

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 CANON U.S.A., INC. and CANON INC.,

6 Petitioners,

7 vs.

8 SLINGSHOT PRINTING, INC.,

9 Patent Owner.

10
11 Case No. IPR2022-00309

12
13 EXPERT VIDEOCONFERENCE DEPOSITION TESTIMONY OF

14 STEVEN J. DIETL

15 VOLUME 1

16 TUESDAY, DECEMBER 19, 2023

17 ONTARIO, NEW YORK

18 * * *

19
20 Reported by:

21 Rebecca Klanderud, RPR, CSR

22 Illinois CSR License No. 084.003990

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Expert Videoconference Deposition Testimony
of STEVEN J. DIETL taken remotely with the
witness being located in Ontario, New York on
Tuesday, December 19, 2023, commencing at 8:00
a.m. EST before Rebecca L. Klanderud, a
Registered Professional Reporter and Certified
Shorthand Reporter.

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1 THE COURT REPORTER: Good morning,
2 everyone.

3 This is Rebecca Klanderud, the court
4 reporter for today's deposition.

5 Do counsel stipulate and agree that I
6 may administer the oath remotely, and that the
7 oath so given is valid for purposes of this
8 deposition, please?

9 Mr. Kritsas?

10 MR. KRITSAS: Um, I agree on behalf
11 of Canon U.S.A. and Canon, Inc.

12 THE COURT REPORTER: Thank you, sir.
13 Mr. Borsos?

14 MR. BORSOS: Yes, agreed.

15 THE COURT REPORTER: Thank you, sir.
16 Mr. Dietl, please raise your right
17 hand.

18 * * *

19 (Whereupon, the court reporter
20 administered the oath to
21 STEVEN J. DIETL.)

22 * * *

1 THE WITNESS: I do.

2 THE COURT REPORTER: Thank you, sir.

3 Counsel, you may proceed.

4 MR. KRITSAS: Okay. Thank you,
5 Rebecca.

6 * * *

7 STEVEN J. DIETL,
8 a witness in the above-entitled matter,
9 having been first duly sworn,
10 testified on his oath as follows:

11 * * *

12 EXAMINATION

13 * * *

14 BY MR. KRITSAS:

15 Q. Good morning, Mr. Dietl.

16 A. Good morning, Mr. Kritsas.

17 Q. Um, for the record, would you please,
18 uh, state your full, uh, first and last name?

19 A. Steven Dietl.

20 Q. And that's spelled, uh, D-i-e-t-l,
21 correct?

22 A. That's correct.

1 Q. Um, Mr. Dietl, where are you
2 currently located?

3 A. I'm loc- -- my mailing address is
4 Ontario, New York. It's actually in the town of
5 Walworth, New York, but we're right on the
6 border.

7 Q. Okay. And is that where you're --
8 you're -- you're currently at now?

9 A. Yes, it is.

10 Q. Um, and is anyone in the room with
11 you right now?

12 A. No one's in the room with me, no.

13 Q. Um, do you have other -- other than
14 your computer, do you have any -- uh, any notes
15 or other papers in front of you?

16 A. Um, I have a -- a notepad, um, next
17 to me.

18 Q. Do you have anything written on the
19 notepad?

20 A. Oh, a couple -- uh, just, uh, quick,
21 uh, overview notes, yes.

22 Q. Okay. Um, and what -- what -- what

1 kind of overview notes do you have on your --
2 uh, your notepad?

3 A. Um, just a, uh, summary of the
4 declaration that I wrote.

5 Q. Okay. Um, any -- any notes from
6 counsel, uh, that you recorded on your notepad?

7 A. No.

8 Q. Um, other than a summary of your
9 declaration, is there anything else written on
10 the notepad?

11 A. No.

12 Q. Um, do you have any copies of your,
13 uh, declaration or other exhibits there in the
14 proceeding?

15 A. I have a -- uh, a second monitor, and
16 I have the court -- the docket that was provided
17 to me by counsel and, uh, so that I can pull up
18 the PDFs of items that are in the docket.

19 Q. Um, within, uh, those -- those
20 digital versions of the docket, uh, did you
21 include any notes or highlighting, uh, within
22 them?

1 A. I did not.

2 Q. Okay. Um, so just -- I know, um,
3 Rebecca was kind enough to go over some of the
4 ground rules with you ahead of time, but just so
5 we're clear on the record, I'll -- I'll go over
6 a few of them with you as well.

7 Um, so as you know, uh, in a -- in a
8 deposition, we have a court reporter that's
9 going to be taking down, uh, everything that's
10 said today.

11 Um, do you understand that?

12 A. Yes, I do.

13 Q. So -- so, uh, the court reporter will
14 only be able to record, uh, anything that is
15 said verbally. So that means no -- no nods or,
16 um, any sort of, you know, sign language on --
17 on the screen won't be recorded.

18 Do you understand that?

19 A. Yes, I do. I'll try my best.

20 Q. Great.

21 I will as well. I fall into the
22 trap, too.

1 A. Yeah.

2 Q. Um, so I'm going to be asking the
3 questions today. That's -- that's the purpose
4 of -- of the deposition, um, and then you'll be
5 providing the answers.

6 Is that fair?

7 A. That is fair.

8 Q. Um, I'll ask that we not speak over
9 each other just so we can get a very clear
10 record. Um, so if -- if you, you know, have
11 questions or want to, um, respond, just make
12 sure you give me an opportunity to finish
13 speaking, and I'll do the same for you.

14 Is that fair?

15 A. Yes. That's fair.

16 Q. Uh, your lawyer, Mr. Borsos, may, uh,
17 lodge an objection to a question I ask, um, but
18 unless he specifically instructs you not to
19 answer, you need to respond to the question as
20 it was asked.

21 Is that fair?

22 A. Yes, it is fair. I understand.

1 Q. Um, and you understand you're under
2 oath today, so your answers must be truthful and
3 honest as if you were in, uh, court before a
4 jury.

5 Do you understand that?

6 A. I understand, yes.

7 Q. Um, do you agree that the answers
8 you're going to provide today are going to be
9 truthful and honest?

10 A. Yes, I agree.

11 Q. Um, is there any reason that you know
12 of that would prevent you from testifying
13 truthfully and honestly to the questions that I
14 ask you today?

15 A. No.

16 Q. Um, and then, finally, if -- if I ask
17 a question and -- and you don't understand my
18 question, will you please be sure to ask for
19 clarification?

20 A. Yes. I would like to do that.

21 Q. Um, and if I -- if I don't, uh, hear
22 you ask for clarification, I'm going to assume

1 that you understood my question.

2 Is that fair?

3 A. That's fair.

4 Q. Um, so, Mr. Dietl, where do you
5 currently work right now?

6 A. I'm self-employed. Um, my -- a sole
7 proprietor of, uh, Pike Lake Consulting, LLC.

8 Q. And -- and what type work do you do
9 at Pike Lake Consulting?

10 A. Well, I've done, um, some product --
11 what I call product development consulting, um,
12 with a few ink jet companies. Um, I also, uh,
13 got involved with, uh, helping a -- a, um,
14 biotech start-up, um, with, uh, consulting
15 services around microfluidics and design of --
16 uh, of invitro diagnostic test systems, and, um,
17 that kind of evolved into, um, also starting
18 a -- a company, AMDX BioSystems, of which I was
19 one of the three, uh, owners to develop a COVID,
20 uh, assay. So we've done -- I've done that type
21 of product development work.

22 More recently, though, um, all my

1 work has been -- uh, has been on, um, expert
2 witness services for ink jet patents.

3 Q. Uh, so you mentioned you've done
4 product development consulting with a few ink
5 jet companies.

6 Uh, what -- what ink jet companies
7 have you done work for?

8 A. Uh, EFI which is a super wide format,
9 uh, ink jet printing system. Um, and, um, the
10 name of the other company, uh, escapes my mind
11 at this point, so -- but it was a -- uh, it was
12 a company in, uh, Dallas, Texas that was
13 developed using ink jet to, uh, print
14 screen-printing screens, um, so they could have
15 a digital production of screen-printing screens,
16 um, and they were having problems integrating a
17 printhead, uh, into that system.

18 Q. Other than EFI, have you done
19 consulting work for any other ink jet printing
20 companies?

21 A. That was -- the company in Dallas,
22 Texas was an ink jet printing company.

1 Q. Do you remember the name of the
2 company in Dallas, Texas?

3 A. If you, uh, give me a second, I'll
4 look in my drawer here and get their name.

5 I don't have it handy. I'd have
6 to -- I'd have to dig into some older files to
7 do that. Um, if you would like me to do that, I
8 could.

9 Q. Um, that's okay.

10 Um, so other than your work at
11 Pike Lake Consulting, um, have you done work for
12 any other ink jet printing companies?

13 A. Yes. Yes. I've worked at -- uh, 20
14 years at Deluxe Corporation in which I was
15 primarily involved with the development of ink
16 jet printers, printheads, ink supplies, um, and
17 print -- and integration into printers.

18 And then, uh, 14 years at Eastman
19 Kodak where I -- uh, the entire time I worked on
20 ink jet printing systems.

21 Q. Have you done any work for, uh,
22 Lexmark?

1 A. No. I've never done any work for
2 Lexmark.

3 Q. Mr. Dietl, what did you do to prepare
4 for today's deposition?

5 A. So, um, I read through the, uh,
6 reference materials, the -- uh, the Canon IPR,
7 um, my declaration, the -- the, uh, patents
8 cited in the -- uh, in the IPR, as well as the
9 patent owner's, uh, Slingshot's patent.

10 Um, and then -- um, and counsel and I
11 met yesterday and kind of went through any
12 questions I might have regarding those
13 materials, and we also went through the -- uh,
14 at that point, the, um, institution decision.

15 Q. And without -- without telling me,
16 um, any specific conversations you had with --
17 uh, with counsel for Slingshot, um, about how
18 long was your meeting, uh, that you had
19 yesterday?

20 A. Uh, about four hours.

21 Q. Okay. And who did you meet with
22 yesterday?

1 A. Mark Borsos.

2 Q. Did you meet with anyone else?

3 A. No.

4 Q. Other than your meeting with
5 Mr. Borsos yesterday, did you, uh, have any
6 other meetings to prepare for the deposition
7 today?

