

STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Home Depot USA, Inc.,
Petitioner,
v.
Lynk Labs, Inc.,
Patent Owner.

Case PGR2023-00016
U.S. Patent No. 11,297,705

DEPOSITION OF DR. DEAN NEIKIRK
TAKEN REMOTELY BY VIDEOCONFERENCE
October 5, 2023

Reported by: Mary Ann Payonk, CSR No. 13431
Job No. 1158

October 5, 2023

10:30 AM

Deposition of DR. DEAN NEIKIRK, taken
remotely by videoconference pursuant to Notice and
agreement of counsel, stenographically reported by Mary
Ann Payonk, Shorthand Reporter, CA CSR No. 13431. All
attorneys participating in this deposition acknowledge
that the reporter is not physically present in the
deposition room and there is no objection to the oath
being administered remotely.

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15
16 ALSO IN ATTENDANCE:

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1 THE REPORTER: Before we start, let me give
2 you my California license number so you know I'm legit,
3 and that's 13431. Now I'll swear the witness.

4 DR. DEAN NEIKIRK,

5 called as a witness, having been duly
6 sworn, was examined and testified as
7 follows:

8 EXAMINATION

9 BY ATTORNEY McBRIDE:

10 Q. Good morning, Dr. Neikirk. My name is Steve
11 McBride, and I'll be taking your deposition today.

12 A. Good morning.

13 Q. Can you please state your full name and
14 address for the record.

15 A. Dean Paul Neikirk. And my address is 365
16 Medlin Creek Loop, Dripping Springs, Texas.

17 Q. And you understand that you are under oath
18 today. Correct?

19 A. I do.

20 Q. Is there any reason you cannot give complete,
21 truthful, and accurate testimony to the best of your
22 ability today?

23 A. No, there is not.

24 Q. Can you confirm you have all applications
25 other than Zoom closed on your computer?

1 A. Yes. I have everything else closed except the
2 Zoom window.

3 Q. And what documents do you have there with you?

4 A. I have a clean paper copy of my declaration in
5 this matter, and I have clean paper copies of most of
6 the exhibits that are listed in that declaration on page
7 7.

8 Q. Do you understand that today's deposition
9 involves only PGR2023-00016?

10 A. Yes, I do.

11 Q. And do you understand that the patent in issue
12 in this PGR is US Patent Number 11,297,705?

13 A. I do.

14 Q. And I'll refer to that as the '705 patent as
15 we go along.

16 A. That's fine.

17 Q. Please let me know if you do not understand
18 any question and I will try to rephrase it or repeat it.

19 A. I will.

20 Q. If you don't let me know, I will assume you
21 understand the question.

22 Is that fair?

23 A. Yes, it is.

24 Q. And from time to time, your attorney may
25 object. Unless your attorney asserts privilege and

1 instructs you not to answer, you do still have to answer
2 the question.

3 Do you understand that?

4 A. I do.

5 Q. Who is your current employer?

6 A. I am currently self-employed. I am an
7 emeritus professor at the University of Texas at Austin.
8 That's an honorary title as opposed to an appointment
9 title.

10 Q. Do you still have any responsibilities at
11 University of Texas as emeritus professor?

12 A. No, I don't have any formal ones. I am still
13 a member of the voting faculty, but I would probably
14 refer to that as an informal responsibility.

15 Q. Thank you.

16 And what do you do in the scope of your
17 self-employment?

18 A. I primarily do consulting with -- related to
19 patent litigation.

20 Q. When did you assume emeritus status at that
21 University of Texas?

22 A. I retired in January of 2021, and I believe my
23 emeritus position was approved a month or two after
24 that.

25 Q. Approximately how many times have you been

1 deposed?

2 A. Well in excess of 50 times. I actually think
3 it's probably around 100 times now.

4 Q. And were all of those depositions in the
5 context of patent litigation?

6 A. I believe they were. There were a couple, a
7 few depositions related to some trade secrets cases, so
8 that's I guess slightly different.

9 Q. But mostly patent litigation?

10 A. Yes, mostly patent litigation.

11 Q. And when I say patent litigation, or when you
12 say patent litigation, you're referring to inter partes
13 review depositions. Correct?

14 A. Yes, I am.

15 Q. How many of your depositions were for a
16 proceeding before the PTAB, whether that be an IPR or
17 PGR?

18 A. I don't really know, but I would guess that
19 that's probably maybe 20 or so over the last 10-ish
20 years.

21 Q. And how many of those depositions have you
22 represented Home Depot on?

23 A. I think there have been about four of the IPR
24 or -- or PGRs so far. I think that's about right, four
25 or five.

1 Q. Are you serving as an expert for Home Depot in
2 the related litigation?

3 A. I believe that I was retained for that as
4 well, although the only thing I've done today has been
5 related to the IPRs or PGRs.

6 ATTORNEY McBRIDE: Let's pull up -- let me see
7 if we can do this. Let's pull up your declaration. It
8 should be in the chat box, let me know if you're able to
9 access that?

10 THE WITNESS: I am, if you give me just one
11 moment so I can open that electronic version. I have
12 the electronic version open as well as my paper copy in
13 front of me.

14 ATTORNEY McBRIDE: Thank you.
15 (Exhibit No. 1002, previously marked, was
16 referenced and indexed.)

17 BY ATTORNEY McBRIDE:

18 Q. This is an electronic version of Exhibit 1002
19 in this matter. Correct?

20 A. Yes, it is.

21 Q. And that is -- just to be clear, your
22 declaration. Exhibit 1002 is your declaration.
23 Correct?

24 A. Yes, that is correct.

25 Q. How many hours did you work preparing your

1 declaration in this matter?

2 A. This was done some time ago. I would guess it
3 was probably on the order of 20-ish hours. I don't
4 really recall precisely now.

5 Q. Could you turn to Paragraph 10 of your
6 declaration.

7 A. I have Paragraph 10 in front of me.

8 Q. And in Paragraph 10, you state: In preparing
9 this declaration, I have reviewed and/or considered at
10 least the documents cited in the List of Exhibits
11 appended below and the documents referenced in this
12 declaration.

13 So what list of exhibits are you referring to
14 there?

15 A. So I think it does actually say "below," but
16 my list of exhibits is back on Roman page VII, so I
17 guess actually this is kind of -- it's not below, it's
18 preceding. So the List of Exhibits is on Roman page VII
19 of my declaration.

20 Q. Thank you.

21 Did you review any other documents other than
22 those discussed in Paragraph 10 in preparing your
23 declaration?

24 A. I've certainly reviewed a large number of
25 documents. The ones upon which I relied are listed

1 either as -- in that exhibit list or are directly cited
2 within the body of the declaration.

3 Q. Thank you.

4 And in Paragraph 10 of your declaration again,
5 last sentence, you state: I have also reviewed the
6 entire prosecution history of the '705 patent.

7 Do you see that?

8 A. I do.

9 Q. How long did you spend reviewing the
10 prosecution history for the '705 patent?

11 A. I'm sure it was many, many hours. It is long.
12 I did not study every single word in the entire set of
13 priority chains, but I certainly reviewed what seemed to
14 me to be the relevant sections of the prosecution
15 histories of the various applications and the priority
16 chain for the '705.

17 Q. Do you recall what some of the relevant
18 sections of the prosecution history were that you
19 reviewed?

20 A. I couldn't point you to specific pages off the
21 top of my head, but the general topics, I was looking
22 for topics in that priority chain related to the use of
23 switches as -- and in particular, switches as required
24 by the claims of the '705.

25 I was also reviewing it for references to

1 forward voltage, again really in the context specific to
2 the claims of the '705.

3 Q. And how did you go -- you mentioned looking
4 for the use of switches in forward voltage.

5 How do you go about identifying those sections
6 in the priority chain?

7 A. Well, certainly one way was by searching the
8 documents for those phrases to see what was discussed
9 with -- in relation to the use of switches, what kind of
10 switches, where they might have been in circuitry as
11 well as the use of the phrase "forward voltage."

12 Q. So this was a text search, in other words?

13 A. That certainly is one of the -- that's the
14 primary method that I used, yes, was text searching.

15 Q. Were there any other methods?

16 A. Well, I had discussions with counsel. There
17 may have been times when there were suggestions as to
18 particular sections to review, but those again, I think,
19 would probably all correspond to the same ones found via
20 a text search.

21 Q. Okay. So you're saying that counsel suggested
22 certain portions of the prosecution history to look at,
23 and you reviewed those?

24 A. Where counsel did suggest particular sections,
25 I certainly reviewed them carefully. Again, I believe

1 all of those correspond to what will come up if you do a
2 text search again on "switch" or for -- and/or "forward
3 voltage."

4 Q. Do you recall any sections of the prosecution
5 history that were relevant to your analysis in your
6 declaration that did not include either the words
7 "switch" or "forward voltage"?

8 A. Well, I would -- I'm -- I have referenced all
9 of the relevant sections in my declaration. There would
10 certainly be text surrounding those words.

11 I read for the context when I review, so I'm
12 sure I would have gone back at least a paragraph or two
13 or maybe several pages and gone forward from where those
14 words are located. All of those would be areas that I
15 have reviewed.

16 Q. Thank you, Doctor.

17 How much time did you spend preparing for
18 today's deposition?

19 A. Over the last several weeks, I would guess
20 something on the order of 10 to 20 hours.

21 Q. In preparing for today's deposition, did you
22 review any documents other than those listed in
23 Paragraph 10 of your declaration?

24 A. I don't think so. I think really what I
25 reviewed is my declaration, the file histories, the

1 priority chain, the references that I cited in terms of
2 the various grounds under which I believe the claims are
3 invalid. But those are the documents that I reviewed.

4 Q. Thank you.

5 Let's take a look at Paragraph 21 of your
6 declaration starting at page 11. Actually, it's just
7 page 11.

8 A. I have that in front of me.

9 Q. In the second sentence, you state that the
10 '705 patent discloses four embodiments.

11 Do you see that?

12 A. I do.

13 Q. Where does the '705 patent state that it has
14 four embodiments?

15 A. Well, I've discussed in the following
16 paragraphs, Paragraph 22, 23, 24, and 25, as being the
17 embodiments that I can identify.

18 I don't know that the patent itself says that
19 there are four embodiments. I don't know that it uses
20 that phrase.

21 But again, in Paragraphs 22, 23, 24, and 25 of
22 my declaration, I have discussed each of the four
23 embodiments that I identify.

24 ATTORNEY McBRIDE: All right. I'll put the
25 '705 patent in the chat as well. You can open it if you

1 like.

2 (Exhibit No. 1001, previously marked, was
3 referenced and indexed.)

4 THE WITNESS: I do have the electronic copy of
5 the '705 open, and I also have a paper copy at hand.

6 BY ATTORNEY McBRIDE:

7 Q. All right. So actually, if you look at the
8 '705 patent, a couple questions about the embodiments
9 discussed in your declaration.

10 Figure 10 of the '705 patent, which embodiment
11 is that related to?

12 A. So let me get to Figure 10 in the patent
13 itself. So I have Figure 10. Let me look at my
14 declaration. So in my declaration itself, I don't think
15 I have a reference to Figure 10.

16 Within the '705 patent itself, the discussion
17 of Figure 10 is in column 11, starting at Paragraph 50,
18 and discusses it in terms of -- let me look at Figure 10
19 again. One in which the LEDs themselves form a bridge
20 circuit, and states that there's a DC voltage output
21 provided.

