that when
25 I'm looking at Tank 15 is representing a liquid fuel,

1 and then when I'm looking at Tank 16 is representing
2 the gaseous fuel, and the line associated with each of
3 them is representing the type of fuel that they have
4 here.

5 So for 16, because you remember, earlier, I
6 mentioned -- it mentioned in the context of the
7 automobile applications. So the type of the gaseous
8 fuel that we will have here -- so in 16, we will have
9 the type of the fuel that they will consider as gas, in
10 this case, it's mentioned about, let's say, LPG.

11 BY MR. FINCH:

12 Q. I don't think that got anywhere near my
13 question.

14 Do you think it is relevant whether or not a
15 specific fuel is considered a normally gaseous fuel
16 when considering the claims of the patent-at-issue?

17 MR. STEMLER: Same objection as to
18 scope.

19 And Counsel, appreciate your point about
20 speaking objections. I think scope is a permitted
21 objection under the Trial Practice Guide, and I would
22 direct you to 37 CFR, Section 42.53 (D)(52) for the
23 requirement that the cross-examination testimony be
24 limited to the scope of the direct examination
25 testimony.

1 MR. FINCH: So your response about
2 speaking objections was additional speaking objections;
3 correct?

4 MR. STEMLER: You asked me --

5 MR. FINCH: If you want to make a
6 scope objection, I understand, that's fine, but please
7 prohibit these long-winded, multi-paragraph objections.

8 MR. STEMLER: I simply referred you to
9 the authority that you were looking for regarding what
10 authority required you to identify where in the
11 declaration your questioning was directed.

12 MR. FINCH: That's not what that says,
13 but we're going to move on.

14 A. And if you need, I can emphasize that what
15 matters most is that at what state is the fuel that I
16 have in Tank 16, so that one is representing gaseous
17 fuel.

18 BY MR. FINCH:

19 Q. Does it matter what type of fuel is in
20 Tank 16?

21 A. It's aimed to represent the gaseous fuel.

22 Q. And the reference doesn't provide any
23 details other than the fact that it's a gaseous fuel;
24 correct?

25 MR. STEMLER: Objection; form.

1 A. It provides that information that is a
2 gaseous fuel that is compressed and thereby maintained
3 in a liquefied condition.

4 BY MR. FINCH:

5 Q. But it doesn't identify specific types of
6 gaseous fuel; correct?

7 MR. STEMLER: Objection; form.

8 A. If you remember earlier, I mentioned it
9 talks in the same context of the automobile. So the
10 POA will know the type of the gaseous fuel that will
11 be used in the application of the automobile.

12 BY MR. FINCH:

13 Q. Can you direct me to where it references
14 type of gaseous fuels in the context of an automobile?

15 A. If you look at it, and on Column 1 and
16 page 1 when it's trying to describe Figure 1. It says,
17 "Figure 1 is a diagrammatic view indicating the various
18 elements" --

19 (Reporter clarification.)

20 A. I will read from the beginning.

21 "Figure 1 is the diagrammatic view
22 indicating the various elements of both the liquid and
23 gaseous fuel supplies in proper relation to an
24 automobile engine."

25 Q. What fuels would you consider to be normally

1 gaseous as contemplated by Exhibit 1008?

2 A. In 16, you can have LPG, you can have
3 propane, you can have natural gas.

4 Q. Are there any others?

5 A. The type of fuels that we use for the
6 application of engines that they will be considered as
7 gaseous fuel. Natural gas include also CNG, that's
8 another example.

9 Q. What is CNG?

10 A. Compressed natural gas.

11 Q. Numeral 17 on Exhibit 1008, what does that
12 refer to?

13 A. Sorry, you are referring to Item 17 in the
14 Figure 1?

15 Q. Correct.

16 A. It says the gaseous fuel supply to 17.

17 Q. And that's connected to gaseous -- strike
18 that.

19 That's connected to Fuel Supply Tank 16 that
20 we discussed previously?

21 A. That is correct.

22 Q. Does the gaseous Fuel Line 17 that you
23 referred to draw gaseous fuel or liquid fuel from
24 Tank 16?

25 MR. STEMLER: Objection to form.

1 A. I would say it can draw both.

2 BY MR. FINCH:

3 Q. Your testimony is that it draws both gaseous
4 fuel and liquid fuel?

5 MR. STEMLER: Objection; form.

6 A. I would say depending on the state of the
7 Tank 16, in terms of the temperature, pressure, and the
8 percentage of the -- I mean what we call it in
9 thermodynamics, quality, then that will determine what
10 is coming out of 16. Is it gas? Is it liquid? Or is
11 it a combination of gas and liquid?

12 BY MR. FINCH:

13 Q. Exhibit 1008 states, "From Tank 16 there
14 extends a suitable gaseous fuel supply tube 17
15 extending to the bottom of the tank 16 so as to draw
16 off the liquid and not gas."

17 Despite the fact that it explicitly states,
18 "And not gas," is it still your opinion that Fuel
19 Supply Tube 17 draws gaseous fuel?

20 MR. STEMLER: Objection; form.

21 A. Given my experience working with IC engines
22 for many years, I would say in the Tank 16, I repeat
23 what I mentioned. Depending on the state of the
24 Tank 16, temperature, pressure, and percentage, I have
25 liquid and gas inside, then from 17, you can have the

1 situations that you will draw liquid, and liquid and
2 gas, and only gas.

3 BY MR. FINCH:

4 Q. So it's your testimony that Exhibit 1008 is
5 wrong when it says that it is not drawing gas from that
6 tank?

7 MR. STEMLER: Objection; form.

8 A. A POSA will understand that the state of the
9 Tank 16 in terms of the temperature and pressure and
10 then the percentage of the liquid and fuel will have a
11 direct impact of what will go to the 17. So there
12 would be conditions that it will be just gas. There
13 would be conditions that can be mostly liquid, and
14 there can be conditions that is a combination of them.

15 So even the patent says POSA's understanding
16 is that based on the conditions that we have in the
17 tank, that will determine what is coming out from 16
18 going to 17.

19 BY MR. FINCH:

20 Q. So your opinion is that the disclosure in
21 the patent is incorrect?

22 MR. STEMLER: Objection; form.

23 A. I would say what this one is referring to is
24 referring to an example of the conditions that happen.
25 So if you connect it to what I said before, you can

1 have all these different conditions depending on the
2 state that you have in the gas.

3 So for this patent it's referring to those
4 examples of the conditions that you can have liquid,
5 but -- and it would be other conditions that you will
6 have combination of the liquid and gas, and there would
7 be the combinations that it would be just gas.

8 BY MR. FINCH:

9 Q. So your understanding is that Exhibit 1008
10 is only referring to those situations where it is
11 disclosed -- or where the supply tank is providing just
12 liquid; is that correct?

13 MR. STEMLER: Objection; form.

14 A. My understanding is that what is mentioned
15 over here is not comprehensive.

16 BY MR. FINCH:

17 Q. When you say it's not comprehensive, what
18 does that mean?

19 A. It means is not including all the conditions
20 for the state of the gas that is leaving 16 and going
21 to 17.

22 Q. So the reference doesn't disclose the
23 conditions that would result in gaseous fuel being
24 supplied?

25 MR. STEMLER: Objection to form.

1 A. If you see what I mention is that what this
2 patent is mentioning here is a subset of the conditions
3 that you can have going from 16 to 17.

4 (Whereupon, Deposition Exhibit 1009
5 was introduced.)

6 BY MR. FINCH:

7 Q. Handing you another document previously
8 marked as Exhibit 1009. A copy for each of you.

9 A. Thank you. I'm ready.

10 Q. Have you seen this document before?

11 A. Yes.

12 Q. What is this document?

13 A. It is the, "Workshop Manual, Gasoline, LPG,
14 Natural Gas Engine."

15 Q. There are three numbers on the first page of
16 this exhibit.

17 Do you see that?

18 A. Yes, I can see that.

19 Q. What do those numbers refer to?

20 MR. STEMLER: Objection to form.

21 A. I can see for DF972-E2 is referring to the
22 type of engine. It says, "Vertical, water-cooled,
23 four-cycle, dual-fuel." Inside the parentheses, it
24 says, "(Gasoline/LPG engine)."

25 For WG972, it says, "Vertical, water-cooled,

1 four-cycle gasoline engine."

2 BY MR. FINCH:

3 Q. Turn to page 65 of the exhibit, please.

4 A. I am there.

5 Q. What's depicted in the diagram on page 65?

6 MR. STEMLER: Objection; form.

7 A. The diagram on the left is referring to
8 WG972-E2 engine. The diagram on the right is referring
9 to DF972-E2.

10 BY MR. FINCH:

11 Q. Referring to the diagram on the right, what
12 is it a diagram of?

13 MR. STEMLER: Objection; form.

14 A. It says fuel system. It also says general.

15 BY MR. FINCH:

16 Q. Other than the words "fuel system" and
17 "general," do you have any opinions as to what this
18 diagram refers to?

19 MR. STEMLER: Objection; form.

20 A. Reading from my declaration, paragraph 62,
21 "The Workshop Manual describes Kubota's DF-972-E2
22 engine. A dual-fuel engine with an alternator to
23 function as a generator that runs off of gasoline or
24 LPG," and referring to the same page, page 65.

25 And then, "The Workshop Manual discloses a

1 carburetor through which gasoline and LPG are routed as
2 shown in the images."

3 BY MR. FINCH:

4 Q. What is your understanding of what the right
5 image on page 65 of the Workshop Manual depicts?

6 MR. STEMLER: Objection; form.

7 A. It shows that a carburetor system, and it's
8 showing the fuel supply line including gasoline and
9 LPG.

10 BY MR. FINCH:

11 Q. When you say, "Fuel supply line including
12 gasoline," what are you referring to?

13 MR. STEMLER: Objection; form.

14 A. Here, number 6 is a gasoline tank, and then
15 we can see that the passage from the gasoline's tank
16 that is going to the carburetor, that's what I'm
17 referring as a gasoline line.