8 A. I did not.

9 Q. Um, other than, uh, your own review
10 of some of the documents cited in your
11 declaration in your meeting with Mr. Borsos, did
12 you do anything else to prepare for the
13 deposition today?

14 A. Uh, not that I can recall in addition
15 to that, no.

16 Q. So, today, we're going to be
17 addressing your declaration, uh, in connection
18 with IPR Number 2023-00309.

19 Um, is it your understanding that you
20 submitted a declaration in that IPR?

21 A. Yes, it is my understanding.

22 MR. KRITSAS: So I'd like to

1 introduce Exhibit 2004, Michelle.

2 Could you please, uh, make that
3 available?

4 * * *

5 (Whereupon, Dietl Exhibit 1 was marked
6 for identification.)

7 * * *

8 BY MR. KRITSAS:

9 Q. Mr. Dietl, do you have Exhibit 2004,
10 uh, in front of you?

11 A. Yes.

12 Q. Um, is this your declaration that you
13 submitted in IPR2023-00309?

14 A. Yes, it is.

15 Q. Um, so what did you do to prepare,
16 uh, your declaration?

17 A. Um, so I -- I met with counsel. We
18 talked about the key aspects of the case and --
19 uh, and, um, reviewed the -- uh, the draft,
20 supplied technical -- uh, I supplied technical
21 analysis of the case and -- uh, and the IPR and,
22 uh, worked with counsel to produce the

1 declaration.

2 Q. Were you provided a draft declaration
3 to review?

4 MR. BORSOS: Objection to the extent
5 you're asking any information that could reveal
6 attorney-client privileged communications.

7 BY MR. KRITSAS:

8 Q. Uh, I -- so just to be clear,
9 Mr. Dietl, I'm just asking whether you were sent
10 a draft of your declaration to review already
11 written?

12 A. Um, counsel provided a first -- a
13 first draft, and then, uh, we made several
14 changes to that draft after that point until we
15 got the final product.

16 Q. Got it.

17 Um, so in your declaration, you
18 address, um, U.S. Patent Number 7,290,864.

19 Is that right?

20 A. 7,290,864. Yes. That's correct.

21 Q. Um, I'm also going to introduce
22 Exhibit 1001, uh, which is the -- the '864

1 patent that we just referenced.

2 * * *

3 (Whereupon, Dietl Exhibit 2 was marked
4 for identification.)

5 * * *

6 BY MR. KRITSAS:

7 Q. Mr. Dietl, do you recognize, uh,
8 Exhibit 1001?

9 A. Yes, I do. Although, I'm going to
10 try to get a larger screen view of it.

11 MR. KRITSAS: Um, and, Michelle,
12 if -- if I -- well, let -- let me just ask.

13 BY MR. KRITSAS:

14 Q. Mr. Dietl, would you like to have
15 control of the document so you can -- you can
16 look through it or manipulate the sizing?

17 A. Um, I think you made it a little
18 larger. I -- one more click might help, but
19 beyond that, I think that's okay.

20 Yeah. I think that's fine.

21 Q. So, Mr. Dietl, what's your
22 understanding of the point of novelty of the

1 '864 patent?

2 MR. BORSOS: Objection, calls for a
3 legal conclusion.

4 THE WITNESS: So the -- uh, the idea
5 behind the -- uh, the patent, the '864 patent
6 is, um, Mr. King was trying to, uh, reduce -- to
7 address an array of, uh, heaters and drop
8 ejector heaters on -- uh, that are positioned
9 on -- um, adjacent to via, on two sides of a
10 via, and, um, he was trying to, uh, fire a
11 larger number of, uh, drop ejectors or heaters
12 simultaneously, um, and, um, in order -- because
13 the arrays at the time were getting bigger
14 and -- um, and trying to, uh, increase the print
15 speed that the -- the printhead, uh, prints
16 across the page.

17 Um, and so the idea was that if, um,
18 he could, uh, reduce the -- uh, if he could feed
19 each side -- a group of heaters on each side of
20 the array with eight heaters at a time on each
21 side, that he -- and then doing that by having
22 traces that stemmed from a single bondpad, he

1 could both, um, fire more heaters at a time. He
2 could fire 16 at a time, eight on each side, and
3 he could also reduce the -- the size of the
4 printhead die, um, by reducing the number of
5 bondpads, um, because he could have two traces
6 that -- um, that stemmed from each bondpad.

7 And so it was a size reduction and
8 a -- and a, uh, productivity improvement of the
9 ink jet technology.

10 BY MR. KRITSAS:

11 Q. So one of the -- the points of
12 novelty that you mentioned was, um, with respect
13 to firing 16 heaters at the same time.

14 Is that right?

15 A. That's correct.

16 MR. BORSOS: Objection, form.

17 BY MR. KRITSAS:

18 Q. I'm sorry, Mr. Dietl.

19 Could you repeat your answer?

20 I couldn't hear you.

21 A. Yes. Eight -- eight on each side of
22 the -- uh, of the via for a total of 16.

1 Q. Could I direct your attention to --
2 well, I guess let me ask you first: Um, was --
3 you know, was it known at the time of the '864
4 patent, um, to make 16 simultaneous fires, um,
5 of heaters?

6 MR. BORSOS: Objection to form.

7 THE WITNESS: Um, if we read into --
8 uh, go and look at the -- the patent, um,
9 Mr. King describes the problem, and, uh, you can
10 see in the -- um, column 5, he's -- "In
11 exemplary embodiments of the present invention"
12 -- right at the top of column 5 -- "320 heaters
13 may be grouped and/or addressed in blocks of 20
14 or 40 heaters each, although alternative
15 groupings with varying numbers of heaters may be
16 utilized."

17 And, in other embodiments, each of
18 the heater arrays -- varying numbers of heaters
19 grouped in varying blocks. (As read)

20 And so it -- um, what was known at
21 the time was that, you know, um, it was
22 important to fire as many heaters at once in

1 order to get through the array, uh, of more
2 heaters and be able to keep up with print speed.
3 And so whether it was eight or 16 or whatever,
4 or 20 or 4,0 was dependent on whether -- the
5 size of the array and the type of speed
6 requirements they had in their -- uh, in their
7 requirements document.

8 BY MR. KRITSAS:

9 Q. I see.

10 So -- so at the time of the '864
11 patent, um, you know, it was -- it was a design
12 choice as to how many heaters you wanted to fire
13 at the same time?

14 Is that what you're saying?

15 A. Yes.

16 MR. BORSOS: Objection to form.

17 THE WITNESS: Yes. It's a design
18 choice based on the requirements.

19 BY MR. KRITSAS:

20 Q. Okay. So --

21 A. With lots of trade-offs associated
22 with those design choices.

1 Q. Sure. So -- um, so at the time of
2 the '864 patent, would you at least agree that
3 it was known to fire, uh, 16 heaters
4 simultaneously?

5 MR. BORSOS: Objection to form.

6 THE WITNESS: I don't think that that
7 was a specific thing that everybody knew.

8 They were -- people at the time were
9 working on the problems that were associated
10 with the -- with their devices and their
11 requirements, and if 16 heaters simultaneously
12 was required, I'm sure they would try to work on
13 how to do that in the best way possible.

14 BY MR. KRITSAS:

15 Q. Well, you mentioned a point of
16 novelty of the '864 patent is firing 16 heaters
17 simultaneously. So I'm trying to understand
18 if -- you know, you know, whether that was known
19 at the time, you know, the capability to fire 16
20 heaters simultaneously was known at the time of
21 the '864 patent.

22 A. I don't think the number was the

1 important part, and I'm sorry if I, uh, got us
2 off in that direction. It's not the number, but
3 it's the fact that you -- that you fire heaters,
4 a group of heaters simultaneously on each side
5 of the via and -- um, and that you do that by
6 having, uh, traces that are dedicated -- that
7 come off of one bondpad and, uh, feed those two
8 arrays that exist on each side of -- one on each
9 side of the via.

10 So whether it's groups of 16 or some
11 other number is not really the important part.
12 That's not the novelty. The novelty is that
13 you're increasing the number that you can fire
14 because you're firing on each side of the via
15 using these -- uh, these traces that stem from a
16 single bondpad.

17 Q. And why are you able to increase the
18 number of simultaneous fires, um, by having
19 power traces on both sides of the ink via?

20 A. Because --

21 MR. BORSOS: Objection, form.

22 THE WITNESS: The -- when you --

1 you're firing a group of heaters, there's a
2 current, um, that is needed to -- to eject the
3 droplets and generate the -- the heat in the
4 resistor, right?

5 And, um, by having these traces that
6 are split at the bondpad, you can split that
7 current between, uh, two different traces and
8 reduce voltage drop that is commonly seen, um,
9 in the traces that lead to the -- from the bond
10 pad to the firing array. You're trying to get
11 uniform voltage, uh, across all the heaters in
12 the array, and so this allows -- the novelty
13 here was, um, that Mr. King was allowed to tune
14 the -- what is called sometimes the parasitic
15 resistance of the traces that lead from the bond
16 pad to the arrays such that they receive the
17 same voltage and -- uh, and then you could fire
18 more at once because -- more -- more at once
19 because you split them between two different
20 traces.

21 BY MR. KRITSAS:

22 Q. But if you're still firing the same

1 number of heaters, how does that actually reduce
2 the current requirement?

3 A. Because it has --

4 MR. BORSOS: Objection to form.

5 THE WITNESS: Because you have
6 multiple traces, it reduces the current per
7 trace.

8 BY MR. KRITSAS:

9 Q. Could I direct your attention, um, to
10 column 5 starting at line 21?

11 And actually, I want to show you --
12 have you start at line 24, actually.

13 So the '864 patent states that: "In
14 an exemplary embodiment of the present
15 invention, the bondpads 328 are limited to
16 supplying eight simultaneous fires given
17 commonly used heater resistances."

18 Do you see that?

19 A. Yes.

20 Q. Um, and then it goes on: "For
21 example, the configuration of FIG. 3 requires
22 only 8 simultaneous fires per 320 heaters,

1 rather than 16 simultaneous fires per 320
2 heaters (required in several prior art
3 configurations)."

