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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner

v.

AUTONOMOUS DEVICES, LLC,

Patent Owner.

Case: IPR2023-01055

U.S. Patent No. 11,238,344

REMOTE DEPOSITION OF

ELI SABER, PH.D.

Zoom Recorded Videoconference

05/21/2024

10:04 a.m. (EDT)

REPORTED BY: MONIQUE CABRERA

DIGITAL EVIDENCE GROUP

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05/21/2024

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10:04 a.m. (EDT)

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REMOTE DEPOSITION OF ELI SABER, PH.D., held

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virtually via Zoom Videoconferencing, before

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Monique Cabrera, Shorthand Reporter, and Notary

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Public of the State of New York.

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

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I N D E X

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WITNESS

EXAMINATION BY

PAGE

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ELI SABER, Ph.D.

MR. KHAN

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E X H I B I T S

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EXHIBIT

DESCRIPTION

PAGE

7

Exhibit

IPR2023-01055 Cosic United States

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8

1001

Patent: Patent No.: US 11,238,344 B1

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Exhibit

IPR2023-01055 Grotmol US Patent: Patent

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10

1004

No. US 9,604,359 B1

11

Exhibit

IPR2023-01055 Hickman US Patent:

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1005

Patent No. US 8,639,644 B1

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Exhibit

IPR2023-01055 - Declaration of Dr. Eli

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2007

Saber, Ph.D. in support of Patent

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Owner's response.....

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1 ELI SABER, PH.D., called as a witness, having
2 been first duly sworn by a Notary Public of the
3 State of New York, was examined and testified as
4 follows:

5 THE WITNESS: I do.

6 COURT REPORTER: Can you state your
7 name and address for the record?

8 THE WITNESS: Yes. Eli Saber,
9 600 Hosta Circle, Webster, New York 14580.
10 H, as in Henry; O, as in ordinary; S, as in
11 Sam; T, as in Thomas; A, as in alpha.

12 EXAMINATION

13 BY MR. KHAN:

14 Q. All right. Good morning, Dr. Saber.

15 A. Good morning. How are you?

16 Q. I am doing well. I hope you are
17 too.

18 A. I am doing very well. It's been a
19 while.

20 Q. Indeed. So much like we did last
21 Thursday, I am going to start off with some
22 general questions. Then maybe get into

1 specifics.

2 In the middle, I will try to take
3 breaks on the hour. Along the way, if you need a
4 break, please let me know.

5 A. Excellent.

6 Q. And you understand that you are not
7 allowed to discuss the substance of your
8 testimony today until your cross-examination has
9 concluded?

10 A. I do.

11 Q. And will you let me know if at any
12 point anyone communicates with you in any manner
13 during the course of your cross-examination
14 regarding your testimony?

15 A. I will.

16 Q. Thank you.

17 Today do you understand that we will
18 be discussing your declarations submitted as
19 Exhibit 2007 in IPR Proceeding IPR2023-01055,
20 which relates to U.S. Patent Number 11,238,344?

21 A. I do.

22 (Whereupon, Exhibit 2007,

1 IPR2023-01055 - Dr. Eli Saber's Declaration,
2 was marked for identification.)

3 Q. For purposes of brevity, I will
4 refer to the patent-at-issue as the '344 patent,
5 and the proceeding as the '055 proceeding; is
6 that okay?

7 A. That's perfect.

8 Q. Great.

9 Do you understand that your
10 testimony today is sworn testimony taken under
11 oath?

12 A. I do.

13 Q. Do you understand that that oath
14 you've taken today is as solemn as the oath you
15 would take as if you were testifying during
16 trial?

17 A. I do.

18 Q. Do you understand that your
19 testimony today can be used at trial or
20 subsequent ways to these proceedings?

21 A. I do.

22 Q. Are you taking any medication that

1 would prevent you from answering questions
2 completely and truthfully to the best of your
3 ability?

4 A. No, I do not.

5 Q. Okay. Did you write the
6 declaration, Exhibit 2007, yourself?

7 A. I provided the first draft of this
8 declaration. And then it was a collaborative and
9 iterative effort between myself and counsel to
10 arrive at the final document.

11 Q. And in preparation for this
12 deposition, you reviewed the declaration and your
13 remarks in the declaration?

14 A. I have.

15 Q. Last Thursday, May 16th, you were
16 deposed with respect to the 10,452,974 patent in
17 IPR Proceeding IPR2023-01054.

18 Do you recall that?

19 A. I do.

20 Q. I'm going to ask a few questions now
21 just with the goal of efficiency and so that we
22 don't have to repeat a lot of what we did last

1 Thursday.

2 But during the deposition on
3 Thursday, you provided some answers to questions
4 about your CV and your work experience and your
5 legal understanding of the concepts of POSITA and
6 obviousness.

7 Do you recall that?

8 A. I do.

9 Q. For the purposes of this IPR
10 proceeding, are your answers that you provided
11 regarding your CV, work experience, your legal
12 understanding of these concepts such as POSITA
13 and obviousness, the same as what you provided
14 last Thursday?

15 A. Yes.

16 Q. And do you understand that the
17 '344 patent is a continuation of the '974 patent
18 that we were discussing last Thursday?

19 A. I do.

20 Q. And do you understand that because
21 it's a continuation, the specification and
22 figures of the '344 and '974 patents are the

1 same?

2 A. Yes.

3 Q. As such, would you agree that the
4 answers you provided with respect to your opinion
5 about the '974 patent figures and specification
6 also apply to the '344 patent?

7 A. With respect to the figures and
8 specifications, yes. I mean, we know the '344
9 has a different set of claims.

10 Q. Yeah. Okay. Thank you. So I think
11 that will save us a lot of time today. I
12 appreciate that.

13 So I'm going to drop a few documents
14 in the chat box like we did last time.

15 A. Okay.

16 Q. And just give me a minute.

17 I shared with you Exhibit 1001.
18 That's the '344 patent. Exhibit 1004, that's
19 Grotmol; and Exhibit 1005, that's Hickman.

20 Do you see that?

21 A. I see them. I'm in the process of
22 downloading.

1 Q. Great.

2 (Whereupon, Exhibit 1001,
3 IPR2023-01055 Cosic, was marked for
4 identification.)

5 (Whereupon, Exhibit 1004,
6 IPR2023-01055 Grotmol, was marked for
7 identification.)

8 (Whereupon, Exhibit 1005,
9 IPR2023-01055 Hickman, was marked for
10 identification.)

11 A. So I have the '344, Grotmol, and
12 Hickman.

13 Q. Great.

14 A. I'm missing the declaration.

15 MR. KHAN: Okay. Actually, Monique,
16 do you mind me just -- and do mind if we just
17 go off the record for -- we'll take a
18 two-minute break or something? I'm having
19 some technical issues here on my computer.

20 (Whereupon, a brief recess was
21 taken.)

22 MR. KHAN: Back on the record.

1 BY MR. KHAN:

2 Q. All right. Dr. Saber, in your
3 declaration, you offered an opinion on the term
4 "connections."

5 Do you recall that?

6 A. Yes, I do.

7 Q. And you noted in paragraph 58 that a
8 "connection should be construed as a
9 'relationship that includes a link.'"

10 Do you see that?

11 A. I do.

12 Q. What is a link?

13 A. Well, we describe that in the next
14 paragraph. So if you look at paragraph 59 that's
15 referring to Figure 17, it's got 853 circled.
16 And if you look through the paragraph, it defines
17 the link.

18 Q. I'm sorry. Can you point to me
19 where you've defined the word "link"?

20 A. Sure. So let me go through the
21 paragraph. So the paragraph states: "In
22 describing Figure 17" -- as you see the figure

1 above -- "in this particular use of connections,
2 the '344 patent states that 'machine learning,
3 knowledge structuring or representation, decision
4 making, pattern recognition, and/or AI
5 functionality may include network of Nodes" --
6 that's 852 in the diagram. And some people refer
7 to those as neurons -- "and Connections 853
8 similar to that of a brain. Node 852 can store
9 any data, object, structure" -- data structure
10 and/or other item or reference thereto."

11 And Exhibit 1001, which is the '344,
12 discusses that at that citation. So a node may
13 include at least a portion of a the circumstance
14 representation or a portion of object or
15 representation, while another node may include at
16 least a portion of an instruction set. And the
17 two nodes may be in a relationship that includes
18 a connection or a link. And that is, you know,
19 shown in Figure A, connecting the two nodes
20 together.

21 Q. Now, I'm -- I'm still waiting for an
22 answer. But the question was how you define a

1 "link." I didn't see any definition here,
2 anything you -- in anything you just read. And
3 for what it's worth, I can also read the
4 declaration. So repeating what your declaration
5 says won't offer any clarification.

6 The point of a deposition is to seek
7 clarification on your comments. So of course you
8 can refer back to your comments in your
9 declaration; but reading it out to me, I can
10 already do that on my own. So I'm going to ask
11 the question again.