18 BY MR. FINCH:

19 Q. Is the gasoline labeled in this photo or
20 diagram?

21 A. It is also labeled, if I'm looking A, it
22 says, "gasoline line."

23 Q. And label A identifies a structure between
24 Number 3, fuel feed pump, and Number 8, DF carburetor;
25 is that correct?

1 MR. STEMLER: Objection; form.

2 A. The way that this label A is pointing to is
3 referring to that connection between the Fuel Feed Pump
4 3 and carburetor, and it can also refer to this whole
5 line as the gasoline line. By whole line, I mean what
6 is connecting from 6 all the way when it goes to the
7 carburetor.

8 BY MR. FINCH:

9 Q. You also referenced a fuel supply line
10 including LPG earlier.

11 What were you referring to?

12 MR. STEMLER: Objection to form.

13 A. We can see in the right image, I think is
14 labeled as B, the right side is showing that it goes
15 from the LPG tank. We have these fuel passage that
16 goes from LPG tank all the way to the carburetor.

17 BY MR. FINCH:

18 Q. Are there structures in-between the tank and
19 the carburetor?

20 MR. STEMLER: Objection; form.

21 A. In this schematic, we can see Items 13, 12,
22 11, and 10.

23 BY MR. FINCH:

24 Q. What is Item 13?

25 A. It's an LPG manual valve.

1 Q. What is an LPG manual valve?

2 MR. STEMLER: Objection; form.

3 A. My understanding is a manually operated
4 mechanical valve that is connected to the LPG tank.

5 BY MR. FINCH:

6 Q. Does the Workshop Manual disclose the
7 structure of LPG Manual Valve 13?

8 MR. STEMLER: Objection; form.

9 A. It's a long document. I mainly looked into
10 the fuel system section which is Section 4, and I could
11 not identify details for the structure of the Valve 13.

12 BY MR. FINCH:

13 Q. What does Item 11 refer to?

14 A. LPG shutoff solenoid valve.

15 (Reporter clarification.)

16 A. Shutoff solenoid valve.

17 BY MR. FINCH:

18 Q. And what is an LPG shutoff solenoid valve?

19 MR. STEMLER: Objection; form.

20 A. My understanding is a solenoid valve that it
21 will block the LPG flow that it's going, let's say,
22 after 12, going to the Item 10, which is the vaporizer.

23 BY MR. FINCH:

24 Q. What is the purpose of Vaporizer 10 in
25 the -- that's being depicted in Figure B on page 65 of

1 the Workshop Manual?

2 MR. STEMLER: Objection; form.

3 A. Pages 69 all the way to 72, it describes
4 of -- it's Item 10 that we are referring.

5 (Reporter clarification.)

6 A. Item 10. And it's, I would say, a
7 multifaceted device. It include vaporizer, it includes
8 regulator, it also includes the function that serves
9 for the -- what is called vacuum lock chamber. So it's
10 a device that it's serving all these three purposes.
11 It includes multiple chambers, and is referred as
12 primary chamber, secondary chamber, and the vacuum lock
13 chamber.

14 So overall, it does -- serves as vaporizer,
15 regulator, and also the third items with that vacuum
16 lock chamber, that it helps for the operation that
17 engine is starting.

18 BY MR. FINCH:

19 Q. On page 69 it states, "Vaporizer is the
20 device which converts the liquid fuel into the gaseous
21 fuel."

22 Is that correct?

23 A. I would say this refers to that because
24 I told you it's a multifaceted device, so then
25 this device does that functions, that it will

1 convert any liquid fuel that is in the gaseous fuel,
2 it will convert that that liquid fuel to gaseous
3 fuel.

4 Q. And when you say, "Any liquid fuel into
5 gaseous fuel," is it your opinion that gaseous fuel is
6 entering the vaporizer?

7 MR. STEMLER: Objection; form.

8 A. In my opinion what goes after, let's say,
9 the Solenoid Valve 11 is the one that is connecting 11
10 to 10, and that will include both gaseous fuel and
11 liquid fuel, and the percentage of them will depend on
12 operating conditions.

13 BY MR. FINCH:

14 Q. And that's Line C you're referring to?

15 A. Yes, that -- what Line C you see because it
16 can be referring to all those connections that goes
17 from the Tank 14 all the way to vaporizer, but the part
18 that I was referring -- let's say at least that portion
19 that is going from 11 to 10.

20 MR. STEMLER: And Thomas, whenever you
21 get a sec, if there's a convenient spot to break for
22 lunch.

23 MR. FINCH: Do it in a few more
24 minutes.

25 MR. STEMLER: Okay.

1 BY MR. FINCH:

2 Q. Is it your opinion that Line C extends all
3 the way from Tank 14 to vaporizer tank?

4 MR. STEMLER: Objection; form.

5 A. It's hard to say, but let's make it simple.
6 Between 13 all the way to 10, you have a mixture of the
7 gas and liquid.

8 BY MR. FINCH:

9 Q. And that's your opinion even though the
10 Workshop Manual refers to Line C as a liquid propane
11 line?

12 MR. STEMLER: Objection; form.

13 A. A POSA will understand that even the -- this
14 manual that's calling it liquid propane line, it can
15 include all gas.

16 BY MR. FINCH:

17 Q. Okay. So it could be 100 percent gas even
18 though it's referred to as a liquid propane line?

19 MR. STEMLER: Objection; form.

20 A. In my opinion because the conditions in the
21 LPG tank both determines that -- how much mixture of
22 the gas and liquid you have and depending where you are
23 taking that out, it can be 100 percent gas.

24 MR. FINCH: Let's go ahead and take a
25 break for lunch.

1 (Whereupon, a recess was taken
2 from 12:41 p.m. to 1:34 p.m.)

3 BY MR. FINCH:

4 Q. All right. Dr. Shahbakhti, welcome back.
5 Did you have a good lunch?

6 A. Yes, I did. Thank you.

7 Q. Before we left, we were talking about the
8 Workshop Manual reference, Exhibit 1009.

9 Do you remember that?

10 A. Yes, I do.

11 Q. If you could turn to page 68 of that
12 reference, please.

13 A. I'm at page 68.

14 Q. What does page 68 refer to?

15 A. It's referring to the carburetor being used
16 in DF9 --

17 (Reporter clarification.)

18 A. To the D -- in the DF972-E2 engine.

19 MR. FINCH: Okay. The word was
20 "carburetor," I believe.

21 BY MR. FINCH:

22 Q. And there are three figures on this page.
23 Do you see that?

24 A. Yes, I can see three figures.

25 Q. And the top picture is a side view of the

1 carburetor; is that correct?

2 MR. STEMLER: Objection; form.

3 A. It is showing the carburetor, and it
4 including the passage of the float, including air, it
5 showing also the LPG/gaseous fuel, and it's also
6 showing the mixture of air and fuel, showing the
7 direction that it will go.

8 BY MR. FINCH:

9 Q. And there's a center photo on this page as
10 well; correct?

11 A. Say it again, please?

12 Q. There's a second center photo on this
13 page as well; correct?

14 A. That is correct.

15 Q. What's depicted in that photo?

16 A. It is including the carburetor, and as part
17 of that carburetor is showing the Number 4, which is
18 the LPG main jet, Number 5, which is the gasoline main
19 jet, and then also including the Number 6, which is the
20 gasoline cut-off solenoid, and also it's depicting the
21 LPG cut-off solenoid as Number 3.

22 Q. And in general, what is the purpose of the
23 carburetor?

24 MR. STEMLER: Objection; form.

25 A. Looking at what is also mentioned on this

1 same page, it will -- mixes air and fuel that will be
2 supplied to the engine, and it is also aiming to adjust
3 that ratio of that air and fuel. This I would say at
4 least two of the functions that you expect from a
5 carburetor.

6 BY MR. FINCH:

7 Q. And referring specifically to the carburetor
8 depicted on page 68. When you say "fuel," are you
9 referring to gasoline, LPG, or both?

10 MR. STEMLER: Objection; form.

11 A. I would say when we are talking about the
12 mixing, so it would be the mixing of the fuel with air,
13 and that will be applied to both gasoline and also the
14 gaseous fuel.

15 BY MR. FINCH:

16 Q. And the first photo on this page or first
17 diagram on this page depicts where air enters the
18 carburetor with letter "A"; is that correct?

19 A. That is correct.

20 Q. Where does the gasoline enter the carburetor
21 at?

22 MR. STEMLER: Objection; form.

23 A. In the middle image, you can see that
24 Number 5 that is referring to the gasoline main jet.
25 That is showing the gasoline fuel. That then is going

1 to go through the passage, and then it will get to that
2 Venturi area.

3 (Reporter clarification.)

4 A. Venturi area.

5 BY MR. FINCH:

6 Q. So your understanding is that gasoline
7 enters the carburetor at numeral 5?

8 MR. STEMLER: Objection; form.

9 A. At least in this image, we can see gasoline
10 will enter to this carburetor at point 5. Whether
11 there are other parts not depicted for the gasoline
12 package -- passage, those ones I cannot comment on, but
13 here, it is clear that gasoline is entering the
14 carburetor as shown here with gasoline main jet in
15 Number 5.

16 BY MR. FINCH:

17 Q. So there's a structure located to the left
18 of main jet Number 5.

19 Is it your testimony that that structure is
20 not part of the carburetor?

21 MR. STEMLER: Objection; form.

22 A. Are you referring to that Number 6?

23 BY MR. FINCH:

24 Q. Any structure to the left of Number 5 along
25 the fuel float path in the middle picture on page 68?

1 MR. STEMLER: Objection; form.

2 A. I would say if I just looking at the portion
3 that goes left of Number 5, those are part of the
4 carburetor, and Number 6 is attached to the carburetor,
5 and then if I consider the boundaries of that
6 carburetor, I can see that also that Number 6 will
7 enter the boundary of the carburetor.