4 Did I read that right?

5 A. You read that right, yes.

6 Q. So isn't the '864 patent telling us
7 that we're actually reducing the number of
8 simultaneous fires to get the same number of
9 firings as the prior art?

10 MR. BORSOS: Objection to form.

11 THE WITNESS: Uh, what he's saying is
12 that you're reducing the number of simultaneous
13 fires per -- per array and because you split
14 the -- them between two arrays with eight on
15 each -- eight on each array.

16 BY MR. KRITSAS:

17 Q. But in -- in your experience, are you
18 firing both sides of the array at the same time?

19 A. In --

20 MR. BORSOS: Objection to form.

21 THE WITNESS: In Mr. King's patent,
22 that is what -- what he is, uh, describing.

1 Is -- now, is it precisely to the
2 microsecond at the same time?

3 I don't think he goes -- he doesn't
4 go into that level of detail, but, um, you know,
5 they're -- they're trying -- they're getting
6 through an array of -- of heaters which
7 contribute to the image of a single color,
8 right?

9 So they have to go down into all the
10 image, and they're filling -- the rest on the
11 page from -- from heaters on both sides of the
12 that via. And so they are -- they have to be
13 very carefully coordinated, um, so that they --
14 they land on the right spot on the paper, right?

15 Uh, even though they come from one
16 side of the via or the other side of the via,
17 they have to land in the proper location. So,
18 um, the exact timing of how they do that is not
19 disclosed in King, but I think that's the -- um,
20 the problem he's trying to solve is to get --
21 uh, get those down as quickly as possible and in
22 the right location and, um, without having

1 voltage drop problems in the traces.

2 BY MR. KRITSAS:

3 Q. Mr. Dietl, are you aware of any other
4 points of novelty in connection with the '864
5 patent?

6 MR. BORSOS: Objection to form, calls
7 for a legal conclusion.

8 THE WITNESS: I don't think it's
9 additional. I think I already referred to the
10 fact that -- that, um, using this configuration
11 where, um, he uses a bond pad with multiple
12 traces that stem from that bond pad to feed the
13 voltage to heater arrays which exist on, um,
14 opposite sides of an ink via, he's able to use
15 the traces, um, in that -- that space between
16 the bond pad and the heater arrays to fine tune
17 the parasitic resistance of the traces such that
18 the arrays on each side of the via, um, have the
19 same voltage.

20 So I think they refer to it as
21 voltage balance or, um, reduced voltage
22 variation.

1 BY MR. KRITSAS:

2 Q. What does it mean to fine tune the
3 parasitic resistance of the traces?

4 A. So that's done by, um, chain -- by,
5 uh, what width of the trace you use and the --
6 and -- uh, and you could vary the thickness of
7 the metal, but usually the traces are in the
8 same metal layer. So, um, you could have
9 different trace width between, um, the two
10 traces such that the one that's farther away has
11 a wider trace, and the one that's closer to the
12 bond pad has a narrower trace such that, um,
13 when they're each firing eight heaters, um, they
14 have of the same voltage trap.

15 Q. So you might have, um, a trace that
16 is one width near the bond pad, but then a --
17 maybe a wider width as it gets closer to certain
18 heaters.

19 Is that -- is that fair to say?

20 MR. BORSOS: Objection to form.

21 THE WITNESS: Um, so you -- what you
22 have -- what I -- what I said is that there's

1 multiple traces, right?

2 There's two traces, and they each are
3 going to try to have the same resistance, uh,
4 even though they might be going different
5 distances. So how you do that, whether or not
6 on one of the traces it goes to the longer
7 distance, might, um, be narrower and then wider
8 or whatever, but whatever it takes to get the
9 parasitic resistance to be the same between the
10 shorter distance and the longer distance, that's
11 what the designer would -- would work on.

12 I don't -- I mean, typically, I don't
13 think they would do what you said, but I think
14 that they would pick a -- pick a trace width
15 that would go the entire -- the entire distance
16 that would match the parasitic resistance.

17 BY MR. KRITSAS:

18 Q. Yeah. I guess what I'm trying --
19 trying to understand is if -- you know, if you
20 would have a variable width along the length of
21 the trace such that it's -- it's maybe wider at
22 certain portions than it is at other portions?

1 A. That's not -- that's not what I would
2 recommend. I mean, I think it's possible, but I
3 don't think that that's how they would do it. I
4 think they would keep the trace width to the --
5 um, to the array that's farther away from the
6 bond pad, wider, um, than the trace width to
7 the -- um, from the bond pad to the array that's
8 closer to the bond pad, and they would do that
9 for the entire distance, typically.

10 Q. Well, why don't we take a look at,
11 um, Figure 3 of the '864 patent?

12 And if we look at, um, the bottom
13 right corner of Figure 3, there's a bond pad
14 328.

15 Do you see that?

16 A. Yes, I do.

17 Q. Um, and then coming off of that,
18 there are, uh, two traces, uh, 326?

19 A. Yes.

20 Q. Um, so we were just talking about,
21 um, fine tuning the parasitic resistance of the
22 traces.

1 Um, could you just explain to me, uh,
2 how you would fine tune the parasitic resistance
3 of the two traces 326 shown in Figure 3?

4 A. Sure. So if you -- um, you look at
5 the bond pad 328, you can see that both of those
6 traces originate or stem from that single bond
7 pad, right?

8 And then, um, 326 is as you've
9 stated, are the two traces, um, that stem from
10 that bond pad. One -- the bottom trace, uh,
11 feeds supply voltage to the yellow heater array
12 that is, um, positioned on the left side of the
13 yellow-ink via. And the top trace 326, uh,
14 supplies voltage to the yellow heater array
15 which is positioned on the right side of the
16 yellow-ink via.

17 The distance, um, of -- that the
18 bottom trace has to travel is longer than the
19 distance that the top trace has to travel, and
20 so what the -- uh, the chip designer and -- uh,
21 and people that are designing the printhead will
22 do is, the bottom trace 326 will have a wider

1 trace width than the -- uh, the upper trace 326
2 such that when -- um, you know, half an amp is,
3 the way he describes it in the patent, is the
4 amount of current that you get, um, from the
5 bottom pad could be one amp. Uh, half an amp on
6 each trace would have the same, um, voltage
7 drop.

8 So there's some -- you're going to
9 lose some voltage due to resistance of those
10 traces, and you want that voltage that you lose
11 to be the same.

12 Q. Are the thicknesses of the traces 326
13 depicted in, uh, Figure 3 of the '864 patent?

14 A. The thicknesses are not depicted in
15 the -- in the -- in the picture. I think it's
16 the schematic drawing, so the widths aren't
17 depicted either, and that's, um, something
18 that's in -- in the specification, the
19 description of balancing the voltage to reduce
20 voltage variation.

21 Q. I want to ask my question again
22 because I -- I used the wrong term.

1 Um, so are the widths of the traces
2 326 depicted in Figure 3 of the '864 patent?

3 A. No, I don't believe so. I don't
4 believe -- I think it's more a schematic
5 representation of the trace path.

6 Q. Does Figure 3 show the entire length
7 of the traces 326?

8 A. I don't understand your question.

9 Q. So would you agree that, um, the
10 power traces 326 are attached to individual
11 heaters within, uh, each of the yellow heater
12 arrays?

13 A. He -- he hasn't depicted that. I
14 would have to go back and look at the
15 specification to see if he gets into those
16 details. Um, but, typically, the -- uh, the
17 voltage is supplied to, um, the heaters, uh,
18 along a common bus along the -- the length of
19 the ink jet printer, that length being top to
20 bottom in this Figure 3. Um, and in this case,
21 as described by Mr. King, um, half of the -- the
22 top half would be fed from the bond pads that

1 are more located at the top of the silicon chip,
2 and the bottom half of heaters in the array
3 would be, uh, fed by the bond pads that are at
4 the bottom half of the -- of the silicon
5 substrate.

6 And so, yeah. It probably extends,
7 um, up, at least halfway, uh, up the yellow
8 heater array on each side.

9 Q. So each of the power traces 326
10 extend from the bond pad 328 to approximately
11 the -- the centerline or halfway point of each
12 yellow heater array.

13 Is that fair?

14 MR. BORSOS: Objection to form.

15 THE WITNESS: Yeah. Yeah.

16 You know, I don't know if there's any
17 other -- there could be other considerations
18 that they have that there could be different
19 resistances and the like on the sides, you know,
20 but the idea would be to balance it, right, so
21 that you have the same -- the same voltage on
22 both ends also. So I think --

1 BY MR. KRITSAS:

2 Q. We would at least agree that the --
3 the power trace 326 doesn't simply stop, um, at
4 the arrowhead that's shown in Figure 3, right?

5 A. It does- -- right. It does not.

6 Q. So it extends some portion, uh, of
7 the way along each heater array.

8 Is that -- is that fair?

9 A. Correct. Yeah.

10 Q. Um, and I wanted to ask you about,
11 uh, the -- the bond pad 328, um, shown in
12 Figure 3.

13 Do you see that?

14 A. Yes.

15 Q. So the bond pad 328 is located on
16 the -- on the right-hand side, along the edge of
17 the chip.

18 Is that right?

19 A. 328 is, yes.

20 Q. In your opinion, why -- why would the
21 bond pad be placed on the edge of the chip?

22 A. So, um, you know, a bond pad is

1 typically a large area that's placed on the --
2 uh, its intention is to interconnect the silicon
3 printhead die to, um, the -- to the printer,
4 right?

5 You have to make a connection to
6 somehow get to the -- the signals, um, from the
7 printer.

8 And so, um, they're positioned up
9 next to a, uh, circuit board or a flex board,
10 um, so the connection can be made between the
11 circuit board and flex board and the bond pad.
12 That is done, um, lots of -- multiple ways, um,
13 through -- wire bonding is -- is a very typical
14 way. Another process is called tape automated
15 bonding or TAB, where leads from the flex extend
16 across the bond pad, and they solder those
17 together. Um, there's also, um, bump-on flex
18 and flip-chip-type bonding.