12 What is the definition of a "link"
13 that you used?

14 A. Well, we can continue down these
15 paragraphs; and it will continue to describe
16 that. So if I continue, I'm on page 25 now. So
17 I'm talking on the top of -- the first sentence
18 on the top there. You see, "Connections 853 are
19 included in connecting or linking Nodes 852."

20 So these connections are linking the
21 nodes 852, which in the figure, it would be,
22 obviously, you can see the node 852. And the one

1 on the other side will also be 582. And those
2 two nodes are linked together with that
3 connection.

4 So the next sentence -- or that
5 particular sentence you see, "Connections 853 are
6 included in connecting or linking Nodes 852." So
7 you're linking the two nodes together through
8 this connection.

9 And the next sentence says,
10 "Connections are included as some of the elements
11 connecting to those nodes and showing the
12 relationships between those nodes." So that
13 connection between the two 852s essentially
14 provides some relationship, you know, linking
15 both of those nodes.

16 "Connections 583 may include or be
17 associated with a value such with a value such as
18 symbolic label or numeric attributes" that links
19 those two nodes together.

20 There's further description in
21 figure 18A that you see starting on paragraph 60.

22 Q. I'm going to repeat my question.

1 What's the definition you used for
2 "link"?

3 A. I --

4 MR. JAIRAM: Objection. Asked and
5 answered.

6 A. I just described that to you in
7 those paragraphs. We can continue if you'd like
8 in paragraph 60.

9 BY MR. KHAN:

10 Q. In the paragraphs you read, there is
11 not a definition for the word "link." You have
12 used "connection" and "link" in the paragraphs,
13 but you have not explained what the definition of
14 "link" is. And that is exactly what I'm asking
15 you. If you repeat these paragraphs, that's not
16 going to clarify what your definition is.

17 And so again, what is your
18 definition of the word "link"?

19 A. Well, I believe I have answered your
20 question; but I'll try to answer it again. So
21 these paragraphs that I just read to you describe
22 connectivity between the nodes, the connection,

1 the relationship that includes a link. The link
2 is linking the two nodes together.

3 So if -- if you did not have -- for
4 instance, if you look at figure 18A, you see a
5 knowledge cell and you see that blue circle link
6 and you see a knowledge cell again. That,
7 essentially, that's your 853 that you see in
8 figure 17. You see that reference to 853. There
9 is a link there that links the two together,
10 those two nodes together.

11 You know -- you know, you don't need
12 to have such a link. You know, so, for example,
13 you can have a node that is not linked, that's
14 not connected to the other node. So I think
15 that's the best I can possibly explain to you
16 what a link is in the context of the '344.

17 Q. So you mention in your answer that
18 the link links the two nodes together. You're
19 using the word in its own definition. That
20 doesn't provide any clarity.

21 So when you say a link links two
22 nodes, what exactly does it mean to link two

1 nodes?

2 A. Well, the -- the construction here
3 that we're using as -- for the connection, it's a
4 relationship that includes a link. So let me
5 make sure that I read that instruction.

6 So it's a relationship that includes
7 a link. So if you look at figure 17, for
8 instance, you have a relationship between those
9 two nodes. You have 852 and then 852, if I were
10 label the node on the top left of 853 as 852.

11 And the node, where that blue circle
12 is, if you label both nodes on both sides of 852
13 and that circle or that ellipse is your
14 connection, that's the relationship between those
15 two nodes, that includes a link between them
16 essentially linking those two nodes together so
17 there is data flow between them, there is
18 instruction flow them, et cetera. That's
19 essentially the definition.

20 Q. I want to understand what you said.
21 So I'm going to try to repeat my understanding of
22 what you just said, and please let me know if

1 that's correct or incorrect.

2 You said that there is a
3 relationship between these two nodes and that
4 relationship is the link between the two nodes;
5 is that right?

6 A. Well, as you look at the
7 construction, the construction says it's a
8 relationship that includes a link. So you have
9 the relationship between those two nodes; and
10 they are linked together, as you see in the
11 figure 17 and 18A. Those two nodes are linked
12 together for, you know, flow of data and, you
13 know, instructions, et cetera.

14 Q. So that's part of the issue here is
15 I'm trying to understand your construction.

16 When you say it's a relationship
17 that includes a link and I'm asking you what is
18 the definition of link and then you go back and
19 point to a relationship between the two nodes,
20 you're basically saying a relationship is a
21 relationship between a relationship of two nodes,
22 which is very confusing.

1 And this is why I need clarification
2 on what do you mean by the word "link."

3 A relationship that includes a link,
4 what is that word? What does it mean? So I
5 know, what is that relationship that you are
6 referring to?

7 A. I --

8 MR. JAIRAM: Objection to form.

9 A. I think I have explained this
10 clearly to you, and these paragraphs will explain
11 it. So it's a relationship that includes -- so
12 you see the link 853? That's the link linking
13 the two nodes together.

14 So it's a relationship that includes
15 a link linking those two nodes together,
16 connecting those two nodes together, essentially.

17 And the description -- you know, if
18 you look, for instance, on paragraph 61, it says,
19 "The specification further explains that, in this
20 particular use, connections between correlations
21 (each knowledge cell depicted in Figure 18A" --
22 as you see there -- "includes a correlation) 'may

1 include or be associated with at least one of, an
2 occurrence count, a weight, a parameter," data,
3 et cetera.

4 So you have a connectivity between
5 the two nodes so that you have data flow between
6 them. And that's essentially the description of
7 this construction, a relationship that includes a
8 link.

9 BY MR. KHAN:

10 Q. Is the link -- I'm sorry. Pointing
11 to what you just discussed in paragraph 61, and I
12 will quote the sentence I think that you are
13 referring to.

14 It says, "Connection between
15 correlations (each knowledge cell depicted in
16 Figure 18A includes a correlation, see
17 Figs. 13-16) 'may include or be associated with
18 at least one of: an occurrence count, a weight,
19 a parameter, or a data.'"

20 Did I read that right?

21 A. You read it correctly.

22 Q. Okay. So is it that a link is

1 basically connections between these nodes?

2 A. Well, it's a connection -- it's a
3 relationship that includes a link. That's the
4 construction definition. And if you look at the
5 next sentence in figure 61 -- in paragraph 61,
6 you see it says, "In addition, Figure 18A
7 discloses 'that Knowledge Cell 800za" -- which
8 you can see at Figure 18A, at the bottom, you
9 have 800za, you have a knowledge cell there --
10 "is connected to Knowledge Cell 800zb."

11 So -- and we have that -- so we have
12 connection 800 -- knowledge cell 800za connected
13 to -- is connected to knowledge cell 800zb that
14 you see at the top left of that figure. And
15 knowledge cell 800zc is connected by -- and
16 knowledge cell 800zc by connection 853z1 and z2,
17 respectively.

18 So you see those two connections,
19 one of them has 800z1 and the other one has
20 800z2. The first one is connecting knowledge
21 cell 800za to knowledge cell 800zb, and the
22 second one is connecting knowledge cell 800za to

1 knowledge cell 800zc.

2 Q. Yes. I can see that.

3 So you would agree that 853z1 is a
4 connection in figure 18A; is that right?

5 A. That is correct.

6 Q. What is the link in that connection?

7 A. Well, essentially what you see there
8 in that, it's a relationship that includes a
9 link. It's linking those two knowledge cells
10 together. So there is --

11 Q. Sorry.

12 A. -- flow between those knowledge
13 cells.

14 I don't think I can explain it any
15 better than this.

16 Q. So is a link any type of flow
17 between the knowledge cells?

18 A. It's a connect -- where the
19 construction here is about the term "connection."
20 It's a relationship between those knowledge cells
21 that includes a link that links those two
22 knowledge cells together.

1 I think that's the best I can
2 explain it.

3 Q. I understand what your construction
4 is; but you use the term that you have not
5 defined, which then, therefore, makes your
6 construction ambiguous.

7 Now, I have asked you what a link
8 is. And sometimes you are pointing me towards
9 the word "flow," like you did in your last
10 answer; or sometimes you are referring to
11 relationship. Sometimes you are referring to
12 connectivity.

13 I have asked you this a few
14 different times. You are pointing to very
15 different things, which further leaves me in a
16 position where I don't fully understand what you
17 mean.

18 And so I'm pointing to this again.
19 Your statements and which your support, you point
20 to figure 18A and these -- and you pointed just
21 now to 853z1 connection. And you have also said
22 the connection is a relationship that includes a

1 link.

2 And I am asking you: In 853z1, what
3 is the link?

4 A. Well, 853z1 is essentially a
5 pictorial -- an illustration of a link between
6 knowledge cell 800za and knowledge cell 800zb.
7 It's a graphical illustration of it.

8 Just like you would have nodes
9 linked in a neural net or nodes linked in a graph
10 in a sense, there is a link in the context of
11 this patent. The connection between those two
12 knowledge cells is a relationship that includes a
13 link between them.