22 So in terms of the four that I identified in
23 my declaration, this would broadly, I believe, fit into
24 what I referred to as the second embodiment, broadly,
25 which is -- in this case, there's not multiple forward

1 voltages, but the diodes are connected there in series
2 and parallel, broadly.

3 Q. Thank you.

4 And which of the four embodiments listed here
5 in your declaration would Figure 11 fit into?

6 A. So Figure 11 is discussed in column 11
7 starting at line 56, I believe. And in that case, it
8 shows series LEDs.

9 And on this assembly, there are two of those
10 which are not connected as shown, but they could be
11 connected in parallel. And again, I would say that that
12 broadly fits into what I referred to as the second
13 embodiment, Paragraph 23 of my declaration.

14 Q. Is your answer the same for Figure 12 as well?

15 A. Let me look at Figure 11 and Figure 12.
16 Description. Yes. And, in fact, in column 12 of the
17 '705 patent starting at line 1, it says that Figure 12
18 is a schematic of the same lighting device 90 as shown
19 in Figure 11. And looking at the two schematics, they
20 are very similar.

21 Q. Could you take a look at Paragraph 27 of your
22 declaration. It states that: The '705 patent also
23 discloses a full-wave bridge rectifier can be used to
24 convert AC to DC but does not disclose any connection of
25 that disclosure to any of the embodiments discussed

1 above.

2 So is that a separate embodiment, what you're
3 talking about in Paragraph 27?

4 A. Well, Paragraph 27, I actually reference
5 Figure 10 which, as I believe we just discussed, shows a
6 bridge. Figure 9 does show bridges connected to
7 series-connected LEDs.

8 Q. Following up on the bridge rectifier of
9 Figure 10, is it fair to say that bridge rectifiers
10 convert AC to DC?

11 A. As the patent itself states, yes. In column
12 11 starting at lines -- at 50, so line 50 through 54
13 where it discusses Figure 10, it states: A bridge
14 circuit has electrical contacts to provide for AC
15 voltage input connectivity and DC voltage output
16 connectivity.

17 And yes, that's a fair statement. I agree
18 with that.

19 Q. But the output of a bridge rectifier is DC
20 voltage. Correct?

21 A. The output of a bridge rectifier when driven
22 with an AC input is a waveform which contains a DC
23 component.

24 Q. What's the distinction you're drawing between
25 DC voltage output and waveform which contains a DC

1 component?

2 A. Well, a bridge rectifier with no further
3 filtering, for instance, a filter capacitor, provides a
4 rectified AC waveform that -- one way to describe it is
5 a series of humps all of the same polarity. That's a
6 waveform. It varies in time.

7 But if you look at what frequencies make up
8 that waveform, DC is included in that. It has a DC
9 offset, if you will.

10 Q. Could you describe the -- would you describe
11 the output of a bridge rectifier as AC?

12 A. It contains an AC component as well. So it is
13 a combination of DC and many other frequencies.

14 Q. You mentioned further filtering, for instance,
15 a filtering capacitor.

16 Would that be something that is typically used
17 with a bridge rectifier?

18 A. It depends on the demands of the circuit. It
19 might be; it might not be. Depends on whether the
20 circuit that is being driven requires primary -- I hate
21 to call it pure DC, because it's very difficult to get
22 pure DC, but a signal that is mostly DC, or whether it
23 does not require that.

24 Q. So what I understood you to say essentially is
25 that the filtering component is added to filter out AC

1 components when you're trying to get --

2 A. Could you --

3 Q. -- a relatively pure DC output. Is that
4 correct?

5 A. Could you repeat your question?

6 Q. Sure. So what I was understanding or
7 inferring from your response is that the filtering
8 capacitor is used to filter out the AC components when
9 you're trying to get a relatively pure DC output.

10 Is that correct?

11 A. So that is a way to phrase it. A capacitor is
12 an element that tends to smooth the waveform. And if
13 you look at the components that make up that waveform,
14 it will tend to increase the magnitude of the DC
15 component and decrease the magnitude of AC components.

16 Q. You had mentioned Figure 9, the rectifiers in
17 Figure 9 a few questions -- a few responses back, and I
18 had a question about that.

19 Isn't the bridge rectifier of Figure 10 simply
20 an unconnected version of the bridge rectifier in
21 Figure 9?

22 A. So in Figure 9, there are four LEDs
23 illustrated on the left side of Figure 9, two sets of
24 them. And they are electrically connected to one
25 another in a way that is the same as Figure 10.

1 It illustrates them being driven from an AC
2 source, which I believe is labeled 78 in Figure 9, and
3 providing then an output to a chain of LEDs that shows
4 up on the right two-thirds of Figure 9.

5 So yes, I think that the bridges shown in
6 Figure 9 are illustrations of the bridge in Figure 10
7 but connected to further LEDs.

8 Q. Thank you, Doctor.

9 Let's move on to your declaration at
10 Paragraph 33. Let me know when you get there.

11 A. I have Paragraph 33 in front of me.

12 Q. Great.

13 So the limitation you're discussing in this
14 paragraph is, quote: Wherein the switch is electrically
15 connected between the DC voltage output and at least one
16 of the first operating LED circuit or the at least one
17 additional LED circuit, end quote.

18 Is that correct?

19 A. That is correct.

20 Q. So this limitation specifies where in a
21 circuit to add a switch. Correct?

22 A. It does.

23 Q. Would a POSITA understand how to connect a
24 switch between a driver output and an LED circuit?

25 A. I think broadly, yes. This, of course, is

1 specific -- we require that the D -- that the voltage
2 output be DC. But in broad terms, yes, I believe one of
3 ordinary skill would understand where to put that
4 switch.

5 Q. In the second sentence, you state that: This
6 limitation was new matter added in the 17/181802
7 application as filed on February 22, 2021.

8 Do you see that?

9 A. I do.

10 Q. And is this statement an opinion you formed as
11 a result of your review of the prosecution history?

12 A. It is certainly based on that prosecution
13 history. When looking at the priority chain, so
14 Paragraph 34, I discuss applications to which the '705
15 claims priority.

16 I couldn't find this -- a switch between a DC
17 voltage output and at least one of the first operating
18 LED circuits. So in the file history of the -- well, I
19 discuss the application there, 17/181802. I saw that it
20 was added to an abstract. And in looking at the other
21 applications that the '705 claimed priority to, I also
22 did not find it.

23 Q. Thank you.

24 Looking at still on Paragraph 33, when you use
25 the term "new matter," what does the term "new matter"

1 mean to you?

2 A. A topic that had not previously been discussed
3 or covered, disclosed. So it was an additional
4 requirement that I did not see as having been previously
5 discussed or disclosed.

6 Q. What's your basis for this understanding of
7 the term "new matter"?

8 A. My general understanding of the term. That
9 would be informed by counsel's explanation of various
10 parts of the law.

11 But just as a simple issue, the phrase "new
12 matter" to me means just that. It's new. And "matter"
13 refers to the content.

14 Q. So I take from your response that a limitation
15 would not be new -- a limitation would not be new matter
16 if the limitation were expressly disclosed in a prior
17 application.

18 Is that fair to state?

19 A. Well, for a given patent application, if it
20 wasn't in the original application but added, for
21 instance, in prosecution history, I think it might still
22 be fair to refer to that as -- with respect to that
23 patent prosecution, it would be new matter.

24 As terms of whether it appeared in a previous
25 application in a priority chain, for instance, if it was

1 absent, I would again certainly still use the same
2 phrase, "new matter." If it was present, I'm not sure I
3 would then say it wasn't new matter to the application
4 at issue.

5 If an application contained a claim that did
6 not have a certain element and during prosecution that
7 element was added, then to me, that's new matter that
8 was added in the process of that application.

9 If that was previously disclosed, I don't know
10 that that would tell me it's not new matter for that
11 given application.

12 Q. Okay. Thank you for that.

13 Then I guess just for simplicity we can think
14 of this as -- I know there's a complex priority chain
15 here, but I'm just drilling down on what "new matter"
16 means to you. And so just assume that there's -- you
17 know, that we have the current application and just one
18 previous application for this so we don't get too bogged
19 down in the priority chain.

20 So if the term were implicitly disclosed in
21 the previous application, would that term still mean new
22 matter in the current application?

23 ATTORNEY ERICKSON: Objection. Form.

24 A. If it was implicitly contained. So it's not
25 an explicit disclosure in the previous application?

1 BY ATTORNEY MCBRIDE:

2 Q. Correct.

3 A. If I was trying to evaluate a priority date,
4 then I would be looking at this previous application.
5 And at least my general understanding is that any
6 disclosure has to be explicit in the sense it can't
7 simply be obvious. If it was intrinsic, perhaps. But
8 implicit, I don't know that that would tell me what I
9 needed to know.

10 As far as the, if you will, the current
11 application in your hypothetical, if it was added in
12 prosecution history, I still -- I would think you would
13 refer to it as new matter for that application.

14 But in trying to assess the amended claim and
15 whether it could claim an earlier -- what is -- what's
16 the right phrase? -- is entitled to an earlier priority
17 date, then I'd be looking at that previous application
18 to see whether that matter was supported.

19 Again, it has to be not simply obvious. It
20 has to be, I believe, explicitly disclosed. I'm not
21 sure implicit would be sufficient, that if that's simply
22 obvious, that -- I don't think that's enough.

23 Q. Thank you.

24 What if the new matter -- would it be new
25 matter if the previous application inherently disclosed

1 the limitation?

2 A. Again, for the new application, if it was
3 added during prosecution history, I still think I would
4 think it would be referred to as new matter for that
5 application. But in terms of assessing whether it is
6 entitled to the earlier priority date of the previous
7 application, if the -- what was added was inherently
8 present, that means it has to be there, that might well
9 qualify as a disclosure supporting the earlier priority
10 date.

11 Q. I guess what I'm getting at is what if the
12 exact words do not appear in prior specification, in the
13 priority specification, the prior application, but the
14 limitation is reasonably understood to be present in
15 that prior application. Is the newly added -- are the
16 newly added words in the present application still
17 considered new matter?

18 A. I'm not a lawyer, and I don't know whether
19 this phrase has some very specific limit -- you know,
20 meaning within case law. I don't know.

21 Again, the -- if it was added in prosecution
22 for that application, seems to me I would think it
23 perhaps is new matter for that application. If it was
24 present in an earlier application and the issue was does
25 the new application get the benefit of the earlier

1 filing date, then that would be relevant, that it was
2 disclosed there.

3 Q. Paragraph 37 of your declaration. Let me know
4 when you get there.

5 A. Okay, I have Paragraph 37 in front of me.

6 Q. In the second half of the first sentence, you
7 state that Exhibit 1014 -- and Exhibit 1014 is the '215
8 provisional, just for the record. But Exhibit 1014
9 relates solely to AC-driven LEDs. So I want to dig into
10 this a little bit.

11 Are you interpreting the term "LED driver" in
12 Exhibit 1014 to be limited to LED drivers that output an
13 AC voltage?

14 ATTORNEY ERICKSON: Objection. Form.

15 A. Well, what I was looking at in Exhibit 1014
16 was what kind of driver or drivers were disclosed. And
17 as I went further to discuss in the next sentence where
18 I have some references, I see discussion of LED circuit
19 driver, and that discussion outputs an AC voltage with a
20 frequency. So when I looked at Exhibit 1014, I did not
21 see a driver. Well, what I saw were drivers that
22 produce -- that drive the LEDs using AC, as I stated in
23 that first sentence.