19 So there's multiple bonding
20 techniques that are used, um, between the -- the
21 board and the die. So -- but in all those
22 cases, just limits to how far you can extend

1 that bonding connection.

2 So you want it close to the edge.

3 You want it relatively large size, um, so it can
4 facilitate those external connections, um,
5 because you're going from a technology which
6 is -- you know, semiconductors have very tight,
7 small circuitry design rules to kind of the next
8 level of technology which is a board which has
9 design rules that are much larger, right?

10 So you've got to have a relatively
11 large, um, area near the edge of the die, um, in
12 order to make that connection.

13 Q. So is it fair to say it's desirable
14 to put the bond pad on the edge of the chip,
15 then, for those interconnections with the
16 external circuitry?

17 A. It's -- um, it's desirable but the --
18 you know, it's also relative, but the terms you
19 used are pretty, uh, loose, right? Near the
20 edge of the chip.

21 There are certainly cases that I've
22 seen where the bond pads are not, like, right up

1 on the edge. There's some that -- I've seen
2 devices where there's multiple rows, and, uh,
3 the wire bonds jump across, uh, into the second
4 row and the first row, and so they're not all
5 right at the same distance near the edge. So,
6 you know, it's -- that's kind of a relative
7 subjective term, "near."

8 Q. That -- that's fair.

9 So in the example you gave where
10 there are two rows of bond pads, uh, are
11 those -- those rows of bond pads placed along
12 the edge of the chip?

13 A. I think they try -- try to get as --
14 they're spaced at the appropriate location for
15 the technology that's used to connect them,
16 right?

17 So they -- they wouldn't likely be in
18 the middle of a chip, right?

19 So they're going to be more proximal
20 to the edge of the chip.

21 Q. And where -- what are the limits
22 of -- uh, well, I guess let me take a step back.

1 So, um, you described a process
2 called TAB bonding.

3 What is TAB bonding?

4 A. TAB stands for Tape Automated
5 Bonding. It is a process where there's small
6 leads that extend from a -- from the edge of a
7 flex board. They -- that line up with the, uh,
8 pads on a silicon substrate and overlap.
9 There's a solder bump on those little tabs, and
10 then they're -- they're set basically, I think,
11 ultrasonically melted and soldered to make a
12 connection between a silicon substrate and a
13 board.

14 Q. Does TAB bonding, uh, require a bond
15 pad, uh, for its interconnection?

16 A. Yeah. I would say it requires a bond
17 pad, yeah. It certainly requires some
18 conductive surface there to bond to, so, yeah.
19 That would be known in the -- in the art, a bond
20 pad would be required.

21 Q. And what are the limits of placement
22 of a bond pad to interface, uh, with a TAB

1 bonding interface?

2 A. I don't understand your question.

3 Q. Well, you had -- I believe you
4 testified earlier that, um, you can only place a
5 bond pad on a chip within the limits of the
6 interconnecting technology.

7 A. Um-huh.

8 Q. So my question is: You know, what
9 are the limits of placement of a bond pad when
10 you use TAB bonding?

11 MR. BORSOS: Objection to form.

12 THE WITNESS: So I don't think the
13 TAB bonding can be used to have multiple rows of
14 bond pads as I described earlier. I think
15 that's -- typically wire bonding would be used
16 for that application.

17 So TAB bonding, they're usually, uh,
18 aligned in a -- in a single row. Um, they --
19 uh, of course you want it very near the edge.
20 You want it near the edge of the -- the
21 substrate, um, and you want them -- they have --
22 the bond pads have to be relatively large, um,

1 because the wires on the board, you know, the
2 leads on the board are -- are wider technology,
3 right?

4 So that's part of the reason why
5 there's a challenge to reduce the number of bond
6 pads, um, because that can also help you reduce
7 the size of the printhead silicon which is
8 costly. And so, um, the bond pads have to be
9 spaced to -- to match up with the spacing of
10 the -- um, the widths and spaces that are on
11 the -- the flex board.

12 BY MR. KRITSAS:

13 Q. So, Mr. Dietl, I wanted to direct
14 your attention to, uh, your declaration, which
15 is Exhibit 2004. Specifically, I wanted to
16 point you to paragraph 54 of your declaration.

17 MR. KRITSAS: Michelle, if we could
18 scroll down to paragraph 54?

19 Perfect. Thank you.

20 BY MR. KRITSAS:

21 Q. So, Mr. Dietl, in your declaration,
22 you provide opinions on the meaning of certain

1 claims terms used in the '864 patent, correct?

2 A. Yes.

3 Q. Specifically, you provide an opinion
4 on the meaning of "bondpad."

5 Is that right?

6 A. Yes.

7 Q. In paragraph 54 of your declaration,
8 you state: "In my opinion, the term 'bondpad'
9 as used in the '864 patent would be understood
10 by a PHOSITA to refer to a relatively large area
11 near the edge of a heater chip that facilitates
12 connections to external structures."

13 Did I read that right?

14 A. Yes.

15 Q. So I wanted to talk about a few
16 aspects about your -- uh, your construction
17 here.

18 So your construction of bond pad
19 includes a requirement that the bond pad is
20 "near the edge of a heater chip."

21 Is that right?

22 A. Yes.

1 Q. Um, and I think we were talking about
2 it earlier.

3 That's because that's where bond pads
4 are -- are located, is at the edges of the
5 chips, right?

6 A. Right.

7 Q. And other than the example with wire
8 bonding where you might have two rows of, uh,
9 bond pads, are you aware of any other situations
10 where you wouldn't put a bond pad at the edge of
11 the chip?

12 A. Well, I think even in the wire
13 bonding example that I gave, it's still near the
14 edge of the chip, right?

15 But it's -- so in either case, it
16 follows -- I still stand by the claim
17 construction.

18 Q. Got it.

19 So -- so in your opinion, all bond
20 pads are located near the edge of the heater
21 chip?

22 Is that fair to say?

1 A. I would say for the purposes of this,
2 uh, ink jet technology, yes.

3 Q. Um, and what are you referring to for
4 this ink jet technology?

5 A. Um, well, the field of -- the field
6 of art that we're talking about here in ink jet
7 printheads.

8 Q. Okay. So -- so with respect to
9 thermal ink jet printheads, it is fair to say
10 that bond pads are -- are going to be located
11 near the edge of the heater chip?

12 A. Yes.

13 Q. And so your construction also
14 addresses the size of the bond pad, correct?

15 A. Yes. Relatively large.

16 Q. So what does it mean for a bond pad
17 to be relatively large?

18 A. So as I said, uh, a few minutes ago,
19 is that the design rules for the width of traces
20 and spaces in a semiconductor substrate are very
21 small, right?

22 The field -- the semiconductor field

1 is pushed and pushed and pushed to make chips
2 smaller and, you know, at any given time in
3 history, there's design rules which allow --
4 that were available for the ink jet printhead
5 designers to use, um, to -- to make their -- to
6 make their devices, but those -- those design
7 rules are much smaller than, uh, circuitboard
8 design rules.

9 So you -- so, typically, in a ink jet
10 printhead, you have a semiconductor substrate as
11 the -- uh, you know, which is sometimes referred
12 to the print -- as the printhead, but then it
13 has to connect into a board which then in turn
14 allows the -- the bigger printhead or cartridge
15 structure to connect into the printer. And so
16 the design rules in that board, that goes from
17 the semiconductor substrate to those connection
18 points in the printer, are much larger, right?

19 Like, you know, trace widths of a
20 millimeter wide and a half millimeter space
21 between traces, wherein the semiconductor
22 substrate, um, the traces might be a micron, the

1 minimum trace width might be a micron with a
2 half of a micron, uh, distance between traces.
3 So they could be like a 1000x difference in
4 design rules. So in order to make that -- uh,
5 to make that transition, you have to put a
6 rela- -- a large structure to connect to that
7 technology that is not as small as a
8 semiconductor technology. So that's what I mean
9 by relatively large.

10 There's also a lot -- (breaking up)
11 tolerances, right, that, um, you know, when
12 you --

13 THE COURT REPORTER: I'm sorry.
14 Could you start the last part of your answer
15 over?

16 You broke up a little bit there.

17 THE WITNESS: Okay.

18 THE COURT REPORTER: You said . . .

19 * * *

20 (Whereupon, the reporter read back
21 the partial answer.)

22 * * *

1 THE COURT REPORTER: And then from
2 there, pick up, please. Thank you.

3 THE WITNESS: Right.

4 And they said they also want it to be
5 relatively large because of tolerances. You
6 have to place the semiconductor substrate, uh,
7 adjacent the -- the board and they both -- those
8 operations, placing the board and placing a
9 semiconductor substrate, have, uh, a tolerance
10 associated with that placement, and so you don't
11 want a connection to short to the neighboring
12 bond pad, right?

13 Or the neighboring trace, uh, or
14 contact on the flex, and so, you know, you need
15 some -- you need some, uh, size there to pick up
16 alignment tolerances and get -- you know, get
17 the minimum required overlap.

18 BY MR. KRITSAS:

19 Q. Would a person of skill in the art,
20 you know, attach, uh, an external contact, uh,
21 directly to -- to a trace on a heater chip?

22 MR. BORSOS: Objection to form.

1 THE WITNESS: So I -- I think that,
2 um, the answer is that a bond pad is a special
3 structure, right, that has -- um, that has --
4 for one thing, it's -- it's exposed. It's not
5 buried underneath passivation materials, right?

6 And that's typically plated with, um,
7 aluminum or gold sometimes so that they don't
8 oxidize and -- um, and so the distinction
9 between, uh, a trace and a bond pad is that it's
10 prepared for bonding-to, right?

11 So, um, for wire bonding, I mean, you
12 could take a narrower trace and if you didn't
13 cover it with passivation and you prepared the
14 surface of that metal, um, properly, you could
15 wire bond to something, uh, to a trace, but, um,
16 I mean, it's the -- the distinction we've made
17 here is -- in the King patent is that the bond
18 pads are these large structures, these large
19 surfaces, and the traces are something quite
20 smaller, and they're -- function of the trace is
21 typically just to supply voltage from the bond
22 pad to the heater arrays, not as a bonding

1 surface.

