

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KUBOTA NORTH AMERICA CORPORATION,

Petitioner,

v.

VERMEER MANUFACTURING COMPANY,

Patent Owner.

IPR2025-00167

IPR2025-00168

IPR2025-00169

IPR2025-00170

IPR2025-00171

U.S. Patent No. 9,321,386

IPR2025-00381

U.S. Patent No. 11,465,891

PGR2025-00016

U.S. Patent No. 12,098,063

DEPOSITION OF

MARK FLEMING, PH.D., P.E.

November 14, 2025

9:00 a.m. CST

Reported by:

Janice M. Koczek, CSR, CLR

Job No. 57603

Henderson Legal Services

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1 The deposition of MARK FLEMING, PH.D.,
2 P.E., reported stenographically by Janice M.
3 Koczek, License No. 084-002871, Certified
4 Shorthand Reporter, Certified LiveNote Reporter,
5 and Notary Public of the state of Illinois, held
6 at the Law Offices of Armstrong Teasdale,
7 100 North Riverside Plaza, Suite 1500, Chicago,
8 Illinois, commencing at the hour of 9:00 a.m.
9 CST, on the 14th day of November, 2025.

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1 A P P E A R A N C E S:

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1 I N D E X

2

3	MARK FLEMING, PH.D., P.E.	PAGE
4	Examination by Mr. O'Dell	5

5

6 E X H I B I T S

7	EXHIBIT DESCRIPTION	PAGE
8	Exhibit A	128

9 Declaration of Mark Fleming, Ph.D., P.E.

10 Vermeer Manufacturing Company vs.

11 The Toro Company, Patent 10,597,843

12

13	Exhibit 1001-00169	30
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14 United States Patent 9,321,386 B1

15

16	Exhibit 2016-00169	71
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17 Declaration of Mark Fleming, Ph.D., P.E.,

18 in Support of Patent Owner's Response to

19 Petition for Inter Partes Review of

20 U.S. Patent No. 9,321, 386

21

22	Exhibit 2017-00167	65
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23 United States Patent 5,004,398

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5

1 (Witness sworn.)

2 MARK FLEMING, PH.D., P.E.,

3 called as a witness herein, having been first

4 duly sworn, was examined and testified as

5 follows: 09:07

6 EXAMINATION

7 BY MR. O'DELL:

8 Q. All right. Good morning. Would you

9 mind stating your name for the record?

10 A. Mark Fleming. 09:07

11 Q. Okay. Would it be all right if I

12 just referred to you as Dr. Fleming?

13 A. That's fine.

14 Q. Okay. Great. And have you had your

15 deposition -- you have had your deposition taken 09:07

16 before? Tell me about your other depositions.

17 A. Yes, I have had my deposition taken

18 before a few times, both in patent litigation

19 and in -- I guess patent litigation. I gave a

20 deposition in an IPR matter before. And I've 09:07

21 given some product liability depositions as

22 well.

23 Q. Okay. The product liability, did

24 that have to do with tractors or loaders and

25 machines? 09:08

6

1 A. I -- I'm trying to recall what I've
2 been -- some were on automotive, some on
3 fracture. I obviously analyzed off-highway
4 equipment. I don't remember if I've given a
5 deposition on something where there was an
6 alleged failure or some kind of accident with a
7 piece of off-highway equipment.

09:08

8 Q. Okay. Is the generic term for all
9 this off-highway equipment -- is that a word I
10 could use -- I tried to come up with a word --
11 skid steers, loaders, and things like that.

09:08

12 What's a generic term that I could
13 use for that?

14 A. Yeah. I mean, I think the generic
15 term goes under off-highway equipment --

09:08

16 Q. Okay.

17 A. -- which would encompass agriculture,
18 construction equipment or -- you know, in this
19 case one of the pieces of prior art was for
20 working inside of a building, which would also
21 be off-highway.

09:09

22 Q. Okay. Great. Thank you.

23 Okay. And you're appearing today as
24 an expert on behalf of Vermeer; is that correct?

25 A. Yes.

09:09

1 Q. So I'll go over some ground rules.

2 You understand you're under oath,

3 correct?

4 A. Yes.

5 Q. And when I ask you -- I interrupted 09:09

6 you. Sorry. When I ask you a question, I will

7 try to stop and wait for you to answer verbally

8 with a yes.

9 Do you understand that?

10 A. Understood. 09:09

11 Q. Good. And you'll answer truthfully

12 and completely. And if I interrupt that, you

13 can say I need to keep answering and I will stop

14 and you can keep answering so that your answer

15 is always truthful and complete. 09:09

16 Do you understand that?

17 A. Yes, I understand.

18 Q. If I ask a question and you answer

19 it, I'll assume you understood the question. If

20 you don't understand a question, you can ask me 09:10

21 to rephrase it.

22 Is that okay?

23 A. Yes, I'll do that.

24 Q. If you need to take a break at any

25 time, just let me know and we can take breaks 09:10

8

1 throughout the day.

2 **A. Okay.**

3 Q. Have you ever worked on -- as an
4 expert on behalf of Vermeer before?

5 **A. Yes, I have.** 09:10

6 Q. Okay. When?

7 **A. I recall a few years back doing some**
8 **analysis of a -- a skid steer product and**
9 **writing a report on that.**

10 Q. Okay. Were you involved in any 09:10
11 re-exams or IPRs on behalf of Vermeer?

12 **A. I believe that one was a PGR.**

13 Q. PGR. Okay. Okay.

14 And who was the opposing party?

15 **A. I believe that one was Toro.** 09:11

16 Q. Toro. Okay. And who did you work
17 with when you were working on the Toro matter?

18 **A. I -- my recollection was that the**
19 **firm was Armstrong Teasdale.**

20 Q. Okay. And what attorneys did you 09:11
21 work with?

22 **A. The one I recall was Mr. Vander Tuig,**
23 **who's here with us today.**

24 Q. And you prepared seven reports for
25 today -- for today's matters; is that correct? 09:11

9

1 **A. Yes, I prepared them for this matter.**

2 Q. Okay. And who did you work with to
3 prepare those reports?

4 **A. I recall working with Mr. Vander**
5 **Tuig. And there were some other people from** 09:11
6 **Armstrong Teasdale that I recall being on some**
7 **of the calls that we had as well.**

8 Q. Okay. But Mr. Vander Tuig was the
9 primary person you worked with?

10 **A. I would say so, yes.** 09:12

11 Q. And did you review the patents at
12 issue?

13 **A. Yes, I did.**

14 Q. Okay. As you know, there are five
15 patents and seven IPRs and they're family 09:12
16 members. I'd like to refer to them as the
17 Vermeer patents if we're talking generically.
18 If I want to talk about a specific claim of a
19 specific patent, I'll refer -- try to identify
20 the patent number. But for the most part I'll 09:12
21 talk about the Vermeer patents as we go forward.

22 Does that make sense?

23 **A. Okay.**

24 Q. Are you aware of any differences
25 other than the claims between the five patents? 09:12

10

1 A. There are obviously some differences
2 between the patents. So I'm not going to say
3 that there's no differences. But as far as what
4 I analyzed, the -- the claims and the written
5 descriptions and the -- those kind of details
6 were quite similar to me, I would say.

09:13

7 Q. Good. Good. In the IPR and PGR
8 proceedings there was a petition filed and a
9 patent owner, which is Vermeer, preliminary
10 response.

09:13

11 Did you read those two documents?

12 A. Yes, I did.

13 Q. Patent owner -- there was a petition
14 and the patent owner preliminary response.
15 Okay.

09:13

16 Did you read the institution
17 decisions that were issued by the board?

18 A. I did read through those, yes.

19 Q. Okay. And how did you prepare for
20 this deposition?

09:14

21 A. Well, going back to the beginning, I
22 guess, I did my analysis work. I wrote reports.
23 And then there was -- as far as in this last
24 week or so, I spent some time reviewing
25 documents, reviewing -- you know, including the

09:14

11

1 reports, reviewing the reports from
2 Dr. Velinsky, reviewing the patents at issue,
3 the Vermeer patents as you call them. I
4 reviewed the prior art patents as well.

5 Q. Okay. Okay. And then the documents 09:14
6 we just discussed?

7 A. Yes, the documents --

8 Q. The petition?

9 A. -- that were provided to me in this
10 matter. 09:14

11 Q. Okay. We mentioned earlier calling
12 this off-highway equipment. But in particular I
13 think the patent refers to compact utility
14 loader; is that correct?

15 A. Yes. 09:15

16 Q. Are there other terms for a compact
17 utility loader?

18 A. Yes.

19 Q. Can -- off the -- can you say some of
20 those? 09:15

21 A. Probably the biggest one that I've
22 seen is mini skid steer.

23 Q. Okay.

24 A. Other ones would be like compact tool
25 carrier. 09:15

12

1 Q. Okay. Okay. And you said this in
2 your declaration, but you kind of refer to each
3 of those terms interchangeably. And for the
4 purposes of this meeting they're the same?

5 A. Yes. 09:15

6 Q. Okay.

7 A. Unless I would point out some
8 specific difference.

9 Q. So I have a question. Does a skid
10 steer need to be tracks or do you refer to skid 09:15
11 steers including the wheeled versions of the
12 machines?

13 A. I would say skid steers could be
14 either wheeled or tracked.

15 Q. Okay. Okay. But skid steer kind of 09:16
16 talks about how it's -- how you turn it, right?
17 It skids to turn; is that correct?

18 A. Yes, the name literally talks about
19 how you steer it.

20 Q. Okay. 09:16

21 A. You have some differential speed from
22 one side to the other, which causes it to -- to
23 turn one way or the other. And it ends up
24 skidding on one side or the other.

25 Q. Okay. Great. Great. 09:16

1 At this time I'd like to discuss your
2 background and experience. You are currently
3 employed by Northwestern University; is that
4 correct?

6 Q. Okay.

10 Q. For your adjunct professorship -- 09:16
11 professorship, what do you teach?

16 Q. Okay.

17 A. And then I also will participate --
18 I've filled in teaching other classes like the
19 -- a couple years ago I taught the first finite
20 element class when a professor was on leave of 09:17
21 absence. I've worked with summer programs at
22 the university with high school students and
23 college students that want to learn about things
24 like data science, for instance. And so those
25 are some of the things that I do at 09:17

14

1 **Northwestern.**

2 Q. It has been a while since I've been
3 in engineering college. Finite element, is that
4 a math -- is that a math class?

5 A. **No.** 09:18

6 Q. Tell me what finite element analysis
7 is.

8 A. **Finite element analysis is computer**
9 **simulations. So engineering involves a lot of**
10 **calculations for doing your design work. And so** 09:18
11 **finite element analysis is a way of doing**
12 **detailed calculations that involves breaking --**
13 **breaking the problem down into the geometry, you**
14 **know, the thing that you can look and see and**
15 **touch, the material properties, what it's made** 09:18
16 **of, and then the loads and boundary conditions.**

17 And so you put all that -- you break
18 all that up, build a model of that, and then you
19 can do a detailed calculation to see how it
20 moves, what the stresses are when it moves or 09:18
21 when it's loaded, and, you know, how it deforms,
22 for instance.

23 Q. Okay. And what do you use that for?

24 A. **Well, some of the things that I just**
25 **talked about. So when you're doing design work** 09:19

15

1 you might be looking to see, for instance, what
2 the load paths are for a structure, where the
3 stresses are high, where the stresses are low.
4 You may be looking at analyzing the motion of a
5 machine. So that's some of the big uses of
6 finite element analysis.

09:19

7 Q. Is a result of this potentially
8 modifying a design or changing the materials of
9 a design?

10 A. Well, that's design work in general.
11 So you can analyze the effect of modifying these
12 different parameters. So if you modify the
13 geometry, if you modify the material, what
14 effect does that have. If you evaluate
15 different load cases, what effect does that
16 have.

09:19

09:20

17 Q. So if a member is under stress that's
18 unacceptable, you can potentially change a
19 characteristic of the member?

20 A. For instance.

09:20

21 Q. Okay. Is this an undergraduate class
22 or is it graduate level?

23 A. The one that I teach is primarily
24 graduate students, Ph.D. students, master
25 students.

09:20

16

1 Q. Okay.

2 A. The first level one that I was
3 talking about, that's primarily seniors and
4 maybe some master students.

5 Q. Senior -- I mean, bachelor degree 09:20
6 students?

7 A. Correct.

8 Q. Okay. Okay. All right.
9 Have you -- what were you doing in
10 the 2015 time frame? Let me strike that. 09:20

11 Before I go there. Your other job
12 you're working on is Fusion; is that correct?

13 A. Correct.

14 Q. Tell me about that job.

15 A. Fusion Engineering is an engineering 09:21
16 consulting company. So we do consulting work
17 for companies or people that need some kind of
18 help. It could be on -- for instance, on patent
19 litigation.

20 Q. Okay. 09:21

21 A. We may provide some engineering
22 assistance on that. We may do some work on
23 product liability. And then we also do what I
24 call industrial consulting for people that maybe
25 need some specialty testing or maybe they need 09:21

17

1 some finite element calculations done. We were
2 just talking about finite element analysis. Or
3 else they may need some material evaluation or
4 some specialty microscope -- microscopy work
5 done. We've got some specialty microscopes and
6 other material evaluation work. So that's kind
7 of a -- a broad-brush look at the kind of work
8 that we do at Fusion Engineering.

09:21

9 Q. Would you say that finite element
10 analysis is a routine part of design engineering
11 for off-highway equipment?

09:22

12 A. It is heavily used in developing
13 off-highway equipment.

14 Q. And finite element analysis allows
15 you to move, change, or alter a characteristic
16 of one member that is a potential failure?

09:22

17 A. Well, it allows you to evaluate how a
18 structure performs under load. So whether it's
19 under design loads or some kind of extreme
20 loads, you can assess what the effect of those
21 loads are. And then if you want to make some
22 design changes, you can do that.

09:22

23 Q. Okay. But making those design
24 changes in light of finite element analysis is
25 part of the routine design process?

09:23

18

1 A. Well, that's part of the design
2 process in general. And finite element analysis
3 is one way to do it. You can do hand
4 calculations as well. You can do testing. It
5 kind of depends where you are in the -- in the
6 process of the design.

09:23

7 Q. Okay. Okay. All right.
8 Let's go back. Before -- let's go to
9 the 2015 time frame. What were you doing then?

10 A. Which day?

09:23

11 Q. I'm sorry. You pick.

12 A. Well, I was -- professionally
13 speaking, I was doing by and large the same
14 things that we were just talking about.

15 Q. Okay.

09:23

16 A. I was working at Fusion Engineering.
17 Back then it was actually called Caulfield
18 Engineering. We bought the company in 2019 and
19 changed the name to Fusion. But I was still
20 doing engineering consulting and I was also
21 teaching at Northwestern.

09:24

22 Q. Have you ever performed design
23 projects or finite element analysis for Vermeer?

24 A. I don't recall doing any design
25 projects or FEA work for -- if you hear me refer

09:24

19

1 to FEA, that's just a short-form acronym for
2 finite element analysis. I -- getting back to
3 answering your question, I don't recall doing
4 any design or FEA work for Vermeer.

5 Q. Have you been involved in the design 09:24
6 work for any off-highway equipment?

7 A. Yes, I have.

8 Q. Tell me about that.

9 A. I worked for six years at a company
10 called Case, which then at some point during my 09:25
11 tenure there they merged with New Holland and
12 changed the name to CNH. And so I worked on
13 designing off-highway equipment when I was there
14 for six years. That was -- that included skid
15 steers, skid steer loaders, as well as a variety 09:25
16 of other pieces of off-highway equipment.