14 And that 853 defines essentially
15 that connection between 800za and 800zb.

16 Q. So I am a little confused because a
17 few minutes ago and I think in your paragraph 61,
18 it says that 853z1 is a connection. And in your
19 last answer, you said that 853z1 is a link.

20 Which one is it? Is it a link or a
21 connection?

22 A. No. 853z1, if I said it's a link,

1 it's probably -- the accurate statement here is
2 each of connection 853z1 and 853z2 may include or
3 be associated with occurrence count, weight, or
4 other parameter or data.

5 So this 853z1 and 853z2 is the
6 connection between those knowledge cells, which
7 is -- in our construction is defined as a
8 relationship that includes a link.

9 So connection is what we are talking
10 about in the patent, and that's defined as a
11 relationship that includes a link.

12 Q. So let's go with your construction
13 here. You said 853z1 is a connection, which,
14 according to your construction, is a relationship
15 that includes a link.

16 A. Yes.

17 Q. So in 853z1, can you tell me what is
18 the relationship and what is the link?

19 A. Well, I think I have explained that
20 to you already. So I don't think I can explain
21 it any better than I have already explained it.
22 I have explained that to you already.

1 Q. So let me try to see if I can get
2 further clarification because you still have not
3 answered my question.

4 In paragraph 61, you mention that
5 you provided, quote, may include or be associated
6 with at least one of: an occurrence count, a
7 weight, a parameter, or a data.

8 Do you see that?

9 A. I do.

10 Q. Great. Thank you.

11 Is the occurrence count the
12 relationship?

13 A. I think you're misreading the
14 sentence here and mischaracterizing what it says.

15 So if you continue down this
16 paragraph, you see it says, "In addition,
17 Figure 18A discloses." Then you have:
18 "Knowledge Cell 800za is connected to Knowledge
19 Cell 800zb."

20 So if you look at Figure 18A, there
21 is a connection that we -- excuse me -- we
22 highlight in the figure with the oval -- the blue

1 oval there. That connection is 853z1.

2 It's connecting 800za to 800zb; and
3 in the patent, it's discussed as a connection.
4 The construction for that is a relationship
5 between them that includes a link that links the
6 two together so that connects the two together in
7 a sense.

8 So it's a relationship that includes
9 a link. I don't know how to define it any better
10 than that.

11 Q. So I am not asking you to define or
12 repeat your construction. We already know what
13 your construction is.

14 What I am asking for is: What do
15 you mean by those words? You've used the words
16 "relationship" and "link." And every time I ask
17 you what you mean, you are just repeating the
18 same sentences over and over again.

19 That does not provide any
20 clarification. I asked you about the first
21 sentence in paragraph 61, which you mention
22 occurrence count, weight, parameter or data. And

1 your answer was to repeat the second and third
2 sentences.

3 That does not give me any
4 clarification, right?

5 So, you are an expert in this field,
6 and perhaps you may know better here. But I
7 think part of the task here is so when you offer
8 a construction is to explain clearly what you
9 mean by it, and that's what I am trying to get at
10 here.

11 So when you use the words
12 "relationship" and link" in your construction,
13 right, I am trying to understand what you mean by
14 that.

15 I think you have already mentioned
16 853z1, 853z2 are connections. I understand that.
17 You have written that in paragraph 61. I
18 understand that.

19 I also understand that, in your
20 opinion, the construction of a connection is a
21 relationship that includes a link. I understand
22 that, so we do not need to repeat that.

1 I am trying to understand in 853z1
2 what is the relationship and what is the link.
3 Can you please let me know in 853z1, which you
4 have said is a connection, can you please let me
5 know what is the relationship and the link?

6 A. So let me see if we can clarify that
7 by looking at 61 and 62 together. And then,
8 obviously, 63, there is some dictionary
9 definitions.

10 So 61 essentially is referring to
11 Figure 18A. And if you look at 61, second
12 sentence, it will say, "Figure 18A discloses
13 'that Knowledge Cell 800za is connected to
14 Knowledge Cell 800zb,'" and et cetera with 800zc.
15 And we have talked already about that connection,
16 853z1 and 853z2.

17 Each of those connections, 853z1 and
18 z2, may include or be associated with occurrence
19 count, weight and/or other parameter or data.

20 Now, if you look at paragraph 62,
21 that adds more description. So the '344 patent
22 further provides that knowledge cells -- which is

1 we're talking about 800za and 800zb, including
2 correlations, may be connected, interrelated, or
3 interlinked into knowledge structures using
4 statistical, AI, machine learning and/or models
5 or techniques. And there's a citation there.

6 So in this particular use,
7 connections are used to indicate and track
8 relationships, including links to enable more
9 efficient autonomous drive operations --
10 operation.

11 Further connections are used to
12 create paths through the knowledge base or
13 efficiency storage on autonomous operation. And
14 this disclosure confirms that with respect to
15 claim 7, connections are relationships that
16 include links.

17 Now, there's also, in paragraph 63,
18 we -- I confirmed that a POSA would understand it
19 that way based on the review of the spec claims
20 and other materials. But we also cite a couple
21 of dictionaries.

22 "Several dictionaries confirm that

1 'connection' can be defined as a 'relationship
2 that includes a link.'" And there is a couple of
3 exhibits there that -- Exhibit 2012 and 2013.

4 So Exhibit 2012 or Exhibit 20 --
5 yeah. Exhibit 2013 define -- one dictionary
6 defines the term "construction" -- or
7 "connection" as "the state of being connected or
8 linked." And another dictionary defines
9 "connection" as "a link." All of this supports
10 my opinion.

11 So I think these paragraphs describe
12 the construction and the reasoning for having
13 this construction as a relationship that includes
14 a link. I don't think I can define it any better
15 than that.

16 Q. So I -- my question was not to
17 explain where you got your support from for your
18 construction, right? My question was very
19 specific to connection 853z1. Everything you
20 just said, none of that provided an answer to
21 that, right?

22 So I'm going to ask you again.

1 Please answer the question. I'm not interested
2 in you repeating your declaration, which is what
3 you're doing. You're not answering questions.
4 And so I would like you -- the whole purpose of
5 this exercise is to get clarification on your
6 statements in your declaration, not to repeat
7 your declaration.

8 And you're not answering the
9 questions I've asked. It's been almost one hour
10 now. This is a gigantic waste of time. So we
11 need to get to how to -- to have any benefit of
12 this deposition, I again request that you answer
13 the question.

14 The question was very specific to
15 853z1, not your dictionary definition, not where
16 you got support for your construction. That's
17 already there on the record.

18 I'm asking you to clarify, when you
19 point to 853z1 as a connection, what is the
20 relationship and what is the link?

21 And please answer the question.

22 Please do not avoid the question. Please answer

1 the question.

2 MR. JAIRAM: Objection. Form.

3 A. Well, I don't think I can answer it
4 any better than I've already answered it. So I
5 can either go back and show you the description
6 in paragraphs 61 and 62, if that helps. But I
7 think I have answered your question, and I don't
8 have any additional answer to that beyond what I
9 just said.

10 BY MR. KHAN:

11 Q. So when you look at figure 18A, what
12 is the relationship in 853z1?

13 A. So you have -- as I've answered to
14 you already multiple times, you have knowledge
15 cell 800za. You have knowledge cell 800zb.
16 There's a connection between them. That's 853z1.
17 That is the connection connecting those two cells
18 together, which is described in these paragraph.

19 And that construction for that is
20 the relationship between the two of them that
21 includes a link between the two of them. That --
22 that's the best I can explain it to you. I don't

1 have any --

2 Q. Are -- okay. I'm sorry, I didn't
3 mean to cut you off.

4 MR. KHAN: But, Arvind, if your
5 expert is not going to answer the question
6 then, you know, I'm happy to pick up the
7 phone and call. This is literally the first
8 substantive question I've had today. And I'm
9 happy to pick up the phone and call the
10 board, show them the transcript, and see that
11 we've been going around 40 minutes and your
12 expert has not been willing to answer the
13 question.

14 So I'm happy to go do that. I'd
15 rather avoid doing that. But, you know, I'll
16 put this out for -- for you, Arvind, to
17 consider. Again, I don't -- like I said, I'd
18 rather not do that.

19 I think my question is fairly
20 simple; and so I'd just appreciate, you know,
21 the candor and -- and response, really put
22 out there. Arvind, I don't know if you have

1 anything to say.

2 MR. JAIRAM: I suggest we take a
3 break, and we discuss this on a phone call.

4 MR. KHAN: Okay. That sounds good.
5 We can go off the record.

6 (Whereupon, a brief recess was
7 taken.)