2 So long way around is you could do
3 it, but it's not -- that's not desirable.

4 BY MR. KRITSAS:

5 Q. And if -- if you were using a TAB
6 automated bonding procedure, would you be able
7 to interface that -- you know, that portion of
8 the flex circuit directly to a -- uh, to a power
9 trace using TAB automated bonding?

10 A. I don't -- I don't know.

11 You could have a trace that comes
12 right to the edge of the die that doesn't
13 connect to a bond pad.

14 And could you connect TAB automated
15 bonding to that?

16 I -- I don't know.

17 Q. Well, part of your -- you know, your
18 definition for a bond pad is it needs to be
19 relatively large to allow for, uh, you know, the
20 interface between the chip and external
21 structures.

22 Is that fair?

1 A. Yes.

2 Q. So -- so what I'm trying to
3 understand is why does it need to be relatively
4 large if you can attach, you know, external
5 structures directly to, uh, a power trace, for
6 example?

7 MR. BORSOS: Objection to form.

8 THE WITNESS: So I mean, you said
9 could, and you could do a lot of things, but I
10 think that the standard practice would be to --
11 TAB automated bonding would connect directly to
12 a bond pad. You wouldn't want to connect it to
13 a trace.

14 But could you? I -- that's the part
15 I don't know.

16 BY MR. KRITSAS:

17 Q. Why wouldn't you want to connect, um,
18 an external structure directly to a power trace?

19 A. Because it's not relatively large.
20 It doesn't have alignment tolerances built in,
21 um, to be able to tolerate the alignment
22 tolerances' differences, and give you enough

1 surface area.

2 Q. Is it fair to say a person of skill
3 in the art would not connect an external
4 structure directly to a power trace?

5 A. I think that a person --

6 MR. BORSOS: Objection to form.

7 THE WITNESS: -- a person having
8 ordinary skill in the art would -- would, uh,
9 try to avoid it, yes.

10 BY MR. KRITSAS:

11 Q. So I want to go back to, um, the
12 discussion about the size of the bond pad.

13 Um, so it's -- so it's your opinion
14 the bond pad needs to be relatively large
15 relative to the power trace.

16 Is that -- is that fair?

17 A. Um, that's typically, um, the
18 requirements for the bond pad, uh, size are
19 usually larger than the requirements for the
20 trace, trace width.

21 Q. Are the requirements for the bond pad
22 size always larger than the requirements for the

1 trace width?

2 A. Um, I don't know. That's kind of a
3 broad term. I don't -- I don't know.

4 Q. Well, you said "usually," so I'm
5 trying to understand if there are situations
6 that you understand where the bond pad might be,
7 uh, smaller than the power trace.

8 A. Um, typically not, not that I -- not
9 that I've seen.

10 Q. Um, so is there a -- you know, a
11 limit as to how much larger the bond pad should
12 be compared to the width of the power trace?

13 A. No. I don't think that that's -- um,
14 the -- the bond pad size is more determined by,
15 um, the size of the contact area you want to
16 make on it or the number of wire bonds you want
17 to make to it or, um, the -- um, you know, and
18 also the -- the manufacturing capability in
19 terms of alignment tolerances are going to drive
20 the bond pad size, um, more than the trace,
21 trace width would.

22 Q. So if -- so the bond pad size, you

1 would agree then, is -- it's really focused on
2 having a successful interface between the -- you
3 know, the printhead die and those external
4 structures we talked about earlier.

5 Is that fair?

6 MR. BORSOS: Objection to form.

7 THE WITNESS: It's fair if you
8 consider, you know, the definition of
9 "successful" is both a -- you know, a
10 reliability perspective, right, that you get a
11 good -- good connection that's reliable and
12 long-term, as well as the current carrying
13 capability, right?

14 You need to have enough surface area
15 in the interconnection that -- that it's not
16 resist -- too resistive. So that would make it
17 successful.

18 BY MR. KRITSAS:

19 Q. So if there were a bond pad, um, that
20 met all of the requirements that you just
21 identified, um, yet were connected to a power
22 trace that were wider than the bond pad, um,

1 would you -- would you agree that that would
2 still be considered a -- a bond pad under your
3 definition?

4 A. Um, I don't know how that would
5 typically work. Um, I'm trying to envision what
6 that looks like, but, uh, I mean, I -- that's
7 not something I've seen where the trace -- trace
8 can be as wide as the bond pad typically, but
9 not -- not wider.

10 Q. So is it your opinion then that a
11 bond pad needs to be, um, at least as wide as
12 the power trace it's connected to?

13 MR. BORSOS: Objection to form.

14 THE WITNESS: No.

15 Bond pad at least as wide (sotto
16 voce).

17 BY MR. KRITSAS:

18 Q. Maybe -- maybe I can clarify.

19 So, um, you said you've seen, um,
20 power traces that are as wide as the bond pad.

21 Is that what you had testified to
22 earlier?

1 A. I think, yeah, I have seen that, yes.

2 Q. So -- so would you agree then that --
3 um, that a -- um, an area near the edge of the
4 chip that facilitates connections to external
5 structures that is as wide as a power trace
6 would be a bond pad under your construction?

7 MR. BORSOS: Objection to form.

8 THE WITNESS: Sure. It could be.
9 I'm sure it could be if it was designed to
10 connect properly to the outside world.

11 BY MR. KRITSAS:

12 Q. And what about if that power trace
13 is -- is wider than that -- uh, that bond pad we
14 just talked about that's properly designed to
15 connect to the outside world?

16 Is that still a bond pad under your
17 definition?

18 A. Yeah. I -- I don't think there's any
19 reason why that wouldn't be a bond pad, and you
20 couldn't have a ground plane or something
21 that -- where the bond pad is smaller than
22 the -- than a ground plane or, you know, where

1 the lead would fan out from the -- to something
2 wider from the bond pad. I don't know why you
3 would do it, but, you know, you -- I don't see
4 there's a reason why you couldn't do it.

5 Q. So is it fair to say that there --
6 there aren't any size constraints on -- on a
7 bond pad other than, uh, the bond pad being
8 large enough to, uh, connect to the outside
9 world as you -- you put it earlier?

10 MR. BORSOS: Objection to form,
11 misstates the testimony.

12 THE WITNESS: Yeah.

13 I think there's lots of factors to
14 determine the size of a bond pad, right?

15 You're trying to reduce overall
16 silicon size. You've got to carry the right
17 amount of current. Um, you -- um, have to have
18 a reliable interconnect over the lifetime of the
19 device. Um, so I think there's a lot of factors
20 that determine the bond pad. There's not any --
21 only one thing.

22 BY MR. KRITSAS:

1 Q. But at least with respect to, uh, a
2 power trace, would you at least agree that, you
3 know, the -- the patent doesn't impose a
4 restriction on the size of a bond pad relative
5 to a power trace?

6 MR. BORSOS: Objection to form.

7 THE WITNESS: The patent doesn't talk
8 about -- (broke up) -- doesn't address the size
9 of the bond pad relative to the power trace,
10 so --

11 THE COURT REPORTER: Could you start
12 your answer over again, Mr. Dietl?

13 THE WITNESS: I'm sorry. I --

14 THE COURT REPORTER: You broke up
15 again.

16 THE WITNESS: I said the patent does
17 not address the size of the bond pad relative to
18 the power trace, but as a PHOSITA, you know,
19 it's typically larger than the power trace, in
20 my experience.

21 BY MR. KRITSAS:

22 Q. Mr. Dietl, um, under your

1 construction of bond pad, uh, does a bond pad
2 need to connect to any particular type of trace
3 on the printhead die?

4 MR. BORSOS: Objection to form.

5 THE WITNESS: Can you -- can you tell
6 me what you mean by "type of trace"?

7 BY MR. KRITSAS:

8 Q. Sure. Would -- um, you know,
9 would -- under your construction of bond pads,
10 um, does the patent limit -- uh, limit the
11 traces that are connected to the bond pad -- uh,
12 let me -- let me ask it a better way.

13 Does the patent require, uh, that the
14 bond pad connect to a power trace under your
15 construction?

16 MR. BORSOS: Objection to form.

17 THE WITNESS: My definition of bond
18 pad, I -- I don't believe is the -- isolated to
19 just the patent claims of the -- of a bond pad
20 for a supply line. I think it's, in general,
21 you know, the bond pad is a relatively large
22 structure and other traces like logic or data

1 that, uh, come from a bond pad still are subject
2 to the same constraints around interconnecting
3 to the outside world that relate alignment
4 tolerances and the technology of the -- the
5 interconnecting board. So I think that the
6 definition still stands for those, um, other --
7 other signal traces on the device.

8 BY MR. KRITSAS:

9 Q. So under your definition of bond pad,
10 uh, that could include use cases where the bond
11 pad is, uh, for example, a data line bond pad.

12 Is that fair?

13 A. Yes.

14 Q. So I wanted to switch to, uh, your
15 next construction, um, but wanted to give you an
16 opportunity if you wanted to stretch your legs
17 or anything. Otherwise, I'm happy to keep
18 going.

19 A. Yeah. I'm fine right now if everyone
20 else is.

21 Q. Great.

22 Uh, so if we go to paragraph 55 of

1 your declaration, uh, you provide, uh,
2 construction for the term "physically separated
3 proximal to the bondpad."

4 Do you see that?

5 A. Yes, I do.

6 Q. Uh, so in your declaration, you
7 provide the opinion that "the term 'physically
8 separated proximal to the bondpad' would be
9 understood by a PHOSITA to mean that the
10 structure of a power trace diverges or separates
11 closer to the bondpad than to the heater arrays
12 to which it connects."

13 Did I read that right?

14 A. Yes, you did. Yep.

15 Q. So I want to focus, uh, on the
16 "proximal" term first.

17 So you opine that: The term
18 "proximal" is related to, uh, the distance from
19 a connection or point of origin, not merely
20 orientation. (As read)

21 Do you see that in paragraph 56?

22 A. Yep, I do.

1 Q. I'm going to -- I think you rely on
2 two different dictionary definitions in
3 paragraph 56.

4 Is that right?

5 A. That's correct.

6 Q. Uh, and I think one of the
7 definitions you rely on for "proximal" is
8 defined as "'nearest' or 'near the central part
9 of a body or a point of attachment or origin.'"