17 And then since that time we have
18 worked with various manufacturers on different
19 projects. Probably more so as far as
20 off-highway equipment goes, in things related to 09:25
21 like things that are in factories like forklifts
22 and, you know, carriers for packages and things
23 like that.

24 Q. What was the time frame of this?

25 A. Some projects I remember -- well, you 09:26

20

1 know, there's been a variety of projects that
2 have taken place over the course of the last
3 20 years. So some of them -- you know, many
4 years ago, some of them just a few years ago.

5 Q. You said you worked on a mini skid 09:26
6 steer. Do you remember when that was? I'm
7 sorry, you said you worked on a skid steer. Do
8 you know when that was?

9 A. Well, the skid steers that I worked
10 on as far as design work goes was back during my 09:26
11 time at Case/CNH.

12 Q. Okay.

13 A. Which would have been in the late
14 '90s, early 2000s.

15 Q. When you say you worked on design 09:26
16 work for Case, is that primarily doing FEA?

17 A. That was a lot of the work that I
18 did, was FEA. But we also did things like
19 tolerance stackup analysis. We collaborated
20 with the testing group on setting up the testing 09:27
21 and comparing our calculations versus how it
22 performed in testing.

23 I also recall participating in some
24 like dealer surveys when we would bring dealers
25 in and talk to them about our product versus 09:27

21

1 competitive products. So there was a variety of
2 tasks that I did, including some FEA
3 calculations.

4 Q. And FEA, would you call that failure
5 analysis? 09:27

6 A. Not necessarily, no.

7 Q. Not necessarily. Was there a
8 separate group that did failure analysis?

9 A. What do you mean by "failure
10 analysis"? 09:27

11 Q. If a product fails, you would analyze
12 why it failed.

13 A. As far as the work that I was doing
14 is primarily design work.

15 Q. Okay. 09:28

16 A. And so we would be looking forward.

17 Q. Okay.

18 A. If there was an occasional issue that
19 came up where we were looking at, you know,
20 maybe something with tracks or something with 09:28
21 various components that was having a problem
22 that needed some kind of redesign work. But as
23 far as field, there was other people that dealt
24 with the issues in the field but didn't have a
25 whole lot of interaction with them. Very, very 09:28

22

1 **occasional.**

2 Q. Okay. Okay. What components had
3 problems that you addressed while you were
4 working at Case?

5 A. **Problems from what standpoint?** 09:28

6 Q. Problems that needed -- that you
7 addressed with FAE -- FEA. I said the wrong.

8 A. **Well, I recall working on the design**
9 **of the mainframe, for instance, which was sort**
10 **of a -- the core of the machine and, you know,** 09:29
11 **very important structural component. So worked**
12 **on that. And then worked on some of the drive**
13 **system, you know, some of the structure for the**
14 **drive. Worked on loader arms and connections**
15 **for that. Looked at tolerance stackup analysis** 09:29
16 **between the various structural components**
17 **related to when they were manufactured, did they**
18 **fit together properly.**

19 There were projects I remember where
20 we were analyzing the -- the controls, for 09:29
21 instance, and, you know, whether -- you know,
22 the feel of those, whether they were going to
23 survive the loads that we put on them.

24 There was the ROPS, the rollover
25 protection structure, that wanted to make sure 09:30

23

1 that it could absorb -- if there was a rollover,
2 absorb the load and protect the occupant.

3 So those are some of the projects.

4 Buckets. I remember analyzing buckets. Worked
5 with some of the -- you know, we looked at
6 attachments as well, other attachments beyond
7 just buckets.

09:30

8 Q. When you -- after your FEA of a
9 component, would you recommend changes or
10 reconfigurations of the component?

09:30

11 A. Depends what the results were.

12 Q. Okay. If they were poor results,
13 would you recommend a change?

14 A. Obviously.

15 Q. When you recommended a change, did
16 you just say this needs to be changed or did you
17 give specific direction on how the changes
18 should be made?

09:30

19 A. I mean, design is collaborative. So
20 there would -- if there was a design issue that
21 was found, we would get together and have a
22 design review meeting. And there would be a
23 path forward that we would determine and further
24 evaluation would be done, either through testing
25 or through calculation and -- to resolve the

09:31

09:31

24

1 **issue.**

2 Q. When you say design is collaborative,
3 can you explain that further?

4 A. **Right. So I was not solely working**
5 **by myself designing a skid steer. There was a** 09:31
6 **skid steer group. And so if I was doing a**
7 **calculation and I found an issue, I may go talk**
8 **to somebody else who was on the design team that**
9 **maybe would have some input on that as well.**

10 **And we would discuss a path forward.** 09:32

11 Q. When you were doing your FEA, did you
12 use CAD?

13 A. **Yes, CAD is how the drawings are done**
14 **for engineering.**

15 Q. Have you ever worked on the design or 09:32
16 development of a mini skid steer?

17 A. **I don't believe or I don't recall**
18 **doing any design development work specifically**
19 **for a mini skid steer. The ones that I worked**
20 **on were a full-size skid steer with a cab** 09:32
21 **structure in it.**

22 Q. Okay. Okay. So in the full-size
23 skid steer, the operator, where would that
24 person be located?

25 A. **There's an operator seat with a cab** 09:33

25

1 **ROP structure around them. So they would be**
2 **sitting in the operator seat.**

3 Q. Would that be mid, center of the
4 machine?

5 A. **Generally it would be.** 09:33

6 Q. When was your first experience with
7 mini skid steers?

8 A. **Professionally or personally?**

9 Q. Let's go -- let's start with
10 professionally. 09:33

11 A. **Professionally, the first one I**
12 **remember working on was when we were doing the**
13 **analysis that I talked about before with the**
14 **Vermeer and the -- the Toro PGR issue.**

15 Q. Okay. And that was in the early 09:34
16 2020s; is that correct?

17 A. **I don't remember the exact date. It**
18 **was sometime -- sometime around 2020 but I don't**
19 **remember the exact time frame --**

20 Q. Okay. 09:34

21 A. **-- or the exact date. But it was in**
22 **that time frame.**

23 Q. Okay. And what about personally?

24 A. **I had seen them around. You know,**
25 **the landscapers who would use them. So I had** 09:34

26

1 seen them around and talked to landscapers that
2 were using them. But I had not used them or
3 done design work before that.

4 Q. What was the name of the skid steer
5 that you eventually worked on for Case? Do you 09:34
6 have a model name for that?

7 A. The -- you want the -- we always
8 refer to them by the internal code. So I don't
9 know -- I can't remember what the internal code
10 was at this point. But we had the -- I always 09:35
11 refer to them by internal codes. I don't know
12 what the -- the marketing name was now.

13 But there were some that were the --
14 the one that was our kind of bread-and-butter
15 product back then was the 1845. So we were 09:35
16 working on an upgrade to the 1845. I remember
17 doing a bunch of work on that. And there was
18 some other skid steer products that were larger
19 than that I recall doing work on.

20 And then when we merged with New 09:36
21 Holland, New Holland also had a line of skid
22 steers. And so did some work with the New
23 Holland product as well.

24 Q. Okay. Okay. Previously you
25 mentioned that you had worked with CAD. Do you 09:36

27

1 know the name of the software that -- the CAD
2 software that you have experience with?

3 A. The one that we used back when I was
4 at Case, CNH, was Pro/Engineer, or Pro/E it was
5 called. So that was the one that we used many
6 years ago for our design work. The one that we
7 use at Fusion Engineering is SolidWorks.

09:36

8 Q. At Northwestern do you use it, CAD?

9 A. I don't. The students do. They've
10 got SolidWorks. I believe they've got licenses
11 of NX.

09:37

12 Q. When you say you work with CAD, do
13 you input the data to CAD?

14 A. Generally not anymore. Back when I
15 was at CNH I would -- I would use Pro/E for some
16 of my work. And you know, that was where we got
17 the -- the models that we would use as our
18 starting point for doing our finite element
19 analysis. So that would -- we would use Pro/E
20 for that.

09:37

09:37

21 Q. So you would input the data into
22 Pro/E when you were working at Case?

23 A. I generally was not making the final
24 design changes. There were people that were
25 specifically tasked with doing that. And so I

09:38

28

1 would more like get the -- get the CAD models
2 from Pro/E. And then I would extract that for
3 building finite element models.

4 Q. So that's part of the collaborative
5 work design process?

09:38

6 A. That would be one aspect of it.

7 Q. At this time I would like to give you
8 a copy of the -- what we call the '386 patent.
9 And I'm going to give you an exhibit number
10 here. I know you've seen this one.

09:39

11 MR. VANDER TUIG: Somewhat familiar.

12 MR. O'DELL: Somewhat familiar.

13 And this one, has as an exhibit
14 label, will be Exhibit 1001. And let me
15 say for the record that I -- just a second.
16 So for the label, let's make this
17 Exhibit 1001-00169.

09:39

18 I would like to explain my -- my
19 reasoning here. In the IPR -- you have
20 seen this patent -- it's Exhibit 1001 for
21 some of the IPRs but not all of the IPRs.
22 All of the IPRs refer to another Vermeer
23 patent. And so I've also given the last
24 five digits of the IPR number, that this is
25 Exhibit 1001, so that when we look at it

09:40

09:40

29

1 later we'll be able to recognize what
2 exactly you're referring to.

3 Does that make sense?

4 THE WITNESS: We'll see how it is
5 down the road, if we remember this. 09:41

6 MR. O'DELL: Yeah. Yeah.

7 THE WITNESS: I forgot to bring my
8 reading glasses in here. If I'm going to
9 need to read this, can we take a
10 three-second break and I can go grab those. 09:41

11 MR. O'DELL: Let's take a five-minute
12 or ten-minute break, as long as you need.

13 THE WITNESS: I just need to walk
14 down and grab them out of my bag.

15 (Whereupon, a recess was taken 09:41
16 from 9:41 a.m. to 9:45 a.m.)

17 BY MR. O'DELL:

18 Q. Before we get -- move forward, you
19 had mentioned off-highway equipment. Is
20 off-highway equipment used to make highways? 09:45

21 A. Generally that would be one of the
22 uses for it is the construction projects.

23 Q. Okay. What about demolishing a
24 highway or removing debris from a highway?

25 A. There is equipment that's used for 09:45

30

1 **that as well, yes.**

2 Q. Okay. Okay. So off-highway
3 equipment kind of means not cars and trucks and
4 motorcycles?

5 A. **Yeah, not driving -- driving and** 09:45
6 **using the highways.**

7 Q. Okay. Okay.

8 A. **Building and demolishing or -- would**
9 **go under, you know, construction or off-highway.**

10 **(Deposition Exhibit 1001-00169** 09:45
11 **was marked for identification.)**

12 **BY MR. O'DELL:**

13 Q. Okay. Okay. All right. So I have
14 before you the '386 patent, Exhibit 1001-0069.

15 A. **Mine says 001 something 9. Is that** 09:46
16 **169?**

17 Q. 00169. Thank you.

18 Do you see the listed inventors of
19 this patent on the front page?

20 A. **Yes, I do.** 09:46

21 Q. Do you know or have you met with any
22 of these inventors?

23 A. **No, I do not know them.**

24 Q. When did you first become aware of
25 this patent? 09:46

1 A. I don't remember when I first became
2 aware of it. I can't remember if it was at
3 issue in a previous -- previous matter or not.
4 Obviously I became aware of it in this
5 litigation, or this IPR matter.

09:46

6 Q. Was this patent at issue or did you
7 review this patent for the Toro matter?

8 A. Possibly. I don't remember all of
9 the literature that I reviewed for that matter.

10 Q. Have you ever rendered an opinion on
11 the validity of this patent?

09:47

12 A. Outside of this litigation here, I
13 don't recall ever doing that.

14 Q. Let's turn to Figure 1 of the patent.
15 Is this a CAD drawing?

09:47

16 A. I don't know if this is CAD or if
17 this is drawn by hand. It doesn't say one way
18 or the other.

19 Q. Does it look like it could be a CAD
20 drawing?

09:47

21 A. It possibly could be. Like I said,
22 it doesn't say one way or the other whether it's
23 CAD drawing or drawn some other way.

24 Q. Would you consider this drawing to be
25 drawn to scale?

09:48

1 A. I don't know if it's drawn exactly to
2 scale or not.

3 Q. Are there any materials indicated in
4 the drawing of this patent?

5 A. The drawing itself doesn't say the 09:48
6 materials. The written description, I don't
7 remember if it specifies materials or not.

8 There may be -- there may be some. For
9 instance, it talks about welds. So it's going
10 to be some kind of a metallic material, probably 09:48
11 steel welded together.

12 Q. Okay. Could someone of skill in the
13 art make a contact utility loader based off this
14 drawing?

15 A. Only this drawing? 09:49

16 Q. Let's start with only this drawing.

17 A. It would be a starting point. I
18 don't know that there's enough information on
19 only this drawing to make a complete product,
20 though. 09:49

21 Q. If you were given only this drawing,
22 do you think you have enough skill that you
23 could make a compact utility loader?

24 MR. VANDER TUIG: Object to the form.

25 THE WITNESS: Based on only this 09:49

1 drawing, I don't think there's enough
2 information that I could build a complete
3 compact utility loader.

4 BY MR. O'DELL:

5 Q. Okay. What do you need to know to 09:49
6 make a complete compact utility loader?

7 A. I would want to see other angles. I
8 would want to see cutaways, detailed drawings,
9 component drawings. Things like that are
10 usually what we rely on in engineering if we 09:50
11 want to actually make a complete, final product.

12 Q. If there's not something in this
13 drawing, do you think you'd know how to engineer
14 it otherwise?

15 MR. VANDER TUIG: Object to the form. 09:50

16 THE WITNESS: You're talking about
17 engineering or you're talking about
18 actually manufacturing a complete product?

19 BY MR. O'DELL:

20 Q. Both. 09:50

21 A. Well, there's not sufficient
22 information on just this one drawing to
23 completely design a compact utility loader. And
24 also the same answer for manufacturing one.

25 Q. Okay. What if you considered all the 09:50

34

1 drawings of the patent?

2 MR. VANDER TUIG: Object to the form.

3 THE WITNESS: What's your question

4 with regards to considering all the

5 drawings?

09:51

6 BY MR. O'DELL:

7 Q. Do you have enough information to

8 build a compact utility loader considering your

9 knowledge of the art and these drawings?

10 MR. VANDER TUIG: Same objection.

09:51

11 THE WITNESS: I would say I could get

12 pretty -- pretty far along with designing a

13 -- a compact utility loader just using

14 these, you know, making some assumptions

15 about scaling.

09:51

16 Obviously things like the -- the

17 drive line, I don't think there's a whole

18 lot of detail on the drive line components

19 here, what engine would be used. But as

20 far as the structure goes, I believe the

09:52

21 structure is laid out well enough to

22 proceed with a -- in developing a design.

23 BY MR. O'DELL:

24 Q. Okay. Is there an engine in this --

25 in these drawings?

09:52

35

1 (Witness reviewing document.)

2 THE WITNESS: There's something I see
3 in -- through a -- in Figure 3. I can't
4 tell if that's an engine or some other
5 internal component. There's not -- there's 09:52
6 not a detailed drawing of an engine. But
7 there's something I can see through some
8 kind of a window and the side view that is
9 Figure 3.