24 BY ATTORNEY McBRIDE:

25 Q. Thank you. So just to be clear here, I mean,

1 when you look at Exhibit 1014 --

2 ATTORNEY McBRIDE: Let me pull up the 1014 so
3 you have that.

4 THE WITNESS: Yes, please.

5 ATTORNEY McBRIDE: Bear with me. It should be
6 published at this point and you should be able to open
7 it up. Can you see it?

8 THE WITNESS: Yeah, just one moment. I have
9 to save it. And I do have a paper copy as well.

10 ATTORNEY McBRIDE: Okay.

11 THE WITNESS: Okay, I do have the electronic
12 copy open, and I have my paper copy as well.

13 (Exhibit No. 1014, previously marked, was
14 referenced and indexed.)

15 BY ATTORNEY McBRIDE:

16 Q. So as you read through Exhibit 1014, it talks
17 about drivers and AC-driven LED circuits, LED circuit
18 drivers, driven circuits.

19 My question is, is that term, "driver," used
20 in Exhibit 1014, do you believe that that term,
21 "driver," is limited to drivers that output AC voltage?

22 A. So I have to look here. I was looking at
23 figures. And both the text and the figures -- let's
24 see, in the text itself -- let me get the text. In
25 terms of "driver," I don't -- I'll look for a moment for

1 that word specifically.

2 But, for instance, in Paragraph 8, page 3 of
3 Exhibit 1014 there's reference to LEDs driven more
4 efficiently with AC than DC drive schemes. So
5 certainly, that's discussing using AC to drive LEDs.

6 Next paragraph is discussing AC as the power
7 source throughout. Doesn't have a paragraph number, but
8 on page 4 of Exhibit 1014, under Summary of The
9 Invention, the third sentence: Each LED circuit is
10 designed to be driven with the same matching forward
11 voltage such as 12 VAC, 24 VAC, 120 VAC, or other AC
12 voltage level.

13 So again, it seems to -- it is referring only
14 to driving the LEDs using AC. The rest of the paragraph
15 repeatedly refers to AC LEDs. I think everywhere I see
16 any reference to drive the LEDs, it's in the context of
17 using AC to drive the LEDs.

18 Q. Thank you, Dr. Neikirk.

19 Moving along, if you could go down to
20 Paragraph 38, we're now talking about Application
21 Numbers 13/322796 and PCT/US2010/001597.

22 Do you see that?

23 A. I do.

24 Q. And for the record, those are Exhibits 1016
25 and Exhibit 1018.

1 You state these applications, Exhibit 1016 and
2 Exhibit 1018, disclose bridge rectifiers, but the bridge
3 rectifiers are directly connected in series to the LEDs
4 without an intervening switch.

5 Do you see that?

6 A. I do.

7 Q. I just want to be clear. Are these bridge
8 rectifiers LED drivers?

9 A. Well, let me -- let's go to Exhibit -- for
10 instance, in Exhibit 1016, Figure 8 and I believe
11 Figure 9 have illustrations with bridge rectifiers made
12 up of LEDs themselves.

13 The circuit that drives what Figure 8 calls --
14 which is an assembly of LEDs. Let's see, Figure 8 is
15 described as -- so in Paragraph 59 of Exhibit 1016,
16 which is the 13/322796 application -- I believe that's
17 correct -- it describes in paragraph -- for instance,
18 Paragraph 9, Figure 8 discloses a schematic diagram of a
19 multi-brightness LED device 62 having at least two
20 bridge rectifier -- two bridge rectified series LED
21 circuits. It's describing what's in Figure 8, not as
22 being a driver, but as being a LED circuit.

23 If you look at Figure 9, we see LED 62, just
24 as we saw it in Figure 8, being driven using what's
25 illustrated as an AC source 78. And I believe that is

1 discussed -- that is discussed in Paragraph 59, but more
2 explicitly in Paragraph 60, where it discusses this LED
3 device electrically connected to the AC voltage source.
4 So I don't think it's discussing those bridges as being
5 a drive circuit.

6 Q. Let me unpack that a little bit.

7 In general, outside of the context of Exhibits
8 1016 and 1018, can bridge rectifiers be used as LED
9 drivers?

10 A. In general, outside the context of these
11 applications or these documents, these exhibits? In
12 general, a bridge could be part of a drive, certainly.
13 Of a drive circuit, certainly.

14 Q. Thank you.

15 So I think what you're saying is, as you
16 stated, a bridge rectifier could be part of a drive
17 circuit, but because of the specific way that they are
18 used in Exhibits 1016 and Exhibit 1018, it is your
19 opinion that bridge rectifiers in those exhibits are not
20 drivers.

21 Is that correct?

22 ATTORNEY ERICKSON: Objection. Form.

23 A. To be a little bit clearer, what's illustrated
24 in these documents are LEDs. And those LEDs are
25 connected to other LEDs. They all emit light. Those

1 LEDs are connected to an AC source.

2 If you were to subdivide -- and again, let me
3 use the words of Exhibit 1016. So in Figure 8 and 9, it
4 refers to element 62. And in the text at Paragraph 59,
5 it refers to 62. It describes it as being a
6 multi-brightness LED lighting device.

7 If you were to subdivide that into individual
8 LEDs, because, for instance, they're series-connected
9 LEDs, in some general sense, each LED feeds the next in
10 the chain. But I don't believe that that means that in
11 the context of these patents each of those LEDs
12 constitutes a drive circuit.

13 Q. So if I understand you correctly, if you look
14 at Figure -- well, Figure 8. You mentioned Figure 8 and
15 Figure 9. If you look at Figure 8 and you have a box
16 62, that's your LED -- LED lighting device, right?

17 A. That's what Paragraph 59 calls it, yes.

18 Q. Right.

19 So the inputs to that are the driver. Is that
20 what -- is that what you're saying?

21 A. In the context of this patent, I don't --
22 again, I don't recall whether this patent uses the word
23 "driver," but all the discussions are that they be
24 connected to an AC source input, for instance.

25 So on page 4 of Exhibit -- well, I'm sorry.

1 My page numbering for Exhibit 1016 says page 13 at the
2 top. In that application, it calls it page 4. In
3 Paragraph 52, it points out that these are options for
4 an AC source voltage source input.

5 So in Figure 8, the input is intended to be
6 via 72. I think they're all labeled 72, A, B, and C.
7 So it's driven from that source.

8 Q. So you're saying that the source is the
9 driver.

10 Is that correct?

11 A. Well, in this specific example, it repeatedly
12 refers to the AC voltage input and it does not disclose
13 anything else. So the only place there's anything other
14 than LEDs, which are part of the lighting device, in
15 Figure 4, there's a 120 VAC voltage, to use the words of
16 this application a -- let me just have that. I'm sorry.
17 Voltage source input. There does happen to be a
18 resistor, R1, shown there in Figure 4, but the -- other
19 than that, everything else is an LED. They're all part
20 of the lighting device. In that case, it refers to
21 element 30, which is -- describes a multi-brightness LED
22 device 30.

23 Q. So, I'm sorry, I'm not sure I'm seeing the
24 answer in there.

25 With respect to Figure 8 of Exhibit 1016,

1 you're saying the AC source that is the input to 72A, B,
2 and C, is the driver in that example. Correct?

3 A. It's the only thing disclosed or discussed
4 that provides an input to the LEDs. And the -- this
5 application doesn't actually call that a driver, but
6 here, the only thing disclosed that can drive the LED
7 lighting device would be the AC source.

8 Q. And the LED lighting device is that box in
9 Figure 8 labeled 62. Correct?

10 A. Yes. It's the box labeled 62 in Figure 8.
11 That's how it's described in Paragraph 59.

12 Q. If the box in 62 were drawn such that it did
13 not include the bridge rectifiers, would those bridge
14 rectifiers then be a driver of lighting device 62?

15 A. Well, if all of those bridge rectifiers were
16 LEDs, then they would be a lighting device. So in the
17 hypothetical you just proposed to me, I think it would
18 probably matter whether those components, those diodes,
19 are LEDs or just rectifiers.

20 Every LED is a rectifier, but in the context
21 of these patents, I don't think one of ordinary skill
22 would look to the individual LEDs inside the lighting
23 device and identify them as being part of a drive
24 circuit.

25 Q. Just to make sure I understand correctly, are

1 you saying that a bridge rectifier is part of a drive
2 circuit if it uses diodes that are not LEDs, but it
3 would not be part of a drive circuit if it used diodes
4 that are LEDs?

5 A. Well, what I'm saying is that if they're LEDs,
6 they're part of a lighting device, so they're -- they
7 emit light. The bridge we're talking about here is
8 simply two diodes in series, another pair in series, the
9 whole thing connected in -- well, actually, I guess
10 they're in anti-series. But they're in series and then
11 connected in parallel. That's -- that forms a bridge.

12 So just as there have been disclosures of LEDs
13 connected in series or parallel, this is just another
14 example of a connection of the LEDs in series and
15 parallel.

16 I don't believe one of ordinary skill would
17 see that as the drivers or the LEDs any more than they
18 would pick out -- for instance, in Figure 8, it labels
19 LEDs 71. I don't think one of ordinary skill in the art
20 would identify one of those as being a driver or part of
21 the drive circuit. They're certainly connected to other
22 LEDs, but they're part of a lighting device.

23 Q. And just to clarify my question, I'm defining
24 the lighting device as not including the bridge
25 rectifier.

1 If the lighting device 62 were a box just
2 drawn around the LEDs after the bridge rectifier, would
3 the bridge rectifiers then be considered a driver?

4 ATTORNEY ERICKSON: Objection. Form.

5 A. As shown in Figure 8, all the diodes shown are
6 LEDs. And I'm not sure I understand your hypothetical.
7 You want to draw -- you want to keep the same circuit
8 connections. They're all LEDs, but you want to draw one
9 box around, if you will, the right two-thirds of that
10 Figure 8 and another box around the left.

11 Do I understand your hypothetical?

12 Is that correct?

13 BY ATTORNEY McBRIDE:

14 Q. Well, just to clarify, you understand when you
15 look at Figure 8 there are two bridge rectifiers, right?

16 A. There are two collections of four LEDs that
17 are connected to one another in a configuration that
18 would be called a bridge, yes.

19 Q. So I'm saying if the LED lighting device 62
20 did not include those two bridge rectifiers, would those
21 bridge rectifiers then be considered part of the driver?

22 A. If, as illustrated in Figure 8, they were made
23 up of LEDs? No, I don't believe one of ordinary skill
24 would interpret that as being part of the driver.
25 They'd be interpreted as part of the lighting device.

1 Q. Doctor, I think you understand I'm not talking
2 about the strict illustration in Figure 8. I'm talking
3 about a hypothetical where you drew the box around --
4 LED lighting device 62 was drawn around the LEDs that
5 are not part of the rectifiers.

6 Now, if that was done, would those rectifiers
7 then be, in your opinion, considered part of the driver?

8 A. I believe I just answered that. If those two
9 bridges were made up of LEDs, then they would be
10 considered part of the lighting device.

11 Q. I'm defining it so that they are not part of
12 the lighting device.

13 A. I -- I just don't --

14 ATTORNEY ERICKSON: Object to form.

15 A. -- your hypothetical.

16 Do they emit light? The devices that make up
17 those bridge -- that bridge configuration? I'm just
18 trying to understand your hypothetical.

19 Do they emit light?

20 BY ATTORNEY McBRIDE:

21 Q. I'm sorry, Doctor, I'm asking the questions
22 here. But the bridge rectifiers are LEDs. LEDs don't
23 have to be part of the lighting device. There are a
24 number of other LEDs there. If -- shown in Figure 8.
25 So I'm asking you if you were to define LED lighting

1 device 62 not to include those bridge rectifiers, would
2 those bridge rectifiers be drivers for the LED lighting
3 device 62?