10 Is that right?

11 A. Yes, it is.

12 Q. Um, so -- so under these dictionary
13 definitions that you've cited, um, the
14 separation needs to occur just near the bond
15 pad.

16 Is that fair?

17 A. Near as in, you know, less than
18 halfway, right?

19 So, you know, I -- "proximal" being a
20 relative term. It's closer to the bond pad than
21 to the heater array would be nearer.

22 Q. So you said "less than halfway,"

1 right?

2 Less than halfway of what?

3 A. Of the distance between the bond pad
4 and the heater array.

5 Q. So what are you relying on in the
6 '864 patent to support your opinion that the
7 separation must occur closer to the bond pad
8 than to the heater array?

9 A. I'm -- in the patent, I'm relying
10 upon Figure 3, and, you know, it's quite, uh,
11 precisely, you know, shown that those
12 connections separate very near the bond pad,
13 right?

14 So "proximal," meaning right there at
15 the bond pad.

16 I'm also relying on the specification
17 of the '864 patent which talks about why they --
18 why it's important to separate "proximal to the
19 bondpad," "as close as possible to the bondpad"
20 because that gives you more distance to tune
21 the -- to match the resistance of the traces,
22 um, to get equivalent parasitic resistance of

1 the traces to the two arrays, and so that's what
2 I use to make that, uh, assessment.

3 Q. So where does it say in the '864
4 patent, um, that the separation needs to occur
5 closer to the bond pad than the heater array?

6 MR. BORSOS: Objection to form,
7 mischaracterizes testimony.

8 THE WITNESS: I don't believe it uses
9 the -- that precise language.

10 BY MR. KRITSAS:

11 Q. So -- so what portion of the
12 specification of the '864 patent, then, do you
13 rely upon to support this construction?

14 A. So the first -- as I said, the first
15 thing I rely upon is Figure 3, right?

16 And -- and if we go to column 5, line
17 64: Further, as shown in the exemplary
18 embodiment of FIG. 3, the power traces are
19 physically separated as they meet the bond pad.
20 As shown, it may be advantageous to utilize two
21 separate power traces from a single bond pad 328
22 to efficiently balance the resistance of the

1 power traces 326. This ensures adequate power
2 balancing to the heater arrays. Additionally,
3 the on-chip routing of the power traces from a
4 single bond pad may also be positioned close
5 together, and more closely than conventional
6 power traces stemming from different bondpads.

7 (As read)

8 And then it says: Although not
9 illustrated, it would be appreciated that a
10 single power trace may extend from the bond pad,
11 and then branch into two or more traces that
12 extend to the respective heater arrays. (As
13 read)

14 So in reading that, the desire of
15 what they're trying to do is to have this, uh,
16 distance that's required to efficiently balance
17 the series resistance of the power traces, and
18 that a person having ordinary skill in the art
19 would, uh, recognize that that means that you'd
20 want to split them out as close to the bondpads
21 as possible. And, um, not having a definition
22 of "proximal" in the specification, having to,

1 you know, rely on those dictionary definitions
2 to say that it's "nearer" is "proximal" would --
3 would meet that requirement. Although you
4 really want it as close as possible to the bond
5 pad.

6 Q. So the -- so you agree, though, that
7 the patent doesn't give us a definition of
8 "proximal."

9 Is that right?

10 A. I don't believe so.

11 Yes, I -- I agree. It only -- it
12 only exists in the claims.

13 Q. And the excerpt of the '864 patent
14 you just read, it doesn't use the word
15 "proximal" in it either, does it?

16 A. It doesn't, but it describes the --
17 the idea of why you want multiple traces that
18 extend from a single bond pad and why even if
19 you, um, split out from one trace to multiple
20 traces, that you do so as close as possible to
21 that bond pad so that you have the space you
22 need to efficiently balance a series resistance

1 of the power traces. So, you know, you have to
2 use PHOSITA knowledge to understand that.

3 Q. Well, let's -- let's go to Figure 3
4 of the '864 patent because you had said you'd
5 relied upon Figure 3 to support construction,
6 right?

7 A. Yes.

8 Q. So Figure 3 depicts two separate
9 power traces attached to a single bond pad,
10 right?

11 A. That's -- that's correct.

12 Q. So it's -- it's not showing us a
13 single trace that separates into two traces.

14 Is that fair?

15 A. That -- (breaking up) -- yes. That
16 embodiment is not shown. That's correct.

17 THE COURT REPORTER: I'm sorry.
18 Could you repeat your answer, Mr. Dietl?

19 I -- I didn't hear it.

20 THE WITNESS: Yes.

21 I said that embodiment is not shown.
22 That is correct.

1 BY MR. KRITSAS:

2 Q. So Figure 3 doesn't depict what
3 proximal's is with respect to a trace that
4 splits.

5 Is that fair?

6 A. Figure 3 does not show a trace that
7 splits. That's correct. So it doesn't -- it
8 doesn't show what -- where a split location
9 would be.

10 Q. And so Figure 3 doesn't show where a
11 split location would be that would be proximal
12 to the bond pad.

13 Is that fair?

14 A. Um, but what the specification does
15 show, when it talks about Figure 3, is that it's
16 very important to have these leads 326 extend
17 either from the bond pad, uh, or close enough to
18 the bond pad in order that you have enough
19 distance to balance the voltage, right?

20 And, uh, so it does talk to that. So
21 it does imply that you need to get that as close
22 as possible to the bond pad, and I think

1 preferably having the traces, um, stem from the
2 bondpads themselves.

3 Q. Right. So Figure 3 shows two traces
4 that are connected directly to the bond pad,
5 right?

6 A. That's correct.

7 Q. And we're trying to understand, you
8 know, at what point or at what location, um, a
9 single trace that splits would be proximal to
10 the bond pad, correct?

11 A. That's correct.

12 Q. And Figure 3 doesn't depict where
13 along that trace, uh, would be proximal.

14 Is that fair?

15 A. The -- the figure does not show it,
16 but the specification does describe your desire
17 to have that split as close as possible to the
18 bond pad, uh, as you can so that you can balance
19 voltage variation.

20 Q. So I think earlier you -- you
21 mentioned, um, you're considering "proximal" to
22 be, um, at most, half of the length of -- of the

1 power trace; is that -- is that correct?

2 A. Yes. That was what I mean by
3 "nearest," right.

4 In the definition of the --
5 dictionary definition of "nearest," um, where,
6 um, near the central part of a body or point of
7 attachment or origin or -- uh, or nearest.

8 And so, you know, the -- my
9 interpretation of "nearest" is "less than
10 halfway."

11 Q. So under your interpretation of
12 "physically separated proximal to the bondpad,"
13 a person of skill in the art would consider the
14 overall length of the power trace; is that
15 correct?

16 MR. BORSOS: Objection to form.

17 THE WITNESS: The -- the length of
18 the power trace from the bond pad to the first
19 heater of the array I think is the important --
20 the -- the -- the end heater of the array would
21 be the important dimension, and half of that
22 would be "nearest."

1 BY MR. KRITSAS:

2 Q. And so I think you testified earlier
3 that the power trace -- the overall length of
4 the power trace is from the bond pad to the
5 furthest heater that the power trace is
6 connected to.

7 Is that right?

8 A. No. I did not testify to that, no.

9 Q. Well, I think we talked earlier about
10 Figure 3.

11 Do you recall that, uh, we discussed
12 that the power trace would extend from the bond
13 pad to, um, some distance, uh, into the heater
14 array box that's depicted in Figure 3?

15 A. That -- that's correct, and it
16 supplies voltage to all the heaters in the array
17 up to that point.

18 Q. Yeah. And so I think what I'm --
19 what my question is, um, so the overall length
20 of the power trace runs from the bond pad to the
21 furthest heater array that that particular power
22 trace is connected to.

1 Is that fair?

2 A. Um, I think that in the -- in the
3 context of talking about the parasitic
4 resistance of -- balancing the parasitic
5 resistance, that distance from the first heater
6 to the center is equal on both sides, right?

7 And so you need to do your balancing
8 of parasitic resistance before you get to the
9 first heater, that first group of eight. And
10 so, um, what's important is that the, um,
11 "proximal" would be defined as halfway between
12 the first heater of the array and the bond pad.
13 That's the -- the important parameter to balance
14 the parasitic resistance.

15 Q. So you're telling me you don't need
16 to consider the parasitic resistance between the
17 first heater in the array and the last heater in
18 the array that's connected to that power trace?

19 MR. BORSOS: Objection to form.

20 THE WITNESS: That parasitic
21 resistance is important, but it's not parasitic
22 resistance that you can balance by -- um, by the

1 traces that stem from the bond pad to the array,
2 right?

3 So you don't have an opportunity from
4 the first heater into the -- uh, the center
5 heaters to change that. So your -- your
6 opportunity is between the bond pad and the
7 first heater.

8 BY MR. KRITSAS:

9 Q. Why can't you adjust the parasitic
10 resistance between the first heater in the array
11 and the last heater, uh, that's connected to
12 that particular power trace?

13 A. I think that would provide problems,
14 um, relative to the layout of where the heaters
15 are positioned in respect to the via, the --
16 the -- the -- uh, the channel, the channel
17 length for fluid -- microfluidics and, uh,
18 internal flow resistance. So you need that --
19 you need that, uh, supply line to be uniform and
20 not influence the position of the heaters
21 themselves.

22 Q. So is it your opinion that a person

1 of skill in the art would not adjust the -- the
2 parasitic resistance between the first heater in
3 an array and a last heater in an array connected
4 to a particular power trace?

5 A. Um, I don't know the --

6 MR. BORSOS: Objection to form,
7 mischaracterizes testimony.

8 THE WITNESS: I don't know that they
9 would not, but I think it's not -- it's harder
10 to do. Your opportunity to adjust that
11 parasitic resistance due to this length
12 difference, uh, of the farther heater array and
13 the closer heater array is between the bond pad
14 and that first heater. Any parasitic resistance
15 that -- and -- and tuning of that trace between
16 the first heater and the middle heater would be
17 done equivalently on each side, right?