8 BY MR. FINCH:

9 Q. There's a third picture on page 68 as well.
10 Do you see that?

11 A. Are you referring to the one on the bottom?

12 Q. Yes.

13 A. Yes, I can see.

14 Q. What is depicted in the third image on
15 page 68?

16 MR. STEMLER: Objection; form.

17 A. It is showing some of the elements in
18 relation with carburetor, and the elements that are
19 shown in this image are Number 7, main switch,
20 Number 8, which is the fuel select switch, and it also
21 showing Number 9, which is LPG shutoff solenoid valve.

22 BY MR. FINCH:

23 Q. What is the purpose of the main switch,
24 Number 7?

25 MR. STEMLER: Objection to form.

1 A. So looking at the page 68 and then looking
2 at the bottom image, referring to that Item 7, which it
3 says main switch, so here on this page, it mentioned
4 some of the functions of that AC switch, it does says
5 that when the fuel select switch is in gasoline
6 position D and the main switch is in on positions, the
7 battery current follows to the gasoline cut-off
8 solenoid 6.

9 It also refers to the off position when it
10 says that, "When the main switch 7 turned to the OFF
11 position, the battery current stops to both of the
12 solenoids."

13 And then later on page 77, if you look at
14 the top figure, it's referring to the key switch that
15 it also have that AC, and it's essentially saying that
16 this key switch has four positions, Terminal 30 is
17 connected to the battery. It is released at the start
18 positions and returns to the on position, and then
19 explains for the start what will happen.

20 It mentions that when the key is turned to
21 the start positions through the on positions, the
22 current supply to the starter and to the regulator to
23 oil pump -- sorry, oil lamp and auxiliary. And 50 to
24 the starter, 30 from the battery and AC to regulator
25 oil lamp and auxiliary here. And then it mentions when

1 it goes to the on situation, then what it's going to
2 do. It says only terminal AC is connected to the
3 battery at any positions of the key except the off
4 positions, the terminal AC is connected to the terminal
5 30, and 30 coming from the battery, AC going to the
6 regulator, oil lamp, and auxiliary.

7 BY MR. FINCH:

8 Q. And based on that disclosure of the Workshop
9 Manual, what is your understanding of the purpose of
10 Main Switch 7?

11 MR. STEMLER: Objection; form.

12 A. Basically, I answered that one, that at
13 least these functions have been already disclosed in
14 this Workshop Manual.

15 BY MR. FINCH:

16 Q. On the same picture on page 68, there's also
17 a Fuel Select Switch 8.

18 Do you see that?

19 A. Yes, I can see.

20 Q. And Fuel Select Switch 8 has two positions,
21 D, the gasoline position, and E, the LPG position.

22 Do you see that?

23 A. Yes, D represents gasoline position,
24 E represents LPG position.

25 Q. What state are LPG Cut-Off Solenoid 3,

1 Gasoline Cut-Off Solenoid 6, and LPG Shutoff Solenoid

2 Valve 9 in when the Fuel Select Switch 8 is in the
3 gasoline position D?

4 A. This is my declaration page 54, and I put
5 them next to each other to make it easier. It is
6 position D, which is gasoline fuel being selected, in
7 that one, the switch will trigger Solenoid Valve 6, and
8 Solenoid Valve 6 is controlling the flow to the
9 carburetor, so you expect that when the position D is
10 selected, then the fuel will go through the tank all
11 the way to the carburetor. So in that situation, the
12 solenoid cut-off -- gasoline cut-off solenoid will let
13 the fuel go to the carburetor.

14 Q. And what position will LPG Cut-Off Solenoid
15 3 and LPG Shutoff Solenoid Valve 9 be in when the fuel
16 position switch is in D, the gasoline position?

17 A. During the situations that D is selected,
18 which means that we will require gasoline going to the
19 engine, on that situations, what is showing here at
20 Number 9, the solenoid valve, and also these Number 3,
21 so they will be in the closed position.

22 Q. And what's the impact of moving Fuel Select
23 Switch 8 to E, the LPG position?

24 MR. STEMLER: Objection; form.

25 A. When that happens, that means the engine now

1 would like to run with the LPG, so then in that
2 situation, Solenoid Valve 3 and Solenoid Valve 9, they
3 will come to open position.

4 BY MR. FINCH:

5 Q. What about Gasoline Cut-Off Solenoid 6?

6 A. In that situation, it will be closed.

7 Q. Hand you another document previously marked
8 Exhibit 1003.

9 (Whereupon, Deposition Exhibit 1003
10 was introduced.)

11 BY MR. FINCH:

12 Q. This is a copy of your declaration in this
13 IPR.

14 A. Thank you.

15 MR. STEMLER: Counsel, there's a copy
16 for you as well.

17 BY MR. FINCH:

18 Q. Are you familiar with this document?

19 A. Yes.

20 Q. What is this document?

21 A. It is my declaration for '145 Patent.

22 Q. And when you say '145 Patent you're
23 referring to U.S. Patent 11,143,145?

24 A. Yes, referring to patent -- U.S. Patent
25 11,143,145.

1 Q. Did you draft this declaration yourself?

2 MR. STEMLER: Objection; form.

3 A. I discussed my opinions with the counsel,
4 and I asked the counsel to prepare the first draft, and
5 then I went through and I modified it by myself to make
6 sure at the end it fully represents my opinion.

7 BY MR. FINCH:

8 Q. When you say counsel prepared the first
9 draft, which counsel was that?

10 MR. STEMLER: Objection; form.

11 A. At that time, it was Alek. I forgot his
12 last name.

13 BY MR. FINCH:

14 Q. Do you know what law firm?

15 A. Ice Miller.

16 Q. Turn to page 8 of your declaration.

17 A. Yes, I see.

18 Q. There's a declaration on page 8 that was
19 signed on October 7, 2025 certifying that all segments
20 made therein are true; is that correct?

21 A. That is correct.

22 Q. That was true on October 7th?

23 A. Say it again, please?

24 Q. That was true as of October 7, 2025?

25 MR. STEMLER: Objection; form.

1 A. When I signed it, yes, October 7, 2025, I
2 declared that all these opinions are my opinion, and
3 they are true.

4 BY MR. FINCH:

5 Q. The time period since October 7th of 2025,
6 have you discovered any errors in your declaration?

7 MR. STEMLER: Objection; form.

8 A. I did not discover any substantive errors,
9 but I noticed there were some typos.

10 BY MR. FINCH:

11 Q. Referring to substantive errors, if you had
12 discovered an error between October 7th of 2025 and
13 now, what would you have done?

14 MR. STEMLER: Objection; form.

15 A. If I found things that need to change, I
16 would have contacted the counsel at that time saying
17 that these are the changes that I would like to make.

18 BY MR. FINCH:

19 Q. Have you ever submitted a declaration and
20 subsequently discovered an error in the past?

21 MR. STEMLER: Objection; form,
22 relevance.

23 A. Never.

24 BY MR. FINCH:

25 Q. Turn to page 9, Exhibit 1003. Section 9,

1 background information at the top.

2 A. Yes.

3 Q. And Section 8 is qualifications and
4 experience.

5 Do you see that?

6 A. Yes, I can see.

7 Q. You mention that you serve as the director
8 of the Energy Mechatronics Laboratory; is that correct?

9 A. That is correct.

10 Q. It says you conduct research in multiple --
11 multidisciplinary areas of engineering that include
12 mechanical and electrical systems; is that correct?

13 A. That is correct.

14 Q. What's the difference between a mechanical
15 and electrical system?

16 MR. STEMLER: Objection; form.

17 A. Maybe I can refer you to the earlier
18 discussions we have when you asked me what is
19 mechanical engineering that I mentioned for a
20 mechanical system, they can include thermodynamic
21 systems, they can include the systems that have
22 dynamics. So a mechanical system can deal with
23 thermal, fluid, and mechanics. Electrical system, it
24 will be dealing with electricity and then the different
25 forms of conversions and also the usage of that

1 electricity.

2 BY MR. FINCH:

3 Q. If you were trying to distinguish between
4 mechanical and electrical systems with the main
5 difference being that electrical systems deal with
6 electricity?

7 MR. STEMLER: Objection to form.

8 A. I mean, you're asking very general
9 questions, especially for today's that we have these --
10 a lot of integrated system that have both mechanical
11 and electrical. I would say electrical system they
12 typically are dealing with electricity.

13 BY MR. FINCH:

14 Q. Are you familiar with the term
15 "electromechanical"?

16 MR. STEMLER: Objection; form.

17 A. That will imply that there is an electrical
18 component and a mechanical component.

19 BY MR. FINCH:

20 Q. Paragraph 2 in your declaration, you mention
21 that you lead projects dealing with conventional and
22 alternative fuels.

23 Do you see that?

24 A. Yes.

25 Q. What are conventional fuels?

1 A. Sorry, you're referring to the paragraph
2 Number 2; is that correct?

3 Q. Correct.

4 A. Yeah. I would say for conventional fuel
5 include gasoline, diesel, and fuels that include blends
6 of gasoline and ethanol and hydrogen, blend of -- I
7 mean dual-fuel hydrogen diesel. These are at least the
8 ones, we are quite busy. We do a lot of research in
9 these domains.

10 Q. And separate from your research, what does
11 the term "conventional fuel" mean to you?

12 MR. STEMLER: Objection; form.

13 A. I would say hydrocarbons fuels that commonly
14 being used in IC engines.

15 BY MR. FINCH:

16 Q. And what would an alternative fuel be?

17 A. An example would be like hydrogen, and we
18 are doing it now. The other one would be when you
19 start looking at blend of fuels.