4 ATTORNEY ERICKSON: Objection. Form.

5 A. As shown in Figure 8, every diode there is an
6 LED. And I believe, as I've said repeatedly, if you
7 simply draw a different box around the light-emitting
8 devices, the light-emitting diodes, that doesn't convert
9 them into a driver. They're still part of the
10 light-emitting device.

11 BY ATTORNEY McBRIDE:

12 Q. So your distinction here is that bridge
13 rectifiers can be a driver if they do not include LEDs.
14 Is that correct?

15 ATTORNEY ERICKSON: Objection. Form.

16 A. I believe earlier I agreed that a bridge
17 rectifier can be part of a drive circuit, yes.

18 As disclosed in this patent application, there
19 is no such bridge.

20 BY ATTORNEY McBRIDE:

21 Q. And the distinction between the bridge
22 rectifier in this patent application and your prior
23 statement that bridge rectifiers can be part of the
24 drivers is that this bridge rectifier is made up of
25 LEDs.

1 Is that correct?

2 A. Well, here it's because what's illustrated is
3 all part of what is explicitly disclosed as being a
4 lighting device. It's not a separate circuit, separate
5 from the lighting device. It emits light. It's part of
6 it. It basically consists of series- and
7 parallel-connected LEDs. What we were discussing
8 earlier was a separate electrical circuit from the
9 lighting device.

10 Q. So do the bridge rectifiers in Figure 8 serve
11 as inputs to the LEDs that are connected, I guess, in
12 series with them?

13 A. Well, every LED in that circuit diagram is
14 providing in that sense an input to the next LED in its
15 chain.

16 Q. Does that -- I'm sorry, is that a yes?

17 A. Well, I'm sorry, could you repeat the question
18 again?

19 Q. Do the bridge rectifiers in Figure 8 serve as
20 an input to the LEDs that are connected in series with
21 them?

22 A. And as I answered, every LED shown there
23 that's connected to the next LED, if you will, provides
24 an input in that sense to the next LED. So yes, they
25 do. But in that same way, LED 71 provides the, quote,

1 "input," unquote, to the next LED 71.

2 Q. I guess I'll ask a slightly different question
3 because we've already established, for one, that bridge
4 rectifiers can be part of a driver. Correct?

5 A. In general, they can be, yes.

6 Q. And we established that you don't believe that
7 the bridge rectifiers in Figure 8 of Exhibit 1016 are a
8 driver. Correct?

9 A. That's correct, not in the -- not in the sense
10 that the patent uses either "driver" or -- in this
11 particular patent, it talks about voltage drive levels,
12 I believe, as opposed to using the word "driver."

13 Q. So is the distinction you're drawing because
14 the LED lighting device 62 is drawn to include the
15 rectifiers, or is it because the rectifiers are composed
16 of LEDs?

17 A. Well, in this patent disclosure, they are both
18 LEDs, and they're explicitly described as being part of
19 the LED device -- of the -- let me get the phrase right
20 again -- of the LED lighting device. They all emit
21 light. They are provided with a -- and to cite
22 specifically, for instance, in Paragraph 22, it's a
23 single chip or a substrate or direct AC power operation.
24 So these are provided with AC power. They are driven
25 using an AC source.

1 Q. Well, I'm not sure I understand the answer to
2 my question in there.

3 Are you saying that the bridge rectifiers in
4 Figure 8 are not a driver because both A, the LED
5 lighting device 62 is drawn to include them, and B,
6 because the rectifiers are composed of LEDs rather than
7 normal diodes?

8 A. I would answer that it's A and B and C which,
9 for instance, in Paragraph 24, states specifically that
10 the AC LED device would be able to be driven with at
11 least, in this example, at least two different AC
12 forward voltages. So throughout the disclosure, it
13 repeatedly describes how these LED circuits are driven.

14 So of the things, you give me an A, and then
15 you gave me a B. It's not A or B, it's A and B, as well
16 as the explicit discussion in this patent application
17 about where -- how things are driven. And they are
18 driven with an AC source.

19 ATTORNEY McBRIDE: Let's take a 10-minute
20 break, if that works for you.

21 THE WITNESS: Okay.

22 (Recess taken.)

23 ATTORNEY McBRIDE: I want to go ahead and add
24 Exhibits 1016 and 1018 to the record. I just published
25 them in the chat, Mary Ann. They're there for you, as

1 we were just discussing, these two documents on the
2 record before the break.

3 (Exhibit No. 1016, previously marked, was
4 referenced and indexed.)

5 (Exhibit No. 1018, previously marked, was
6 referenced and indexed.)

7 ATTORNEY McBRIDE: Doctor, please go ahead and
8 turn to Paragraph 90 of your declaration.

9 THE WITNESS: I'm sorry, you broke up a little
10 bit. Paragraph?

11 ATTORNEY McBRIDE: 90.

12 THE WITNESS: I'm sorry, nine zero?

13 ATTORNEY McBRIDE: Nine zero, yes. Sorry.

14 While you're doing that, I'll put
15 Exhibit 1004, which is the Bruning reference, in the
16 chat.

17 THE WITNESS: I have Paragraph 90 in front of
18 me.

19 (Exhibit No. 1004, previously marked, was
20 referenced and indexed.)

21 BY ATTORNEY McBRIDE:

22 Q. If you look at Paragraph 90, in the first
23 sentence where it starts "Bruning provides," it states
24 that Bruning provides at least two different DC forward
25 voltages (e.g., high and low amplitudes of voltage

1 corresponding to high and low current and brightness) to
2 at least one of the first operating LED circuit (circuit
3 210R) or the at least one additional LED circuit
4 (circuits 210G and 210B).

5 So I had a question about the high and low
6 amplitudes of voltage here from Bruning.

7 Is the high amplitude forward voltage where
8 that transistor is on and current is flowing through it?

9 A. Well, as I pointed out in this paragraph, at
10 the beginning I pointed out that the transistors Q3, Q4,
11 Q5 can be operated in their active regions. So it's not
12 that it's just on or off. It's, if you will, a valve,
13 so it varies how much.

14 Q. So you're saying that these transistors Q3,
15 Q4, Q5 are being operated across, I guess, a range of
16 different voltages.

17 Is that correct?

18 A. They can be operated in such a way that they
19 modulate the magnitude of the voltage applied to the
20 LEDs. They -- in an earlier section, I was discussing
21 how they can be used as on/off switches, but here I'm
22 discussing their use as a variable voltage source, if
23 you will.

24 Q. Go ahead and walk me through, I guess it's --
25 walk me through the portions of Bruning that describe

1 this variable voltage source use of Q3, Q4, and Q5.

2 A. Bruning is --

3 Q. Exhibit 1004. It's in the chat if you need
4 it.

5 A. I should have it in the chat, but I should
6 have a -- I have a paper copy as well. Give me just one
7 moment.

8 So in my Paragraph 90, I pointed to discussion
9 15C, so let me flip back to that first. And that begins
10 back in Paragraph 77 of my declaration. And in
11 particular, if you look at Paragraph 81, now, in that
12 example there, it's switching transistor completely on
13 and off. Let me go on from there.

14 So more specific to the discussion of
15 Paragraph 90 is my Paragraph 83. Within Bruning itself
16 there is discussion at Paragraph 43 of Figure 5, which
17 discusses not turning the transistors completely off but
18 varying between operating in an active region and
19 alternating to high and low values. That alters the
20 modulation of the light, and so it's average brightness.

21 In Paragraph 90 that you asked about, I
22 pointed to that same paragraph. If you look at the last
23 sentence -- is it the last? The last two sentences.
24 Well, really, let's look at the second-to-the-last
25 sentence of Paragraph 43. It states: By operating

1 switch Q5 in the active region, the magnitude of the
2 current going through the LED can be modulated.
3 Combinations of different modulations are also possible
4 to achieve a desired backlighting effect.

5 And then following, in Paragraph 44, it says:
6 In like manner, the output of green and blue LED
7 subarrays are independently controlled. So this is
8 discussing using those transistors to provide different
9 currents and different voltages to the LEDs.

10 And to be clear, this is only under the
11 interpretation of forward voltage, which is mentioned in
12 Claim 17, not in what I believe is the correct
13 construction. So under the alternative, that is simply
14 a voltage in a forward direction.

15 Q. Doctor, but to be clear, it is your opinion
16 that Bruning teaches at least two different DC forward
17 voltages being provided to LED circuits. Correct?

18 ATTORNEY NITTA: Objection. Form.

19 A. Well, no. To be clear, I believe that
20 providing two different forward voltages under the
21 proper construction is impossible. I've stated that
22 quite clearly in Paragraph 89. If it's impossible, then
23 clearly, Bruning can't do it either.

24 But under the interpretation, the alternative
25 construction that forward voltage means nothing more

1 than a voltage in a forward direction, then Bruning does
2 teach that. It teaches more than one of such voltages.

3 BY ATTORNEY MCBRIDE:

4 Q. Just to be clear, under your -- what you
5 believe is the correct construction of "forward
6 voltage," Bruning's impossible as well. Correct?

7 A. Well, under what I believe is the proper
8 construction, it's impossible, period. If it's
9 impossible, then no one can teach it, so Bruning
10 wouldn't teach it either.

11 Q. Now, what is -- under Paragraph 43 of Bruning,
12 what is this -- explain to me how a transistor can be
13 operated in the active region to provide varying
14 different voltage outputs.

15 A. Well, the type of -- just to be very specific,
16 let's use the circuit diagram from Bruning in -- well,
17 we can look at Figure 4 or -- without any layer, or we
18 could do Figures 4B, 4C, and 4D. They both show the
19 transistors Q5, Q3, Q4, which are illustrated as
20 being -- those happen to be N-channel MOSFETs. And the
21 controller, which is -- if we look at Bruning,
22 Figures 4B, 4C, and 4D are controlling the bias to the
23 gate of those N-channel MOSFETs, which can be used to
24 modulate the conductance of the channel of those
25 MOSFETs, and that will control the current and voltage

1 produced by -- supplied by those MOSFETs to the loads
2 that they are connected to.

3 Q. So to use your earlier analogy of a valve, as
4 Bruning adjusts the gate of those MOSFETs, that's
5 similar to opening up a valve for the current to go
6 through. Is that correct?

7 A. So in Paragraph 43 of Bruning, he actually
8 talks about two different options. One is a on/off
9 option, which is then using time domain modulation of
10 intensity.

11 But he specifically talks about also going
12 from a high value to a low value without turning it off,
13 so you can think -- again, if you want to use a valve
14 analogy, maybe the easiest version is a ball valve.
15 When you open a ball valve fully, it lets all the
16 flow-through that it can. If you close it partway, you
17 can modulate that flow. And a MOSFET can be used in a
18 similar fashion.

19 Q. Then if we look at Figure 5 of Bruning, we
20 have two different diagrams here, T on the X axis and
21 the Q5 on the Y axis, and then the other -- the one --
22 that's the one on the top. And the one on the bottom
23 is -- doesn't have the X axis labeled, but the Y axis
24 appears to be saying LM_red.

25 Do you see that?

1 A. I see it. I believe -- let me look and see
2 the discussion now. I believe that's not an -- may not
3 be an LM. It may be an LN. I believe it's referring to
4 the intensity of light emitted by the red LED.