8 MR. KHAN: Back on the record.

9 BY MR. KHAN:

10 Q. So, Mr. Saber, turning to the
11 '344 patent itself.

12 A. Yes, sir.

13 Q. The claims of the '344 patent use
14 the term "circumstance representation"?

15 A. Yes.

16 Q. What is a circumstance
17 representation?

18 A. So if you look, for instance, at
19 claim 1 of the '344 -- and I'm looking at line --
20 column 169, line 51. So it says, "Wherein the
21 first circumstance representation represents a
22 first circumstance detected at least in part by

1 one or more sensors of the first devices."

2 So you essentially have for an -- as
3 an example, as an illustration, here as an
4 example, you have the -- say, a series of images
5 that you have detected with -- with one or more
6 sensors and you've done some processing with --
7 within these images to get to a circumstance
8 representation.

9 It's not just a series of images.
10 It's -- it's -- you have, you know, some --
11 you've done some processing, object
12 representations, et cetera, to get to a
13 circumstance representation that represents the,
14 say, for example, a person jaywalking or a person
15 walking in a crosswalk. This is just an
16 illustration example, but.

17 Q. A circumstance representation, it --
18 does it include objects and more than objects or
19 information more than objects or just objects
20 detected by a sensor?

21 A. Well, it's more than just a series
22 of images detected by a sensor. It's -- it --

1 you have -- you have a series of images that you
2 have done some object representations on. You
3 have, you know, created the, say, object links
4 or, you know, object representations and you have
5 essentially tracked those or connected those
6 through the imagery to create a circumstance.

7 So it's not just a collection of
8 images. It's -- there's some knowledge base
9 between the images to create a circumstance.
10 Like a person, let's say, walking in a crosswalk.

11 Q. When you say it's "more than just
12 images," what's the scope of that "more"? What
13 is the "more" in that "more than just images"?

14 A. Well, I mean, you can stand out
15 there with your iPhone and take a video of
16 somebody walking down the road. That's just a
17 series of frames. You haven't done any analysis
18 on them. So there's no analyses on these frames.
19 So that's just a series of frames that depict a
20 person walking down the road.

21 The circumstance here represents
22 more than just a series of images of a person,

1 let's say, walking in a crosswalk. There's some
2 knowledge between the frames. You've done some
3 processing, some defining, maybe detecting
4 objects and tracking them through the frames,
5 representing them in a given frame and tracking
6 them through the frame to define a circumstance.

7 So, you know, here's the person
8 walking through the crosswalk. So it's not just
9 a video of images of frames.

10 Q. So can -- can the circumstance
11 representation include data about the time of
12 day?

13 A. I mean, certainly. I mean, you can
14 include -- you can include, obviously, data. You
15 can include object representations and analysis,
16 essentially, to define the circumstance. Let's
17 say, in the -- in the simplistic example that I'm
18 giving you here, you have a person walking in a
19 crosswalk.

20 So you see a series of frames.
21 Maybe there's 100 of them. And you interlink
22 that person through the -- through the series of

1 frames. You define the object. You identify it.
2 You've tracked it. You've -- you define features
3 about it and time of day. And there's data
4 structures, obviously.

5 Q. You mentioned data structures. What
6 type of information is typically included in the
7 data structures?

8 A. Well, I mean, if you look at, for
9 instance, at figure 18A that we've been
10 discussing for awhile, it talks about, you know,
11 the knowledge cells and the information that
12 could be included in the knowledge cells.

13 I'll just give you one example here.
14 You have a knowledge cell including correlations.
15 I'm reading at paragraph 62 of my declaration.
16 "May be connected, interrelated, or interlinked
17 into knowledge structures using statistical,
18 artificial intelligence, machine learning, and/or
19 other models or techniques."

20 So you have, essentially -- you have
21 a circumstance with the person walking in the
22 crosswalk, that's defined. You have a series of

1 images that you have done some processing on
2 and -- and you've tracked the object. You've
3 done -- defined the object. You've done some,
4 you know, representation of the object. You
5 might have done some recognition; and you've done
6 some tracking and interlinked all of these
7 together to define a circumstance so for you to
8 be able to say this is a person, you know,
9 walking in a crosswalk.

10 Q. Can the circumstance representation
11 be -- sorry. Scratch that.

12 Can the circumstance representation
13 include data obtained from just one sensor?

14 A. Generally speaking, I mean, if you
15 only had one sensor on -- on the vehicle, let's
16 say. You have just a camera, and you've acquired
17 a series of images. There's only one camera, one
18 sensor only. You've acquired a series of images,
19 and you've done some analysis on these images.
20 And you've created this circumstance that defines
21 a person, you know, crossing in a crosswalk.

22 Q. And through this camera, it's

1 possible to get data on one object or data on
2 multiple objects; is that right?

3 A. Well, let me ask for a second. I
4 mean, is this in reference to something that I've
5 opined on in my declaration? I mean, are you
6 asking me about something I've opined on in my
7 declaration? So we can be specific and not be,
8 you know, talking in general.

9 Q. Well, I'm -- I'm trying to
10 understand your understanding of the term
11 "circumstance representation," which is in part
12 of every single claim term -- every single claim.

13 A. Right.

14 Q. So -- so I would like to --

15 A. Is there a certain claim you are
16 asking about or a specific opinion in my
17 declaration that you are asking about? That's
18 what I am trying to understand.

19 Q. You have opined on how the prior art
20 maps onto the claims, right?

21 A. On the claims that are listed in my
22 declaration, yes.

1 Q. Yes. And so in order to understand
2 that, I am trying to understand your
3 understanding of the claims so that's where my
4 questions are coming, right?

5 You have offered opinions of the
6 claims --

7 A. Yes.

8 Q. -- and I am trying to understand
9 your opinion of your -- your understanding of the
10 claims.

11 A. Well, we can walk through a claim
12 that I have opined on, like claim 7.

13 Q. I understand. I think claim 7 also
14 use the term "circumstance representation."
15 So --

16 A. Yes.

17 Q. -- if you would rather -- my
18 question is regarding your understanding of the
19 term "circumstance representation."

20 Whether you preferred to do that
21 with respect to claim 7 or claim 1 or any other
22 claims, it's fine for me because my question is

1 more so just with respect to your understanding
2 of the term "circumstance representation." Okay?

3 And so my question there again that
4 I'd asked you was the circumstance
5 representation -- let me backtrack a little bit.

6 We had talked about the circumstance
7 representation, whether it can be detected by
8 just one sensor. And your answer was -- sorry.

9 Could you repeat your answer? What
10 was your answer?

11 A. Well, I said, generally speaking,
12 yes, if you only had one sensor on the vehicle,
13 let's say. Let's say we are talking about
14 vehicles here, and I only have one camera on the
15 vehicle. Then I will detect that circumstance
16 through that one sensor.

17 Q. And the circumstance representation
18 could include data on one object or data on
19 multiple objects; is that right?

20 A. Well, I mean, again, you are asking
21 things are very general and it's hard to
22 understand exactly what the question is because

1 you have to kind of see what is going on.

2 But, generally speaking, if I were
3 to capture, for instance, a person walking in the
4 crosswalk and there are cars coming from the
5 other side or whatever and your car is coming up
6 to the crosswalk, it would capture imagery of
7 this crosswalk. Obviously, it's going to see
8 other cars coming in the other direction.

9 So it's going to do an analysis on
10 this imagery to define the person walking in the
11 crosswalk. And, obviously, there is other
12 objects there that is it has to deal with to do
13 the analysis properly.

14 Q. The analysis that's started, is that
15 dependent on the number of detected objects in
16 the images?

17 A. Well, I mean, again, you are asking
18 very general questions. But if you have a series
19 of frames, those series of frames capture a
20 scene, in essence, of what's in the world out
21 there, so for the vehicle.

22 That, each frame would need to be

1 analyzed and relationships between the frames
2 would need to be comprehended to define the
3 circumstance of a person walking in the
4 crosswalk. So you would have to do the proper
5 analysis across this imagery to define the
6 circumstance of this is a person walking in the
7 crosswalk or this is a person walking in the park
8 or this is a person jaywalking across the street.

9 Q. Yeah. So I am not sure that
10 answered my question, but maybe I can --

11 A. I think I have answered your
12 question.

13 Q. -- give you an example.

14 So let's you have -- using your
15 example of what you just said, you have a sensor
16 that is picking up images or frames of a
17 crosswalk, and you may have vehicles or cars --
18 sorry -- vehicles or pedestrians on the
19 crosswalk.

20 In that example, the analysis that
21 is performed would include multiple objects such
22 as the cars, the crosswalk, and any pedestrians

1 present; is that right?

2 A. Well, again, we are --

3 MR. JAIRAM: Objection. Form.

4 A. -- we are talking about a single
5 example here in a hypothetical setting in an --
6 as an illustration here.

7 Just so it's clear, this is in the
8 constraint of this example we are talking about,
9 the illustration, and what we are discussing
10 here.

11 We can be more specific when we talk
12 about the patent and the claims in detail, but
13 just in regards to this illustration that we are
14 talking about so if you had, for instance, three
15 people walking in a crosswalk at the same time,
16 one person heading east, the other person heading
17 west or, you know, a third person maybe trailing
18 behind one of them.