20 Q. Turn to page 10 of your declaration,
21 paragraph 5.

22 A. Yes, I'm there.

23 Q. It states that you've worked with both
24 dual-fuel and bi-fuel engines.

25 Do you see that?

1 A. Yes.

2 Q. What's the difference between a dual-fuel
3 and a bi-fuel engine?

4 MR. STEMLER: Objection; form.

5 A. I would say in the literature, we can see
6 that sometimes they use these names interchangeably,
7 but what I mean here by the bi-fuel this will be the
8 cases that either, let's say, gasoline or LPG, and when
9 you are talking about dual-fuel, those would be the
10 cases that you have both of the fuel present in the
11 combustion chamber. That would be an example of the
12 work we are doing now that is running it as, let's say,
13 hydrogen diesel, we are testing it out.

14 But then if the same engine is now operating
15 situation that is just hydrogen and just diesel, in
16 that case we use the term bi-fuel. But literature,
17 they have used them interchangeably, but I would say
18 technically correct, we typically use bi-fuel when you
19 have either/or dual-fuel, then you have both of them
20 being present in a combustion chamber.

21 BY MR. FINCH:

22 Q. What are the design considerations that go
23 into designing a dual-fuel engine versus a bi-fuel
24 engine?

25 MR. STEMLER: Objection; form.

1 A. I would say on a very high level because you
2 have a mixture of the air and fuel, and then you will
3 need to make sure that that mixture will get combusted
4 properly. In the case of bi-fuel, I only have one
5 fuel. In the case of the dual-fuel, now I am having
6 two of those fuels, so the property of the mixture
7 should match with the way that I will control that
8 engine.

9 BY MR. FINCH:

10 Q. Turn to page 17 of your declaration.

11 A. Yes, I'm here.

12 Q. In paragraph 18 it says you have been
13 retained as an expert in eight inter partes review
14 proceedings; is that correct?

15 (Reporter clarification.)

16 MR. FINCH: Inter partes review.

17 A. At that time was eight, but now I have,
18 including this one, 14.

19 BY MR. FINCH:

20 Q. And at that time, the eight inter partes
21 review proceedings include four separate proceedings on
22 behalf of MWE?

23 A. Not at that time. So eight plus those four
24 would become 12, and then two I finished recently, then
25 the total would become 14.

1 Q. And paragraph 20 says you've been retained
2 by counsel for MWE Investments; is that correct?

3 A. That is correct.

4 Q. And MWE Investments is no longer a
5 petitioner in this IPR.

6 Did you know that?

7 MR. STEMLER: Objection to form.

8 A. Yes.

9 BY MR. FINCH:

10 Q. Are you still retained by MWE Investments?

11 MR. STEMLER: Objection; form.

12 A. What happens through my contract was through
13 Doar. Over here it's mentioned WIT Legal, LLC, so I've
14 worked for them, and previously WIT, LLC, now become
15 Doar --

16 (Reporter clarification.)

17 A. WIT Legal, LLC, now the new name Doar,
18 D-O-A-R. Then they have now contract with Merchant &
19 Gould, so that's part of that one now, I assume the
20 counsel in this case is Merchant & Gould.

21 BY MR. FINCH:

22 Q. What is Doar?

23 MR. STEMLER: Objection; form.

24 A. I don't know the exact -- all the things
25 that they do, but as part of a job, they provide like

1 expert witnesses, is more like a matchmaking based on
2 the needs of the legal firm, they provide expert.

3 BY MR. FINCH:

4 Q. Can you turn to page 29 of your
5 declaration. Paragraph 49, it states that the '145
6 Patent is a continuation of U.S. Patent Number
7 10,697,398.

8 What does "a continuation" mean?

9 MR. STEMLER: Objection; form.

10 A. I'm not a legal expert, so I provide what's
11 my understanding when I'm reading patents. From what I
12 understood is that when, let's say, you have a case
13 that you have a parent, they call it, let's say, parent
14 patent, that it was filed, and then later on they will
15 go and they can come up with a new patent that is
16 relying on that main body. So that's why I have seen
17 cases that in some of the major portion of the text are
18 the same, but then the claim languages are becoming
19 different.

20 So given it's referring to that original --
21 basically it's repeating that original, and that's
22 how -- is my understanding that when they say
23 "continuation," is that means -- is referring to those
24 original texts that was included in that, let's call
25 it, parent patent.

1 BY MR. FINCH:

2 Q. So in this case, the parent patent would be
3 the '398 Patent?

4 MR. STEMLER: Objection; form.

5 A. In this case, my understanding is '780
6 Patent would be the parent patent.

7 BY MR. FINCH:

8 Q. Is it fair to say that the '398 Patent is
9 the direct parent of the '145 Patent we're discussing
10 here?

11 MR. STEMLER: Objection; form.

12 A. You're asking something that maybe is more
13 becoming legal, and so I probably should refer this one
14 to the counsel to answer it precisely.

15 BY MR. FINCH:

16 Q. Did you review the '398 Patent as part of
17 your work on this declaration?

18 MR. STEMLER: Objection; form.

19 A. I reviewed '780, not '398.

20 BY MR. FINCH:

21 Q. Why not?

22 MR. STEMLER: Objection; form.

23 A. So reading from the Patent '145, on the
24 first page it says that continuation of Application
25 Number 14-925441 filed on October 2015, now

1 Patent 10,698 -- 697,398, which is a continuation in
2 part of application Number 14/738060 filed on June
3 20 -- June 12, 2015, now Patent Number 10,221,781.

4 So this one, I understood that it's coming
5 originally from '780, so that was my understanding that
6 if I look at the '780, I can see how it has started.

7 BY MR. FINCH:

8 Q. So you didn't think the '398 Patent was
9 relevant to your declaration here?

10 MR. STEMLER: Objection; form.

11 A. When I look at '780, I saw a lot of overlap
12 to this '145 Patent, and that helped me to understand
13 this patent better. And then -- then I did not look
14 into the '398.

15 BY MR. FINCH:

16 Q. Do you know what the term "file history"
17 means in the context of a patent?

18 MR. STEMLER: Objection; form.

19 A. Given I'm not -- I don't have the background
20 in law, but by looking at patent history, because I
21 look at those files, I get a sense that when they file
22 the patent, then from there the examiner -- it includes
23 a lot of informations, what the examiners found, and
24 then back-and-forths until actually one becomes
25 completely a full patent. So in that patent history, I

1 could see all those informations.

2 BY MR. FINCH:

3 Q. Did you review the file history of the '398
4 Patent as part of your work in preparing this
5 declaration?

6 MR. STEMLER: Objection; form.

7 A. So if you look at my declaration on page 18
8 and 19, I list that all the materials that I considered
9 for preparation of this declaration.

10 BY MR. FINCH:

11 Q. So you did not review the file history of
12 the '398 Patent while preparing this declaration?

13 MR. STEMLER: Objection; form.

14 A. Given it's not listed here, I did not
15 consider it in preparing the history here, but what
16 happens in '145, because its provide the background, I
17 see a chance that if there was a connection with '398,
18 I should have -- get exposed to those informations
19 through the file history of the U.S. Patent 11,143,155.

20 BY MR. FINCH:

21 Q. Did you make the determination not to review
22 the '398 Patent, or did counsel tell you not to review
23 it?

24 MR. STEMLER: Objection; form.

25 A. I didn't ask for it.

1 BY MR. FINCH:

2 Q. Did you identify the prior art referenced in
3 your declaration?

4 MR. STEMLER: Objection; form.

5 A. I would say these exhibits along with other
6 prior arts was provided to me by counsel, and I,
7 myself, given I have a lot of expertise in IC engines,
8 also look into some other documents. And as an
9 example, like say 1006, small engine technology, do you
10 see that one? That's the book being used. So they
11 provided some prior art, and I also look into some
12 other prior art, and at the end, selected the ones that
13 it can lead to the conclusions that it was required for
14 this declaration.

15 BY MR. FINCH:

16 Q. Turn to page 36 and 37 of your declaration.

17 A. I'm there.

18 Q. There's some annotated figures on these
19 pages.

20 Do you see them?

21 A. Yes.

22 Q. Did you prepare those annotated figures?

23 MR. STEMLER: Objection; form.

24 A. I asked the counsel to prepare it.

25 Generally, I'm a picky person, asked them to do this

1 color and that -- these things, but typically, I don't
2 do it by myself. I asked them to do what I need.

3 BY MR. FINCH:

4 Q. Is that true of all of the figures in this
5 declaration?

6 MR. STEMLER: Objection; form.

7 A. As I mentioned, I did not prepared any of
8 these images because I asked the counsel to prepare.
9 To remember it better, I asked them, for example, to
10 make this one yellow versus blue and others. Those
11 parts I did not ask for.

12 Typically, what I will do is after
13 discussing my opinions with the counsel, I ask them to
14 prepare to represent the ideas that I have, and then I
15 will take a look at the images that they provide, and
16 if I see it will make it even more clear by having more
17 annotations or including more coloring, that's how I
18 typically ask.

19 BY MR. FINCH:

20 Q. To be clear, are you referring to the
21 figures on page 36 and 37 or all of the figures in your
22 declaration?

23 MR. STEMLER: Objection; form.

24 A. I would say that's the style I have done it
25 for all the declarations. I asked them, this is my

1 opinion, and if they provide -- it's already include
2 annotations, I will check if it's representing my idea,
3 and if I see something is missing, I will ask them to
4 add it.

5 BY MR. FINCH:

6 Q. Turn to page 51 of your declaration, please.

7 A. I'm there.

8 Q. Section 1B, first Element 1.1, engine
9 operable on a gaseous fuel and a liquid fuel.

10 Do you see that?

11 A. Sorry, are you referring to 51, page 51?

12 Q. Page 51.

13 A. And you said 1b?

14 Q. Yes.

15 A. Because I only see 1.1.

16 Q. Section 1b of your declaration referring to
17 Element 1.1 --

18 A. I see.

19 Q. -- an engine operable on a gaseous fuel and
20 a liquid fuel?

21 Do you see that?

22 A. I got it. You are referring to that
23 subsection 1b. Yes, I can see it's referring to the
24 Element 1.1, an engine operable on a gaseous fuel and a
25 liquid fuel.