5 Q. You're referring to the diagram on the bottom.
6 Correct?

7 A. Yes. If you look at Paragraph 43 in Bruning,
8 it references Figure 5. It talks about switch Q5
9 operated in an active region so that the current through
10 the LED is altered from a high to a low value. That's
11 the upper diagram in Figure 5. Thus, the light output
12 varies between a high and low value. I believe that
13 lower graph is supposed to indicate light output.

14 Q. So on the lower graph in Figure 5 of Bruning,
15 the X axis represents time as well, in your opinion?

16 A. Oh, yes, absolutely. You see the dashed lines
17 connecting the upper and the lower? Yes, the bottom
18 axis is time.

19 Q. Go ahead and turn to Paragraph 192 of your
20 declaration. I'll put Exhibit 1012, VanWinkle, in the
21 chat if you need it.

22 A. I also have my paper copy of VanWinkle in
23 front of me.

24 Q. All right. So you're looking at Paragraph 192
25 of the declaration?

1 A. I am.

2 Q. So Paragraph 192 states: VanWinkle's Figures
3 13 and 23 are the circuit diagrams for LED downlight
4 100, referring to Figure 1, and ceiling fan light 102,
5 referring there to Figure 20, respectively.

6 Do you see that?

7 A. I do.

8 Q. When we look underneath 192 on page 85 and
9 then going on to 86, there are annotated versions of
10 Figures 13 and Figures 23.

11 Can you see that?

12 A. I do.

13 Q. And each box has -- each diagram has two green
14 boxes that annotate it.

15 Do you see that?

16 A. I do.

17 Q. And each of these green boxes -- I want to be
18 clear. Each of these green boxes indicates a different
19 LED circuit, in your opinion. Correct?

20 A. Yes, that is correct. As I stated at the end
21 of Paragraph 192, both diagrams depict two LED circuits.

22 Q. And that depiction is annotated by the green
23 boxes in Figure 13 and Figure 23. Correct?

24 A. Yes, that is correct.

25 Q. And if you look at Figures 13 and 23, within

1 the green boxes, it's showing a single LED. Correct?

2 A. In that circuit diagram, it shows only one
3 circuit element, yes.

4 Q. And I think you say elsewhere that even though
5 it shows only one circuit element, it can be multiple
6 LEDs within there, right? Multiple LEDs within the
7 green box. The green boxes can represent multiple LEDs
8 as well.

9 Is that correct?

10 A. So I discuss that, I believe, in my
11 declaration. This happens to be element 1B of the
12 claim, but Paragraphs 193 and following. And as an
13 example, I pointed to Figure 38D, where there is more
14 than one LED that electrically could be represented with
15 a single diode symbol.

16 But I did point out in Paragraph 196 that if
17 it's determined that's not an explicit disclosure, it's
18 clearly an obvious one, that you would use more than
19 one -- or could use more than, or at least, to use claim
20 language, at least two LEDs.

21 Q. Can an LED circuit be a single LED?

22 A. I'm sorry, could you repeat it? It was
23 garbled a little bit again.

24 Q. Can an LED circuit be a single LED?

25 A. It could be.

1 Q. Let's take a look at the '705 patent. And I
2 want to turn to Figures 3 and 4. Let me know when
3 you're there, Doctor.

4 A. I am in the '705 patent and I can see Figures
5 3 and 4. Give me just one moment. Let me -- it's
6 probably even more efficient for me to have the paper
7 copy. Okay, I have my copy of the '705, and I'm at
8 Figures 3 and 4.

9 Q. Okay. It looks to me from just reviewing
10 Figure 4 and Figure 3, the Figure 4 basically adds
11 120-volt AC power source to the circuit described in
12 Figure 3.

13 Is that an accurate statement?

14 A. So the figure shown in Figure 3 inside what
15 appears -- I think it's a dotted box labeled 30 in
16 Figure 3 and also labeled as 30 in Figure 4, those
17 appear to me to be identical, yes.

18 Q. Figure 4 is just essentially wiring Figure 3
19 in a parallel configuration. Correct?

20 A. Yes. And, in fact, in the '705, column 10,
21 lines 55 through 61, it describes Figure 4 as being one
22 same multi-voltage, multi-brightness LED device 30 and
23 connected in parallel to an AC voltage source. So
24 that's exactly how it describes it.

25 Q. And if we turn to Figure 5, that again is just

1 taking Figure 3 and wiring it in a series configuration.
2 Correct?

3 A. Yes, it is. And again, in the text of the
4 '705 in the written description, column 10, starting at
5 line 62, it describes it as a series configuration, yes.

6 Q. Then if we look at Figure 6, it's a bunch of
7 LEDs in the same configuration as Figure 4, essentially,
8 except without a power source, right?

9 A. Well, Figure 6 connects -- I'm sorry, you
10 asked -- your question was is it the same as 4.

11 Q. Yeah. And I understand Figure 4 shows more
12 LEDs. It's still basically the same circuit with --

13 A. Well, this --

14 Q. -- power source, right?

15 A. Well, the -- there are -- I would phrase it as
16 there are internal connections made within the box 50 of
17 Figure 6 that connect these LED subcircuits that are
18 labeled 52 in a particular way. The collections of LEDs
19 in Figure 4 labeled 32, within that grouping, they're
20 connected in a manner similar, except for the number, as
21 52 in Figure 6.

22 Q. It's pretty much the same circuit as Figure 4,
23 except there's a switch added between the power source
24 and the LEDs. Correct?

25 A. Well, there are different AC voltages listed.

1 In Figure 7, it's listed as 12 votes AC. In Figure 4,
2 it happens to be listed as 120-volt AC. The collection
3 of LEDs within the box 50, again, there are connections
4 inside the box 50 that are the same as the ones in
5 Figure 6, which are somewhat different than what are
6 shown to be done inside the box 30 of Figure 4.
7 Certainly, there is a switch shown in Figure 7 that is
8 not shown in Figure 4.

9 Q. So, Doctor, you seem to be placing an emphasis
10 on the boxes drawn on Figures 4, 6 and 7.

11 Is that correct?

12 A. Well, the --

13 ATTORNEY ERICKSON: Objection. Form.

14 A. The patent itself is discussing placing AC LED
15 circuits on a single chip or substrate, for instance, in
16 column 4 at the first paragraph.

17 So the patent is distinguishing that you can
18 have different -- let's see. In Figure 4, it's labeled
19 as element 30 and is called a multi-brightness LED
20 lighting device. In Figure 7, it's labeled as 50 and
21 also calls it a multi-brightness LED lighting device.

22 So I'm doing that simply because the patent
23 itself is talking about assemblies and illustrating that
24 those assemblies can be done in different ways.

25 BY ATTORNEY McBRIDE:

1 Q. Well, between, for example, Figure 4 and
2 Figure 7, if we look at the circuit diagram, the only
3 difference in the circuit really is a switch added in
4 Figure 7, and the difference in the voltage of the
5 voltage source.

6 Is that accurate?

7 A. Well, Figure 4, a single voltage source with a
8 limiting resistor R1 is connected across those LED
9 subcircuits in parallel. In Figure 7, depending on the
10 state of the switch, you have to go through what it
11 calls out that switch can do is to determine whether
12 these are ever connected in parallel in a manner similar
13 to what is in Figure 4. It might be.

14 Q. So, Doctor, do you think that Figure 7 might
15 not be interpreted to show these two circuits being
16 switched into parallel?

17 A. No, I said we need to look and see what it
18 describes switch 60 is doing. That discussion is -- so
19 in column 11 at lines 24 through 28, it discusses
20 Figure 7. At that point, it only says that the switch
21 is to control brightness. It doesn't say anything more
22 about how it controls brightness, at least not there.
23 You know, Figure 9, there is a different discussion.
24 But for Figure -- sorry, Figure 7 and switch 60, it only
25 says it controls brightness. It doesn't say how it does

1 it.

2 Q. Does the '705 patent talk about how the
3 brightness level of LED lighting devices can be
4 controlled?

5 A. It does.

6 Q. And how are some of the ways that it talks
7 about that?

8 A. So it discusses changing, I believe, the
9 number of LEDs or the value of the AC voltage device.
10 It certainly discusses using a switch in the context of
11 Figure 9.

12 So, for instance, in column 11, discussing
13 Figure 6, it talks about applying an AC voltage --
14 connecting an AC voltage to 56B and C with either a
15 fixed connection or a switched connection. It says the
16 second brightness occurs when voltage is applied to 56A,
17 B, and C. So just reading that description, I believe
18 it's discussing powering either 56B and 56C, or powering
19 only one.

20 Figure 9 points to a two-way switch 74.
21 Two-way switches usually operate where one contact --
22 either they're both -- all is off, one is on, and then
23 you add an additional is fairly typical for a two-way
24 switch.

25 Q. You were discussing Figure 6. If you were to

1 provide power to both 56B and 56C, that would be a
2 parallel connection. Correct?

3 A. Assuming the other set of the power's
4 connected to 56A, yes.

5 Q. Now let's go to the '705 patent at column 9,
6 lines 9 -- 22 through 29. It states: According to
7 other aspects of the invention, the LED circuit driver
8 may be coupled to a dimmer switch that regulates voltage
9 or frequency or may have integrated circuitry that
10 allows for adjustability of the otherwise relatively
11 fixed voltage and/or relatively fixed frequency output
12 of the LED circuit driver.

13 A. I'm sorry, where were you reading from? That
14 wasn't in column 9, I don't think.

15 Q. Column 9, lines 22 through 25.

16 A. Oh, 22. I'm sorry, I didn't hear the line
17 numbers correctly. Yes, I am there now. I see that.

18 Q. Okay. So where that section states the LED
19 circuit driver, it's referring back to a previously
20 described LED circuit driver. Correct?

21 A. Here, yes, I believe it does.

22 Q. And I think we talked about this and
23 established this earlier, but I want to make sure. When
24 this patent, the patent uses LED circuit driver or LED
25 driver, or driver, in your opinion, that's all more or

1 less the same thing, right?

2 ATTORNEY ERICKSON: Objection. Form.

3 THE WITNESS: I'm sorry, could you repeat that
4 again?

5 ATTORNEY McBRIDE: Yeah.

6 BY ATTORNEY McBRIDE:

7 Q. So the '705 patent talks about drivers using
8 various different -- it talks about them using various
9 different descriptors. So sometimes it will call it an
10 LED driver, sometimes it'll call it driver, an LED
11 circuit driver, a driven circuit.

12 These are all talking about the same driver.
13 Correct?

14 ATTORNEY ERICKSON: Objection. Form.

15 A. So I'd have to look and see if in every case,
16 those are used interchangeably. See lots of references
17 to LED circuit driver. Now, it does describe, for
18 instance, in column 9 that an LED circuit driver is a
19 mains power source, high frequency LED circuit driver,
20 or other LED circuit driver capable of providing a
21 relatively fixed voltage and relatively fixed frequency
22 output. So there's certainly different types of LED
23 circuit drivers.

24 But without looking for every other use, I --
25 I'm not completely sure that they use those terms

1 interchangeably. Yeah, they talk about driven in
2 parallel. Well, that doesn't change the driver. That's
3 about the circuit, the LED circuit.

4 Q. So in your opinion, is the '705 patent
5 distinguishing between the term "LED circuit driver" and
6 just "driver" alone?

7 ATTORNEY ERICKSON: Objection. Form.

8 A. And I didn't say that. I just said I'd have
9 to look and find every use where -- so I used
10 paragraph -- or column 9 where it uses the phrase "LED
11 circuit driver" repeatedly. In column 7, talks about
12 a -- so down around line 60 -- well, let's see. 61
13 through 64 refers to package substrates will include
14 electrodes or leads for uniform connection of the
15 package to a device or system associated with an AC
16 driver or power source. And there, I'm not completely
17 sure that that is referring directly to the LED driver.