19 You take an imagery of that
20 crosswalk. You are going to analyze that imagery
21 to detect these multiple objects that are
22 potentially moving through this crosswalk to

1 define the circumstance, as you know, this is a
2 crosswalk and there are people walking through
3 the crosswalk.

4 So it has to do the proper analysis.
5 That involves frame analysis, multi-frame
6 analysis. So intra -- what we intra- and
7 inter-frame analysis in order to get to the
8 circumstance representation that represents the
9 circumstance.

10 And again, this is in the context of
11 this example that we are talking about, this
12 illustration. We can be more specific when we
13 talk about the claims directly, as I have done in
14 my declaration.

15 So to be clear, this is in confines
16 of this example that we are talking about in the
17 sense.

18 Q. Yes. And let's say there is another
19 example where there is just a building and it's
20 pictures of images of the building at different
21 times of the day.

22 In that case, the analysis regarding

1 the circumstance representation, could that be
2 limited just to, like, the building itself and,
3 you know, how it's shown at different times of
4 the day?

5 A. I don't know. I don't know what you
6 are asking. I mean, I would have to see the
7 images to be able to give you an opinion as to
8 what exactly -- you know, you would have -- I
9 would have to see the images to be able to
10 provide you with more details on this particular
11 case.

12 I don't understand what you are
13 asking. I mean, obviously, there is buildings.
14 As the car is driving, there are buildings.
15 There are people. There are other cars. So I am
16 not sure what you are asking.

17 Q. All right. We will get to it.

18 All right. You had mentioned
19 earlier on that the circumstance representation
20 also includes a data structure.

21 Do you recall that?

22 A. I mean, I don't recall every

1 sentence I said, but.

2 Q. Okay. Well, maybe I can ask you:
3 Does a circumstance representation include a data
4 structure?

5 A. Well, a circumstance representation
6 is going to represent a circumstance based on the
7 analysis. So for you to conduct a proper
8 analysis on the imagery to represent the
9 circumstance, you would have to have the proper
10 structures to do that.

11 The proper structures to, you know,
12 analyze the objects, track the objects, identify
13 the objects. So you would have to have proper
14 structures to do all that.

15 Q. Does that structure include a data
16 structure?

17 A. Well, you would have to have the
18 proper structures. I mean, there could be data
19 structures. You have connectivities between
20 objects from frame to frame.

21 So you would have to have the proper
22 data structures to handle intra-frame and

1 inter-frame relationships to define the
2 circumstance.

3 Q. Does the circumstance representation
4 also include object representations?

5 A. Generally speaking, yes, it would
6 include -- the object representations would be
7 represented in a given frame. So you have a
8 frame. You have an object that is the
9 representation of the object.

10 And as the object transpires from
11 frame to frame or moves from frame to frame,
12 there is the defined the circumstances. So you
13 have a person frame -- one frame of a person in a
14 crosswalk that defines the object. And then as
15 you -- as the person is walking across the
16 crosswalk, you see that in frame after frame
17 after frame. So there is some relationships
18 between these frames which would define the
19 circumstance as a person walking in the
20 crosswalk.

21 Q. Can you turn to figure 4B?

22 A. In the patent?

1 Q. Of the '344 patent.

2 A. Figure 4B?

3 Q. Yes.

4 A. Yes, sir.

5 Q. Great.

6 Figure 4B shows a object processing
7 unit, 93, that includes a collection of object
8 representations, 525.

9 Do you see that?

10 A. Yes, I do.

11 Q. The information that is provided in
12 the object representation is in, for instance,
13 CL625c -- sorry -- in 625c, we have the addition
14 of identity for that object representation, and
15 then we do not have that in the object
16 representation 625a and 625b; is that right?

17 Do you see that?

18 A. Are you referring to the John Doe
19 claim?

20 Q. Yes.

21 A. Yes. So not every object is a
22 person.

1 Q. So the object representation fields
2 are variable; is that right?

3 A. Well, depends in the sense -- I
4 mean, there is a description of the figure in the
5 patent starting at column 80, line 23. But the
6 object representation would have to represent the
7 appropriate object. So if I am talking about a
8 car here, it wouldn't say "John Doe" on it.

9 Q. But it would include the name of the
10 car? Like, say, like a Honda or a Volvo or a
11 Mercedes?

12 A. Yeah. Make and model, probably,
13 yes. Sure. I mean, it would include the
14 appropriate representations, the appropriate
15 object. I mean, this is just -- the figure here
16 is just an illustration, right?

17 You can see, like, figure 4A, you
18 have a person, John Doe. That's 615. And then
19 you have AC, and then you have 615A. You have a
20 cat. In 16B, you have a tree. And those would
21 have different descriptions in the object
22 representation.

1 MR. KHAN: Okay. We've been going
2 for about an hour and a half now. Maybe this
3 is a good time for a ten-minute break. Does
4 that work?

5 THE WITNESS: It works for me.

6 MR. KHAN: Great. Arvind, does that
7 work for you?

8 MR. JAIRAM: Sounds good.

9 (Whereupon, a brief recess was
10 taken.)

11 BY MR. KHAN:

12 Q. Can I ask you to please turn to
13 Exhibit 1004, which is the Grotmol reference.
14 Please let me know when you have it open.

15 A. Yes, I have the Grotmol reference
16 open.

17 Q. If you turn to figure 4A, please?

18 A. Of Grotmol?

19 Q. Yes, of Grotmol.

20 A. Yes.

21 Q. Great. Grotmol's figure 4A includes
22 an adaptive predictor 422, corrector 412,

1 combiner 414, decoder 424, and robotic
2 platform 430.

3 Do you see that?

4 A. I do.

5 Q. What's the function of the adaptive
6 predictor 422?

7 A. Well, if you go to Grotmol
8 column 15, starting at line 21, it'll describe
9 all those pieces in the figure. Though, you were
10 asking about the adaptive predictor?

11 Q. Yes.

12 A. So if you look at the -- I'm -- I'm
13 on column 15, starting on line, let's say, 22,
14 21. It's talking about the adaptive control
15 system 400, which is labelled there in figure A.
16 And it mentions all the things you just
17 mentioned.

18 And your adaptive -- "the learning
19 process of the adaptive predictor may comprise a
20 supervised learning process, a reinforcement
21 learning process," et cetera.

22 Describes a learning process of the

1 predictor. So that's essentially what it's
2 describing here.

3 Q. Okay. Thank you.

4 What's a supervised learning
5 process?

6 A. Well, typically, a supervised
7 learning process would be like -- I'll give you
8 an example with, let's say, neural nets; but in
9 this case, it would be applicable. A supervised
10 learning process would be where you have, let's
11 say, an image or you have an object and you know
12 what the object is, so you have an understanding
13 of that object.

14 I know -- if I'm doing face
15 recognition, for instance, I know this is John.
16 And when you present the image of John to the
17 network or, you know, the essential adaptive
18 predictor here, you -- the network would predict
19 something.

20 So in a neural network setting, so
21 I'm not talking directly about Grotmol now. I'm
22 talking in a neural network setting. You present

1 the image of that particular object in a network.
2 The network will say, this is Tom. Since you
3 know it is John, not Tom, so you now got to
4 quantify that error between them and make some
5 corrections.

6 So a supervised learning would be
7 where you have supervision to teach, essentially,
8 the system, to guide the system to the answer
9 that you're looking for. And this is a generally
10 speaking answer, again.

11 Q. So can you answer the question
12 within the context of Grotmol, what is supervised
13 learning process in Grotmol?

14 A. Well, Grotmol essentially does not
15 apply an exact definition. So Grotmol mentions
16 that you -- that it's using a supervised learning
17 process. And in column 16, down towards line 57,
18 so you notice it says, "The predictor 422 may be
19 configured to adapt its internal
20 parameters...according to a supervised learning
21 rule."

22 Now, there's a description in

1 Grotmol on column 24. So if you go to column 24
2 in Grotmol, I'm reading at line 19. So it'll
3 say, "In supervised learning, a user may train
4 simple tasks by demonstrating example tasks to
5 the system. To achieve an acceptable performance
6 of a complex task by the system, the user may
7 provide additional information to the system in
8 addition to examples. In particular, with the
9 system, the user may organize simple 'low level'
10 behaviors into hierarchies and train extra 'high
11 level' classifiers or 'switchers' to control
12 which low level behaviors should be active in a
13 given context."

14 So that's a description of what
15 Grotmol provides for supervised learning. So
16 essentially, you have -- you have a user that's
17 affecting the learning process.

18 Q. And what's a reinforcement learning
19 process?

20 A. Well, that's slightly different from
21 supervised learning. So are you asking the
22 question with regards to Grotmol, or are you

1 asking the question in general?