1 Q. What does it mean for an engine to be
2 operable on a gaseous fuel?

3 MR. STEMLER: Objection; form.

4 A. In this context, means that you can run the
5 engine by gaseous fuel and you can run the engine by
6 liquid fuel.

7 BY MR. FINCH:

8 Q. When you say, "Run the engine by gaseous
9 fuel," what does that mean?

10 MR. STEMLER: Objection; form.

11 A. It means use the gaseous fuel to run the
12 engine as a fuel that you need for the engine.

13 BY MR. FINCH:

14 Q. When you say you can run the engine by
15 liquid fuel, what does that mean?

16 MR. STEMLER: Objection; form.

17 A. It means to operate the engine by using
18 liquid fuel, that's the fuel you need.

19 BY MR. FINCH:

20 Q. When you say using liquid fuel as the fuel
21 you need, what do you mean?

22 MR. STEMLER: Objection; form.

23 A. Internal combustion engine needs fuel in
24 order to operate, and then when it says, "Operable on a
25 gaseous fuel," means that fuel that you run the engine

1 is gaseous fuel. If it says, "Operable on liquid
2 fuel," it means that the fuel that you use to run the
3 engine is a liquid fuel.

4 BY MR. FINCH:

5 Q. With respect to Element 1.1, do you
6 understand the claim to be referring to the state of
7 the fuel at a particular point in the system?

8 MR. STEMLER: Objection; form.

9 Tom, when it's a good spot, can we take
10 another break, too?

11 MR. FINCH: In a few minutes.

12 A. I would say because this one is connected to
13 Element 1, which is a dual-fuel generator. That means
14 that generator being able to run with gaseous fuel, and
15 the same generator being able to run with liquid fuel.

16 BY MR. FINCH:

17 Q. So the fact that Element 1.0 says a
18 dual-fuel generator guides your understanding of what
19 Element 1.1 means?

20 MR. STEMLER: Objection; form.

21 A. The way I read it, because it says, "A
22 dual-fuel generator comprising:"

23 So that means that dual-fuel generator then
24 is trying to describe that dual-fuel generator.

25 MR. FINCH: Let's go ahead and take a

1 short break.

2 (Whereupon, a recess was taken
3 from 2:32 p.m. to 2:44 p.m.)

4 BY MR. FINCH:

5 Q. Welcome back.

6 A. Thank you.

7 Q. Dr. Shahbakhti, can you turn to page 73 of
8 your declaration, please?

9 A. I'm on page 73.

10 Q. At the top of 73, it refers to Claim 6 of
11 the '145 Patent.

12 Do you see that?

13 A. Yes, I can see.

14 Q. Ground 2, you're referring to a combination
15 of references that Claim 6 is rendered obvious by
16 multiple references; is that correct?

17 A. That is correct.

18 Q. Which references are you referring to with
19 respect to Claim 6?

20 A. I was referring to Workshop Manual and
21 Matsushima.

22 MR. STEMLER: Barb, I keep forgetting
23 to ask, do you have a total run time?

24 THE REPORTER: About 4 hours and 15
25 minutes.

1 MR. STEMLER: Thank you.

2 BY MR. FINCH:

3 Q. Dr. Shahbakhti, on paragraph 140, you say
4 that "Accordingly, a POSA would have understood the
5 workshop and Matsushima teaches Claim 6."

6 Is that correct?

7 A. That is correct.

8 Q. And this is an obviousness argument?

9 A. Yes.

10 MR. STEMLER: Objection; form.

11 BY MR. FINCH:

12 Q. What's your understanding what "obviousness"
13 means?

14 MR. STEMLER: Objection; form.

15 A. I reflected that one in my declaration, I
16 believe. I included 11 paragraphs that reflects my
17 understanding of the obviousness, which are depicted on
18 page 24 to 29.

19 BY MR. FINCH:

20 Q. Sorry, was there more to that answer, or
21 we're finished?

22 A. Yep. You don't want me to read all these,
23 so it's basically Section E from paragraph 38 to
24 paragraph 48. That's how I reflected my understanding
25 of "obviousness" as a person who is not familiar with

1 that.

2 Q. Do you have any understanding what
3 "obviousness" means separate and apart from
4 paragraph 38 to 48 of your declaration?

5 MR. STEMLER: Objection; form.

6 A. I would say 38 to 48 reflects my
7 understanding.

8 BY MR. FINCH:

9 Q. Did you draft paragraphs 38 to 48?

10 MR. STEMLER: Objection; form.

11 A. I asked the counsel, so they prepared, and
12 then I asked for modifications wherever I feel that I
13 needed to add more content.

14 BY MR. FINCH:

15 Q. Did you ask for any modifications from
16 paragraph 38 to 48?

17 MR. STEMLER: Objection; form.

18 A. It has been a long time since I did that
19 one, but I would say a high chance that I did because
20 what happens from my other declarations that I explain
21 "obviousness." So when I see that there are things
22 that's reflecting better, so I ask the counsel also
23 include that one.

24 So there's a high chance that I have asked
25 for modification based on that, but I don't remember

1 all details, yeah.

2 BY MR. FINCH:

3 Q. Did counsel provide you with the
4 understanding of "obviousness" that's represented in
5 paragraph 38 to 48?

6 MR. STEMLER: Objection; form.

7 A. Because it was a long time ago, I would see
8 a very high chance that I provided my own text from my
9 other declarations, so I asked Alek, also, to include,
10 but at this point, I cannot say which ones were my
11 sentences and which ones are the sentences that Alek
12 wrote. But at the end, I would look at it to make sure
13 that is reflecting my understanding as well.

14 BY MR. FINCH:

15 Q. What's the source of the understanding
16 reflected in paragraphs 38 to 48?

17 MR. STEMLER: Objection; form.

18 A. If you remember earlier, you asked me how
19 many IPRs I have been involved with, so over the past,
20 at least six years, because I have been involved in so
21 many different IPRs, and I have worked with a number of
22 lawyers, and then so all those have helped me to have a
23 better understanding when I'm using the term
24 "obviousness" when it's used in the IPRs.

25 BY MR. FINCH:

1 Q. Let's go back to Claim 6 on page 73 of your
2 declaration.

3 A. You said page 76; is that correct?

4 Q. Claim 6 on page 73.

5 A. Sorry. Claim 6 on page 73, yeah. I'm
6 looking at it now.

7 Q. You testified earlier that it's your opinion
8 that Claim 6 is obvious over the combination of the
9 Workshop Manual in Matsushima; is that correct?

10 MR. STEMLER: Objection; form.

11 A. You see in paragraph 140, I mentioned that
12 POSA would have understanding of Workshop Manual, and
13 Matsushima teaches Claim 6.

14 BY MR. FINCH:

15 Q. So is it your opinion that a POSA would have
16 combined the Workshop Manual and Matsushima to teach
17 Claim 6?

18 MR. STEMLER: Objection; form.

19 A. I would not say to teach Claim 6. It's that
20 a POSA looking at a Workshop Manual and looking at
21 Matsushima, knowing that they are related to each
22 other, then with that understanding, putting them next
23 to each other, then that will provide a teaching that
24 it can make the Claim 6 obvious.

25 BY MR. FINCH:

1 Q. What teachings from Matsushima are you
2 referring to that would make Claim 6 obvious?

3 A. So both of these patents -- not both of them
4 being patents, Matsushima and this Workshop Manual,
5 they are related to the IC engines that they discuss
6 here, and what learning comes from the Matsushima is
7 that it's providing a governor -- sorry, generator that
8 it will make the engines possible to run without having
9 the need for a battery.

10 So here is referring to generator in the
11 Matsushima that is showing in Figure 1 for the parts
12 that is including the magnet as part of the flywheel.
13 So this capability to have the generator that will let
14 the engine to run without the need for the battery is
15 the part that it will make that part for the power
16 generator not being discussed in the case of the
17 Workshop Manual, so this will help that one for the
18 switch receive the power from the system that doesn't
19 need to run with the battery.

20 Q. Can you turn to page 89 of your declaration?

21 A. I'm at page 89.

22 Q. In paragraph 176, you state that "A POSA
23 would have found it obvious to use solenoid, such as
24 that disclosed by Olmr, for Nakafushi's gasoline cut
25 valve 17 and/or control valve 23, as discussed below."

1 Do you see that?

2 A. Yes, I can see it.

3 Q. What type of valve is Nakafushi's Gasoline
4 Cut Valve 17?

5 MR. STEMLER: Objection; form.

6 A. Sorry, you are referring to Figure 2 of
7 Nakafushi and referring to Valve 17; is that correct?

8 BY MR. FINCH:

9 Q. I'm referring to your statement in
10 paragraph 176 in your declaration when you refer to
11 Nakafushi's cut Valve 17, and I want to know what type
12 of valve is Nakafushi's Gasoline Cut Valve 17?

13 A. So if you look at the Figure 1 of Nakafushi,
14 it shows gasoline cut-off Valve 17, so that's the valve
15 that I'm referring to.

16 Q. What type of valve is Nakafushi's Gasoline
17 Cut Valve 17?

18 A. It's a type of valve that it's, I would say,
19 electrically actuated.

20 Q. Does Nakafushi disclose anything else about
21 the structure of Gasoline Cut Valve 17?

22 MR. STEMLER: Objection; form.

23 A. So I'm reading some parts from Nakafushi's
24 page 5, and then line 25, and it says, "Both of the cut
25 valve 17 and 18 are connected to a gasoline-side

1 contact point 19a and an LPG side contact point 19b of
2 a two-poled fuel-switching switch 19 respectively, and
3 a switching means 20 in which a common contact point
4 19a of the fuel-switching switch 19 is connected to a
5 battery beyond ignition switch 20."

6 And then if you flip the page on the page 6,
7 it's mentioned that on page 6, line 4, it says that "In
8 the fuel switching switch 19 is switched to the LPG
9 side, contact point 19b and a cut signal is input to
10 the gasoline cut valve 17, whereby the gasoline
11 supplied to the carburetor is blocked and an LPG supply
12 means (LPG bomb) 16 is operated to switch so as to
13 supply LPG to the LPG mixer 10, is provided."