10 BY MR. O'DELL: 09:52

11 Q. Would you say that routine
12 engineering and design principles would allow
13 you to select and provide an engine that would
14 work in this without further description from
15 the patent? 09:53

16 MR. VANDER TUIG: Object to the form.

17 THE WITNESS: That would be one thing
18 that would be done as far as engineering
19 project for designing product like this,
20 would be to work with, you know, engine -- 09:53
21 engine designers in an engine group in
22 coming up with an engine that would work in
23 this application.

24 BY MR. O'DELL:

25 Q. Similarly for the hydraulics, 09:53

36

1 hydraulics are known. An engineer or design
2 team could design the -- and choose the proper
3 hydraulic mechanisms for this machine?

4 **A. That would be one thing that is done**
5 **as far as the design work is to come up with** 09:53
6 **hydraulic pumps, hydraulic lines, routing,**
7 **hydraulic cylinders for making the -- making the**
8 **hydraulics work.**

9 **Q. As far as the pivot points and**
10 locations for the linkages and the actuators, 09:54
11 they are shown generally in the figures. But
12 would you say a design engineer could identify
13 and place the pivot points for the linkages and
14 actuator through -- through routine engineering
15 and design? 09:54

16 **MR. VANDER TUIG: Object to the form.**

17 **THE WITNESS: Yes, that could be done**
18 using these drawings that are in the
19 patent.

20 **BY MR. O'DELL:** 09:54

21 **Q. Okay. If finite element analysis**
22 shows a weak point or a failure, potential
23 failure, a typical engineer design POSITA would
24 know how to make changes to accommodate that?

25 **MR. VANDER TUIG: Object to the form.** 09:55

1 THE WITNESS: That would be something
2 that could be done as part of design work.

3 BY MR. O'DELL:

4 Q. Okay. I believe all of these
5 pictures show a track; is that correct?

09:55

6 A. No.

7 Q. Let me say that again. I believe all
8 these pictures show a track or accommodations
9 for a track; is that correct?

10 A. I guess the way I would answer it,
11 the figure on the front page shows a track. And
12 then Figure 1, Figure 2, and Figure 3 show a
13 track. And then Figure 4, Figure 5, Figure 6,
14 and Figure 7 do not show a track or four wheels,
15 either one.

09:56

09:56

16 Q. In Figure 1, what is No. 30 referring
17 to?

18 (Witness reviewing documents.)

19 BY MR. O'DELL:

20 Q. I certainly want you to consider the
21 entire patent. But one place to look at would
22 be column 3, line 25.

09:58

23 A. Yeah, there it is. I usually look at
24 these on the computer where I could search for
25 the No. 30. And I wanted to give you the -- the

09:58

38

1 right term.

2 Yeah, that's the -- yeah, column,
3 line -- column 3, line 25, they call it the
4 drive opening. So it's going to be the opening
5 in the side of the frame where the drive line 09:58
6 comes through to drive the -- you know, it's got
7 tracks. It's going to drive the -- the -- they
8 say it's going to drive the hub 26. So 30 --
9 item No. 30 is going to be a drive opening. And
10 the hub 26 extends through there. 09:59

11 Q. Would you agree that that
12 accommodates a track system as shown in figures
13 4 through 7?

14 A. That's what it -- what the written
15 description for this embodiment is talking 09:59
16 about, is you got a -- a hub that extends
17 through the -- through the mainframe.

18 Q. Okay. So yes?

19 A. In this particular case, yes, the --
20 the hub will drive that kind of a sprocket piece 10:00
21 there. Let's see if that's called out, No. 22.
22 Yeah, the drive sprocket is connected to a hub
23 and the hub goes through the drive opening to,
24 in this case, drive the track.

25 Q. Would you consider it a routine 10:00

1 design engineering for a person of ordinary
2 skill in the art to make a wheeled version of
3 this compact utility loader?

4 MR. VANDER TUIG: Object to form.

5 THE WITNESS: There -- there would 10:01
6 have to be some structural changes
7 probably. But there are compact utility
8 loaders with wheels and some with tracks.

9 BY MR. O'DELL:

10 Q. So is that a yes? 10:01

11 A. Can you restate your question?

12 MR. O'DELL: Can you repeat the
13 question?

14 (Record read as requested.)

15 MR. VANDER TUIG: Same objection. 10:01

16 THE WITNESS: I would say that's
17 routine. Obviously it would be some
18 challenges, some design challenges but
19 something that could be done by a person of
20 skill in the art. 10:01

21 BY MR. O'DELL:

22 Q. Okay. What structural changes would
23 be made, for example?

24 A. Well, like this track, for instance,
25 has an elevated drive. You'd probably change 10:02

40

1 the drive system a little bit. And there would
2 be some associated structural changes that would
3 happen to go from a wheeled system to a -- so
4 there's a couple ways that it could be done.

5 One would be where you've got a drive 10:02
6 right at each wheel. So you'd have to put in
7 structure to drive each wheel. Or else you
8 could have some kind of a drive with chains
9 going to the front and rear wheels to drive
10 them, one side versus the other. 10:02

11 Q. So in that one there would be a drive
12 mechanism let's say in the rear with a chain or
13 other connection mechanism to the corresponding
14 wheel in the front.

15 Is that what you were describing? 10:02

16 A. No, not quite.

17 Q. Okay. Could you help me with that?

18 A. So some kind of a drive sprocket that
19 has chains going to the front and back wheels to
20 drive -- to drive those. Or else have some kind 10:03
21 of a drive mechanism, some kind of hydraulic
22 drive, for instance, right at each of the four
23 wheels.

24 Q. So those are two options for having
25 wheeled systems? 10:03

1 **A. Potentially, yes.**

2 **Q. Okay. Are there other options?**

3 **A. There might be some kind of electric**
4 **motors that you would have at the wheels.**

5 **Q. Are any of these skid steers that are** 10:03
6 **wheeled rear-wheel drive?**

7 **A. Which ones are you talking about?**

8 **Q. Skid steers in general.**

9 **A. The ones that I've been familiar with**
10 **that I recall had all the -- all the wheels that** 10:03
11 **drove.**

12 **Q. Okay.**

13 **A. Power going to all of the wheels.**

14 **Q. Okay. Is it a possibility to be**
15 **rear-wheel drive only?** 10:04

16 **A. I suppose if you wanted to disconnect**
17 **the drive going to the front wheels, then you**
18 **would only have rear-wheel drive.**

19 **Q. Potentially it could be a cheaper**
20 **option for some applications?** 10:04

21 **A. I don't know if it's cheaper or not.**

22 **Q. But potentially could be an option**
23 **for some applications?**

24 **MR. VANDER TUIG: Object to form.**

25 **THE WITNESS: Potentially. Like I** 10:04

42

1 said, it's not something that I've seen.
2 So I don't know the -- the cost benefit
3 analysis on driving only rear wheel versus
4 all four wheels.

5 BY MR. O'DELL: 10:05

6 Q. Is it your opinion that the patent
7 drawings in general should be to scale?

8 A. **Is it my opinion?**

9 Q. That they should be to scale.

10 A. **Close -- close to being to scale. I** 10:05

11 **mean, do they represent the final product? You**
12 **know, that's -- as an engineer, I don't**
13 **necessarily rely on patent drawings to**
14 **absolutely be to scale. But in general I would**
15 **think that they're close to being to scale.** 10:05

16 Q. We just talked about the drive
17 motors. How is the drive motor connected to the
18 engine?

19 A. **You're talking about the drive that**
20 **drives the -- drives this unit through the hub?** 10:06

21 Q. Yes.

22 A. **I don't recall if it says the**
23 **specifics of the drive line for this one. In**
24 **general, though, there's some kind of -- some**
25 **kind of a transmission that comes from the --** 10:06

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1 from the engine. And it will transmit the --
2 the power and the -- and change the speed from
3 the engine. And then have shafts that come out
4 so you could have some kind of hydraulic drive,
5 for instance, some other kind of transmission 10:07
6 that transmits the power and the torque from the
7 engine and then out -- you know, it's got to
8 turn it and come out to the sides to drive the
9 -- you know, in this case to drive the tracks or
10 to drive the wheels. 10:07

11 Q. The way you're describing it, are
12 engines in these compact utility loaders or skid
13 steers in general, are they typically aligned
14 with front-rear -- like is the cam aligned with
15 the front-rear -- let me rephrase that. 10:07

16 In a front-wheel drive car, an engine
17 will be transverse driving the wheels. Will the
18 engine be aligned in line with the skid steer?

19 MR. VANDER TUIG: Object to form.

20 THE WITNESS: I'm trying to remember 10:07
21 the engine alignment. The ones I recall
22 are more in line with the -- with the axis
23 of the vehicle.

24 BY MR. O'DELL:

25 Q. Okay. 10:08

1 **A. But I can't say that all of them are**
2 **that way.**

3 Q. Okay. Do drive motors come in
4 different sizes and shapes?

5 **A. You're talking the engine?** 10:08

6 Q. No. Talking about the drive motor of
7 the patent.

8 **A. In general, yes, drive motors are**
9 **going to come in different sizes and shapes.**

10 Q. Okay. Does a POSITA decide when 10:08
11 designing a skid steer the size and shape of the
12 drive motor?

13 **A. To a certain extent. I mean, you**
14 **would -- a designer of a product like this would**
15 **work with suppliers of components, engine, drive** 10:08
16 **line components, hydraulic motors, to select the**
17 **correct component and -- that would work within**
18 **their -- within their design, both for space and**
19 **for power requirements and whatever else you**
20 **need for your design.** 10:09

21 Q. Is a drive motor different for track
22 assembly versus wheel assembly?

23 **A. There may be some differences. But**
24 **in general you're trying to accomplish the same**
25 **thing of taking the power and the torque from** 10:09

45

1 the engine and transmitting it to make the --
2 the vehicle move.

3 Q. Let's turn to Figure 5 of the patent.
4 Do you see the letter R in the figure?

5 A. Yes, I do. 10:10

6 Q. What is that?

7 A. That was a -- it's kind of a center
8 of rotation. I believe there's a specific name
9 for it, though.

10 (Witness reviewing document.) 10:10

11 THE WITNESS: I'm looking at column
12 5, line 33, it looks like. It calls it a
13 rotational axis R.

14 BY MR. O'DELL:

15 Q. And what is this rotational axis? 10:10

16 A. Well, that's going to be the
17 rotational axis of that -- I guess the shaft for
18 the -- for the drive line.

19 Q. Do you see the number D5 in the
20 figure? 10:11

21 A. Yes, I do.

22 Q. What is that?

23 A. D5 is the distance from the bottom of
24 the mainframe structure up to the rotational
25 axis. 10:11

1 Q. Is it common that a portion of the
2 mainframe is -- will be below the rotational
3 axis as shown in this figure?

4 A. **Sorry. I don't quite understand your**
5 **question.**

10:11

6 Q. Is it common that a portion of the
7 mainframe is below the rotational axis as shown
8 in this figure?

9 A. **I would expect so, yes.**

10 Q. Another way to say it, is it common
11 that D5 would be greater than zero or -- yeah,
12 greater than zero?

10:12

13 A. **For a skid steer, I would expect it**
14 **to be greater than zero.**

15 Q. Is there a minimum D5?

10:12

16 A. **I don't know that there's a minimum.**

17 Q. Would that be something that your FEA
18 would assist in checking?

19 A. **That would probably be more based on**
20 **what components were available for designing**
21 **your drive line, how big they were. And then**
22 **obviously for designing the structure to**
23 **accommodate that, things like FEA testing would**
24 **be done to ensure that your mainframe structure**
25 **can actually support the loads that are**

10:12

10:13

1 **associated with that.**

2 Q. All right. Let's turn to Figure 2.

3 And what is D1?

4 A. **D1 is the distance from the bottom of**
5 **the track in this figure, which I assume is** 10:13
6 **ground level. But from the bottom of the track**
7 **up to the rotational axis.**

8 Q. Is it common that the rotational axis
9 has a distance from the ground, such a skid
10 steer that's greater than zero? 10:13

11 A. **Yes, I would expect so.**

12 Q. Why does the distance D1 matter?

13 A. **Well, that's going to be -- it's**
14 **going to be related to the things like the**
15 **center of gravity of your machine and the** 10:14
16 **operational characteristics, where you're --**
17 **where you're driving it from versus where you're**
18 **engaging the ground or the floor or whatever**
19 **you're driving on.**

20 Q. Let's turn back to Figure 1. What is 10:14
21 element 12? And I certainly encourage you to
22 look at the entire patent, but column 2,
23 line 46, could help.

24 A. **Yes, column 2, line 46, loader**
25 **includes an attachment plate 12. So it's an** 10:15

48

1 **attachment plate.**

2 Q. Have you ever used a skid steer?

3 A. Yes.

4 Q. Tell me about replacing attachments.

5 Where do you store your attachments for your 10:15
6 skid steer?

7 A. Well, it -- we were doing engineering
8 work. So we had our engineering, you know,
9 storage facility where we would put our -- our
10 attachments. And we could switch out 10:15
11 attachments from there. If we were working on
12 road construction or other construction
13 projects, you know, that's up to the -- you
14 know, whoever controls the site, where the
15 attachments would go. 10:15

16 Q. Okay. Is it commonplace to have the
17 attachments like on a drive -- driveway or a
18 parkway or a piece of road that's not being
19 used?

20 A. Well, typically you would want to 10:16
21 have the unused attachments off to the side,
22 whether it's -- you know, it really depends on
23 what the site is. Like I say, we were doing
24 engineering work and I was using them in the --
25 more in like a proving-grounds-type environment. 10:16

1 **So we had them either off to the side if we were**
2 **out in the field or they'd be stored in some**
3 **kind of a shop area.**

4 Q. Let's think of a job site. You're
5 digging a hole at some field. Would you store 10:16
6 the attachments in the hole?

7 A. **Where you're trying to dig?**

8 Q. Yes.

9 A. **Most likely not.**

10 Q. Would you store them -- let's say 10:16
11 where your pickup truck or trailer, whatever
12 brought the skid steer to the job site, would
13 you store them near that?

14 A. **Potentially.**

15 Q. Potentially would you store them on a 10:17
16 driveway or piece of road that's not being used?

17 A. **Potentially.**

18 Q. So when you change out attachments,
19 you just drive the skid steer to where your
20 attachments are located to pick up the new 10:17
21 attachment?

22 A. **Yeah, obviously you'd have to take**
23 **your skid steer to wherever the attachment is.**

24 Q. Are attachments sold with a skid
25 steer? 10:17

50

1 **A. Well, typically they're -- I guess**
2 **there's two places you can get attachments to go**
3 **with the skid steer. You can get them from the**
4 **manufacturer or could be like an aftermarket**
5 **company.**

10:18

6 **Q. Are there ever any applications where**
7 **only one attachment is needed?**

8 **A. I'm sure there are, yes.**

9 **Q. What is a common attachment for a**
10 **mini skid steer?**

10:18

11 **A. I would say a bucket is a common**
12 **attachment to put on the ends of the loader arm**
13 **for a mini skid steer.**

14 **Q. What's another common attachment?**

15 **A. You may have something like a --**
16 **maybe like a small mower that you would put on**
17 **there.**

10:18

18 **Q. Mower?**

19 **A. A mower, yeah, if you want to do some**
20 **kind of mowing or cutting.**

10:18

21 **Q. Are mini skid steers ever used for**
22 **snow removal?**

23 **A. They could be, yes.**

24 **Q. Snow removal like on a parking lot or**
25 **a road?**

10:19

1 A. Yeah, for instance. Yeah, that's
2 where you'd want to remove snow from.

3 Q. All right. I want to go back to your
4 work experience.

5 Is it fair to say that you've worked 10:19
6 on equipment with engines?

7 A. Yes.

8 Q. What type of engines?

9 A. I mean, most of them I recall were
10 diesel engines. There may have been some 10:19
11 gasoline engines in some of our equipment. But
12 most of them I recall were diesel engines.