18 In column 8, it refers to line 6. According
19 to one aspect of the invention, the LED circuits and AC
20 drivers of the present invention permit prepackage in
21 the LED portion of a lighting system to be used with
22 standardized drivers of known specified voltage and
23 frequency. That would appear to be the LED drive -- LED
24 circuit driver.

25 Again, without going through the entire thing,

1 I don't know whether it always uses them
2 interchangeably. It certainly frequently does. But it
3 looks like the most common usage is to say "LED circuit
4 driver," the whole phrase.

5 BY ATTORNEY McBRIDE:

6 Q. And in your opinion, does the phrase "LED
7 circuit driver" mean a driver that outputs AC within the
8 context of the '705 patent?

9 A. I'm sorry, you broke up again. I didn't hear
10 what it was -- what you said. It outputted what?

11 Q. In your opinion, does the term "LED circuit
12 driver" always mean a driver that outputs AC voltage?

13 A. Well, in the '705, all of the drivers that are
14 discussed are AC.

15 Q. So in the '705 patent, is it your opinion that
16 the term "driver" means a driver that outputs AC
17 voltage?

18 ATTORNEY ERICKSON: Objection. Form.

19 A. So in column 3 at lines 4 through 7, it does
20 refer to having a multi-voltage and/or multi-brightness
21 circuit that can provide options and voltage level,
22 brightness level, and/or AC or DC powering input power
23 preferences. So there is a reference to a DC powering
24 input, but -- let's see, there is references to a
25 12-volt DC in column 3 at line 39.

1 BY ATTORNEY MCBRIDE:

2 Q. So is it your opinion that the term "driver"
3 is broad enough to encompass drivers -- as used in the
4 '705 patent is broad enough to encompass drivers that
5 output either AC or DC?

6 ATTORNEY ERICKSON: Objection. Form.

7 A. So it certain -- the '705 certainly does
8 mention substrates providing a multi-voltage AC or DC
9 operable LED voltage, to quote from column 4, lines -- I
10 guess that's the paragraph at 32 through 36.

11 Now going forward to -- let's see, there are
12 other references to both AC and DC in column 5. There
13 are numerous references to DC voltage levels.

14 BY ATTORNEY MCBRIDE:

15 Q. Moving back to column 9, lines 22 through 29,
16 see where it says the LED circuit driver may be coupled
17 to a dimmer switch?

18 A. I see that.

19 Q. So the dimmer switch is connected to the
20 driver. Correct?

21 A. Well, it states it's coupled there. It
22 doesn't say where the dimmer switch is relative to the
23 driver's input and output.

24 Q. So it could be either the input or the output.
25 Correct?

1 A. But it states that what this dimmer does is
2 allow for the adjustability of the output of the LED
3 circuit driver. So reading that paragraph in its
4 entirety, I believe what it's describing is a dimmer
5 that is, if you will, before the driver, not after the
6 driver. The dimmer affects the driver's -- the driver
7 has an output that is changed by the dimmer. I'm trying
8 to -- just let me read from it. Allows that -- the
9 dimmer allows for adjustability of the otherwise
10 relatively fixed voltage and/or relatively fixed
11 frequency output of the LED circuit driver.

12 So the LED circuit driver still has its
13 output. The dimmer is before the driver then the dimmer
14 affects what the driver's output is.

15 Q. Do you think that the phrase that allows for
16 adjustability of the otherwise relatively fixed
17 voltage -- let me back up.

18 Do you think that a dimmer switch that
19 allows -- your opinion is that a dimmer switch that
20 allows for adjustability of the otherwise relatively
21 fixed voltage and/or relatively fixed frequency output
22 of the LED circuit driver means that the dimmer switch
23 has to be placed at the input.

24 Is that correct?

25 A. I believe reading the entirety of this

1 statement, the preceding paragraph teaches that that
2 dimmer would come before the driver, yes.

3 Q. You just mentioned the preceding paragraph.
4 Where in the preceding paragraph are you pointing to?

5 A. Well, I'm reading for context. And in the
6 preceding paragraph, it talks about the LED circuit
7 driver having a relatively fixed voltage and frequency.
8 Gives examples, whether that's a mains power source, a
9 high frequency LED circuit driver, or other circuit
10 driver. So I'm just reading for context about the LED
11 circuit driver.

12 Q. And what in that indicates that the switch
13 that regulates the relatively fixed voltage and/or
14 relatively fixed frequency output of the LED circuit
15 driver must be placed at the input of the LED circuit
16 driver?

17 A. It's a dimmer switch, and it regulates voltage
18 or frequency or has other integrated circuit. That is
19 placed before the driver and leads to the driver's
20 output being varied. That's the conventional way to put
21 an AC dimmer in, that's for sure.

22 Q. But, I'm sorry, wouldn't an equally or perhaps
23 more conventional way to put an AC dimmer in that
24 regulates a fixed voltage output of an LED circuit be to
25 put that dimmer on the output of the LED circuit driver?

1 A. No, I don't agree with that.

2 Q. Can you elaborate on why you don't agree with
3 that?

4 A. Well, the more conventional -- you know, the
5 more conventional is you place it at the input of the
6 driver and regulate the input to the driver in such a
7 way that its output is varied. That's the most
8 conventional way in my mind.

9 Q. Can you point me to anything in the record
10 that indicates that that is the most conventional way?

11 A. Well, I think the description in that
12 paragraph in column 9 that we were just discussing, the
13 paragraph starting at line 22 is describing controlling
14 the input to the driver, not after the driver.

15 Certainly, in LED lighting installations where
16 I've put in dimmers, they've all been before the driver.
17 But that's not in this patent.

18 Q. I'm sorry, Doctor, I still don't see any
19 evidence in what you just read from the '705 patent that
20 this dimmer would be put before -- I mean, I don't
21 really see any evidence. I don't see any evidence it
22 would be put before the LED circuit driver.

23 A. That's how I read this paragraph. We
24 disagree.

25 Q. Okay. So just to be clear, you believe that a

1 dimmer switch that regulates the fixed voltage output of
2 the LED circuit driver must be placed before the input
3 of the LED circuit driver.

4 Is that correct?

5 A. Well, the context there, that fixed voltage is
6 the AC amplitude, because it talks about having a
7 frequency. So it's regulating the amplitude of the AC
8 signal produced by the driver. And yes, I believe what
9 that is discussing is placing that dimmer before the
10 driver, not after.

11 Q. Couldn't you place the dimmer on the output as
12 well?

13 A. In the world of all possibilities, then that's
14 part of the driver, I think. It's not separate from the
15 driver anymore. It's not a dimmer switch; it's part of
16 a driver.

17 Q. But the dimmer switch is still a dimmer
18 switch. Correct?

19 A. It's part of the driver in that example
20 because that's what produces the output that goes to the
21 LED device.

22 Q. Where in the '705 patent does it indicate that
23 the dimmer switch is part of the circuit driver?

24 A. Well, it doesn't, because in my opinion,
25 what's disclosed here, it's is before the driver. Your

1 hypothetical was to assume it's after the driver, in
2 which case I would characterize it as being part of the
3 driver now, not separate from, because it's its output
4 then that connects to the LED lights directly.

5 Q. If the dimmer switch were interpreted to be
6 part of the LED circuit driver, then what meaning does
7 the dimmer switch have?

8 A. Well, if you -- if it's part of the -- if it's
9 after, it's part of the driver, then I don't think it
10 has any meaning. It's part of the driver. It's a
11 variable driver now.

12 Q. It's coupled to the LED circuit driver.
13 Correct?

14 A. No, I -- I don't think that that's how it
15 would be viewed. It would be part of the driver.

16 Q. Okay. So just to be clear, column 9, line 22
17 to 23 says the LED circuit driver may be coupled to a
18 dimmer switch. So you don't think the dimmer switch --
19 you don't think that that -- somebody reading that
20 patent would understand that the dimmer switch is
21 coupled to the LED circuit driver?

22 A. Well, but the hypothetical you wanted me to
23 accept was that it was after the driver, between the
24 driver and the LEDs --

25 Q. No, that's not --

1 A. -- in which case --

2 Q. Go ahead.

3 A. Well, in which case, as I've explained, I
4 believe, that then it's part of the driver. That's -- I
5 mean, you could subdivide a driver into multiple circuit
6 components, and obviously they're all coupled together.
7 But the collection is the driver, so --

8 Q. Let's start with the premise that the LED
9 circuit driver may be coupled to a dimmer switch. Do
10 you see that statement in column 9, line --

11 A. I do.

12 Q. All right. So clearly, the dimmer switch is
13 something different than the LED circuit driver, right?

14 A. That's what that would certainly suggest, yes.
15 It has to be.

16 Q. Could an LED circuit driver be coupled to the
17 output of an LED circuit driver? I'm sorry. Back up.
18 Could a dimmer switch be coupled to the output
19 of an LED circuit driver?

20 A. But if it is, then that thing is part of the
21 driver. It's what drives the LEDs after. The output of
22 the driver drives the LEDs.

23 Q. I think I understand what your position is.
24 Thank you very much.

25 Can the dimmer switch turn a circuit on or

1 off?

2 A. Well, in its general sense, a dimmer switch
3 frequently does, placed before a driver. A Lutron or a
4 Leviton dimmer replacement switch can turn the light
5 completely off, yes.

6 Q. If you place the dimmer switch after a LED
7 circuit driver could it turn the circuit on or off?

8 A. Well, but as I just explained, I don't believe
9 you'd characterize it, if it was after, as being
10 separate from the driver. In terms of its electrical
11 function, that -- that block of circuitry could turn
12 something on and off, yes.

13 Q. If we look at Figure 7, it shows a switch 60.
14 Correct?

15 A. Yes, it does.

16 Q. Could that switch be a dimmer switch?

17 A. It doesn't say anything about the details of
18 what that switch is other than that it controls
19 brightness. It doesn't say how it does it.

20 Q. Could a dimmer switch control brightness?

21 A. A dimmer switch can control brightness, yes.

22 Q. Could switch 60 be a dimmer switch?

23 A. I suppose it could. Doesn't say one way or
24 the other.

25 Q. Looking at Figure 9, there's a two-way switch

1 74. Do you see that?

2 A. I do.

3 Q. Could that two-way switch be a dimmer switch?

4 A. I've never seen something that was called a
5 two-way switch that was a dimmer.

6 ATTORNEY McBRIDE: Now might be a good time
7 for a break. Let's go off the record for a second.

8 (Recess taken.)

9 BY ATTORNEY McBRIDE:

10 Q. I've just dropped in the chat Exhibit 2036,
11 which is a datasheet for Samsung LED. Go ahead and take
12 a look at that when you get a chance, Doctor.

13 A. I have it open.

14 Q. Have you seen this document before?

15 A. I don't know whether I have or haven't.

16 Q. It appears to be a datasheet for a Samsung
17 LED. Correct?

18 A. It does.

19 Q. Do you want a second to take a look at this,
20 or should I just start asking questions?

21 A. Why don't you give me just a second so I can
22 click through the pages and get an overview of what's
23 here.

24 ATTORNEY McBRIDE: And just for the record,
25 this is marked Exhibit 2036 in this PGR.

1 (Exhibit No. 2036, previously marked, was
2 referenced indexed.)