14 So from here, you understand that -- by
15 "you," I mean the POSA -- will understand that Valve 17
16 is a type of the valve that received the electrical
17 signal, and that electrical signal will actuate this
18 valve in order to, let's say, block or let it go for
19 the fuel.

20 BY MR. FINCH:

21 Q. Thank you.

22 Does Nakafushi disclose anything else about
23 the structure of Gasoline Cut Valve 17?

24 MR. STEMLER: Objection; form.

25 A. Oh, the other part that a POSA will

1 understand, that this is a type of cut-off valve that
2 is used for gasoline, so it's for the liquid fuel, so
3 from here, we can see that it is a type of valve that
4 is receiving the electrical signal and is actuated
5 based on electrical signal, that's one aspect. The
6 other one that is intended to cut fuel flow, and by
7 "fuel," a liquid fuel.

8 BY MR. FINCH:

9 Q. So you said a POSA will understand that this
10 is a type of cut-off valve that is used for gasoline so
11 it's for the liquid fuel.

12 Are there structural differences between
13 valves used for liquid fuel and valves used for gaseous
14 fuel?

15 MR. STEMLER: Objection; form.

16 A. I have not investigated the exact
17 specification that you will need for a gaseous valve
18 versus the liquid valve, but I would say, at minimum,
19 the pressure that the valve that is operating -- by
20 "pressure," I mean fluid pressure -- it's an important
21 factor.

22 BY MR. FINCH:

23 Q. And that would be different in a gaseous
24 valve versus a liquid valve?

25 MR. STEMLER: Objection; form.

1 A. It depends because depending on your gaseous
2 paths, then what's the pressure you are referring to,
3 and on the liquid fuel, what pressure you will be
4 referring to.

5 BY MR. FINCH:

6 Q. Are you aware of any other structural
7 differences between valves used for liquid fuel and
8 valves used for gaseous fuel?

9 MR. STEMLER: Objection; form.

10 A. I have not investigated that exact topic, so
11 it's better to actually investigate so I can be
12 precise.

13 BY MR. FINCH:

14 Q. That's not something you considered while
15 preparing this declaration?

16 MR. STEMLER: Objection; form.

17 A. Let's say if you are looking at this case,
18 let's say it is 17, this is a gasoline 1, and the one
19 let's say, for example, if I'm using this Olmr, is also
20 another one that is being used for gasoline. So when
21 I'm seeing that it's being used both for the same type
22 of fuel, so then I can make a conclusion that it can
23 also be applied over here.

24 BY MR. FINCH:

25 Q. I'm not asking about the specific

1 Nakafushi/Olmer combination. I'm asking if you
2 considered structural differences between gasoline
3 valves and liquid valves as you prepared this
4 declaration?

5 MR. STEMLER: Objection; form.

6 BY MR. FINCH:

7 Q. Let me restate the question.

8 Did you consider structural differences
9 between liquid fuel valves and gaseous fuel valves
10 while preparing your declaration?

11 MR. STEMLER: Objection; form.

12 A. When I was preparing the declaration, I
13 was aware that solenoid valves, they are being used
14 for both liquid fuels and also being used for
15 gaseous fuel. So that was known to me as a POSA.

16 So I know that there are these type of
17 gasoline fuels, that they are a solenoid valve, and
18 they are also a type of valve that they are gaseous
19 fuel solenoid valve.

20 So then in my declaration, I focus mostly on
21 their functions and also seeing that other patents,
22 what are they providing.

23 BY MR. FINCH:

24 Q. Are there differences between solenoid
25 valves used for gasoline fuels and solenoid valves used

1 for gaseous fuels?

2 MR. STEMLER: Objection; form.

3 A. This needs investigation to make a right
4 call. Going back to what I mentioned regarding to the
5 pressure, depending on the type of the pressure, the
6 gaseous fuel will run versus the liquid fuel, then you
7 will need to make sure that, let's say, the plunger of
8 these solenoid valve is able to go back-and-forth
9 because now it will be running it at different
10 pressure.

11 So one factor would be the pressure that
12 they will be operating at.

13 BY MR. FINCH:

14 Q. When you say this needs investigation to
15 make a right call, did you do that investigation as
16 part of preparing your declaration?

17 MR. STEMLER: Objection; form.

18 A. I was not asked to go and then choose the
19 type of the valves for this specific engine, so what I
20 was aiming is that would that be within the knowledge
21 of the POSA, and then going from one teaching, and then
22 provide the obviousness to use it for the other
23 application.

24 BY MR. FINCH:

25 Q. So yes or no:

1 Did you consider the structural differences
2 between liquid fuel solenoids and gaseous fuel
3 solenoids while preparing your declaration?

4 MR. STEMLER: Objection; form.

5 A. Given I was aware that there are both of
6 these type of valves available for both gaseous fuels
7 and liquid fuels, my focus was mainly on making sure
8 that the functions will be able to be provided by
9 what's being selected.

10 BY MR. FINCH:

11 Q. So structural differences between liquid
12 fuel solenoids and gaseous fuel solenoids weren't
13 relevant to your declaration?

14 MR. STEMLER: Objection; form.

15 A. I would say because I mentioned that it
16 would be relevant from the perspective to think that if
17 that's possible to put that element in the, let's say
18 fuel line, but given that I know that this type of
19 gaseous fuel line, solenoid valve, and also the liquid
20 fuel solenoid valve exists, so their structure is
21 important, but given I know that those valves already
22 exist way before, I would say even a couple of decades
23 before 2015, because they existed, then when I was
24 looking at that saying that how is this patent going to
25 be able to work with the other teaching, then I took

1 that one into the consideration that what's already
2 available in the prior art and also the practice in the
3 industry.

4 BY MR. FINCH:

5 Q. So there are structural differences between
6 gaseous fuel solenoids and liquid fuel solenoids, but
7 those differences weren't relevant to your declaration?

8 MR. STEMLER: Objection; form.

9 A. I think we are repeating the discussion.

10 So what happens, selecting the right type of
11 the solenoid valve that is covering the gaseous fuel
12 versus the liquid fuel, it's an important factor, and
13 those are already available in the prior art.

14 So what happens here when it was more
15 focusing on the functions that I will choose, I could
16 see that the functions that is provided, it would be
17 possible because those structure would be supported.

18 BY MR. FINCH:

19 Q. And specifically going back to Nakafushi's
20 Cut Valve 17, was there anything else in that reference
21 that disclosed the structure of that valve?

22 MR. STEMLER: Objection; form.

23 A. I cannot identify parts being -- any other
24 parts being explicitly mentioned here, other than
25 knowing is a gasoline and it's for gasoline, and is an

1 electrically-operated valve.

2 BY MR. FINCH:

3 Q. Turning back in your declaration to page 89.

4 A. I'm at page 89.

5 Q. Paragraph 176, you suggest using a solenoid
6 in place of Nakafushi's cut valve 17 and/or control
7 valve 23.

8 Do you see that?

9 A. Yes, I can see.

10 Q. I'm a little confused by the use of the term
11 "and/or" there.

12 Are you advocating for replacing both of
13 those valves or just one of them?

14 MR. STEMLER: Objection; form.

15 A. I would say it can be used for either of
16 them, and going back to the discussions that we had
17 earlier in the morning, if you look at 23, because also
18 have those coil that we discussed earlier.

19 So 23 is electrically-actuated valve with
20 the mechanical movement, so a POA can consider 23 is
21 also a solenoid valve. And then if you don't consider
22 23 as a solenoid valve, you can replace it, but then
23 looking at 17, because in Nakafushi, it mainly explains
24 that it is an electrically-actuated valve, and then in
25 that sense, Olmr is providing an example to use it

1 here.

2 BY MR. FINCH:

3 Q. So is it fair to say that you think that 23
4 is already a solenoid, but if it isn't, then a POSA
5 would have been motivated to replace it with a
6 solenoid, and also a POSA would have been motivated to
7 replace 17 with a solenoid?

8 MR. STEMLER: Objection; form.

9 A. I would say given solenoid valve I mentioned
10 earlier that has been known for decades before 2015,
11 and then if the person looking at 17, it will see a
12 high chance, because it is an electrically-actuated
13 gasoline cut-off valve, it's a very high chance it's
14 already a solenoid valve, but if it's not, an example
15 here is mentioned for Olmr here.

16 For 23, it's already -- the schematics shows
17 that is a solenoid valve with much more certainty.

18 BY MR. FINCH:

19 Q. Regardless of what Nakafushi disclosed
20 originally, it's your opinion that after doing the
21 modifications suggested here, both 17 and 23 would be
22 solenoids?

23 A. It is definitely electrically-actuated
24 valves, and in that sense, I would say the solenoid
25 valve is a prime example of the electrically-actuated

1 mechanical valve. So I would say for 23, it is already
2 showing data schematic, I would consider it a solenoid
3 valve.

4 For 17, I would say highly possible is
5 already solenoid valve, but given the discussions we
6 had earlier, that is not disclosed, so then the person
7 can see an example in Olmr.

8 MR. STEMLER: I forgot to object to
9 the prior question. Objection; form.

10 BY MR. FINCH:

11 Q. Can you turn to page 119, please?

12 A. I'm at page 119.

13 Q. And Section 6 on that page refers to
14 Claim 5; is that correct?

15 A. That is correct.

16 Q. Claim 5 says, "The dual fuel generator of
17 claim 1, wherein the gaseous fuel is LPG and the liquid
18 fuel is gasoline."

19 Is that correct?

20 A. That is correct.

21 Q. And you've got at 259, you state, "The dual
22 fuel engine of Holzapfel is configured to operate --"

23 (Reporter clarification.)

24 BY MR. FINCH:

25 Q. "The dual fuel engine of Holzapfel,

1 H-O-L-Z-A-P-F-E-L, is configured to operate on a
2 normally gaseous fuel... which... is compressed and
3 thereby maintained in liquefied condition."