13 Q. The equipment that you worked on, how
14 were the engines secured to the mainframe?

15 A. Some of them -- most of them would be 10:20
16 probably bolted through some kind of a -- you
17 know, engine mounts, for instance. There may be
18 some like large tractors where the engine is
19 actually a part of the drive line itself. But
20 if it's something that's got, you know, a 10:20
21 mainframe like we're talking about here, usually
22 it's going to be coupled with some kind of an
23 engine mount.

24 Q. An engine mount. So the patent talks
25 about an engine bracket. Are those the same 10:20

1 terms or are they different?

2 A. I would say that they're different.

3 Q. Okay. Is it common to have an engine
4 bracket?

5 A. That's one way to attach the -- 10:21
6 between the engine mount and the frame, for
7 instance, would be -- depending on the geometry
8 that you're working with, you may have a bracket
9 or, you know, you may just bolt it directly to
10 like a flange on the frame or to the side wall 10:21
11 of the frame. It really depends on the geometry
12 that -- of the engine and the mainframe that
13 you're working with.

14 Q. You mentioned earlier that the
15 engines were often aligned in the -- with the 10:21
16 axis of the machine. In those scenarios, is it
17 common to mount the engines through brackets or
18 other mounts to the sides of the mainframe
19 versus the front and back of the mainframe?

20 A. My recollection from seeing those, I 10:22
21 recall them being mounted more to the sides than
22 to the -- the front and the back. But there may
23 have been some -- something else on one end as
24 well. Like I say, it really depends on the
25 package space that you have, where you're 10:22

1 **locating the engine at within your mainframe**
2 **environment.**

3 Q. When an engine starts up, it torques;
4 is that correct?

5 A. **Yes.** 10:22

6 Q. And for that reason, is it desirable
7 to have brackets and/or mounts on the sides of
8 the frame?

9 A. **Yes, you do need to withstand the**
10 **torque of the engine. So you would have to have** 10:22
11 **some kind of a -- you know, whether it's**
12 **brackets or mounted directly to flanges or**
13 **frame, you would need some kind of resistance to**
14 **the engine torque, you know, through the**
15 **mainframe.** 10:23

16 Q. And this was true back when you were
17 working on Case as well?

18 A. **Yes.**

19 Q. Would you say this is fundamental?

20 A. **As far as resisting the torque of the** 10:23
21 **engine --**

22 Q. Yes.

23 A. **-- to the mainframe? Yes, you'd have**
24 **to -- that's sort of like basic engineering, is**
25 **that you need to have your -- your structure** 10:23

1 designed in order to withstand the torque of the
2 engine and have it come as a torque output to
3 drive wheels and other applications.

4 Q. Is the lift mechanism of the Vermeer
5 patent a four-bar mechanism as that term is used 10:23
6 in the art?

7 A. I would say, you know, in a broad
8 sense, yes, it's a four-bar linkage or four-bar
9 mechanism.

10 Q. What is a four-bar mechanism? 10:24

11 A. In this context, it is a geometric
12 setup whereby the loader arms are lifted through
13 moving bars that are connected to the mainframe.
14 So you have the -- the lower link of the -- of
15 the connecting bars. They're connected to the 10:24
16 mainframe. And then those links are connected
17 to -- at the other end to the loader arm.

18 As opposed to a radial lift mechanism
19 where you would have usually the -- the rear
20 part of it, of the loader arm, would be 10:24
21 connected directly to some kind of structure of
22 the mainframe. And it would pivot about a fixed
23 point.

24 A four-bar mechanism pivots on the
25 mainframe about two lengths -- or two rotational 10:24

1 **points through two lengths to lift the loader**
2 **arm.**

3 Q. Okay. What does the actuator do in a
4 four-bar mechanism?

5 A. **Well, the actuator is what's going to** 10:25
6 **cause the loader arms to move relative to the**
7 **mainframe.**

8 Q. Does a person of ordinary skill in
9 the art know how to arrange the actuator to
10 manipulate -- manipulate the four-bar mechanism 10:25
11 to do a vertical linked -- vertical lift
12 operation?

13 MR. VANDER TUIG: Object to form.

14 BY MR. O'DELL:

15 Q. Let me have some water and let me say 10:25
16 that again because my voice got unclear.

17 Would a person of ordinary skill in
18 the art know how to position and arrange an
19 actuator to make a four-bar mechanism perform a
20 vertical lift operation? 10:26

21 MR. VANDER TUIG: Object to form.

22 THE WITNESS: I guess I would ask for
23 some clarification on your question.

24 BY MR. O'DELL:

25 Q. You said earlier, if I'm -- correct 10:26

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1 me if I'm wrong, that the actuator allows the
2 four-bar mechanism to do the relative movement.
3 And the four-bar mechanism is something which
4 provides the vertical lift operation.

5 **A. Correct.** 10:26

6 Q. Would a person of ordinary skill in
7 the art know how to design and position the
8 actuator to achieve that result?

9 MR. VANDER TUIG: Object to form.

10 THE WITNESS: I guess I would answer 10:26

11 your question by saying from a high-level
12 perspective a person of skill in the art
13 would know how to position the actuator to
14 make the -- the setup move. Whether they
15 get it to work right or not, that's a 10:27
16 different -- different question.

17 That's why I was a little bit
18 confused with your question. Because you
19 have to design the -- the length of the
20 linkages correct, the position of the 10:27
21 linkages, and -- in order to achieve the
22 vertical lift and to not have the
23 interference. And so in general, yes, you
24 can design four-bar linkages. You need to
25 design one that works, though. 10:27

1 BY MR. O'DELL:

2 Q. Would you say that a person of
3 ordinary skill in the art would be someone who
4 knows how to design one that works?

5 MR. VANDER TUIG: Same objection, 10:27
6 object to form.

7 THE WITNESS: To work, I would say a
8 person of ordinary skill in the art would
9 know how to design a -- a four-bar
10 mechanism and to put an actuator in there. 10:27
11 And there would be some calculations
12 involved in order to make it work according
13 to the way that you need it to work.

14 BY MR. O'DELL:

15 Q. So it may not work the first time but 10:28
16 with adjustment and engineering you could make
17 it work?

18 MR. VANDER TUIG: Object to form.

19 THE WITNESS: I would agree with
20 that. I mean, we see it here in this 10:28
21 patent that they did make a four-bar
22 mechanism work. So obviously it's
23 something that can be done.

24 BY MR. O'DELL:

25 Q. Could that be done back when you were 10:28

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1 working at Case on a regular skid steer?

2 **A. Yes, you could design a four-bar**
3 **linkage. We did have four-bar linkages. I**
4 **believe our New Holland skid steer had some kind**
5 **of a vertical lift mechanism four-bar linkage.** 10:28
6 **And we had other pieces of equipment that used**
7 **four-bar linkages as well.**

8 **Q. And this is back in the early 2000s?**

9 **A. Around that time frame.**

10 **Q. When you're doing the lifting** 10:29
11 **operation, the length of the actuator will**
12 **change; is that correct?**

13 **A. Yes.**

14 **Q. Do you know the stroke length of the**
15 **actuator in the Vermeer patent?** 10:29

16 **A. I don't have that information with**
17 **me.**

18 **Q. Do you think it would be routine**
19 **engineering and design for a POSITA to select**
20 **the stroke length to make the four-bar mechanism** 10:29
21 **of the Vermeer patent work correctly?**

22 **MR. VANDER TUIG: Object to form.**

23 **THE WITNESS: That would be part of**
24 **your design work, is to select the actuator**
25 **that works with your design and your -- the** 10:29

1 kinematics of your design or the design of
2 the motion.

3 BY MR. O'DELL:

4 Q. Would that be routine for a person of
5 ordinary skill in the art in the 2015 time 10:30
6 frame?

7 A. To select an appropriate hydraulic
8 cylinder?

9 Q. Yes.

10 A. Yes. 10:30

11 Q. If the -- if the four-bar mechanism
12 interferes with something such as the tracks or
13 other member of the machine, would you consider
14 it routine design engineering to modify the
15 four-bar mechanism to accommodate that 10:30
16 interference?

17 MR. VANDER TUIG: Object to form.

18 THE WITNESS: To accommodate it or to
19 eliminate it?

20 BY MR. O'DELL: 10:31

21 Q. Either.

22 A. I mean, obviously you can't have a
23 machine that you're trying to use that has
24 interference. So there would be some design
25 work that would be done to eliminate that 10:31

60

1 interference. And that would involve -- you
2 know, that could potentially involve structure.
3 That could involve moving internal components
4 such as engine and drive line components, things
5 like that.

10:31

6 So it's something that can be done.
7 But depending on what and where the interference
8 is, it could be quite involved to make those
9 changes.

10 Q. And this is true in the 2000 time
11 frame -- early 2000s time frame when you were
12 working at Case?

10:31

13 A. Yes.

14 Q. And either a simple change or a
15 complex change but a change could be made?

10:31

16 A. I mean, generally, yes, changes can
17 be made.

18 Q. What are the benefits of having lower
19 lift -- pivot points for a four-bar mechanism?

20 A. All the pivot points?

10:32

21 Q. Pivot points described -- well, let's
22 see. Hold on a second.

23 Let's go with Figure 5 and pivot
24 points P1 and P3. First let me ask, what are P1
25 and P3?

10:33

1 A. P1 is the pivot point on the
2 mainframe that attaches to the forward link, or
3 forward linkage, for the loader arm. And P3 is
4 the pivot point on the mainframe that attaches
5 the rear linkage to the rear of the loader arm. 10:33

6 Q. Okay. Are there benefits to having
7 P1 and P3 lower on the mainframe?

8 A. Yes, I believe there are.

9 Q. Name one benefit.

10 A. Well, if you have those points lower, 10:33
11 you're -- you've got the -- the structure for
12 the -- for the mainframe can all be down there
13 versus if you've got some kind of a tower
14 structure like you do with the -- with the
15 radial lift arms, where you've got to have a 10:34
16 higher structure. So your -- your center of
17 gravity then becomes lower. And also your --
18 your center of force is going through those
19 points. So that will be lower.

20 Q. Is that true in the early 2000s when 10:34
21 you were working at Case?

22 MR. VANDER TUIG: Object to form.

23 THE WITNESS: Is what true?

24 BY MR. O'DELL:

25 Q. The benefit that you just described, 10:34

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1 is that true of pivot points for -- let me start
2 over.

3 You mentioned earlier that Case made
4 vertical lift skid steers in the early 2000s.

5 **A. I believe it was the New Holland skid** 10:34
6 **steer that had the vertical lift. The ones I**
7 **remember for Case were the radial lift skid**
8 **steers.**

9 Q. What time frame were the New Holland
10 vertical lift machines? 10:35

11 **A. The ones I remember were from the**
12 **late '90s, early 2000s.**

13 Q. Did any of them have pivot points on
14 the mainframe?

15 **A. I recall that they do, yes.** 10:35

16 Q. And is it likely that one reason they
17 had it on the mainframe was for the benefit you
18 just described, which was lowering the center of
19 gravity?

20 MR. VANDER TUIG: Object to form. 10:35

21 THE WITNESS: I don't remember where
22 all the pivot points were on the New
23 Holland. So I don't want to overstate
24 exactly where they were. There may have
25 been some that were up on like the upper 10:35

1 structure, the cap or a higher structure on
2 the vehicle.

3 BY MR. O'DELL:

4 Q. What's another benefit of having low
5 pivot points, P1 and P3 from Figure 5, of the 10:36
6 Vermeer patent?

7 A. Well, like I said, when you have all
8 of your support structure, your pivot points
9 down low, then you just have to design the
10 mainframe to support it down low. You don't 10:36
11 have to have some kind of a tower structure that
12 you would have to support that.

13 Then your support is lower so you
14 should lower the center of gravity so hopefully
15 have a more stable machine. And then when 10:36
16 you're -- you've got some kind fore-aft loads,
17 those loads are going through a lower structure.
18 As opposed to having something that's up high
19 that may be shifting your center of gravity
20 front to back, you know, which was an issue for 10:37
21 radial arm machines.

22 Q. Is working with the center of gravity
23 a fundamental component of designing a skid
24 steer, at least at the time you were working
25 with Case? 10:37

1 A. That was one of the things that we
2 would want to evaluate, was where was the center
3 of gravity. Because a lot of times in the
4 construction equipment you're working in uneven
5 environments. And so you would -- for a skid 10:37
6 steer or a mini skid steer, where you're working
7 on sloped surfaces, you'd want to keep the
8 center of gravity at a lower level in order to
9 increase stability.

10 Q. Okay. And that stability is pretty 10:37
11 important to this equipment; isn't it?

12 A. That's one of the important aspects
13 of it.

14 Q. Still referring to Figure 5 of the
15 Vermeer patent and pivot points P1 and P3, would 10:38
16 a POSITA engineer/designer be able to move the
17 pivot points to different locations?

18 MR. VANDER TUIG: Object to form.

19 THE WITNESS: You can always move
20 them to a different location. 10:38

21 Are you saying and still have a
22 working design or just move them?

23 BY MR. O'DELL:

24 Q. And have a working design.

25 A. It's probably possible. 10:38

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1 MR. O'DELL: I think I would like to
2 take a five- or ten-minute break at this
3 time.

4 (Whereupon, a recess was taken
5 from 10:39 a.m. to 10:57 a.m.) 10:39

6 MR. O'DELL: I have a new exhibit to
7 provide, and that is Exhibit 2017-00167.
8 (Deposition Exhibit 2017-00167
9 was marked for identification.)

10 BY MR. O'DELL: 10:58

11 Q. Let's look at Figure 1 of this
12 picture. What type of equipment is this?

13 A. Which part of the equipment are you
14 looking at?

15 Q. I don't know. Show me all the -- 10:59
16 give me a description of what all is in the
17 figure there.

18 A. Well, I would describe that as a skid
19 steer loader. And it's got a mini backhoe
20 attachment mounted on the front of it. 10:59

21 Q. Okay. Do you know if this is a
22 compact utility loader or if it's a mini skid
23 steer -- or it's a regular skid steer?

24 A. Appears to be a regular skid steer.

25 It's got a cab on it. 10:59

1 Q. Okay. What is element 22?

2 A. They call them lift arms. I would
3 call them loader arms.

4 Q. Is this a radial loader arm or radial
5 lift arm? 11:00

6 A. Yes. That is a configuration, it is
7 a radial lift arm, loader arm.

8 Q. Are radial lift arms or loader arms
9 popular still today?

10 A. They still exist. So there are some 11:01
11 machines that have radial lift arms.

12 Q. Is there any benefit of a radial lift
13 arm over a four-bar mechanism?

14 A. I guess the main thing I would think
15 is the simplicity of the structure, less moving 11:01
16 pieces.

17 Q. Does that mean it's more reliable?

18 A. Not necessarily. Just the simplicity
19 of the structure.

20 Q. What's good about simplicity? 11:01

21 A. You have fewer moving parts. So
22 you've got like fewer rotational axes or fewer
23 joints to make sure that you're getting grease
24 on. And so you can not have to worry about so
25 many -- you know, so many different components 11:01

1 that are moving.

2 And you've still got to have all of
3 the -- all of the structure to take all of the
4 load. So I don't know if it's more or less
5 reliable. But you do have fewer moving parts
6 with a radial lift mechanism versus a four-bar
7 linkage.