18 They would be the same.

19 BY MR. KRITSAS:

20 Q. But you would agree, though, it's
21 possible to adjust the parasitic resistance
22 between the first heater and the middle heater

1 in the array, right?

2 A. Adjust?

3 Um, I don't know if "adjust" is the
4 right term, but you would strive to minimize
5 parasitic resistance down the length of the
6 array, um, and you can -- you can try to do
7 that, um, but, typically, you know, in this
8 case, they would -- you would do it the same.
9 That parasitic resistance on the left side and
10 the right side of the via, those two arrays, is
11 the same, and so you can't -- you can't do it
12 differently from one side to the other. The
13 only place you can do it differently from one
14 side to the other is between the bond pad and
15 the first heater.

16 Q. Why is it important to balance the
17 parasitic resistance, um, of the power trace?

18 A. So because, um, the current through a
19 heater is -- uh, is v over r , right?

20 Um, that's what generates the heat
21 and causes the vapor bubble to -- uh, to form,
22 which ejects the ink out of the nozzle, right?

1 That's how an ink jet, thermal ink
2 jet drop ejector works. So you want that
3 voltage to be the same as possible to every
4 heater in -- in the array, at least to within a
5 specification where it doesn't influence the
6 size of the drop of ink that's ejected enough
7 that's visible in the image.

8 So it's important that the -- you
9 control the voltage that the heater array sees
10 to be the same to maintain the right drop size
11 and right image quality.

12 Q. So then why would you stop trying to
13 balance the resistance as soon as you get to the
14 first heater in the array?

15 A. I -- I -- what -- I didn't say that
16 you wouldn't stop trying to reduce parasitic
17 resistance from the first heater to the middle.

18 What I said was that you would do it
19 exactly the same way on each side of the via,
20 right?

21 You wouldn't treat, um, heater one on
22 the bottom, uh, and heater 160 I guess on the

1 left side any different than heater one on the
2 bottom to heater 160 on the right side, right?

3 You want those to be equivalent. So
4 the voltage that gets to that first heater
5 location, you at least want to try to -- what
6 King is trying to do is balance it at least up
7 to that point. He doesn't address what
8 additional means that you would do from heater
9 one to heater 160, but I can tell you, being a
10 person having ordinary skill in the art, you
11 would do it the same. You wouldn't balance any
12 more between one side or the other. You want to
13 start with the same going into the array.

14 Q. But isn't -- isn't what King is
15 referring to, is balancing the series resistance
16 of the heaters in a particular array?

17 A. The -- the series resistance I think
18 he refers to of the -- the trace series
19 resistance.

20 Q. Right. So he's -- he's referring to
21 balancing the resistance across the heaters
22 within a particular array.

1 Isn't that fair?

2 A. I think you -- you want to reduce
3 the -- you want to have the same voltage as
4 equally as possible across the entire array,
5 right?

6 That's definitely what you want to
7 do.

8 What I'm telling you is that once you
9 get to that first heater, you're going to do
10 everything the same on both sides, but the point
11 is that you -- so the point -- (breaking up) --

12 THE COURT REPORTER: Mr. Dietl, you
13 froze again.

14 THE WITNESS: The voltage that gets
15 to that first heater --

16 THE COURT REPORTER: I'm sorry.

17 Mr. Dietl?

18 Mr. Dietl, you froze again.

19 THE WITNESS: Yeah.

20 THE COURT REPORTER: The last part
21 that you said is:

22 * * *

1 (Whereupon, the reporter read back
2 the requested portion of the record.)

3 * * *

4 THE WITNESS: I'm sorry.

5 I said that the point that King is
6 trying to address is that to get the voltage to
7 be the same at that first heater, at the end of
8 the array and at least on both sides, and then
9 whatever you do with the rest of the array will
10 be equivalent, but you need the voltage at that
11 first point to be the resistance, the parasitic
12 resistance up to that first point to be the
13 same.

14 BY MR. KRITSAS:

15 Q. So -- so in your opinion, the '864
16 patent is not concerned with, uh, balancing
17 the -- or ensuring that you have a consistent
18 voltage across each of the individual heaters in
19 a single array?

20 MR. BORSOS: Objection to form.

21 THE WITNESS: They don't address it,
22 but a person having ordinary skill in the art

1 would know that in this device, you're always
2 trying to reduce parasitic resistance to the
3 extent you can possibly do it, uh, and, um, but
4 that's immaterial to what King is talking about,
5 right?

6 He's -- that's -- that's a separate
7 topic that's suggested in other patents, I'm
8 sure, um, but what King is saying is at least,
9 um, getting the voltage -- because of these
10 different distances that I have to deal with
11 between the bond pad and the array on the left
12 side and the right side, I want to introduce the
13 voltage to be equivalent when it goes into the
14 end of the array. So they're concerned with it,
15 but King is not -- King is not addressing that
16 in this patent.

17 THE COURT REPORTER: Hey, Counsel,
18 this is Rebecca, the court reporter. I
19 apologize for the interruption, but I do need a
20 break here pretty soon. Thank you.

21 MR. KRITSAS: Sure.

22 Why don't we -- um, let me just ask

1 one or two more questions, and we can take a
2 break, okay?

3 Um, or actually, you know, why don't
4 we -- why don't we take a break now, put a pin
5 in it, and then we'll pick up from here, okay?

6 * * *

7 (Whereupon, a short recess was taken.)

8 * * *

9 BY MR. KRITSAS:

10 Q. Mr. Dietl, I want to go back to
11 paragraph 56 of your declaration, Exhibit 204.

12 A. Okay.

13 Q. So in the middle of paragraph 66
14 [sic] -- I'm sorry.

15 In the middle of paragraph 56, you
16 state: "A PHOSITA would consider the bondpad to
17 be the point of origin of power traces, because
18 the power traces carry electricity from the
19 bondpad to heater arrays at their opposite
20 ends."

21 Do you see that?

22 A. Yes.

1 Q. So what I want to understand is, you
2 know, where in the claims does it include a
3 requirement that we need to consider the heater
4 arrays for this term "proximal"?

5 MR. BORSOS: Objection to form.

6 THE WITNESS: Okay.

7 Well, the -- the area where the term
8 "proximal" comes up in the claims is, um, both
9 in claim 3 and claim 9. Um, in those -- both of
10 those claims, the heater chip of -- claim 3
11 says: "The heater chip of claim 1, wherein the
12 bondpad supplies power to the first heater array
13 and the second heater array portions by power
14 traces physically separated proximal to the
15 bondpad."

16 And then claim 9 says: "The heater
17 chip of claim 8, wherein the at least two traces
18 are physically separated proximal to the
19 bondpad."

20 BY MR. KRITSAS:

21 Q. So in -- in the portion of claim 9
22 that you just read, um, it -- the separation

1 proximal to the bond pad is -- is not referenced
2 with respect to the heater arrays, right?

3 MR. BORSOS: Objection to form.

4 THE WITNESS: So what's -- I'm sorry.

5 What's the question again?

6 I'm just reading claim 8 that it
7 refers to.

8 BY MR. KRITSAS:

9 Q. So my question is claim 9 doesn't
10 refer to heater arrays, correct?

11 A. Inasmuch as it refers to claim 8
12 which refers to the "traces stemming from the
13 bondpad, wherein at least one the traces is
14 operatively connected to the first heater array
15 and at least another one of the traces is
16 operatively connected to the second heater
17 array."

18 So it's by -- by reference referring
19 to those traces and their connection to the
20 heater array.

21 Q. But claim 9 itself, when it
22 introduces the concept or the limitation of, um,

1 traces that are physically separated proximal to
2 the bond pad, it -- it doesn't tell us that it's
3 proximal with respect to the heater arrays in
4 that claim 9, does it?

5 MR. BORSOS: Objection to form.

6 THE WITNESS: I -- I -- I don't know.
7 I think it does by its reference to claim 8, but
8 I guess, you know, you may interpret it
9 differently, but it -- that's what it's
10 referring to.

11 BY MR. KRITSAS:

12 Q. So if I could understand your, uh,
13 construction of, uh, "'physically separated
14 proximal to the bondpad,'" um, it's your
15 position that we consider the length of the --
16 the power trace between the bond pad and the
17 first heater in the heater array.

18 Is that right?

19 A. Yes. I think that's the important --
20 that's what -- and then half of that distance --
21 close -- closer than half of that distance, um,
22 between there and the bond pad is proximal to

1 the bond pad.

2 Q. And so for -- for consideration of
3 the -- the term "'physically separated proximal
4 to the bondpad,'" we disregard any additional
5 length of the power trace after the first heater
6 array.

7 Is that right?

8 A. Yes. I believe that's -- that's
9 important. Yes, that's right.

10 Q. Got it.

11 So -- so we're looking at "proximal"
12 with respect to a portion of the power trace.

13 Is that fair?

14 A. To the power trace as it extends from
15 the bond pad to the first heater of the array,
16 yes.

17 Q. I want to turn to, uh, Exhibit 1005.

18 MR. KRITSAS: Which, Michelle, would
19 you, uh, please mark and introduce?

20 * * *

21 (Whereupon, Dietl Exhibit 3 was marked
22 for identification.)

1 * * *

2 BY MR. KRITSAS:

3 Q. Exhibit 1005 is patent 7,722,144.

4 Do you recognize Exhibit 1005,

5 Mr. Dietl?

6 A. I do. I do.

7 Q. Um, Exhibit 1005 I'll refer to as

8 Benjamin, uh, '144.

9 Um, is that fair?

10 A. Yes, it is.

11 Q. So I want to point your -- I want to
12 direct your attention to paragraph 59 of your
13 declaration, Exhibit 2004.

14 So in paragraph 59, you discuss
15 Benjamin '144's Figure 25B.

16 Do you see that?

17 A. Can you -- can you say it again?

18 Q. Sure. In paragraph 59 of your
19 declaration, if you go down to, uh, the next
20 page, uh, you discuss Figure 25B of Benjamin
21 '144.

22 Do you see that?

1 A. Yes. Figure 25A and 25B, yes.

2 Q. And so Figure 25A and B both show a
3 flex circuit used to couple external circuitry
4 to a printhead die.

5 Is that right?

6 A. Yes. That's correct.

7 Q. Um, and, you know, Benjamin '144, uh,
8 discusses contacts 2006 that are used to provide
9 the coupling to the printhead die.