4 Is that correct?

5 A. That is correct.

6 Q. You talked earlier about what Holzapfel
7 means by the phrase "normally gaseous fuel"; correct?

8 A. I mentioned LPG is a normally gaseous fuel
9 that may be compressed and maintained in a liquefied
10 condition.

11 Q. And you say you mentioned that what you're
12 doing is actually reading from your declaration; right?

13 A. That is correct.

14 Q. We talked earlier about what Holzapfel means
15 by the term "normally gaseous fuel"; correct?

16 MR. STEMLER: Objection; form.

17 A. I think we had extensive discussions in the
18 morning; correct?

19 BY MR. FINCH:

20 Q. And you discussed that normally, gaseous
21 fuel, as discussed by Holzapfel, means a fuel that
22 is gaseous at ambient temperature and pressure;
23 correct?

24 A. We had those discussions in the morning that
25 I mentioned that in the case of LPG, at the ambient

1 temperature and pressure, it would be in the gaseous
2 state.

3 Q. I'm not asking you about LPG. I'm asking
4 you what the term "normally gaseous fuel" means in
5 Holzapfel.

6 What does the term "normally gaseous fuel"
7 mean in Holzapfel?

8 MR. STEMLER: Objection; form.

9 A. I think we are repeating the discussions we
10 had earlier.

11 So for this normally gaseous fuel, we had
12 this discussion, that it means that if you bring this
13 gas at a normal temperature and pressure -- we had that
14 discussion -- then in that situation, it would be
15 gaseous.

16 But then we had the discussions that for a
17 gas, it always follows a property diagram, which means
18 it will be depending on the temperature and pressure
19 that will determine if the gas will be in the state of
20 the -- this fuel will be in the state of the gas versus
21 being in the state of liquid.

22 BY MR. FINCH:

23 Q. When you say "normal temperature and
24 pressure," what is the normal temperature and pressure
25 considered by Holzapfel?

1 MR. STEMLER: Objection; form.

2 A. We had the same discussions in the morning.

3 It was exactly the same discussion.

4 BY MR. FINCH:

5 Q. It should be easy for you to answer the
6 question.

7 What is the normal temperature and pressure
8 considered by Holzapfel?

9 MR. STEMLER: Objection; form.

10 A. Holzapfel does not disclose that
11 information.

12 So earlier in the morning, I was referring
13 that it would be depending on how the normal
14 temperature and pressure will be used in the
15 literature, and then we had this discussions that what
16 that exact temperature and pressure, that I mentioned
17 that this needs further investigation, but I
18 mentioned an example of that temperature and pressure
19 was 25 degrees C and atmospheric pressure. This is
20 what we discussed in the morning.

21 BY MR. FINCH:

22 Q. Thank you.

23 Turn to page 128 of your declaration.

24 A. I'm at page 128.

25 Q. And if you could turn back to page 125,

1 start at the beginning of this section.

2 A. Sure. I'm at page 125.

3 Q. Subsection d refers to Element 11.3.

4 Do you see that?

5 A. Yes, I can see.

6 Q. 11.3 states, "A manually actuated fuel
7 shutoff coupled to the carburetor, the manually
8 actuated fuel shutoff comprising: a first end in the
9 carburetor that actuates to selectively allow or block
10 a flow of fuel through the carburetor; and a second end
11 external to the carburetor to actuate the first end."

12 Do you see that?

13 A. Yes, I can see.

14 Q. Back to page 128.

15 In paragraph 287, you state, "A POSA would
16 have been motivated to combine Workshop Manual and
17 Winberg."

18 Do you see that?

19 A. Yes.

20 Q. The last sentence on page 128 says, "A POSA
21 would have understood the valve configurations of
22 Winberg's manually actuated valves and the Workshop
23 Manual's solenoid valves to be one of a finite number
24 of valves, each having a reasonable expectation of
25 success."

1 Do you see that?

2 A. Yes, I can see.

3 Q. What does that sentence mean?

4 MR. STEMLER: Objection; form.

5 A. So here, what I'm referring to, because if
6 you are looking at the cases in the Workshop Manual,
7 and there we are talking in the context of the fuel
8 shutoff valve here.

9 And then here, what I'm referring to saying
10 that the POSA would have understood that the valve
11 configurations of Winberg's manually-actuated valves
12 and the Workshop Manual solenoid valves to be one of
13 the finite number of the valves, each having a
14 reasonable expectation of success.

15 So if we put the expectation that the
16 purpose of them is to provide that fuel shutoff, then
17 that solenoid valve in the Workshop Manual and the
18 Winberg manual shutoff valve will both do the purpose.

19 And then saying the finite number of the
20 valves means that there are different ways that you can
21 provide that fuel shutoff.

22 BY MR. FINCH:

23 Q. So you could provide the fuel shutoff either
24 with Winberg's manually-actuated valves or the Workshop
25 Manual solenoid valves?

1 MR. STEMLER: Objection; form.

2 A. To stopping the flow of the fluid, we can
3 see that the Workshop Manual using solenoid valve and
4 its shutoff valve -- sorry, shut off the fuel flow.

5 In the case of Winberg, if you look at
6 Figure 3, it's also shutting off the fuel that is going
7 to the carburetor.

8 BY MR. FINCH:

9 Q. When you say "finite number of valves," what
10 did you mean by that?

11 MR. STEMLER: Objection; form.

12 A. Let's say you have a shutoff valve and then,
13 you want to get that process of shutoff being done
14 manually or you want it to be done electrically-
15 actuated way.

16 So this is an example, when I said "finite
17 number of the valves," then you have these choices to
18 choose between the types of the valves, depending what
19 you would like to accomplish.

20 BY MR. FINCH:

21 Q. So the finite number you're referring to are
22 either manually valves or electrically-actuated valves?

23 MR. STEMLER: Objection; form.

24 A. And also, what happens, even say the
25 manually-actuated valves you can have a variety of

1 manually-actuated valves because there are different
2 ways you can do manually shutting off the fuel.

3 So when I am using the word "valves" in the
4 plural form is referring to the solenoid case, which is
5 electrically-actuated or manually, and there are
6 varieties of these shutoff valves that you can do it
7 manually.

8 BY MR. FINCH:

9 Q. What are the different manually-actuated
10 valves that could have been used?

11 MR. STEMLER: Objection; form.

12 A. Can you repeat the question?

13 BY MR. FINCH:

14 Q. You said that there were a variety of
15 manually-actuated valves that could have been used
16 here, and I want to know what are the different
17 manually-actuated valves that could have been used?

18 MR. STEMLER: Objection; form.

19 A. I would say even if you look at just an
20 example of Winberg, it's providing different
21 embodiments, how to do a mechanically -- they're all
22 manual valves, but it's providing different embodiments
23 for different ways to manually do the function of
24 shutoff valve.

25 So just the Winberg by itself, it includes

1 several examples.

2 BY MR. FINCH:

3 Q. You put in your declaration that there's a
4 finite number of examples; right?

5 MR. STEMLER: Objection; form.

6 A. Let's say if you are looking at this example
7 of this Winberg, we can see there's a finite number of
8 the embodiment that has been depicted in the patent, so
9 that would be examples of the number of the valves that
10 you can use.

11 BY MR. FINCH:

12 Q. So when you say "finite number of valves,"
13 you're referring to the examples in Winberg?

14 MR. STEMLER: Objection; form.

15 A. I would say Winberg is providing several
16 examples of that one, but then there are also other
17 manually-actuated shutoff valves.

18 BY MR. FINCH:

19 Q. How many?

20 MR. STEMLER: Objection; form.

21 A. I have not gone to investigate all the
22 possible manual shutoff valves that is in the prior art
23 before 2015.

24 BY MR. FINCH:

25 Q. So when you say "finite number," you just

1 mean some number less than infinity?

2 MR. STEMLER: Objection; form.

3 A. I would say if you are looking at the case
4 of Winberg, is already several examples of the
5 manually-actuated valves have been shown.

6 BY MR. FINCH:

7 Q. But you said there's a finite number, and I
8 want to know how many there are.

9 MR. STEMLER: Objection; form.

10 A. I would say read -- I think you are now
11 focusing on just selection of these words. So when I
12 said "finite number," we can think about a limited
13 number of the valves.

14 BY MR. FINCH:

15 Q. There's a limited number of the potential
16 valves that could be used here?

17 A. Yes.

18 Q. How many?

19 MR. STEMLER: Objection; form.

20 A. Going back to what I mentioned earlier, I
21 have not gone to look into every single types of the
22 valves that we use, but then looking at Winberg, we
23 can, at minimum, consider the examples of the Winberg
24 being included.

25 I'm not going to give you the exact numbers

1 because I have not gotten to know if this is 11 or is
2 15 or is 18 or 21 or 25. I have not investigated to
3 know exactly what that number is.

4 MR. FINCH: Let's go ahead and take a
5 short break.

6 (Whereupon, a recess was taken
7 from 3:42 p.m. to 3:56 p.m.)

8 BY MR. FINCH:

9 Q. Doctor Shahbakhti, welcome back.

10 A. Thank you.

11 Q. During the break we just took, or any of the
12 breaks today, have you discussed the substance of your
13 testimony with counsel?

14 A. Not at all.

15 Q. In your own words and without looking at
16 your declaration, I have a couple questions for you,
17 again, regarding the concept of obviousness.

18 Do you know the specific U.S. statutory
19 sections that govern obviousness?

20 MR. STEMLER: Objection; form.

21 A. I remember I cite that one in my
22 declaration, the number. I cannot say on top of my
23 head if it's 137 or -- yeah. Yeah, I have -- yes, I
24 looked into that one, but a lot of my understanding
25 was, as I mentioned, reflected in the declaration about

1 what I consider as obviousness.