11:02

8 Q. Is there anything that a radial lift
9 can do that a vertical lift cannot?

10 A. Nothing immediately comes to mind.

11:02

11 Q. Why would anyone make something other
12 than a vertical lift for a skid steer?

13 MR. VANDER TUIG: Object to form.

14 THE WITNESS: Like I say, it could be
15 some aspects of design simplicity that --
16 that they want. Or maybe that's what they
17 know how to make so they keep making the
18 radial lift mechanism.

11:02

19 BY MR. O'DELL:

20 Q. Okay. Where does the lift arm or
21 load arm 22 attach to the vehicle?

11:02

22 (Witness reviewing document.)

23 THE WITNESS: Well, it attaches in
24 the rear up there on -- there's a callout

25 24. I'm trying to find it in the -- where

11:03

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1 24 is in the patent. They call it upright
2 supports, looking at column 3 where it
3 calls it upright supports.

4 BY MR. O'DELL:

5 Q. Okay. 11:04

6 A. **So it attaches high up on that**
7 **structure in the rear on those upright supports.**

8 Q. Do upright supports 24 provide
9 weight-bearing support for the lift arm?

10 A. **What do you mean by "weight bearing"?** 11:04

11 Q. Do they support the downward force of
12 the lift arm at the pivot point shown?

13 A. **They're going to support whatever**
14 **forces are put through the loader arm. So if**
15 **there's a vertical load, it will support the** 11:04
16 **vertical load at that end. If there's a**
17 **horizontal load, it will support the horizontal**
18 **load. And if there's any kind of side-to-side**
19 **load, it will also support that.**

20 Q. What is item No. 16 in this figure? 11:04

21 A. **In column 3 they refer to 16 as a**
22 **mainframe.**

23 Q. Does the mainframe support the loader
24 arm 22?

25 A. **Indirectly. So yes, because the --** 11:05

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1 the upright support 24 is going to be attached
2 to the mainframe. And so ultimately going
3 from -- you know, you could either look at it as
4 going from ground level or either engine level.
5 But you're going to be having the -- the load 11:06
6 path is going to go from the mainframe 16 that
7 we're talking about up through the upright
8 supports and ultimately to the -- the rear end
9 of the loader arms.

10 Q. Would you say that the wheels 20 also 11:06
11 support the loader arm?

12 A. Indirectly.

13 Q. Are there any pivot points for the
14 loader arm on the mainframe?

15 (Witness reviewing document.) 11:06

16 THE WITNESS: There appears to be
17 item No. 26. So item No. 26 is a hydraulic
18 lift cylinder and it is attached where the
19 -- that part 16 meets the upright support,
20 there's a -- a pivot point there that then 11:07
21 goes to another pivot point on the loader
22 arms.

23 BY MR. O'DELL:

24 Q. I'm sorry. I don't see that. I'm
25 not disagreeing with you. I just don't see it. 11:08

70

1 I'm looking at Figure 1 and I see the actuator
2 26. And there's a circle on upright element 24.
3 We call that upright support 24. Is that
4 correct, that circle is on upright support 24?

5 A. Well, I see where that actuator 11:08
6 26 --

7 Q. Yes.

8 A. -- or they call it a hydraulic lift
9 cylinder -- where the hydraulic lift cylinder
10 disappears behind the -- the right edge of the 11:08
11 upright support. Right there where the upright
12 support meets the -- the mainframe, that's where
13 I see the -- the circle there that to me
14 indicates a pivot point.

15 Q. Do you see the number 26 drawn in 11:09
16 Figure 1, the actual reference numeral 26? And
17 is that on top of part of the mainframe 16?

18 A. It appears as though if -- where it
19 has item No. 26, I see it going along what
20 appears to be the upper edge of the mainframe. 11:09
21 I can't tell if there's any -- anything, a lip
22 or something, behind that. But I see it going
23 along at least the upper edge of the mainframe.

24 Q. All right. The next document I'm
25 going to provide is one of your declarations. 11:10

1 MR. O'DELL: This will be

2 Exhibit 2016-00169.

3 (Deposition Exhibit 2016-00169
4 was marked for identification.)

5 BY MR. O'DELL: 11:11

6 Q. So first let me explain what I'm
7 trying to do and then I'm going to have you
8 identify this document.

9 I know that you provided seven
10 declarations. And we've talked before that the 11:11
11 subject matter from all seven IPRs is similar.
12 And the questions I have I think can all be made
13 addressing this one. So that's why I've
14 identified this -- this one to -- for discussion
15 points. 11:11

16 And so with that said, can you tell
17 me what this exhibit is?

18 A. I will just read you what the title
19 is.

20 Q. You bet. 11:11

21 A. This is the Declaration of Mark
22 Fleming, Ph.D., P.E., in Support of Patent
23 Owner's Response to Petition of Inter Partes
24 Review of U.S. Patent No. 9,321,386.

25 Q. For the record, could you read the 11:12

1 bottom part, the footer?

2 A. Where it says Vermeer Manufacturing?

3 Q. Yes.

4 A. Vermeer Manufacturing Company -

5 Ex. 2016 Kubota vs. Vermeer, IPR 2025-00169, 11:12

6 page 1 of 120.

7 Q. Thank you.

8 In your declaration your paragraphs
9 are numbered so I'm going to refer by paragraph
10 number. So can you please go to paragraph 43, 11:13
11 which begins on page 12 of this document?

12 A. And I have pulled the clip off of
13 here. So I hope that's okay.

14 Q. That's okay.

15 A. Otherwise I can't get the pages open. 11:13

16 Q. Does Vermeer still have or still sell
17 radial lift mini skid steers?

18 A. I'm not sure what their entire
19 product line is. So I -- I'm not sure if they
20 still have -- you're talking vertical lift or 11:13
21 radial?

22 Q. Radial lift.

23 A. Radial lift. I'm not sure what their
24 entire product line is for mini skit steers and
25 whether they had a radial lift or not. 11:14

1 Q. Did you provide this picture that's
2 in your declaration at the end of paragraph 43?

3 A. **It was one that -- I think the**
4 **attorneys had that. So we used that from some**
5 **work that -- or some photo that they had.** 11:14

6 Q. Does this appear to be a Vermeer
7 compact utility loader?

8 A. **It does appear to be a Vermeer, yes.**

9 Q. Does it appear to be a radial lift
10 compact utility loader? 11:14

11 A. **Yes, it does.**

12 Q. So should we say at some time Vermeer
13 made and sold radial lift compact utility
14 loaders?

15 A. **Yes.** 11:14

16 Q. But you're not able to answer if
17 they're still selling them today?

18 A. **I'm not sure what their product line**
19 **is currently.**

20 Q. Let's move to paragraph 47 of your 11:15
21 declaration. Can you read this paragraph?

22 A. **To myself or out loud?**

23 Q. To yourself is fine.

24 (Witness reviewing documents.)

25 THE WITNESS: Okay. 11:15

1 BY MR. O'DELL:

2 Q. How do you calculate center of
3 gravity?

4 A. You want to calculate it or you want
5 to measure it?

11:16

6 Q. Or measure it.

7 A. And you want front to back or
8 vertical center of gravity?

9 Q. Tell me both.

10 A. Well, if you were going to measure
11 front to back, you would put scales under the
12 four corners, or you could do the front and the
13 back, and then take the various ratio to come up
14 with where the center is between the front and
15 the back. And I guess if you do the four
16 corners, then you get the side-to-side center of
17 gravity as well.

11:16

11:16

18 Then if you wanted to measure it for
19 the -- the vertical, you could either do like a
20 tilt test or tip the -- tip the vehicle and
21 weigh the four corners again and see how much
22 shift you have in the front to back. And that
23 would allow you to calculate the vertical center
24 of gravity as well.

11:16

25 If you wanted to calculate it, then

11:17

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1 you would have the -- the weight of all the
2 various components and the location. And you
3 would go through and essentially do the same
4 thing, where you come up with, you know, how is
5 the weight distributed and -- and then determine 11:17
6 from that where the center of gravity is.

7 Q. Would a POSITA be able to calculate
8 or measure both the front/back and the vertical
9 center of gravity?

10 A. You're saying measure it or calculate 11:17
11 it?

12 Q. Both.

13 A. If you had the -- if you had the
14 unit, you would be able to set up a test and do
15 whatever testing you needed to do. 11:17

16 If you didn't have the unit and all
17 you had was -- first of all, if all you had was
18 a picture, you wouldn't know what the various
19 weights of the component are. But if you had
20 all of the information for all of the -- you 11:18
21 know, all the structure and all the components,
22 I think a POSITA would be able to calculate that
23 as well.

24 Q. Do you know the center of gravity in
25 the design process? 11:18

1 **A. I don't understand your question.**

2 **Q. You've just described measuring and**
3 **calculating the center of gravity of an actual**
4 **machine.**

5 **A. Correct.** 11:18

6 **Q. In the design process, do you know**
7 **the center of gravity through your CAD and**
8 **software?**

9 **A. That would be something that would be**
10 **calculated. And of course that depends what** 11:18
11 **part of the design process you're in. Because**
12 **early on when you're just laying out the -- the**
13 **geometry, you may not know exactly which engine**
14 **and which componentry you're going to use, which**
15 **is -- those are big, heavy pieces that are going** 11:19
16 **to affect the center of gravity.**

17 **So at some point during the design**
18 **process when the design has been finalized and**
19 **all the density and weight of all the structure**
20 **is known, you know, the engine type and all the** 11:19
21 **componentry, when you have the -- the lift**
22 **mechanism designed so that you can understand**
23 **what the center of gravity is when you've got**
24 **the raised arms versus lowered arms, then you**
25 **could calculate that with the design** 11:19

1 information. If you -- if you're the actual
2 designer of the product you would know that. If
3 you're looking at someone else's product, you
4 would have to go and measure that.

5 Q. I think we talked about this before, 11:20
6 but understanding the center of gravity is an
7 important part of the design process; is that
8 right?

9 A. That would be one of the factors that
10 you would consider when you're -- when you're -- 11:20
11 I assume you're talking about designing a mini
12 skid steer.

13 Q. Uh-huh.

14 A. That would be one of the pieces of
15 data that you would be paying attention to. 11:20

16 Q. And having a lower center of gravity
17 on the vertical dimension is an important
18 benefit?

19 A. It can be, yes.

20 Q. Are there situations when it's not? 11:20

21 A. I mean, I can't think of one right
22 now. But yeah, in general try to get the center
23 of gravity down in a reasonable area.

24 Q. Does the center of gravity affect a
25 vehicle's operation during turning, accelerating 11:21

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1 or de-accelerating?

2 A. Yes, I would think it does.

3 Q. How is that?

4 A. Are you talking about vertical center
5 of gravity? 11:21

6 Q. Yes.

7 A. Yeah. So when you're -- when you're
8 turning, for instance, you've got a force that's
9 essentially -- you know, centrifugal force
10 that's pushing it to the side. So your 11:21
11 side-to-side stability and your side-to-side
12 movement will be affected by how high the center
13 of gravity is. Particularly when you're
14 operating on, you know, rough, uneven surfaces,
15 which you often are if you've got -- if you're 11:22
16 working in a construction environment.

17 And then the acceleration/
18 deceleration, the higher the center of gravity,
19 the more front-to-back movement of the -- of the
20 skid steer you could have as you're accelerating 11:22
21 or decelerating.

22 Q. And these were all true when you were
23 designing in the early 2000s for Case?

24 A. Yes. These are fundamental principles
25 that I'm telling you. 11:22

1 Q. How does raising the bucket affect
2 the center of gravity?

3 A. Typically raising the bucket is --
4 you know, raising the bucket, raising the loader
5 arms is going to, first of all, raise the center 11:22
6 of gravity vertically. Depending on the layout
7 of your loader arms, you could also get some
8 shift of the center of gravity from front to
9 back.

10 Q. Okay. In this paragraph we just 11:23
11 read, 47, you talked about an advantage of
12 having the mass of the mainframe reduced.
13 Explain that to me.

14 A. So if you are going from, say, a
15 vertical -- or a radial lift machine that we 11:23
16 just looked at, for instance, in this previous
17 patent where you have to have that -- that
18 vertical support structure --

19 Q. Can you tell me the exhibit number
20 you're looking at? 11:23

21 A. Yes. I'm looking at Exhibit 2017-00167.

22 Q. Okay. Thank you.

23 A. And that was the skid steer loader
24 for a skid -- or a backhoe mounting device for a
25 skid steer loader. It's the '398 patent. 11:24

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1 But what I was pointing out there was
2 that you've got the -- that vertical support
3 structure. And for a vertical lift machine or
4 radial lift machine, that's got to be a fairly
5 substantial structure in order to accommodate 11:24
6 those loads.

7 And so if you -- instead of having
8 that higher pivot point, if you lower the pivot
9 point down where you are supporting it on the
10 lower mainframe structure, then that's where I'm 11:24
11 talking here about the mass of the mainframe
12 being reduced.

13 Q. Was that true as an advantage when
14 you were at Case?

15 A. In general you try to get the weight 11:25
16 of the machine to be at a -- an acceptable
17 level. You know, you need to -- especially for
18 a machine like this, you need some weight for
19 counterbalance. But you know, the weight of the
20 machine -- the higher the weight of the machine, 11:25
21 the more work the engine has to do to propel the
22 machine versus doing the -- the lifting or other
23 things that you want to do.

24 Plus you could -- if you're working
25 in like landscaping, for instance, where you've 11:25

1 got a very heavy machine, you start leaving, you
2 know, a lot of tracks in the grass and tear up
3 the -- the work environment that you're actually
4 trying to work. So that's kind of a fundamental
5 issue that we deal with in this kind of 11:25
6 machinery.

7 Q. I see that the compact utility loader
8 by definition has a weight kind of high limit --
9 high limit. Is that part of the same thing
10 where they're trying to keep the weight down? 11:26

11 MR. O'DELL: Could you read my
12 question back, please?

13 (Record read as requested.)

14 THE WITNESS: You're talking about
15 the 1500-kilogram, which is roughly 11:26
16 3300 pounds, that's the number that they
17 have come up with where you -- below that,
18 they would call it a compact utility
19 loader. But yes, you're keeping the weight
20 down to a -- below that level. 11:27

21 BY MR. O'DELL:

22 Q. This paragraph, 47, of your
23 declaration also talks about improved visibility
24 as being a key factor. Can you explain that?

25 A. Yes, visibility in construction 11:27

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1 equipment or off-highway equipment in general is
2 an important issue that we deal with. And so if
3 you have the -- the machine that has the loader
4 arms lower versus having the higher pivot points
5 that when you raise the arms like you would for 11:27
6 this '398 patent, Exhibit 2017-00167, when you
7 raise those loader arms -- when they're already
8 in a high position in the rear, when you left
9 them up, then it can affect the visibility,
10 particularly the side-to-side visibility. 11:28

11 Q. Has that always been a design goal
12 for skid steers in general, including when you
13 were at Case?

14 A. Visibility is always something that
15 we take into account because you want the 11:28
16 operators to be able to see what they're doing,
17 where they're going.

18 Q. Let's turn to pages 50 and 51 of your
19 declaration, paragraphs 117 and 118.

20 A. I've got 117 starting on page 49. 11:29

21 Q. Yeah. Okay. There are drawings on
22 page 50 and 51. Did you write this part of your
23 declaration, paragraphs 117 and 118?

24 A. Yes.

25 Q. How did you obtain these figures? 11:29

83

1 A. You're talking the figure on page 50?

2 Q. Yes.

3 A. So first starting on page 50, the --

4 the tracks came from the patent of Bares. I

5 can't remember the number but it's the Bares 11:30

6 patent. So that's where the track came from.