2 Q. So all -- all my questions right now
3 are specific to Grotmol and so -- and your
4 under -- and your understanding of Grotmol. So,
5 you know, you had mentioned earlier that -- you
6 had quoted a sentence of "the learning process of
7 the adaptive predictor 422 may comprise a
8 supervised learning process" --

9 A. Yeah.

10 Q. -- "a reinforcement learning process
11 and/or a combination thereof."

12 A. Yeah.

13 Q. And so I'm trying to understand what
14 your opinion is about the learning process of the
15 adaptive predictor, and in that context, what is
16 the reinforcement learning process in Grotmol?

17 A. Well, reinforcement learning is a
18 very big field. There's actually entire books
19 written on just reinforcement learning. And you
20 can see there's a book out there -- the name
21 escapes me at the moment. But it's a famous book
22 on reinforcement learning. So it's a very wide

1 field.

2 Grotmol does not define what exactly
3 Grotmol means by reinforcement learning in -- in
4 the patent, so that's not defined in Grotmol.

5 So there's no description here of
6 what exactly Grotmol is doing. And I -- like I
7 mentioned, reinforcement is a very big field with
8 a lot of different techniques and activities and
9 so on. And there's no description in Grotmol for
10 what reinforcement learning is besides --

11 Q. Okay. And what -- what is your
12 understanding of it, just for briefly -- you
13 know, not -- not limited to Grotmol's disclosure.

14 But what's your -- what's your
15 understanding of a reinforcement learning
16 process?

17 A. Well, as I mentioned, a
18 reinforcement is a very big -- you could teach a
19 course on just reinforcement learning. Grotmol
20 does not define reinforcement learning. So I'm
21 talking now not in the context of Grotmol, but
22 just in the context of generally speaking,

1 reinforcement learning, but generally speaking.

2 So essentially, you're -- if you're
3 looking at, for instance, machine learning and in
4 neural net-type situations, reinforcement
5 learning would be where you would provide -- you
6 know, you provide a penalty, for instance, when
7 the network isn't doing what you were doing, what
8 you'd like it to do, and provide a kind of reward
9 for when the network is doing what you want it to
10 do.

11 So you have this -- you set up this
12 penalty-and-reward situation. And obviously,
13 with probabilities and mathematics that goes
14 behind all that, but that's generally the idea.

15 You have more than just the loss
16 function. You have some kind of penalty terms or
17 reward terms that you would reinforce or place
18 constraints on the situation that you're trying
19 to train on.

20 You know, I don't want, you know,
21 faces that are sideways looking. I only want you
22 to look at faces that are straight on or

1 whatever. So there are some penalties and reward
2 situation that you would have to set up beyond
3 just a loss function or -- or integrated in the
4 loss functions.

5 But that's in -- that's talking in
6 general now. But I'm not talking specific --
7 about Grotmol specifically. Again, Grotmol does
8 not define what Grotmol means by reinforcement
9 learning process.

10 Q. Okay. And then returning to
11 figure 4A of Grotmol and your understanding of
12 what Grotmol discloses, how do these components
13 shown in figure 4A work together to provide the
14 signal to the robotic platform to execute actions
15 at the robotic platform?

16 A. So it -- it talks a little bit about
17 it in column 15. I'm -- I'm looking at lines --
18 starting at line 22, 23 or so.

19 It says, "The adaptive control
20 system in Figure 4A may comprise a corrector, an
21 adaptive predictor," and et cetera, a robotic
22 platform. That's 430.

1 "The learning process of the
2 adaptive predictor may comprise a supervised
3 learning and reinforcement learning." We went
4 through this already. "The corrector, the
5 predictor and the combiner may cooperate."

6 So you have the corrector, the
7 predictor, and the combiner may cooperate and
8 produce a control signal. That's 420 in the
9 figure.

10 For the robotic platform, which he
11 says here 410, but really it should say 430. And
12 one more implementation is the control signal 420
13 may comprise one or more commands.

14 So you have -- essentially, you have
15 the adaptive predictor that's predicting a
16 certain -- you know, turn -- turn left. The
17 corrector is the -- essentially, is supervised.

18 So you're saying, no, I really want
19 you to turn right or no, maintain straight. So
20 you have a combiner that combines these two
21 together and provides motor control commands to
22 the robotic platform.

1 There is more description on that in
2 figure -- in column 18, but that's the general
3 idea.

4 Q. You mentioned that control signal
5 420 includes one or more motor commands.

6 Do you recall just saying that right
7 now?

8 A. Yes. I mean, it -- it -- the patent
9 says that, right? It says, "The control signal
10 420" -- I'm reading on column 15, line 29: The
11 control signal 420 may comprise one or more motor
12 commands (pan camera to the right, turn wheel --
13 turn right wheel forward), sensor acquisition
14 command, (use high resolution)" and/or other
15 commands.

16 Q. I -- I see that. Thanks.

17 And these -- the -- the control
18 signal is also fed back to the predictor so that
19 the predictor can learn based off of the control
20 signal; is that right?

21 A. Yes. I mean, the control signal, it
22 is technically fed back to the predictor. And if

1 you look at column 18, starting on line 11 or so,
2 it describes the situation. So "in one such
3 realization, the combiner transfer function is
4 configured according to the equation 8-11," which
5 is essentially control equations, "to implement
6 additive feedback."

7 So "in other words, output of the
8 predictor (e.g., 418) -- that we see here in the
9 arrow labelled on figure 4A -- "and the combined
10 signal 420" -- that you see in the -- labelled in
11 the arrow of figure 4A -- "may be used as the
12 teaching input (404) for the predictor."

13 So you cannot teaching this -- you
14 know, feeding this back to the predictor.

15 Q. Can you speak a little more to what
16 the purpose of the corrector 412 is?

17 A. So there are various disclosures of
18 corrector obviously in Grotmol. We can certainly
19 go through those.

20 So if you look at column 16,
21 starting at line 15, "The corrector...may be
22 operable to generate control signal 408" -- so if

1 you are looking at the figure, you can see that
2 label arrow 408 -- "using a plurality of
3 approaches. In some implementations of analog
4 control for robotic vehicle navigation, the
5 corrector output 408 may comprise target velocity
6 and target vehicle steering angle. Such
7 implementations may comprise an 'override'
8 functionality configured to cause the robotic
9 platform 430 to execute action in accordance with
10 the user-provided control signal instead of a
11 predicted control signal."

12 So it's like there's a lot of
13 similarities here, for instance, and I'm -- I am
14 perhaps simplifying it a little bit. But, you
15 know, if you're looking at a cruise control in a
16 vehicle, right? So you set the cruise control.
17 Your vehicle is at the certain speed. And if I
18 want to go faster in that speed, I can push the
19 gas pedal; and it will just put you in override
20 mode. And you are overriding, essentially, the
21 system.

22 So there is that discussion here.

1 But that's the idea behind the corrector.

2 Q. You see in column 15, lines 63
3 to 67, it talks about a control input 428?

4 A. Yes.

5 Q. And the corrector receives -- the
6 corrector 412 receives a control input 428?

7 A. Yes.

8 Q. From a control entity, right?
9 Do you see that?

10 A. Yes.

11 Q. And then the sentence says, "The
12 control input may be determined based on one or
13 more of a sensory input and feedback from the
14 platform (not shown)."

15 A. Yes.

16 Q. In this disclosure, when they refer
17 to "the platform," what are they referring to?

18 A. Well, typically, the robotic
19 platform in essence.

20 So if you look at, you know, "The
21 corrector 412 may receive a control signal [sic]
22 428 from a control entity. The control input 428

1 may be determined based on one or more of sensory
2 input 402 feedback from the platform (not
3 shown)."

4 And then it discusses a little bit
5 about the feedback, such as feedback from servo
6 motors -- on the next column -- joint position
7 sensors and torque resistance or whatever.

8 So it's essentially talking about
9 the robotic platform, and you are getting some
10 feedback from that platform.

11 Q. Can you give an example of a robotic
12 platform?

13 A. I am not sure I understand what you
14 are asking. I mean, Grotmol gives you --
15 discusses a robotic platform. I am not sure what
16 you are asking.

17 Q. Just -- it was just can you give an
18 example of a robotic platform? That's it.

19 A. Well, I mean, generally speaking,
20 you know, you have essentially, let's say, a
21 robot that comprises. You have a camera, the
22 same -- maybe two camera sensors on it. You have

1 motor controls that control the robot so it can
2 move its arms or drive its wheels, if it's on
3 wheels, or maneuver right and left, turn the
4 wheels or whatever.

5 So you have some type of motor
6 controls and, you know, some kind of control
7 system. You have usually processing system, you
8 know, computers, microprocessors, memory whatever
9 is needed to operate this platform and
10 connectivity to some, you know, remote operation
11 or controls or something.

12 Q. Is a car an example of a robotic
13 platform?

14 A. Well, I mean, you have to have --
15 well, generally speaking, you can -- you know,
16 you would have to define exactly what -- it's
17 hard to say. You know, a vehicle, generally
18 speaking, would not be considered a robotic
19 platform.