3 THE WITNESS: Okay, I've got a general idea of
4 what's there.

5 BY ATTORNEY McBRIDE:

6 Q. All right, go ahead and turn down to page 10
7 of 21. Let me know when you're there.

8 A. Okay, I'm on what's marked as page 10 of 21.
9 Yes, I'm there.

10 Q. So in the upper left-hand corner there's a
11 graph marked Forward Voltage vs. Forward Current.

12 Do you see that?

13 A. I do.

14 Q. Does that look like a pretty typical chart for
15 LED voltage vs. current, LED forward voltage vs. forward
16 current?

17 A. That looks -- well, this is forward voltage
18 versus forward current. I don't know how typical it is,
19 but it looks like the IV curve for a diode, yes.

20 Q. And it shows that as the forward current is
21 increased, the forward voltage correspondingly
22 increases. Correct?

23 A. Once there is a sufficiently large forward
24 voltage, yes.

25 Q. It's pretty -- it's typical for an LED's

1 forward voltage to increase as the current, the forward
2 current increases. Correct?

3 ATTORNEY NITTA: Object to form.

4 A. Once there's sufficiently large voltage to
5 cause current to flow, there is a finite resistance and
6 so yes, there's an IV curve that there's -- larger
7 voltage is larger current, larger current is larger
8 voltage, yes.

9 BY ATTORNEY McBRIDE:

10 Q. So forward voltages across an LED can vary.
11 Correct?

12 ATTORNEY NITTA: Objection. Form.

13 A. Well, are we referring to the forward voltage
14 of the patent or out of the context of the patent?

15 BY ATTORNEY McBRIDE:

16 Q. Well, I guess I'm talking about the forward
17 voltage across a typical LED.

18 A. Well, there's an express definition in the
19 file history for the patent of what the patentee said
20 forward voltage meant. If you're just asking about a
21 voltage in the forward dimension -- forward direction,
22 excuse me -- then for any diode, as the voltage in the
23 forward direction increases, the current will increase.

24 Q. And that's what's shown on page 10 of
25 Exhibit 2036. Correct?

1 A. Well, it would appear to show that until a
2 voltage in the forward direction of approximately 5 volt
3 is applied, there is -- that graph seems to show that
4 there is zero current. And for voltages in the forward
5 direction in excess of 5 volts, the current then
6 increases.

7 Q. So depending on the current applied, the
8 forward voltage here can, for this particular LED, can
9 change from roughly 5 volts to somewhere around 6-1/2
10 volts. Is that a fair statement?

11 A. Well, the voltage in the forward direction, in
12 other words, a voltage that causes forward current to
13 flow, for this particular diode, they're showing that
14 for voltages between about 5 volts and 6-1/2 volts, the
15 current ranges from zero to 880 milliamps.

16 Q. When you say "voltage in the forward
17 direction," I'm a little confused, because Exhibit 2036
18 uses the term "forward voltage."

19 When you say "voltage in the forward
20 direction," do you mean what Exhibit 2036 is calling
21 forward voltage?

22 A. I'm trying to be careful. Forward voltage is
23 a claim term. And as I've discussed extensively in my
24 report, the patentee provided a definition of that.

25 This IV curve is plotting the relationship

1 between the voltage in a forward direction and the
2 current flowing through the diode. This is not
3 something that says the axis, the vertical axis, is the
4 claim term contained in Claim -- let's find it. So
5 Claim 3, for instance, of the '705 patent discusses
6 switching of a switch provides at least two different DC
7 forward voltages. The forward voltage on this datasheet
8 doesn't say the forward voltage as defined by the
9 patentees of the '705 patent.

10 Q. Yeah, I don't think I've asked about the '705
11 patent. I'm asking about Exhibit 2036.

12 A. And I'm trying to be very careful, because
13 you're using two words that are -- that is claim
14 language. And so the critical question here is does
15 Samsung in this datasheet use those two words in the
16 same way that the patentees of the '705 patent explained
17 they meant it.

18 I do not -- in my opinion, this, Samsung's
19 datasheet, is using forward voltage in the sense of a
20 voltage in the forward direction, which I don't agree is
21 the proper instruction for the '705 patent.

22 Q. So the term being used in Exhibit 2036 is
23 "forward voltage." Correct?

24 A. In this extrinsic datasheet, it certainly uses
25 the words "forward voltage."

1 Q. And "forward voltage" is a commonly understood
2 term in the industry. Correct?

3 A. Extrinsic to the '705 patent, I would agree
4 with that.

5 Q. And "forward voltage" as commonly understood
6 can have a range of variables across even a single LED.
7 Correct?

8 A. In a context extrinsic to the '705 patent,
9 yes, I would agree with that.

10 Q. Now, if you were to take your construction of
11 forward voltage and apply it to this LED, would this
12 LED's operation be impossible?

13 A. Well, it's not my construction, it's what the
14 patentees of the '705 said it meant. They said -- and,
15 let's see. In my declaration, this would be discussed
16 starting on page 29, so that's Paragraph 63 and
17 following. And in Paragraph 63, I pointed out that the
18 applicant expressly defined "forward voltage" to mean
19 the minimum voltage difference required between the
20 anode and the cathode of the LEDs in the claimed circuit
21 to allow current to flow through the LEDs.

22 Applying what patentees expressly defined as
23 forward voltage, this curve would say that is about
24 5 volts. It's 5 volts from the best I can read the
25 curve.

1 Q. The datasheet itself has values from 5 volts
2 to roughly 6-1/2 volts for forward voltage. Correct?

3 A. For voltages applied to the diode in the
4 forward direction, it has a range of voltages in this
5 graph from 5 to 6-1/2 volts and a range of currents from
6 zero to 880 milliamps.

7 Q. And again, when you say "voltages applied in
8 the forward direction," you are referring to what the
9 datasheet calls forward voltage. Correct?

10 A. In this extrinsic datasheet, they labeled that
11 that has forward voltage, yes.

12 Q. So what you're saying essentially is your
13 construction of "forward voltage" in the context of the
14 '705 patent is inconsistent with the ordinary meaning of
15 the term "forward voltage."

16 A. No. What I'm saying is the patentees provided
17 an express definition. Once they did that, my
18 understanding is that's the construction I should apply.
19 My understanding is the patentee is allowed to be their
20 own lexicographer, and they may choose to use words in a
21 way different from the ordinary application. In my
22 reading of the file histories and so on, it appears to
23 be that's what happened here.

24 Q. What's your understanding of the standard for
25 when a statement in a prosecution history qualifies as a

1 lexigraphic statement?

2 A. In this particular instance, looking at
3 Paragraph 63, I refer to the fact that the application,
4 one of the applications to which the '705 patent claims
5 priority, it was rejected over Colby, and that the
6 applicant expressly defined voltage, forward voltage, to
7 mean -- and I'm quoting from the file history, quote:
8 The minimum voltage difference required between the
9 anode and cathode of the LEDs in the claimed circuit to
10 allow current to flow through the LEDs, close quote.

11 And my understanding in reviewing the file
12 history is that they did that in order to overcome a
13 rejection based on prior art. My understanding would be
14 that would be an express definition.

15 Q. And your further understanding is any
16 statement that would be considered an express definition
17 in the file history would apply to the claims of the
18 patent.

19 Is that correct?

20 A. My understanding is that intrinsic evidence is
21 weighed first. In this case, the intrinsic record is
22 clear; and hence, that should apply. That's my
23 understanding. As opposed to extrinsic sources such as
24 this Samsung datasheet.

25 Q. So I think we just established that your

1 construction here conflicts with the ordinary meaning of
2 the term "forward voltage." Correct?

3 ATTORNEY NITTA: Objection. Form.

4 A. I have not formed an opinion as to what the
5 ordinary meaning is. I've applied what I believe is the
6 express definition provided by the patentee. In
7 Paragraph 64, I did state that if that is not applied,
8 that forward voltage should be construed as a voltage in
9 a diode's forward direction.

10 BY ATTORNEY McBRIDE:

11 Q. We talked earlier that "forward voltage" is a
12 commonly understood term in this field. Correct?

13 A. Well, the voltage in a forward -- in a diode's
14 forward direction is absolutely clear and commonly
15 understood, and I would agree that that is frequently
16 called forward voltage. Voltage in a forward direction,
17 forward voltage. That's extrinsic to the record here.

18 Q. So as a commonly understood term, given that
19 "forward voltage" is a commonly understood term, do you
20 have any opinion about the ordinary meaning of the term
21 "forward voltage"?

22 A. Well, in my declaration, I provided in
23 Paragraph 63 what I believe is the correct construction.

24 Q. I didn't ask you for the correct
25 construction --

1 A. In paragraph --

2 Q. -- Doctor. You understand that. What's the
3 ordinary meaning?

4 A. -- 64, I --

5 ATTORNEY ERICKSON: Please don't interrupt the
6 witness while he's answering.

7 ATTORNEY McBRIDE: The witness is not
8 answering the question.

9 A. In Paragraph 64, I stated what I believe would
10 be the correct construction if the express definition is
11 not implied. And I stated that is a voltage in a
12 diode's forward direction. I stated that -- the next
13 sentence, I stated that is because it is well known to a
14 POSITA, so that would be commonly known, yes.

15 BY ATTORNEY McBRIDE:

16 Q. So your understanding of the common -- so your
17 opinion about the common understanding of the term
18 "forward voltage" is that it's a voltage in a -- let me
19 turn -- this is Paragraph 63 you're quoting?

20 A. No. 63 is where I state what I believe is the
21 correct construction based on the intrinsic record.

22 Paragraph 64 is what I stated my opinion if
23 that express definition is not applied.

24 Q. So your understanding of the ordinary meaning
25 of the term "forward voltage" is a voltage in the

1 diode's forward direction.

2 Is that correct?

3 A. So the second sentence in Paragraph 64, I
4 state: The concept of direction, such as forward and
5 reverse, with respect to diodes is well known to a
6 POSITA. That is certainly true.

7 I then further stated that if forward voltage
8 is not construed according to the express definition, as
9 I explained it should be in Paragraph 63, that if that's
10 not the case, that isn't the construction, then a
11 forward voltage should simply refer to a voltage in the
12 forward direction.

13 Q. And a voltage in a diode's forward direction
14 is your understanding of the common meaning of the term
15 "forward voltage." Correct?

16 A. So outside of the context of the patent,
17 ignoring the intrinsic evidence, the concept of forward
18 and reverse in the context of a diode is well understood
19 to one of ordinary skill; and hence, the two words,
20 "forward voltage," would refer to any voltage in a
21 forward direction. But that is only if one were to
22 remove this from the context of the '705 patent.

23 Q. So Exhibit 2036, when it charts forward
24 voltage versus forward current, that would be consistent
25 with the commonly understood definition of "forward

1 voltage," which is your second -- your alternate
2 construction. Correct?

3 A. That chart shown in the upper left-hand
4 corner, page 10 of Exhibit 2036, is a current voltage
5 curve. And it clearly shows that voltages applied in
6 the forward direction result in an increase in current
7 or, vice versa, an increase in current would result in a
8 larger voltage. And that is simply the IV curve that
9 you'd expect for a diode.

10 So outside the intrinsic record, these labels
11 on this graph I believe would be commonly understood as
12 those appropriate to put on the IV curve of a diode.

13 Q. And your proposed construction for "forward
14 voltage" is inconsistent with the chart where we're
15 looking at in Exhibit 2036, page 10, which is, in your
16 words, the IV curve that you'd expect for a diode.

17 Is that correct?

18 A. I wouldn't describe this as being my
19 construction, my -- I don't know what word you just
20 selected. I'm simply quoting the intrinsic record where
21 the patentee provided an express definition. It's their
22 definition, not mine.