7 The CAD model for the KR996 is something that

8 myself and my team put together based on the

⁹ figures from the KR996 patent.

10 Q. Tell me in more detail how you did 11:30

11 that, you and your team did that.

12 A. Well, we reviewed the KR996 patent.

13 And it had several different images in there.

14 And so we looked at those. We could sketch over

```
15    that.  So import that into -- we used 11:31
```

16 SolidWorks. So we imported that into

17 SolidWorks. And then we could sketch over that,

18 look at the various -- you know, all the various

19 angles and kind of have that laid out here.

20 I think there's a figure a few pages 11:31

21 back that gives a little bit more detail. But

22 we based that on the -- the drawings and the

23 figures from the KR996 patent. And we could do

```
24  some -- some overlays and then scale things off
```

25 of there. 11:31

1 Q. Did you do -- personally do the
2 overlays?

3 A. I did not do that. I've got one of
4 my engineers who did the -- the CAD drawing for
5 me. 11:31

6 Q. Okay. Are these your engineers at
7 Fusion?

8 A. Yes.

9 Q. And did he do this under your
10 direction? 11:32

11 A. Yes, it was under my direction.

12 Q. So he imported the KR996 patent
13 figure into CAD by overlaying -- overlaying the
14 patent Figure 1?

15 A. That was part of the work that was 11:32
16 done.

17 Q. Okay. And then who colored the
18 picture?

19 A. It's colored automatically.

20 Q. The CAD software colors it 11:32
21 automatically?

22 A. I imported this and so I made this
23 figure right here. So he had done the CAD
24 drawing. And then I imported that into another
25 software. And when you import it, it just 11:32

1 **assigns random colors to the -- to the parts.**

2 Q. For page 51, is the story the same
3 for those minus the arrows?

4 A. **The story as far as how it was made?**

5 Q. Yes. 11:33

6 A. **Yes, with the difference being that**
7 **the track came from the patent of Bares.**

8 Q. Okay. You said you imported this
9 into another software from the CAD software?

10 A. **Yes.** 11:33

11 Q. What was the other software?

12 A. **That software was called Abaqus.**

13 Q. Okay. Did you do that?

14 A. **Yes.**

15 Q. Okay. How did you align the tracks 11:33

16 of Bares to the image?

17 A. **You can see on page 50 that we've got**
18 **an overlay there. So we had scaled it to have**
19 **the same track width -- or the track length, if**
20 **you will, between the track and the wheeled** 11:34
21 **vehicle.**

22 Q. The track system has a drive unit
23 different from the wheels of KR996, right?

24 A. **You're talking the elevated sprocket**
25 **and drive?** 11:34

1 Q. Yes.

2 A. That is correct.

3 Q. In the last sentence of paragraph 118
4 you say (as read): Given these issues, a POSITA
5 would not be motivated to combine the track 11:35
6 system of Bares with KR996-JP705 machine, and
7 would not have a reasonable expectation of
8 success in doing so.

9 Can you explain what issues you're
10 talking about? 11:35

11 A. The major thing I saw -- first of
12 all, if you look at the figure on page 50, you
13 can see that the track is going to interfere
14 with -- there's kind of a triangular-shaped
15 structure there. It's kind of a brown/tan color 11:35
16 in this particular image. That track is going
17 to interfere with that structure.

18 That structure is -- in my
19 experience, is usually some kind of a tank for
20 fuel or hydraulic fluid. So it's critical to 11:36
21 the operation of an internal combustion engine
22 and a hydraulically driven device.

23 So you've got interference there to
24 start with. That's more on the external. And
25 then you've got -- looking at the internals, 11:36

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1 going to page 51, you can see that if you're
2 going to elevate the -- the track -- or have an
3 elevated track with an elevated sprocket and
4 drive -- the drive motors that are shown in the
5 KR996 patent are kind of a cylindrical shape -- 11:36
6 and you can see when you elevate those to be the
7 drive mechanism, you're now not only interfering
8 with that triangular-shaped structure but you're
9 also passing through different parts of the
10 mainframe. You're passing through the -- the 11:37
11 engine structure. And so it would require a
12 pretty extensive redesign of this KR996 vehicle
13 to accommodate this track system.

14 Q. Let's talk about that fuel container,
15 that brownish/gray triangular shaped. Are there 11:37
16 different sizes and shapes of fuel containers?

17 A. Yes.

18 Q. Would it be possible to select a
19 different size or shape container and still to
20 have it work? 11:37

21 A. I don't know if you could or not.
22 You know, these -- you want to have a certain
23 volume of fuel for certain length of operation.
24 And so if you put a very tiny tank on there,
25 then you'll wind up with a situation where the 11:38

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1 machine may not operate as long as you need it
2 to.

3 And so then you've got a -- you know,
4 for instance, this KR996 is supposed to be for
5 operating inside of buildings. You don't want 11:38
6 to be constantly having to go and get more fuel.
7 So making a much smaller tank could be
8 problematic from that standpoint.

9 Changing the shape of it, you still
10 have to be concerned with the -- the path of the 11:38
11 loader arm. So if you make very much of a
12 change to the -- to the location of that, then
13 you're going to start, you know, potentially
14 impacting that with the loader arms. And then
15 you could have, you know, either an 11:38
16 environmental or a safety issue where you're
17 spilling -- spilling hydraulic or diesel fuel or
18 gasoline.

19 Q. What is the volume of this tank?

20 A. I don't know what the volume of this 11:39
21 tank is.

22 Q. But you're telling me that you,
23 Dr. Fleming, could not position a fuel tank to
24 make this -- this machine work that accommodates
25 this sprocket? You're not able to do that is 11:39

1 what you're saying?

2 A. Not with the teachings of this
3 patent. If you want to design a completely
4 different machine that doesn't follow the
5 teachings of this patent, then, you know, that's 11:39
6 a different situation.

7 But as far as following the teachings
8 of this patent and having it work as the
9 inventor expected but changing things like
10 hydraulic fluid reservoirs and things like that, 11:39
11 I --

12 Q. You can't do it?

13 A. Not with the teachings of this
14 patent.

15 Q. What do you mean by "not with the 11:40
16 teachings of the patent"? Are you saying that
17 there's no possibility of repositioning that
18 hydraulic fuel container that would allow the
19 KR996 to work as it is intended?

20 A. What I'm saying is that when you 11:40
21 start making these kind of changes to, for
22 instance, how much fuel or hydraulic fluid is in
23 the tank, then you start getting into a
24 different machine.

25 You put a -- a very small tank on 11:40

11:40

11:41

11:41

11:41

11:41

1 going to run for as long as is intended, do as
2 much work as is intended.

3 You know, I can't say that you start
4 putting on a smaller tank, raising the center of
5 gravity, that you're going to be getting a
6 machine that's still consistent with the
7 teachings of this patent.

11:41

8 Q. How long is it intended -- how long
9 is the KR996 machine intended to run?

10 A. They don't give a specific time that
11 they intend it to run. But I know that they are
12 intending to operate in a building. So if you
13 have to be constantly going and getting more
14 fuel or refueling, then that's not preferred by
15 operators.

11:42

11:42

16 Q. Is it ever possible to move the
17 sprocket?

18 MR. VANDER TUIG: Objection to form.

19 THE WITNESS: What do you mean?

20 BY MR. O'DELL:

11:42

21 Q. To a different location away from the
22 fluid reservoir?

23 A. You want to move the sprocket down?

24 Q. Any different location that doesn't
25 interfere with the fluid reservoir.

11:42

1 MR. O'DELL: I'm saying reservoir.

2 THE WITNESS: If you were to move --

3 I guess I would want a clarification on
4 that. Do you want to maintain this kind of
5 triangular-shaped track? 11:43

6 BY MR. O'DELL:

7 Q. It's just a track. I think the track
8 is going to be triangular even if you moved it,
9 let's say, to the right and down.

10 A. Well, if you want to put on a really 11:43
11 tiny track so that you just take this same --
12 this same track shape, start with that, and you
13 shrink the track down in order for it to get
14 down to where it is in the top image on page 51,
15 you're going to wind up with a -- with a track 11:43
16 system that is very small. And then you're
17 going to have a device that's unstable or has
18 much less stability from front to back and
19 possibly from side to side.

20 But definitely from front to back, 11:44
21 you're going to have a very small footprint that
22 you're operating this machine from. So that's
23 not a preferred option in my opinion.

24 Q. Not a preferred option but not
25 possible? 11:44

1 **A. I would say not possible to have a**
2 **functioning machine that customers would want to**
3 **use with such a tiny little track.**

4 **Q. When we talked about the Vermeer**
5 **patent, we talked about a POSITA being able to** 11:44
6 **convert the Vermeer patent's tracks to wheels.**
7 **And you said that was within the capabilities of**
8 **one skilled in the art.**

9 Do you still believe that's true?

10 **A. From what standpoint?** 11:44

11 **Q. Converting the Vermeer patent tracks**
12 **to a wheel-drive system, you said that that was**
13 **within the capability of a person of skill in**
14 **the art.**

15 Do you believe that to be true? 11:45

16 **A. From the standpoint of what I**
17 **answered on that, I believe it to be true. What**
18 **I'm saying on this patent here, if I want to**
19 **follow the teachings of this patent but try to**
20 **incorporate this track, you have a lot of** 11:45
21 **interference. And if I want to then start**
22 **coming up with a completely different machine**
23 **that has to move the engine, move other drive**
24 **line components, move hydraulic motors and**
25 **hydraulic drives, I'm no longer following the** 11:45

1 **teachings of the KR996 patent. I'm designing a**
2 **completely different machine.**

3 Q. And one of those things is the
4 interference of this fluid reservoir with the
5 sprocket?

11:46

6 A. Well, you've got the interference
7 potentially with the sprocket, interference with
8 the track. You're going to have interference
9 with the -- with the engine. You have --
10 potentially have to redesign some of the other
11 structure of the vehicle as well. So you wind
12 up with a very big redesign of this machine to
13 accommodate those tracks.

11:46

14 Q. Is it your opinion that the figures
15 of the KR996 are drawn to scale?

11:46

16 A. They were drawn to scale enough that
17 we were able to complete these -- complete these
18 CAD models.

19 Q. I don't understand that. You could
20 -- you overlaid the picture. So whatever the
21 scale was, you could complete the CAD drawings,
22 right?

11:46

23 A. **Correct.**

24 Q. So do you -- do you think the figures
25 of the KR996 are drawn to scale?

11:47

1 A. From the standpoint of -- to be able
2 to draw these to assess the teachings of the
3 patent and to evaluate the alternatives proposed
4 by -- in the prior art combinations proposed by
5 Dr. Velinsky.

11:47

6 Q. So is that a yes or a no?

7 A. From -- can you restate your question?

8 Q. Is it your impression that the
9 figures of KR996 are drawn to scale?

10 A. Subject to what I said before where
11 we were able to do the overlays and to analyze
12 these, I would say that they're drawn to scale
13 to that -- you know, to sufficient -- or to
14 sufficient scale for us to be able to do this
15 analysis work.

11:47

16 Q. I apologize but I can't understand
17 the answer. I understand that your overlay is
18 mapped to it. But what I'm asking is the
19 underlying image, is that drawn to scale? And
20 you said, well, our overlay was -- matched it.
21 Of course it did. You overlaid it. But is the
22 -- are the patent drawings to scale? And what
23 scale is it?

11:48

24 A. What do you mean by "what scale is
25 it"?

11:48

1 Q. How tall is the KR996 machine?

2 A. It doesn't give specific height. So
3 when we were doing our evaluation of it, we were
4 looking at comparing -- looking at, first of
5 all, the size of the operator gives you some 11:48
6 concept on there. Looking at the size of the
7 wheels. And then looking at the size of the
8 loader arms compared to other units that we were
9 looking at as well in order to come up with a --
10 with a scale. 11:49

11 You know, ultimately for the work
12 that we were doing, the important thing was not
13 the absolute dimension but the relative
14 dimension of this track of Bares and how it
15 would fit in there because we were looking at 11:49
16 the -- the track width of those tracks and
17 whether it would fit on the machine by scaling
18 it up or scaling it down.

19 Q. When you put the Bares tracks on the
20 KR996 machine in the figure on page 50, did you 11:49
21 try to make any adjustments of size or
22 configuration to make it work?

23 A. Like I said, what we did was we had
24 our CAD model and I overlaid the -- the tracks
25 of Bares. And I maintained the proportions and 11:50

5 A. I did not try to -- first of all, 11:50
6 just to clarify, you're talking about
7 modifications to the KR996 design?

A. I did not try to redesign the KR996.
I was trying to follow the teachings and the drawings, following the teachings of patent to see whether the combination that was proposed by Velinsky -- by Dr. Velinsky would actually work.
And what I found is that it would not.

20 THE WITNESS: What I'm showing here 11:51
21 is -- first of all, on page 50 you can see
22 that there's an overlay.

25 A. So we did the scaling there. And 11:51

1 then you can see furthermore on page 51 in the
2 middle of the page there that we actually drew
3 up the tracks from Bares and put that -- removed
4 the tires and wheels from the KR996 and tried to
5 replace that on the KR996.

11:51

6 And that's what we're showing there
7 where we see the interference with the -- that
8 tank and with the engine and other pieces of the
9 structure.

10 Q. So would you describe that as trying
11 to bodily incorporate the tracks from Bares onto
12 the KR996 machine?

11:52

13 A. What do you mean by "bodily
14 incorporate it"?

15 Q. Just taking the exact figure as it is
16 from Bares onto the exact figure as it is in
17 KR996 and see if they work.

11:52

18 A. Yeah, from a high level I would say
19 that's how we ended up scaling those, was
20 tracking the track from Bares and overlaying it
21 on there while maintaining the same track --
22 track length that we had on the KR996.

11:52

23 Q. In the picture in Figure 1, there are
24 -- let's say the picture at the bottom right.
25 On the tracks there is a reddish big circle and

11:53

1 a bluish big circle.

2 Do you see those?

3 **A. Which page and which figure are you**
4 **looking at?**

5 Q. Page 51, the bottom right figure -- I 11:53
6 think you're kind of consistent with the colors.
7 But anyway, in the track there is one wheel
8 that's red and one wheel that's blue.

9 Do you see that?

10 **A. Yes, I do.** 11:53

11 Q. What is the purpose -- or what are
12 these circles -- those four circles in between
13 those two wheels, one of which is colored
14 yellow?

15 **A. You're talking the little ones?** 11:53

16 Q. Yeah, little ones.

17 **A. Those are I think called idler**
18 **wheels. That's what I call them anyway. Idler**
19 **wheels that support the -- the track between the**
20 **two larger wheels that the track goes around,** 11:54
21 **you know, the one that you said was blue and the**
22 **other one that was kind of reddish.**

23 Q. Do the idler wheels as shown in this
24 figure exhibit any downward force on the track?

25 **A. I would state it a little bit** 11:54

100

1 differently than that. Generally idler wheels
2 resist upper movement of the middle of the
3 track. But I don't know that they're
4 necessarily exerting a downward force when the
5 vehicle was just at rest or suspended up in the
6 air, for instance.

11:54

7 Q. Would you say the downward force is
8 applied to the blue and red wheels through the
9 track to the ground and that's where the
10 downward force would be?

11:54

11 A. Well, the track is supporting the
12 weight of the vehicle. And it is -- then goes
13 through all of those wheels up to that carriage,
14 which is kind of that gray-colored elongated
15 piece.