2 BY MR. FINCH:

3 Q. Sure. Are you familiar with the phrase "the
4 Graham Factors"?

5 MR. STEMLER: Objection; form.

6 A. Say it again.

7 BY MR. FINCH:

8 Q. Graham, G-R-A-H-A-M, Factors.

9 A. I'm not familiar with that term.

10 Q. Are you familiar with the phrase "objective
11 indicia of non-obviousness"?

12 MR. STEMLER: Objection; form.

13 A. Sounds a legal term. No, I am not familiar.

14 BY MR. FINCH:

15 Q. What about the term "secondary
16 considerations of non-obviousness"?

17 MR. STEMLER: Objection; form.

18 A. That one, yes, I mention also in my
19 declaration.

20 BY MR. FINCH:

21 Q. Without looking at your declaration, can
22 you just tell me what your understanding of that term
23 is?

24 MR. STEMLER: Counsel, I don't think
25 it's appropriate to be asking the witness to not refer

1 to his declaration during this deposition, and
2 Dr. Shahbakhti is free to refer to whatever materials
3 he'd like.

4 BY MR. FINCH:

5 Q. Let me ask a different question.

6 Dr. Shahbakhti, do you have an
7 understanding, separate and apart from what's in your
8 declaration, of what the term "secondary considerations
9 of non-obviousness" means?

10 MR. STEMLER: Objection; form.

11 A. I would say I used that term in my
12 declaration, so it's best -- because the declaration is
13 reflecting my opinion, is the best -- if you want, I
14 can read it from -- because I mentioned examples of
15 that.

16 BY MR. FINCH:

17 Q. Thank you. And I've read your declaration.

18 I was just wondering if you had anything,
19 other than what's written in your declaration, if you
20 had any understanding of what that term means?

21 A. I would say the declaration, especially
22 now having included 11 paragraphs, a good number
23 of paragraphs explaining what I consider as
24 obviousness.

25 Q. Did you consider any federal circuit or

1 Supreme Court precedent?

2 MR. STEMLER: Objection; form.

3 A. Repeat the question, please.

4 BY MR. FINCH:

5 Q. Did you consider any Federal, Circuit or
6 Supreme Court precedent in preparing your opinions?

7 MR. STEMLER: Same objection.

8 A. I remember before sometimes when looking at
9 the -- because I'm a curious person and usually go and
10 dig into things. For example, I remember reading about
11 Phillips and some of those cases in the past, so -- or
12 sometimes because, again, I'm a very picky person,
13 discuss these things with the counsels over the past
14 years, what was this case versus the other one. So in
15 that case, I become very little, I would say, familiar
16 with the legal terms.

17 BY MR. FINCH:

18 Q. And did you consider any memorandum from the
19 Director of the United States Patent & Trademark Office
20 while considering or preparing your declaration?

21 MR. STEMLER: Objection; form.

22 A. I did not look into the memorandum because I
23 don't know exactly what you are referring to. Is it a
24 certain part that you are referring, or you're meaning
25 general, any memorandum from the patent office?

1 BY MR. FINCH:

2 Q. Does your answer change based off of the
3 understanding of that question?

4 MR. STEMLER: Objection; form.

5 A. The reason I mention it, because I might
6 have read something that will be close to what you
7 mean. That's why I'm asking.

8 BY MR. FINCH:

9 Q. Have you read the case KSR vs. Teleflex?

10 MR. STEMLER: Objection; form.
11 Objection; relevance.

12 A. I cannot remember on top of my head, yeah.

13 BY MR. FINCH:

14 Q. Is your understanding of obviousness
15 consistent with KSR v. Teleflex?

16 MR. STEMLER: Objection; form.
17 Objection; relevance.

18 A. Do you mind to repeat the question?

19 BY MR. FINCH:

20 Q. Sure. Is your understanding of obviousness
21 consistent with KSR v. Teleflex?

22 MR. STEMLER: Objection; form.

23 A. Because those acronyms, I cannot remember it
24 now, so I would like to actually know more about those.
25 Then I can say if it's aligned with that.

1 BY MR. FINCH:

2 Q. Let's move on.

3 Can you go to Exhibit 1008 again, the
4 Holzapfel reference?

5 A. Sure. Let me get the exhibit. What was the
6 exhibit number?

7 Q. 1008.

8 MR. STEMLER: I think you got it right
9 here.

10 A. I'll use this one because it's not stapled.

11 I have 1008 in front of me.

12 BY MR. FINCH:

13 Q. We talked earlier about the difference
14 between mechanical and electrical systems.

15 Do you remember that?

16 MR. STEMLER: Objection; form.

17 A. I mentioned examples, yes.

18 BY MR. FINCH:

19 Q. Does Exhibit 1008 disclose any electrical
20 systems?

21 MR. STEMLER: Objection; form.

22 A. So looking at these Holzapfel patent, it
23 mainly talks about the fueling system. As the title of
24 the patent says, "Fuel System For Combustion Engine."

25 A POSA will understand, even as using a

1 carburetor system over here, and we are looking at the
2 context of, say, 1931, and the type of the fuel working
3 with a carburetor, example would be, for the liquid
4 fuel, would be gasoline, and I would expect this engine
5 to be a spark ignition engine, and spark ignition
6 engines, they will have the electrical components for
7 the coil that supply the electricity for the spark
8 plugs.

9 BY MR. FINCH:

10 Q. Where in Holzapfel does it disclose
11 electrical components for the coil that supply
12 electricity for the spark plugs?

13 MR. STEMLER: Objection; form.

14 A. If you see what I mentioned, so because this
15 one is related to the fuel system, it's not explicitly
16 mentioned here, but for me, as a POSA, the person who
17 knows engine, we are talking about the liquid fuel
18 being used in the carburetor. This is a system that we
19 use it for spark ignition engines. The spark ignition
20 engines, for the spark, you will need the ignition
21 source, and that ignition source is coming from the
22 electrical part.

23 BY MR. FINCH:

24 Q. Other than electricity for the spark plugs,
25 does Holzapfel disclose any other electrical systems?

1 MR. STEMLER: Objection; form.

2 A. Given the case that I mentioned about the
3 ignition, I said is not explicitly mentioned.

4 It does say this is in connection with the
5 automobile engine. Later, there are other electrical
6 system in addition to the electrical systems. It's
7 possible, but I would say Holzapfel does not explicitly
8 disclose it.

9 BY MR. FINCH:

10 Q. Can you turn to Exhibit 1005, the Nakafushi
11 reference, please?

12 A. I have it.

13 Q. Earlier, we discussed the fact that the
14 Nakafushi reference is a translation of a Japanese
15 patent.

16 Do you remember that?

17 A. Yes, I remember.

18 Q. Do you have any understanding of what the
19 composition of commercial grade LPG is in Japan?

20 MR. STEMLER: Objection; form, and
21 objection relevance as well.

22 A. I mean, looking at Nakafushi's patent, it
23 doesn't disclose that the LPG that they are referring
24 for is a specific type of LPG.

25 And then, if you remember, I mentioned

1 earlier that I teach IC engines and alternative fuels.
2 In that course, we look into the history of the fuels
3 and also engines. So what happens after the second
4 world war -- after the first world war, then the fuels
5 become more and more standard, and the reason was that
6 if you got an engine that stays in France, you want the
7 same engines being able to operate in Germany.

8 So as a result, the fuels become more and
9 more standard, and looking at the time scale of, let's
10 say, prior art we are considering in 2015, I would
11 consider that the LPG, that if engine is designed to
12 operate with LPG, it will -- the LPG fuel will be a
13 standard to be used in the Canada, U.S. and Germany or
14 Japan.

15 And then, typically for engines, you
16 will have a small tolerance menu designed for
17 how much variations in terms of -- let's say
18 propane, but the engine is designed such that it
19 will operate with those small variations in the
20 fuel composition.

21 MR. FINCH: I think we're almost done.
22 Let's take a five-minute break and should be able to
23 wrap this up.

24 MR. STEMLER: Thanks.

25 (Whereupon, a recess was taken

1 from 4:21 p.m. to 4:32 p.m.)

2 BY MR. FINCH:

3 Q. Dr. Shahbakhti, did you discuss the
4 substance of your testimony on this last break?

5 A. No.

6 Q. Thank you for your time today.

7 A. Thank you.

8 Q. I don't have any more questions.

9 MR. STEMLER: We'll review and sign.
10 And we'll do a rough and standard electronic.

11 MR. FINCH: Rough and expedited
12 please. Tuesday expedited.

13 (The deposition of Mahdi
14 Shahbakhti Ph.D., P.Eng. concluded at
15 approximately 4:32 p.m.)

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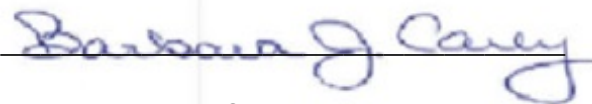
1 CERTIFICATE

2 I, Barbara J. Carey, Registered Professional
3 Reporter and Certified Shorthand Reporter, do hereby
4 certify that prior to the commencement of the
5 examination, Mahdi Shahbakhti Ph.D., P.Eng, was duly
6 sworn by me to testify to the truth, the whole truth
7 and nothing but the truth.

8 I DO FURTHER CERTIFY that the foregoing is a
9 verbatim transcript of the testimony as taken
10 stenographically by me at the time, place and on the
11 date hereinbefore set forth, to the best of my ability.

12 I DO FURTHER CERTIFY that I am neither a
13 relative nor employee nor attorney nor counsel of any
14 of the parties to this action, and that I am neither a
15 relative nor employee of such attorney or counsel, and
16 that I am not financially interested in the action.

17

20 

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23 Certified Shorthand Reporter

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6

7 ERRATA SHEET

8

9 Case: Generac Power Systems Inc. v Champion Power Equipment Inc.

10 Witness Name: Dr. Shahbakhti

11 Deposition Date: 05/22/2026

12 Page No. Line No. Change

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23 Signature

Date

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1 22:23	94:10,19	92:13 94:9,	126:11	128:4,7,11,
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