23 Q. I'm sorry, I thought that you said in one of
24 your previous responses that the curve on page 10 of
25 Exhibit 2036 is the IV curve that you expect for a

1 diode.

2 A. I did say that.

3 Q. All right. And my only point is that your
4 construction in this litigation is inconsistent with
5 this curve.

6 Isn't that correct?

7 A. Again, you phrased it as my construction.
8 It's my understanding of the intrinsic record outside of
9 the context of the '705 patent and its applications that
10 it claims priority to. In other words, outside the
11 intrinsic record, these two words, "forward voltage" and
12 "forward current," are certainly frequently used to
13 label the axes of the current voltage curve for a diode.
14 And the reason for that, as I stated in Paragraph 64, is
15 that the concept of direction, forward and reverse, for
16 a diode is well known to a POSITA.

17 Q. So it seems like when I refer to the
18 construction for "forward voltage" you put forward in
19 your declaration as your construction, you have an issue
20 with that, but your primary construction, your first
21 construction for "forward voltage" is the minimum
22 voltage difference required between the anode and
23 cathode of the LEDs in the claimed circuit to allow
24 current to flow through the LEDs.

25 That's correct, right?

1 That's your construction?

2 A. Based on the intrinsic record, yes, that is
3 correct. That is what I believe is the correct
4 construction.

5 Q. That's your opinion, right?

6 A. Based on the intrinsic record, yes, it is.

7 Q. Your opinion is not consistent with
8 Exhibit 2036's chart, is it? Because there are many
9 different voltages that can be passed across the forward
10 voltage.

11 A. Well, as I've stated in Paragraph 64, if one
12 were to not apply the express definition, then I believe
13 the correct construction would be a voltage in a diode's
14 forward direction. And that is absolutely consistent
15 with this graph.

16 Q. But I guess that's answering a question I
17 wasn't asking. I was asking if your primary
18 construction is consistent with the graph.

19 A. The intrinsic evidence is more limited than
20 this extrinsic evidence.

21 Q. I'm sorry, I don't quite get what you're
22 saying there. Can you rephrase?

23 A. I don't know that I can rephrase.

24 The intrinsic evidence stated that the forward
25 voltage is the minimum voltage difference required

1 between the anode and cathode of the LEDs in the claimed
2 circuit to allow current to flow through the LEDs. That
3 would be one value. A single voltage.

4 This graph illustrates that you can apply a
5 whole range of voltages in the forward direction.

6 Q. And your understanding is this statement, your
7 construction, the minimum voltage difference required
8 between the anode and cathode of the LEDs in the claimed
9 circuit to allow current to flow through the LEDs, that
10 is a lexicographic definition that is binding on the
11 claims. Correct?

12 A. Again, I'm not aware and I'm not sure of all
13 the implications of the words you just chose. My
14 understanding from examining the histories and the
15 applications to which the '705 claims priority was an
16 express definition to overcome a rejection.

17 I would point out that in the intrinsic
18 evidence in Exhibit 2036 on page 5, it also lists
19 forward voltage as being a single value. So apparently,
20 Samsung uses it different ways themselves.

21 Q. I'm sorry, where are you talking about on page
22 5?

23 A. In about the middle of page 5, you'll see the
24 words "forward voltage."

25 Q. I see "forward voltage." And if I go to the

1 right of that, I see a range of 5.9 to 6.1.

2 A. And what that refers to is that each die will
3 be one value. But due to manufacturing variations, any
4 given die will have a forward voltage, as stated in this
5 table, somewhere between 5.9 and 6.1. It doesn't mean a
6 single LED takes on that range. These are -- this is
7 traditional in a specification shift to give minimum and
8 maximums.

9 Q. But, Doctor, you understand that that's a
10 forward voltage rating. That's not the actual forward
11 voltage that can be put across the LED. Correct?

12 A. All's I'm pointing out is that apparently,
13 Samsung uses the word "forward voltage" in a way
14 different on that page than what you're suggesting they
15 used it on page 10.

16 Q. I'm sorry. You're the expert on this matter
17 in this proceeding, and I'm asking you. When they say
18 "forward voltage" there, what they mean is that's one
19 rating. They mean that that's the rated value, and it
20 can have a range as shown in the graph on Figure 10.
21 Correct?

22 A. No. No, no, no, no, no. The graph on
23 Figure 10 shows voltages from 5 to 6-1/2. This number
24 is not 5 to 6-1/2. It gives you two different codes.
25 These are different material properties. They have

1 different light emission characteristics. So the V_{sub}
2 F in a diode equation is a different number depending on
3 the band gap, and this is just -- for the A0 versus A1,
4 those are different materials.

5 I'm just trying to point out there's the
6 express statement by the patentee as to what they meant
7 by "forward voltage." There is an IV curve that you are
8 pointing to on page 10 that happens to be labeled
9 "forward voltage", and that IV curve would be for one
10 diode.

11 But Samsung itself on page 6 -- no, I'm sorry,
12 page 5, uses it a different way. So it's not like
13 Samsung uses it only one way.

14 Q. Well, I guess I do want to point out that what
15 they're showing there is a range, right? There's
16 nothing in there that indicates that's for a specific
17 LED, right?

18 A. No, now you -- anyone of ordinary skill who
19 reads spec sheets expects to get minimum and maximum
20 values. That doesn't mean for one die, it's variable.
21 It means that if I bought 100 die, each different -- 100
22 different devices from Samsung, they call these the --
23 what do they call this product? The LH52C. About 100
24 of them. I'd find each one with a forward voltage, and
25 I should expect that none of them should have a forward

1 voltage of less than 5.9 or more than 6.1. That's what
2 spec sheets do.

3 I'm just trying to point out that Samsung
4 itself apparently uses "forward voltage" in more than
5 one way. The graph that you were so intent on doesn't
6 show a voltage of 5.9 to 6.1. That graph shows a
7 voltage from 5 all the way to 6-1/2.

8 Q. But, Doctor, I think you're being a little
9 disingenuous. This is an estimated range. What you're
10 seeing in Figure 5 -- page 5 is an estimated range of
11 the forward voltage across any one of those specific
12 LEDs. Or, I'm sorry, it's an estimated range for the
13 typical forward voltage you would put across one of
14 those LEDs, right?

15 What they're showing in Figure 10 is the
16 actual limits of the forward voltage you can put across
17 any particular LED, right?

18 So even though they would be rated for a
19 particular forward voltage, you understand that a
20 POSITA -- and a POSITA would understand that that chart
21 on Figure 10 can be applied to any one of those LEDs and
22 you get a similar range of forward voltages. Correct?

23 A. I would agree that a POSITA would expect that
24 a diode has an IV curve similar to that curve. I'm not
25 being disingenuous at all. I'm reading the

1 specification sheet, and it uses the words "forward
2 voltage." And it refers to not that range of voltages
3 in that graph, but a much smaller range of voltages.
4 All's I'm trying to do is point out what is clear on its
5 face. Samsung used the word in more than one way.

6 Q. And both have a range of voltages associated
7 with them. Correct?

8 A. Well, but the 5.9 to 6.1 is clearly not the
9 voltage range that's shown in the graph. One of
10 ordinary skill reading a specification sheet would know
11 that the VF for a diode is determined by the material
12 characteristics, the doping. Basically, the
13 fabrication. And because of the way these are
14 fabricated, there might well be a small range, but any
15 given device will have one VF in the ideal diode
16 equation.

17 Q. But you understand that the forward voltage
18 across that diode can vary significantly from that one
19 rated VF. Correct?

20 A. Well, I understand that one can apply a
21 voltage in the forward direction from zero to any value,
22 although I would presume we would limit it to a value
23 below which the diode melts. So certainly you can apply
24 a voltage in the forward direction from zero up to some
25 limit, presumably at which point the device

1 self-destructs.

2 Q. That's essentially what's being shown in the
3 chart on Figure 10. Correct?

4 A. I don't know whether they're going all the way
5 to the burnout limit, but yes, it's showing a range of
6 voltages in the forward direction from zero to -- well,
7 actually, they started at about 5 because below 5 volts
8 there was no current flow in this graph, apparently.

9 Q. Does the forward current drive the forward
10 voltage, or does the forward voltage drive the forward
11 current?

12 A. You can't say -- they are interrelated. You
13 can't say one without the other. In the ideal diode
14 equation, you calculate current as a function of applied
15 voltage.

16 Q. Let's turn back to the '705 patent at column
17 8, lines, let's see, 3 through 14. Earlier, we
18 discussed your opinion that there are four different
19 embodiments in the '705 patent, and I was wondering
20 which embodiment or embodiments is column 8, lines 3
21 through 14 related to?

22 A. Well, the first sentence is referring to
23 packaging of the LEDs, so that could be any of them.

24 Second sentence simply says you can use
25 prepackaged LEDs. Well, that applies to any of them.

1 The third sentence, I guess it's the last
2 sentence of the paragraph, the packages can be of varied
3 makeup, can be combined with each other. Again, that
4 would apply to any of them. So that entire paragraph
5 there in column 8 starting on line 3 is just about the
6 individual LEDs that are combined to form the LED
7 circuits.

8 ATTORNEY McBRIDE: That's all the questions I
9 have. Thank you, Doctor.

10 THE WITNESS: Okay, thank you.

11 ATTORNEY ERICKSON: Okay, let's take a break.

12 ATTORNEY McBRIDE: When do you want to come
13 back on?

14 ATTORNEY ERICKSON: Let's just do 1:40, so
15 nine minutes.

16 (Recess taken.)

17 ATTORNEY ERICKSON: Petitioner doesn't have
18 any questions, so we'll just reserve the right to review
19 and sign the transcript.

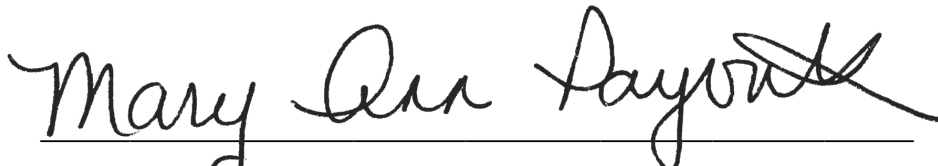
20
21 (Deposition adjourned at 2:45 p.m.)
22
23
24
25

REPORTER'S CERTIFICATE

I, MARY ANN PAYONK, shorthand reporter and Notary Public, CA CSR No. 13431, do hereby certify that the witness whose deposition is hereinbefore set forth was sworn by agreement of all parties, that the proceedings were reported stenographically by me, and that this transcript is a true, correct, and full record of the testimony given.

I further certify that I am not related to any of the parties to this action by blood or by marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of October, 2023.


MARY ANN PAYONK, CSR #13431

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ERRATA SHEET FOR TRANSCRIPT OF: DR. DEAN NEIKIRK

CASE CAPTION: Home Depot vs. Lynk Labs

DEPOSITION DATE: October 5, 2023

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Signature of Deponent

Date

1 I,

2 DR. DEAN NEIKIRK,

3 state that I have read the foregoing deposition and
4 declare under penalty of perjury:

5 That the foregoing is my deposition under
6 oath;

7 That I have read same and have made the
8 necessary corrections, additions or changes to my
9 answers that I deem necessary;

10 That my answers as indicated are true and
11 correct.

12
13 Executed at _____
14 this _____ day of _____, 2023.

15
16 _____
17 DR. DEAN NEIKIRK
18
19
20
21
22
23
24
25

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