11:55

16 Q. Uh-huh.

17 A. And then somehow that carriage would
18 be attached to the mainframe of the vehicle in
19 order to transmit the load between the ground
20 and the mainframe.

11:55

21 Q. When you say "all of those wheels,"
22 do you mean both of those wheels or do you mean
23 all six of the wheels?

24 A. From a high level I'd say all six of
25 those wheels.

11:55

101

1 Q. Okay. Do you know what the term
2 "kinematic diagram" is?

3 A. Well, kinematics is the study of
4 movement. And so a kinematic diagram is going
5 to be a diagram showing what the movement, in 11:56
6 this case the movement of the links and the
7 pivot points is.

8 Q. Is a kinematic diagram necessarily a
9 CAD diagram?

10 A. Not necessarily. 11:56

11 Q. Does a kinematic diagram describe the
12 shape, size, width, or length of the members?

13 A. In general in a kinematic --
14 kinematic analysis you would be looking at the
15 endpoints. So because of that, then you would 11:56
16 be looking at the length of the members. Not
17 necessarily the -- the thickness or anything
18 like that. But you're interested in how the
19 linkages move and how the pivot points move,
20 rotate. And so that's what a kinematic diagram 11:57
21 would show.

22 Q. What purpose does the kinematic
23 diagram have in the process of designing
24 equipment?

25 A. Where I've looked at them before is 11:57

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1 when you have some kind of a structure that
2 moves and you want to know how to adjust, you
3 know, linkage positions. Then you would be
4 looking at are you achieving the overall goal of
5 whatever you're trying to design. In this case 11:57
6 trying to design some kind of a vertical lift
7 mechanism, for instance.

8 You'd be looking at -- if you have
9 pivot points as shown in the -- you know, take
10 the Vermeer patent, you have those pivot points, 11:57
11 do you get the vertical lift movement that you
12 want. If you have this KR996, do you have the
13 movement that you want.

14 If you move those pivots points, do
15 you still get the movement that you want or you 11:58
16 start running into interference problems or does
17 the mechanism not move. And what I found was,
18 doing some of the kinematics on Dr. Velinsky's
19 alternatives, you start moving those linkage
20 points around and you start running into 11:58
21 problems of interference or problems of the lift
22 arms not actually lifting properly.

23 Q. Let's go turn back to page 20 of your
24 declaration. In paragraph 63, which spans
25 page 20 to 21, can you read that paragraph to 11:59

1 yourself?

3 Q. Yes.

5 THE WITNESS: Okay.

11:59

7 Q. Is it ever advantageous to have a
8 separate dedicated machine?

10 Q. For any job. Is there ever a job
11 where it's advantageous to have a separate
12 dedicated machine, a machine you describe as
13 having a unique purpose?

11:59

14 MR. VANDER TUIG: Object to form.

15 THE WITNESS: There can be.

12:00

17 Q. Can you give an example?

18 A. Maybe it's all the construction noise
19 I hear outside or something. But one that comes
20 to mind is a sheepsfoot, where you're trying to
21 compact soil when you're laying out a roadway
22 like we described earlier, You may have a
23 dedicated machine for -- for compaction.

12:00

24 Q. Is there ever a job situation where
25 it would be advantageous just to have a loader?

12:00

1 **A. There would be.**

5 A. I believe that is the section it's 12:02
6 in. Let me read the paragraph to make sure.

8 THE WITNESS: Yes, we're talking
9 about KR996.

11 Q. You also mentioned the detachable
12 feature -- fixture 41; is that correct?

15 Q. Would you say that the detachable 12:02
16 fixture 41 that holds the loader is an important
17 part of the compact utility loader of the KR996?

19 THE WITNESS: What do you mean by
20 "important"? 12:02

22 Q. Is it important for performing loader
23 operations? Is it critical?

24 A. If you are -- I guess to step back a
25 little bit. You've got a machine here that has 12:03

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1 a detachable loader unit and then a detachable
2 arm. And go through the teachings of the
3 patent, it talks about you can have one vehicle
4 and then you could put these loader unit and arm
5 unit on there for green building deconstruction
6 work. 12:03

7 When you want to attach the loader
8 unit to the mainframe of the -- of the machine,
9 or the main body as they call it, then you would
10 do that through the -- the fixture 41. So the 12:03
11 fixture 41 where the -- the linkage for the
12 loader arms attaches would then be connected to
13 the mainframe of the -- of the machine.

14 And so that's -- that's how that
15 operates. And so when you have it configured 12:04
16 for operation as a loader, then you would be
17 having loads going through that fixture and
18 through that combination plate down into the
19 mainframe of machine.

20 Q. Would you say that when you're 12:04
21 operating as a loader that the detachable
22 fixture is a critical component of the machine?

23 A. I mean, it's one of many components
24 that are critical. So when you're operating as
25 a loader, everything from the -- the bucket to 12:04

1 **the wheels is critical and all parts in between.**

2 Q. You discussed throughout your
3 declaration that the wheels of the KR996 are
4 used to engage with the guides of the bogie and
5 pull it in. An example of that can be shown in 12:05
6 the figure of paragraph 138, which is on
7 page 62; is that correct?

8 A. **What are you pointing to specifically**
9 **in that figure?**

10 Q. The wheels of KR996 are used to 12:05
11 engage with the guides of the bogie and pull it
12 in?

13 A. **Yes.**

14 Q. Referring to paragraph 100, we talked
15 -- you show the wheels we just talked about, 12:06
16 150, the -- tell me what you called those wheels
17 again.

18 A. **Which wheels are you talking about?**

19 Q. 150.

20 A. **The idler wheels?** 12:06

21 Q. Idler wheels. Yes, let me start over
22 again.

23 At paragraph 100 of your declaration
24 you have a picture of Bares, Figure 6, and it
25 includes a track assembly, which is similar to 12:06

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1 the track assembly that you combined with the
2 KR996 that we discussed early. And in that
3 discussion we discussed the wheels between the
4 main wheels, the idler wheels 150; is that
5 correct?

12:07

6 **A. Yes, we discussed those.**

7 Q. Is it possible that those wheels are
8 made of rubber?

9 **A. I'm not sure what Bares made those
10 out of.**

12:07

11 Q. Is it possible that those wheels
12 could be made out of rubber?

13 **A. Yes, anything is possible. I don't
14 know if that would be a -- a good place to use
15 rubber wheels or not, though.**

12:07

16 Q. Are there any advantages of using
17 rubber there?

18 **A. There could be advantages or
19 disadvantages. You could -- if it's a
20 lighter-weight application, you may get some
21 advantages from rubberized wheels of, you know,
22 like reduced noise or a smoother ride. But it
23 could be at the expense of not as tough and
24 durable as something like a steel wheel.**

12:08

25 Q. Would they be cheaper to make than a

12:08

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1 steel wheel?

2 A. I'm not sure what the relative costs
3 would be between the steel versus the rubberized
4 wheel.

5 Q. Would a rubber wheel flex when the 12:08
6 pressure is either coming down or up from the
7 ground against it?

8 A. You're talking a solid rubber wheel
9 that's real small?

10 Q. Yeah. Let's try that. 12:08

11 A. I would say probably not, no.

12 Q. Are you saying the rubber compresses?

13 A. Not to the extent of a full pneumatic
14 tire like we're looking at over here or -- or a
15 larger tire. You may get just a very small 12:09
16 amount. But also if you look at the position of
17 where these idler wheels are, they are not on
18 the inboard edge.

19 So even if you had something that
20 could have a lot of compression, it's clear on 12:09
21 the outboard side of the track and not on the
22 inboard side where it would ever engage the --
23 that -- the guides of the bogie.

24 Q. Are the KR996 solid rubber wheels or
25 air-inflated wheels? 12:09

109

1 A. They appear to be pneumatic tires.

2 Q. Why do you say that?

3 A. Just looking at the -- at the design
4 of them and my experience on different types of
5 wheels. Usually if you've got some kind of a
6 solid rubber, you'll see some holes more out
7 towards the track where it gives a little bit of
8 compressibility. I didn't see anything like
9 that that said to me that it was not a pneumatic
10 tire.

12:09

12:10

11 Q. Did you see a pneumatic inflation
12 valve?

13 A. I don't see it but, you know,
14 sometimes those are on the inboard side, too.
15 So I don't see one way or the other whether
16 there's a valve to air it up or not.

12:10

17 Q. Okay. Is it possible that the wheels
18 150 of Bares could extend to the inward side of
19 the track?

20 A. I don't see that it does. I see that
21 there's what appears to be some kind of a ridge
22 going through the center of the track. And it
23 appears like those wheels 150 are on the
24 outboard side of that ridge.

12:10

25 Q. Could they be on the inside portion

12:10

110

1 of the ridge?

2 **A. That's not what I see there in that**
3 **photograph on page -- or that image on page 43.**

4 Q. I'm not asking what you see. I'm
5 asking could they be on the inside of the ridge? 12:11

6 **A. I don't know that they could be. I**
7 **don't see any teachings in Bares that say that.**
8 **And based on the -- the carriage mechanism that**
9 **I see there, it looks like they've got them**
10 **designed to go on the outboard side to support** 12:11
11 **the outer -- outer part of the track.**

12 Q. So you're unwilling to consider a
13 modification to that drawing?

14 MR. VANDER TUIG: Object to form.

15 THE WITNESS: I'm not trying to 12:11
16 redesign to come up with a modified design
17 for this. I'm trying to follow the
18 teachings of the patent as I see them.

19 BY MR. O'DELL:

20 Q. Would you say you're following the 12:11
21 teachings as they're bodily incorporated into
22 this drawing?

23 MR. VANDER TUIG: Object to form.

24 THE WITNESS: That's what I'm
25 following, is what I see in the patent and 12:12

111

1 the teachings of the patent.

2 BY MR. O'DELL:

3 Q. What is wheel 152 made of?

4 A. I don't know that it says what wheel
5 152 is made of. 12:12

6 Q. Could it be made of rubber?

7 MR. VANDER TUIG: Object to form.

8 THE WITNESS: Like I said, I don't
9 recall seeing that it said it was made of
10 any particular material. 12:12

11 BY MR. O'DELL:

12 Q. Let's turn back to page 50 of your
13 declaration, 50 and 51.

14 A. If you get to a good place to take a
15 break, I'd like to take a short break. 12:13

16 MR. O'DELL: Yes, in fact, we can
17 take a lunch break. I do have more
18 questions but I don't have a lot more
19 questions. So take a lunch break.

20 THE WITNESS: I usually just take a 12:14
21 short break. So if you want to take 15,
22 20 minutes.

23 MR. O'DELL: Let me take 30 minutes
24 because we're also going to strategize and
25 eat. So let's be here at 12:45. 12:14

1 (Whereupon, a recess was taken
2 from 12:14 p.m. to 1:06 p.m.)
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113

1 AFTERNOON SESSION

2 MARK FLEMING, PH.D., P.E.,

3 having been previously duly sworn was examined
4 and testified further as follows:

5 RESUMED EXAMINATION

01:05

6 BY MR. O'DELL:

7 Q. I'm going to go back to your
8 declaration, paragraph 138. And really it's --
9 I'm going to refer to one sentence and one
10 drawing. And really I want the drawing on the
11 next page. Yeah.

01:06

12 So we have the main body 11 and the
13 detachable fixture 41 of the KR996 machine. Is
14 it likely or -- that the main body 11 is all
15 welded together?

01:06

16 A. I don't know that the patent says
17 that it's completely welded or not. When I look
18 at the layout of it, I see that it's most likely
19 -- mostly, if not entirely, welded just based on
20 what I can -- what I can see from the -- the
21 design of the structure.

01:06

22 Q. Okay. Okay. For fixture 41, is it
23 likely or could it -- is it a good chance that
24 it is also all welded together as -- as for the
25 pieces of fixture 41?

01:07

114

1 A. I would give the same answer as I
2 gave for the main body, that the layout of the
3 structure, it did appear that it was mostly, if
4 not all, welded.

5 Q. Okay. Okay. I think we had -- I 01:07
6 think both parties recognized that when fixture
7 41 attached to body 11, it's done so in a
8 detachable way. Do you know what that is, that
9 detachable connection is?

10 A. You're talking when the fixture 41 is 01:08
11 on main body 11?

12 Q. Yes.

13 A. There is a -- I believe they call it
14 a combination plate. So the -- the fixture is
15 rolling on the bogie, the wheels of the bogie, 01:08
16 drawn in by the wheels of the -- of -- you know,
17 that are attached of the main body, draws that
18 in. And then there is a mechanism under there
19 that has a hydraulic cylinder and some kind of
20 cam mechanism that has some rollers that will 01:08
21 then press that structure up against the
22 combination plate.

23 Q. So is it a pressure fit into that
24 combination plate that holds it in place?

25 A. It's those rollers that hold it in 01:08

115

1 **place.**

2 Q. Okay. So when you're doing the
3 lifting operation, it's the rollers that are
4 holding it in place?

5 A. That's the -- what's pressing the 01:09
6 part of the fixture that's up against the
7 combination plates that is holding it in
8 position.

9 Q. Okay. Okay. Are you a welder?

10 A. Not really. I have -- 01:09

11 Q. Amateur welder?

12 A. I have -- is there a category below
13 amateur welder? I have welded but I cannot say
14 that I'm good enough that you would want me to
15 weld anything for you. 01:09

16 Q. Have you ever welded something
17 together that was supposed to be detachable but
18 for some reason is not working?

19 A. But not defective?

20 Q. It's defective. It's not working. 01:09

21 A. I guess I don't follow your question.

22 Q. Is it possible that if this mechanism
23 that you described for connecting the fixture 41
24 to the body 11 is failing, could you tack weld
25 it on? 01:10

116

1 **A. Tack weld?**

2 Q. The fixture 41 onto the body 11. If
3 the mechanism that's holding those two units
4 together is failing for some reason, could you
5 tack weld it?

01:10

6 **A. Tack weld is not going to hold.**

7 Q. Could you do another type of weld
8 that would hold?

9 **A. Well, maintaining the removability
10 feature?**

01:10

11 Q. No, no.

12 **A. If you want to design a --**

13 Q. Nope, nope. That's not the question.

14 **A. Sorry. Go ahead and ask your
15 question.**

01:10

16 Q. Could you weld together the fixture
17 41 to the body 11?

18 **A. If you wanted to design a different
19 machine, then -- and eliminate the removability
20 feature, then you would -- that would be welded.
21 But then you've got a completely different
22 machine, completely different design that is not
23 with the teachings of this patent.**

01:10

24 Q. But it could be done?

25 **A. If you wanted to teach a way or**

01:11

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1 design a way from what's in this patent and
2 destroy the removability feature, then you could
3 do some kind of permanent attachment. As
4 opposed to what's in this patent that, you know,
5 it's a selectively detachable or removable
6 piece. 01:11

7 But I would say your -- if you're
8 having trouble with some kind of failure of a
9 mechanism, you're much better off fixing it, not
10 trying to do some kind of a cowboy way of 01:11
11 attaching it together.

12 Q. Okay. Okay. What if it's an
13 emergency situation and that's the only way of
14 you connecting it, if someone's life is at risk?

15 MR. VANDER TUIG: Object to form. 01:11
16 BY MR. O'DELL:

17 Q. Could you do it? Could you weld it
18 together?

19 A. I can't imagine somebody's life being
20 at risk that you need to do this. You know, I 01:12
21 would say if you have to go and -- if somebody's
22 life is at risk, first of all, going and getting
23 a welder and bringing it in and doing that is
24 going to take much more time than, you know,
25 going to some other alternative. 01:12

118

1 Q. Is it an alternative?

2 A. What's that?

3 Q. Welding. If you had a welder there,
4 is it an alternative?

5 A. I would say it's not a very good 01:12
6 alternative to be modifying a design in this
7 matter. And you're destroying the selectively
8 removable feature that is, you know, with the
9 teachings of this patent.