20 You know, like, you have to have --
21 you have some sensory inputs. You have some
22 controls. You have the ability to make, you

1 know, changes or controls to it.

2 So generally speaking, a vehicle --
3 I mean, unless you can -- you know, you can,
4 obviously, take a vehicle and turn it into a
5 robotic platform by putting the proper sensors
6 and feedback and instrument, the vehicle to
7 operate in that sense or the operation.

8 Q. I am sorry. So it may be, but it --
9 is your answer that a vehicle may be a robotic
10 platform or it's not a robotic platform?

11 A. Well, I mean, you would have to be
12 more specific into defining -- you know, show me
13 what you are talking about.

14 But in general, a vehicle that you
15 buy from the dealership is not considered a
16 robotic platform because it's not -- you know, it
17 doesn't have the aspects of this. An
18 instrumented vehicle, perhaps, that you might
19 have bought from a dealer and instrumented, put
20 camera sensors on it, and the ability to override
21 and do a variety of things.

22 You can instrument the vehicle to

1 operate like a robotic platform. But you need to
2 be able to access, you know, different controls
3 and do different things. So it's not just of the
4 market -- off-the-shelf device.

5 Q. Okay. I would like to ask you to
6 turn to columns 21 and 22 of Grotmol, please.
7 Let me know when you are there.

8 A. Columns 21 and 22 of Grotmol. Yes,
9 I am there.

10 Q. With reference to table 3?

11 A. Yes.

12 Q. You see there is different modes?
13 There's a control mode, listen mode, override
14 mode, correct mode and autonomous mode.

15 A. Yes.

16 Q. In the control mode, the
17 corresponding action of the robot, that includes
18 execution of the action in accordance with
19 training input and the robot not learning the
20 association; is that right?

21 A. You read it correctly.

22 Q. In the listen mode, the robot

1 executes the action in accordance with the
2 training input and learns the association; is
3 that right?

4 A. You read that correctly.

5 Q. And so on and so forth, the
6 override, correct, and autonomous, when the robot
7 learns the association in the listen mode,
8 override mode, or correct mode, what steps does
9 it take to learn the association?

10 A. I am not sure what you mean in your
11 question.

12 Q. Okay. I will try to be a little
13 clearer if it was not clear.

14 The listen, override, and correct
15 mode in table 3 indicate that the robot learns
16 the association.

17 Do you see that?

18 A. Yes.

19 Q. My question is, how does the robot
20 learn the association?

21 A. Well, there are some descriptions in
22 Grotmol about that. I mean, like, if you look at

1 column 17, for instance, you see -- I am looking
2 at line 31. You see it says there, "Based on one
3 or more prior encounters the Context_A" -- so
4 whatever the Context_A is defined, you know, the
5 robot hit the wall or something -- "avoidance
6 control output" -- of the Context_A dash --
7 "avoidance control output, the predictor may
8 build an association between these events as
9 described in detail below."

10 And the details below that describe
11 how Grotmol does that. So there's a description
12 here for it. We can walk through it if you would
13 like.

14 Q. Would you agree that in Grotmol --
15 scratch that.

16 Would you agree that Grotmol is --
17 sorry -- includes disclosure related to training
18 autonomous robotic devices?

19 A. What disclosure -- can we be more
20 specific? What disclosure of Grotmol are we
21 talking about?

22 Q. Collectively, the whole thing.

1 A. Well, Grotmol discloses an
2 "Apparatus and Methods For Training Path
3 Navigation By Robots." That is the title of the
4 patent.

5 Q. Are there certain types of robots
6 that are not covered by Grotmol's disclosure?

7 A. I am sorry. I missed part of your
8 question. You cut out a bit.

9 Q. Are there certain types of robots
10 that are not covered by Grotmol's disclosure?

11 A. I don't know what you mean.

12 Q. Let me rephrase.

13 Are there certain types of robots to
14 which Grotmol's disclosure would not be
15 applicable?

16 A. Well, I mean, Grotmol discloses an
17 apparatus, a robot, with proper sensory inputs
18 and controls. It discloses methods for training
19 path navigation by that particular robot.

20 So typically, if you have sensors on
21 a given robot and you have controls, that,
22 generally speaking, you know, constitutes a

1 robotic platform.

2 That's what Grotmol describes. And
3 obviously it describes learning and operating
4 such a robotic platform.

5 Q. I am trying to understand how a
6 robot that has controls and sensors would be able
7 to implement Grotmol's teachings or is it
8 something different?

9 A. Well, if you look at, for instance,
10 in the description of Grotmol about its robotic.
11 So it says -- Grotmol states -- I'm looking at
12 column 8, starting on line 57, "FIG. 1 depicts a
13 mobile robotic apparatus that may be configured
14 with an adaptive controller in accordance with
15 one or more implementations of e.g., the learning
16 apparatuses illustrated in FIGS. 4A-4B. The
17 robotic apparatus may comprise a sensor... the
18 sensor component may be characterized by an
19 aperture/field."

20 So it discusses the sensor component
21 of the robot and obviously, it discusses on
22 column 9, the variety of sensors that could be

1 used and then dives into more specifics about,
2 you know, the sensors and what they can do in
3 column 10, gives a little bit more description.

4 "In some" -- I'm reading at
5 column -- line 16. "In some implementations of
6 robotic navigation in an arbitrary environment,
7 the sensor component." You have a camera.

8 And line 23 talks about a robotic
9 vehicle navigation. So you essentially have a
10 robotic that is equipped with proper sensors,
11 proper controls, and the apparatus to be able to
12 teach the robot certain things.

13 It's an interface, essentially,
14 between a human operator and a robot. If you
15 look at column 10, line 45, you can see, "In some
16 implementations, a user (human operator) may
17 train the system to switch between tasks based on
18 sensory context."

19 Q. Can only one human operator train a
20 system?

21 A. I didn't hear the first part of your
22 sentence.

1 Q. Can only one human operator train
2 the system?

3 A. Well, Grotmol discloses one user in
4 one -- in -- you know, in one learning process,
5 essentially, one user operating one device in one
6 user -- in one learning process, as you -- as is
7 disclosed in Grotmol.

8 Q. That wasn't my question. My
9 question was: Can only one human operator train
10 the system?

11 A. Well, in the context of Grotmol, you
12 have one user, essentially, disclosed operating
13 the system in one learning process. So there's
14 no disclosure in Grotmol of multiple users
15 training the system. There's one user operating
16 one -- the -- the system and one learning
17 process. That's what's disclosed in Grotmol.

18 Q. So based on your understanding of
19 Grotmol, more than one users [sic] would not be
20 able to use the training -- would not able to
21 train the system?

22 A. I'm not sure what you mean, but let

1 me be specific. So Grotmol discloses one user
2 operating one device in one learning process. So
3 you have a single user, John Doe, operating one
4 device in one learning process and working with
5 that particular device.

6 So Grotmol does not disclose any
7 multiple users operating a device and mixing
8 knowledge or any of this kind of thing. That's
9 none -- none of that is disclosed in Grotmol.
10 One user operating one device in one learning
11 process.

12 Q. Can you point me to a place where
13 Grotmol says that only a single user can be used?

14 A. Well, I mean, if you --

15 Q. I'm sorry. Let me -- let me -- I'm
16 sorry. Let me rephrase.

17 Can you point me to disclosure in
18 Grotmol that says only a single user operates one
19 device in one learning process?

20 A. So -- so if you look at column 10,
21 for instance, and some -- I'm looking at line 45.

22 "In some implementations, a user (e.g., human

1 operator) may train the system to switch between
2 tasks," blah, blah, blah.

3 The next disclosure on line 50, "The
4 priorities may be trained by the user via a
5 corrector plus combiner scheme."

6 Line 61, "from the user via a
7 control" -- "remote controller." And there's
8 disclosures like that throughout, you know,
9 Grotmol. Column 11, line 10, the user, correct.

10 Q. So -- sorry -- sorry. So I -- I
11 don't want you to go through every repetition on
12 who is user in the patent.

13 But in each one of those cases,
14 would you agree that the word "single" is not
15 present?

16 A. So the word "single," if you do a
17 search, obviously it refers to a single
18 computerized apparatus. But the words "single"
19 and "user" side by side, is that what you're
20 asking?

21 Q. Yes.

22 A. So the words "single" and "user"

1 side by side are not literally present in Grotmol
2 because you could do a search and find that.

3 But the context of Grotmol, when you
4 read through the patent in detail, describes one
5 user operating one device in one learning
6 process.

7 Q. Would you agree that the words "one
8 user" are not present in Grotmol?

9 A. So off the top of my head, at this
10 point, if I were -- the words "one user" side by
11 side are not present in Grotmol. But, again,
12 when you read the description of the patent in
13 context of what's going -- what's being
14 described, the patent describes one user
15 operating one device in one learning process.