10 Q. Would the loader still work if you 01:12
11 welded it?

12 A. It may or it may not. I mean, you
13 start putting in a lot of welds, you start to
14 get weld-induced distortion. These are some
15 pretty thick pieces they have there. So I just 01:13
16 can't make a blanket statement that just simply
17 slapping weld on there to eliminate the
18 removability feature is going to work and not to
19 create some other problems. Like I said, you
20 know, you get weld-induced distortion or things 01:13
21 like that that are particular problems when
22 you're doing some kind of field modifications.

23 Q. But it could be done?

24 A. Like I said, I'm not going to make
25 that blanket statement that it's going to work. 01:13

119

1 Q. Okay. Okay. Let's turn to page 70
2 of your declaration. There are seven drawings
3 on this page, correct?

4 A. Seven figures, yes.

5 Q. Yes. Let's start with the top left 01:14
6 figure. Where did that come from?

7 A. I'd say the kinematic part, going
8 back to what we talked about before with the
9 figures, came from Dr. Velinsky. That was one
10 of his alternatives that he said that -- he 01:14
11 suggested and was created by somebody. He said
12 it was created by Kubota's counsel. So that's
13 where that came from.

14 And then we were doing some animation
15 of that to see how and if that would work in 01:15
16 conjunction with the KR996 part. And what we
17 found was -- you can kind of see a progression
18 from left to right as you are lowering the
19 mechanism that you actually cannot get the
20 bucket all the way to the ground before you 01:15
21 start to interfere with the tires of the
22 structure.

23 And then if you -- ultimately along
24 the right, if you force it to go all the way to
25 the ground by ignoring the contact interference, 01:15

120

1 **you're actually interfering with the structure**
2 **of the vehicle.**

3 Q. Is there any modification that could
4 be made to the loader arm that could prevent it
5 from engaging with the wheel or the body of the 01:15
6 machine?

7 MR. VANDER TUIG: Object to form.

8 THE WITNESS: We could move the pin
9 locations back to where they originally
10 were. That's one modification I would 01:15
11 know.

12 BY MR. O'DELL:

13 Q. What if you made the top most red
14 portion of the loader arm longer?

15 A. **Coming up with another new design?** 01:16

16 Q. Uh-huh.

17 A. **I don't know what that would do for**
18 **the overall stability of this vehicle if you**
19 **then have the loader arm -- or the -- yeah, the**
20 **loader arm and the bucket extending farther** 01:16
21 **forward. So I have not evaluated the stability**
22 **of changing the loader arm design.**

23 Q. Earlier we talked about part of the
24 design process was working with the center of
25 gravity and the stability of the unit. 01:16

121

1 Would a POSITA know how to make
2 modifications to alter the center of gravity if
3 a longer loader arm was needed?

4 **A. Are you talking fore-aft or vertical?**

5 Q. Both of them. 01:16

6 **A. They -- there would be some design**
7 **work that could be done. But you know, it's not**
8 **within the teachings of this patent.**

9 Q. But there would be some design work
10 that would be done? 01:17

11 **A. Yes, possibly some pretty extensive**
12 **design work.**

13 Q. Okay. Okay. But it could be done?

14 **A. Like I said, there could be some**
15 **extensive design work that's done to possibly** 01:17
16 **find a kinematic solution that would not have**
17 **interference. But I'm not sure what that would**
18 **be with this KR996 part, you know, and ignoring**
19 **that you've -- you've now removed the lower**
20 **pivot locations from the place where they** 01:17
21 **actually were on the fixture and put them down**
22 **somewhere on the mainframe.**

23 Q. What about the next figure, which is
24 Figure 8, annotated with lower pivot points
25 written below it, where did that come from? 01:18

122

1 A. So Dr. Velinsky had also offered
2 another alternative, lowering the pivot points.
3 And so we at Fusion Engineering annotated that
4 to show what would happen with that particular
5 configuration when you lower the pivot points. 01:18

6 And what we found on that one is that
7 actually the bucket starts going down and then
8 it actually rotates rearward and the bucket
9 starts going backward and up in the air. And
10 both on this one and on the other one, you are 01:18
11 getting the loader arms back in the operator
12 areas as well.

13 So it's not just the movement of the
14 -- the movement of the loader arms. You've also
15 got a potential safety issue where you're 01:19
16 putting loader arms right back in the operator
17 compartment.

18 Q. Could a POSITA rearrange pivot
19 points, not the ones at the bottom but other
20 pivot points, or the length of the loader arm or 01:19
21 the position of the pivot points on the loader
22 arm in such a way to make this work?

23 MR. VANDER TUIG: Object to form.

24 THE WITNESS: I'm not sure if you can
25 make this configuration work or not. 01:19

123

1 BY MR. O'DELL:

2 Q. Did you try?

3 A. I did not try to fix Dr. Velinsky's
4 designs, no.

5 Q. Is it your opinion that determining 01:19
6 market demands and competitor benchmarking are
7 evidence of nonobviousness?

8 A. I guess I would put it by saying that
9 reviewing those types of secondary
10 considerations would be supportive of my opinion 01:20
11 of nonobviousness.

12 Q. Do you believe -- is it a true
13 statement that customer demands provide a strong
14 motivation for a POSITA to make a modification?

15 A. That could be one thing that it would 01:20
16 be used for, is what is the customer asking for
17 in the marketplace.

18 Q. The alleged evidence of secondary
19 considerations, is that directed primarily to
20 vertical lift? 01:21

21 A. I would say primarily, yes.

22 Q. I think you have a copy of the
23 Vermeer patent, what we're calling the Vermeer
24 patent, the '386 patent.

25 A. Yes. That was 1001-00169. 01:21

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1 Q. If you could open it up to Claim 1.
2 And I'm going to tell you there's going to be
3 two versions of Claim 1, one in the original and
4 one in the re-exam. But they're both the same
5 so either one works.

01:21

6 MR. O'DELL: Is that correct? Maybe
7 someone could verify that.

8 Yes, that's correct. Okay.

9 BY MR. O'DELL:

10 Q. Do you have it?

01:22

11 A. I am looking at paragraph 6 -- or
12 column 6 with the claims, uh-huh.

13 Q. What in Claim 1 is describing
14 vertical lift?

15 A. In general I would say it's the
16 linkages, that you've got -- you've got the
17 mainframe with the linkage. And there's some
18 discussion of the linkage pivotally attached to
19 the first side of the mainframe and pivotally
20 attached to the loader arm so -- and then the
21 actuator as well that's pivotally attached to
22 the mainframe and also to the loader arm.

01:22

01:23

23 So that's the beginnings of the
24 description of a -- of a linkage that would lead
25 to a vertical lift mechanism.

01:23

125

1 Q. I believe you said earlier that skid
2 steers have vertical lift. Did they have this
3 type of linkage that's being described here?

4 MR. VANDER TUIG: Full size skid
5 steer? Did you say full size?

01:23

6 MR. O'DELL: Yes.

7 BY MR. O'DELL:

8 Q. Skid steers in general.

9 A. The ones that I remember, they did
10 have linkages, some down lower on the mainframe.
11 And then the ones that I'm recalling that were
12 full size had another link that was higher up on
13 the -- either on the frame structure or on, you
14 know, a part of the ROPs that was reinforced to
15 carry some of the load.

01:23

01:24

16 Q. Did any of them have both pivot
17 points on the mainframe?

18 A. On the lower part of the mainframe?

19 Q. Uh-huh.

20 A. I don't specifically recall one from,
21 you know, many years ago that had them down low.

01:24

22 Q. Or a regular skid steer, you don't?

23 A. I don't recall one.

24 Q. What do you think is the point of
25 novelty of Claim 1?

01:24

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1 MR. VANDER TUIG: Object to form.

2 THE WITNESS: From a general

3 standpoint, I would say that for a mini

4 skid steer, putting the -- the pivot points

5 down lower on the mainframe was the -- the 01:25

6 novelty. As opposed to being up higher,

7 particularly when you have like the -- the

8 rotary lift mechanisms, the radial lift

9 mechanisms are going to lower your -- your

10 rotation points and having what is going to 01:25

11 be a four-bar linkage for lifting the

12 loader arms. That is where the novelty

13 came in for this particular patent.

14 BY MR. O'DELL:

15 Q. In the Toro matter, I believe the 01:26

16 prior art used by Toro showed a regular skid

17 steer with linkages pivotally connected to the

18 mainframe. And I believe you discussed the

19 re-exam where that was discussed and said that

20 -- in your declaration that the inventive -- 01:26

21 invention was applying that to a mini skid

22 steer; is that correct?

23 A. I would want to see where I said

24 that, if you recall.

25 Q. Okay. I summarized it but -- if I 01:26

127

1 can direct you to paragraphs 58 through 61 of
2 your declaration.

3 (Witness reviewing document.)

4 BY MR. O'DELL:

5 Q. What was the argument made by Vermeer 01:28
6 that allowed it to be successful in the re-exam
7 discussed in those paragraphs? And is it the
8 same argument that you're making now with regard
9 to secondary considerations?

10 A. Well, if you look at paragraph 60, it 01:29
11 talks -- I talk there about the evidence from
12 Vermeer citing that Toro said it spent
13 significant time and money to maximize lift
14 capacity of an existing radial lift compact
15 utility loader. So I guess that's the -- the 01:29
16 argument from Vermeer that I cited.

17 Q. Is it important that this is
18 referring to a compact utility loader instead of
19 a regular utility loader?

20 A. For what? 01:30

21 Q. For this argument to succeed.

22 A. I mean, ultimately that's what this
23 patent and what that examination was about, was
24 a utility -- or a compact utility loader. So
25 that's what I was looking for, was arguments 01:30

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1 **about the compact utility loader and -- but you**
2 **know, there's also some discussion of full-size**
3 **skid steers and what they had.**

4 Q. To be clear, you've never designed a
5 compact utility loader?

01:30

6 A. **I've not designed a compact, no. The**
7 **ones I worked on were full-size skid steers.**

8 Q. So you have not personally
9 experienced the difficulties -- the alleged
10 difficulties described in this paragraph --
11 these paragraphs of your declaration?

01:30

12 A. **Not from the standpoint of designing**
13 **a compact utility loader.**

14 MR. O'DELL: One more item and we're
15 going to have to give this a new exhibit
16 number. And for now we can say Exhibit A,
17 I guess.

01:31

18 (Deposition Exhibit A was
19 marked for identification.)

20 **BY MR. O'DELL:**

01:32

21 Q. Is this a declaration that you
22 prepared, Dr. Fleming?

23 A. **Appears to be, yes.**

24 Q. On page 77 of the declaration, is
25 that your signature?

01:32

129

1 **A. Yes, it is.**

2 **Q. And at paragraph 130 you declare "all**
3 **statements to be true, made herein in my own**
4 **knowledge are true, and all statements made on**
5 **information and believed to be true" and so**
6 **forth in that paragraph; is that true?**

01:32

7 **A. Yes.**

8 **Q. On paragraph 99 of this paper you say**
9 **that "changes needed to increase the pin height**
10 **of the CTX50" -- which is a mini skid steer --**
11 **"were routine design changes well within the**
12 **capability of those of ordinary skill of the art**
13 **applying known techniques based on design and**
14 **market incentives as of the effective filing**
15 **date of the '843 patent," which was 2015.**

01:33

01:33

16 **Is that what that says?**

17 **A. Yes.**

18 **Q. You can explain that?**

19 **A. Yes. From my memory of this project,**
20 **what we did was we were looking at what it would**
21 **take to increase the pin height up there by the**
22 **bucket close to that -- I'm looking at page 59**
23 **-- close to where that F is. We were looking at**
24 **what it would take to increase the pin height.**

01:33

25 **And what we found was there was some**

01:34

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1 real estate there that the actuator -- and we've
2 got them listed there, A through F -- the
3 actuator could be changed by 6 inches, moved up
4 -- or sorry, the bottom pivot of the -- of the
5 actuator and the rear length pivot were moved up 01:34
6 2.4 inches. So you know, finger -- a couple of
7 fingers apart.

8 And then we've got some other changes
9 there that -- you know, shortening -- shortening
10 a link, increasing the -- one other link a 01:34
11 little bit. So those -- those are laid out
12 there, A through F, where the -- in order to
13 achieve that -- that lift height, we were
14 looking at what would it take to increase that
15 in order to be able to dump into larger 01:35
16 dumpsters, is my recollection on this.

17 And so that was what we found, is
18 that you could make those changes there in order
19 to achieve some additional lift height to dump
20 into a larger dumpster. 01:35

21 Q. So were you willing to make changes
22 to this reference in this case?

23 A. I was looking at what it would take
24 to achieve more lift height for the bucket.

25 Q. What motivated you to change the lift 01:35

131

1 height?

2 A. We were looking at the size of
3 different dumpsters and the height of different
4 dumpsters. And I don't remember now the precise
5 heights. They should all be laid out within the 01:36
6 report. But our motivation was to be able to
7 dump into larger construction dumpsters, we
8 would increase the lift height a little bit.

9 Q. Was that a response to customer
10 demand? 01:36

11 A. I don't remember if it was
12 necessarily customer demand. It's been a few
13 years since I did that. So I don't remember all
14 the details of -- of what was motivating it.
15 But I remember the -- we were looking at the 01:36
16 increased lift height for the larger dumpsters.

17 MR. O'DELL: I may be done but I'd
18 like to go over our list to make sure I've
19 covered every document. So if I could take
20 a short break and it will -- I won't leave. 01:37
21 If we can come back in ten minutes. And
22 then I may have one or two questions or we
23 may be done. But we'll see.

24 (Whereupon, a recess was taken
25 from 1:37 p.m. to 1:49 p.m.) 01:49

1 **MR. O'DELL: I am done and we can**
2 **close the cross-examination.**

3 MR. VANDER TUIG: I have no questions
4 for the witness and we'll read and sign.

5 (Whereupon, the deposition of
6 Mark Fleming, Ph.D., P.E., was
7 concluded at 1:49 p.m.)

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1 CERTIFICATE OF REPORTER

2

3

4 I, Janice M. Kocek, Certified Shorthand
5 Reporter, Certified LiveNote Reporter, and Notary
6 Public in and for the State of Illinois, County
7 of Cook, the officer before whom the proceedings
8 were taken, do hereby certify that the foregoing
9 transcript is a true and correct record of these
10 proceedings; that said proceedings were taken in
11 Stenotype notes by me on the 14th day of
12 November, 2025, at the Law Offices of Armstrong
13 Teasdale, 100 North Riverside Plaza, Suite 1500,
14 Chicago, Illinois 60606, commencing at 9:07 a.m.
15 CST and ending at 1:49 p.m. CST.

16 I further certify that present on behalf
17 of Petitioner Kubota North America Corporation
18 were David O'Dell and Kelly Gehrke Lynch of
19 Haynes and Boone, and present on behalf of Patent
20 Owner Vermeer Manufacturing Company was Marc
21 Vander Tuig of the Law Firm of Armstrong Teasdale

22 I further certify that I am not
23 related to, nor associated with any of the
24 parties or their attorneys, nor do I have any
25 disqualifying interest, personal or financial in

1 the actions within.

2 Dated this 17th day of November, 2025,

3 at LaGrange Park, Illinois.

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My Comm
JANICE M. KOCEK
CSR NO. 084-002871

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