16 Q. You say that the context of Grotmol
17 describes one user operating one device; is that
18 right?

19 A. In one learning process, yep.
20 You're right on.

21 Q. But you agree that the word "one
22 user" is never recited -- sorry -- the words "one

1 user" is never recited in Grotmol?

2 MR. JAIRAM: Objection. Asked
3 answered.

4 A. I've already answered, I think, that
5 question. So the word "one" next to "user," I
6 can't -- I mean, I'm not going to go and look
7 through every sentence of Grotmol. But the word
8 search I did here, the -- the word "one," the
9 word "user" side by side are not directly present
10 in Grotmol.

11 But the word "a user" is present all
12 over Grotmol and you could search that yourself,
13 obviously.

14 And as I mentioned, in the context
15 of Grotmol, it's clearly describing one user
16 operating one device in one learning process.

17 BY MR. KHAN:

18 Q. So the context that you're referring
19 to is because Grotmol uses the word "a user" and
20 not "users"?

21 A. Well, I mean, when you read the --
22 and study Grotmol, as I have done, I have read

1 Grotmol multiple times. I've studied it very
2 carefully. When you read and study Grotmol very
3 carefully, you understand the context of what
4 Grotmol is trying to do.

5 And Grotmol describes a user
6 operating, you know, one device in one learning
7 process. And that's essentially what's being
8 described, you know, and the techniques and
9 methodologies are being described to describe
10 that.

11 It does not describe multiple users
12 co- -- you know, coherently operating devices and
13 mixing knowledge or any of this kind of thing.
14 That's not described at all in Grotmol. What's
15 described is one user operating one device in one
16 learning process. So there is a big difference
17 between that and multiple users simultaneously
18 doing things.

19 Q. Dr. Saber, during our deposition
20 today and the one on Thursday in the '974, have
21 you been using the electronic function for
22 searching keywords?

1 A. As needed, yes. This way, you know,
2 it's more efficient in use of time.

3 Q. And so when I asked you whether one
4 user or single users use, you performed a keyword
5 search using the electronic search function; is
6 that right?

7 A. That's correct. I -- I entered one,
8 space, user. And I did a search, and I didn't
9 find those two words side by side.

10 Q. And when you did that, you did not
11 find any search results; is that right?

12 A. That's correct. For the word "one,"
13 space, "user" in the find search box of Acrobat
14 Reader, I -- that did not yield a result. But
15 when you put: "A," space "user," it would yield
16 multiple results.

17 MR. KHAN: Okay. All right. Well,
18 we are just -- can we go off the record.

19 (Whereupon, a brief recess was
20 taken.)

21 MR. KHAN: We can go back on the
22 record.

1 BY MR. KHAN:

2 Q. Dr. Saber, can you please turn to
3 Exhibit 1005, that's a Hickman reference.

4 A. Yes, sir.

5 Q. Can you turn to figure 3 of the
6 Hickman reference, please?

7 A. Yes, I am at figure 3.

8 Q. In figure 3, do you see the "Shared
9 Robot Knowledge Base 306"?

10 A. Yes.

11 Q. The shared robot knowledge base 306
12 includes various knowledge bases such as
13 knowledge base 307, 308, 309, 310.

14 Do you agree?

15 A. Yes.

16 Q. What information is shared in the
17 unique object knowledge base?

18 A. So if you go to the description of
19 figure 3 in Hickman, I'm on column 10, line 37.
20 So you see there on line 35 it says, "Cloud
21 Computing System with Shared Robot Knowledge
22 Base." And it starts on line 37 describing -- so

1 it shows an example of multiple robots and starts
2 a description of the figure.

3 Q. Sorry. Is that the end of your
4 answer or you -- you're still --

5 A. Well, I'm looking a little bit. I
6 will --

7 Q. Sorry. Please, take your time.
8 Sorry, I didn't mean to interrupt.

9 A. No, I appreciate that.

10 So if you look at the description
11 starting on -- this is a long discussion,
12 obviously, what's described in figure 3. But on
13 column 10, starting on line 35, it talks about
14 figure 3 and it mentions in the first section
15 there that you have, obviously, the three robots,
16 301, 302, and 303 shown there in the figure. It
17 talks about a shared robot knowledge base 306
18 that you have mentioned.

19 The next paragraph there describes
20 essentially the robots, which I don't think is
21 the question you're asking.

22 And then the next paragraph starting

1 on line 57 discusses "The shared robot knowledge
2 base may include multiple component and/or
3 sub-component knowledge bases." And you can see
4 there in the figure, there is a unique object
5 knowledge base labeled 307.

6 There is a general object knowledge
7 base labeled 308, and a task knowledge base
8 labeled 309. They are separate from each other
9 and have separate labels.

10 And there is a little dotted line;
11 and you can see underneath each of them,
12 description 313, 314, and 315, which are
13 obviously discussed in the patent.

14 Q. Is it fair to say that the knowledge
15 base 307, 308, and 309 include various object
16 identifiers?

17 A. Well, let's be specific. So unique
18 object knowledge base 307 includes a UID. That
19 is unique identification essentially, unique
20 object identifier. And the 1, 2, 3 W is however
21 many unique they have.

22 And if you look at the general

1 object knowledge base 308, which is separate from
2 307, you have a GID, which is your general
3 identifier for your object there in that data
4 base. So GID is a general object identifier
5 according to, obviously, Hickman, so.

6 Q. There is a reference to Hickman's
7 column 12, lines 52 through 57?

8 A. If you look at columns 12, that's
9 exactly right. Lines 52 through 57, it describes
10 those acronyms. As you can see UID, GID,
11 whatever.

12 Q. Yes.

13 A. And there's some more description on
14 those.

15 But that section, if you look at the
16 heading of that section, it's on column 11, lines
17 47, you see "Unique Object Knowledge Base," and
18 that's the heading of the section. And then it
19 talks about this whole thing and discusses the
20 details of it.

21 Then if you move on to column 14,
22 line 61, it's got a heading "General Object

1 Knowledge Base"; and it gets into that particular
2 piece of it. And obviously, this continues to
3 the next knowledge base.

4 Q. What is the IMG?

5 A. Image. So if you look at column 16,
6 line 65, IMG is referenced there. You see "The
7 image data (IMG) may be used in connection,"
8 et cetera.

9 Q. So like lines -- sorry -- column 16,
10 line 55 to 67, that paragraph talks about the
11 image data in the general object knowledge base
12 308; is that -- is that right?

13 A. Yes. So column 55 through 67 is
14 talking about the --

15 Q. Sorry. I meant line 55.

16 A. Yeah, I'm sorry. You're right.

17 Column 16, lines 55 through 67, if
18 you scroll up a little bit on line 14, that is
19 under the "General Object Knowledge Base" heading
20 so that's -- those lines [sic] 16, 55 through 67
21 are describing that general object knowledge base
22 308. And they are referring to the conceptual

1 data structure 314, which is labeled in the
2 figure, and going over all the different acronyms
3 in that thing.

4 Q. I see.

5 And is that the same as -- I guess
6 in column 13, lines 25 to 52 also talk about the
7 image data there?

8 A. Yes. That's what they obviously --
9 for the different unique object knowledge base
10 307, so you have corresponding image data that it
11 goes with that data base, with that knowledge
12 base.

13 Q. And the corresponding image data of
14 the UI -- of the unique object knowledge base,
15 what does that include?

16 MR. JAIRAM: Objection. Form.

17 A. So if you go to column 13, lines 25
18 it says, "An individual" -- this is column 13 is
19 under the heading from column 11, line 47,
20 "Unique Object Knowledge Base." So we are now
21 talking about the unique object knowledge base
22 starting on column 11, lines 47, and that goes on

1 until column 14, line 60.

2 That whole section is about the
3 unique. So now I am looking at column 13, lines
4 25 to 31. He says, "An individual unique object
5 identifier (UID) in the example conceptual data
6 structure 313" -- which is you see labeled in the
7 figure -- "of the unique object knowledge base
8 307 shown in FIG. 3 may also have corresponding
9 image data (IMG)."

10 That corresponds to those unique
11 object -- unique objects that are already in that
12 knowledge base.

13 And then it describes, "A particular
14 unique object identifier's (UID) corresponding
15 image data (IMG) may include one or more images,
16 video clips," et cetera.

17 MR. KHAN: Okay. I have no further
18 questions.

19 MR. JAIRAM: Let's -- can we take a
20 ten-minute break?

21 MR. KHAN: Sure thing.

22 MR. JAIRAM: Off the record.

1 (Whereupon, a brief recess was
2 taken.)

3 MR. JAIRAM: Back on record. I have
4 no questions for the witness. This
5 deposition is over. Thank you.

6 Off the record.

7 COURT REPORTER: Can you state your
8 orders on the record?

9 MR. JAIRAM: The rough.

10 MR. KHAN: Rough tonight and
11 expedited for tomorrow.

12 (Time noted: 1:58 p.m. EDT.)
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3 1999 K Street, NW
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