10 Is that right?

11 A. Yes. That's -- that's correct.

12 Q. And those -- those contacts, uh, 2006
13 are -- are shown at the bottoms of Figures 25A
14 and 25B, right?

15 A. That's -- that's correct.

16 Q. Um, and so these --

17 MR. KRITSAS: And I'm not sure if you
18 can zoom in on Figure 25B, Michelle, to the
19 orange part?

20 BY MR. KRITSAS:

21 Q. Mr. Dietl, can you see, uh, the
22 zoomed-in portion of Figure 25B on the screen?

1 A. Yes. I -- yes, I do.

2 Q. So, um, these contacts 2006, they --
3 they kind of look like fingers, um, on the flex
4 circuit.

5 Do you see that?

6 A. Yes.

7 Q. Um, and we talked earlier about tape
8 automated bonding.

9 Do you recall that?

10 A. Yes. We did talk about that, yes.

11 Q. So, um, is -- when the heater chip of
12 Benjamin or the printhead die of Benjamin, um,
13 is coupled to those contacts 2006, um, would you
14 be using tape automated bonding to create that
15 connection?

16 A. That's one means, but that's not the
17 only means. Uh, they -- they also might be
18 using wire bonding to make that connection.

19 Q. In your experience, um, when you have
20 a flex circuit with, uh, finger-like connections
21 like this, uh, what type of connection
22 methodology would you use to --

1 A. In my -- in my experience, I used
2 wire bonding.

3 Q. Are there any special requirements,
4 uh, with a flex circuit, uh, to utilize wire
5 bonding versus, uh, TAB bonding?

6 A. I think, uh, the -- you know, they
7 both need, uh, exposed metal contacts, um,
8 typically plated with gold, um, and, uh, or --
9 yeah. Typically plated with gold and, um, in
10 the -- so I think that's -- they're -- they're
11 pretty much common in that respect. You can't
12 have oxidation on the surface to make good
13 contact in the -- in the joint.

14 Q. And in terms of the physical
15 structure of, uh, you know, these -- these
16 fingers 2006, um, you know, would they be --
17 would those -- that finger-like structure be
18 appropriate for wire bonding?

19 MR. BORSOS: Objection to form.

20 THE WITNESS: Yes. I don't think
21 that there's, uh, a difference in what they've,
22 uh, depicted here -- the -- between wire bonding

1 and tape automated bonding.

2 BY MR. KRITSAS:

3 Q. Okay. And so I think we talked about
4 this earlier, but when we're either using tape
5 automated bonding or wire bonding, um, a person
6 of skill in the art would -- would understand
7 you'd need to bond onto the chip level, uh,
8 using a bond pad, right?

9 A. The -- so in either case, there's
10 a -- on the semiconductor substrate side,
11 there's a bond pad --

12 Q. Okay.

13 A. -- or multiple bondpads.

14 I mean, it doesn't need to be a
15 one-to-one relationship necessarily between
16 the -- the -- the leads contacts on the flex
17 board and the bondpads on the die. There could
18 be overlapping conditions or multiple bondpads
19 bonded with a single trace.

20 Q. How would you connect a single trace
21 to two distinct bondpads?

22 A. It's -- uh, it's quite simple. I

1 mean, it's -- um, you know, you basically -- uh,
2 you know, the bondpads are adjacent to these
3 contact points would -- and particularly with a
4 wire bonder, you'd basically go down here --
5 it's like stitching. It's like sewing. You go
6 from -- take a bonder and bond it from one side
7 to the -- to the -- uh, on the flex to the other
8 side on the semiconductor substrate bond pad and
9 you can -- on that trace size to a wire bonder,
10 that's quite large, so you could put, you know,
11 three or four wire bonds on that given trace,
12 and they could go to different bondpads.

13 Now, they would be -- you know,
14 they're -- they're all getting the same signal,
15 right?

16 They're all getting the same signal
17 that comes in on that trace, but you can --
18 for -- for reasons that you might have, um, wire
19 bond to -- to multiple bondpads from a single
20 trace.

21 Q. Would you be able to bond a single
22 contact 2006 to multiple bondpads using tape

1 automated bonding?

2 A. I -- I think you could. I have less
3 experience with tape automated bonding than I do
4 with wire bonding, but I think that if you had
5 two bondpads that -- underneath a single, uh,
6 contact, you could -- you could, uh, extend it
7 across both of them, and make contact to each.

8 Q. Why wouldn't you just use one large
9 bond pad rather than two small bondpads?

10 A. Well, you may have a need to -- uh,
11 how you wanted to run the traces from that bond
12 pad, um, up to the other ports of the die or
13 something like that. You might do it for
14 redundancy, um, reliability and redundancy.

15 Q. And so let's look at the top of
16 Figure 25B. And it looks like you've
17 highlighted a number of -- uh, or a portion of
18 Figure 25B in purple.

19 Do you see that?

20 A. Yes, I do.

21 Q. And what -- what does the area that
22 you've highlighted in purple represent?

1 A. So those circular areas are the pads
2 that connect into the printer connector pins,
3 right?

4 They have a -- um, sometimes they
5 have a bumped -- a bumped flex in the printer or
6 a spring-loaded pin, um, that contacts each of
7 these circular areas. Um, each of these areas
8 are labeled with what their signal -- um, their
9 signal name is in the, um, Benjamin '144 patent.

10 So, you know, you can see E2 at the
11 top left is enable 2. There's a Ground 2 next
12 to that. Down below that is a Fire 2. Below
13 that is ID, and then below that is Data 2,
14 right?

15 So these are labeled in what their
16 signal names are, and you go through this and
17 say that -- this is talked about in the Benjamin
18 '144. Some of the -- some of the contacts
19 are -- are mentioned.

20 Q. So one of the contacts you mentioned
21 was, uh, data contacts.

22 Um, Is that right?

1 A. That's correct.

2 Q. And those are depicted as D1 through
3 D8 in Figure 25B?

4 A. Yes.

5 Q. Um, in each of the contact areas, D1
6 through D8, uh, those connect to a single, uh,
7 contact 2006 at the bottom.

8 Uh, is that right?

9 A. Yeah. You know, I -- I've looked at
10 these, you know, and traced some of them down,
11 you know. You have to jump the little bridge
12 here, but, you know, I think you pretty much can
13 assume what -- they align, and, uh, you know,
14 you can discern what leads 206 correspond to
15 what interface contact pads up in the -- in the
16 2002 area.

17 Q. Got it.

18 So -- so D1 connects to a single
19 respective, uh, contact 2006 at the bottom of
20 Figure 25B, right?

21 A. Yeah. I mean, I didn't do it
22 exhaustively, but, um, I think that's the

1 general purpose. You know, maybe -- maybe some
2 go to two. I don't know. I didn't do that
3 exhaustively.

4 Q. Well, can you take -- take a look
5 now, and let me know, uh, whether all of the
6 data lines, D1 through D8, connect to -- uh,
7 each connect to a single respective contact
8 2006?

9 And if you want to take a look at
10 your own version of 25B, please -- please go
11 ahead.

12 A. Yeah. I'm going to have to. Yeah.
13 Well, it's a little bit difficult in
14 the center, but I mean I can't see any rea- --
15 anywhere where it shows that they don't go
16 one-to-one. It's a little bit tough in the
17 center. It gets really crowded and blurry.

18 Q. So -- um, and then Benjamin '144, it
19 teaches us that each data line contact, uh, such
20 as D1, uh, provides a signal to a respective
21 data line group on the chip itself.

22 Is that right?

1 A. I'd have to go back and take a look
2 at the language. Um, I'm sorry.

3 Q. Sure. Um, and if it's helpful, um, I
4 can direct your attention to column 77, line 57.

5 A. There you go. Okay.

6 Okay. So, you know, it's -- what it
7 says is they're configured to receive signals
8 from the printer to the contact areas to provide
9 the print data. They don't -- in this
10 paragraph, they don't talk about -- that -- um,
11 you know, that the, uh, contacts 206 -- 2006,
12 but the contact areas 2002 receive those
13 signals.

14 Q. Correct. So at column 77, starting
15 at line, uh, 57, it says: "Data line contact
16 areas D1-D8 are configured to receive signals
17 which provide print data representative of an
18 image to be printed and to provide data signals
19 D1-D8 respectively, to the individual data line
20 groups --"

21 A. Right.

22 Q. "-- e.g., data line groups D1-D8."

1 A. Um-huh.

2 Q. So --

3 A. Agreed. Yes.

4 Q. So the -- the contact areas D1
5 through D8 on the flex circuit, those receive
6 data signals from some external portion of the
7 printer, right?

8 A. Right, right.

9 Q. And so that data is then sent along
10 the flex circuit trace to the contact 2006 for
11 each particular, uh, data pad, right?

12 A. I think they call them -- the
13 contacts, right. On the flex, they're called
14 contacts and then they --

15 Q. Right. Contacts 2006.

16 A. Yeah. Yep.

17 Q. So are you with me so far?

18 A. Yes.

19 Q. We've got data coming from the
20 external circuitry. It connects to the contact,
21 um --

22 A. Yep.

1 Q. -- and it travels through the traces
2 on the flex circuit to the -- uh, to the contact
3 2006?

4 A. Correct.

5 Q. Okay. So -- and then from there,
6 what's described in 77 is, um, that data is then
7 provided to the data line groups that are on
8 the -- uh, the printhead die, right?

9 A. Right. And they basically say
10 there's coupling. The contacts 2006 provide
11 coupling to the printhead die.

12 Q. And that's the coupling between the
13 contact 2006 and the bond pad on the printhead
14 die we talked about, right?

15 A. Yeah. Presumably, it's, yeah, the
16 bond pad we talked about, right. They don't
17 really say a bond pad, but, yes, I think that
18 would be the -- that would be the traditional
19 way of doing it.

20 Q. Well, I think -- I think they do
21 reference a bond pad in the -- the patent, don't
22 they?

1 A. Yeah. They mention it in one area,
2 um, and it's -- but then they -- they refer to,
3 um, Figure 25 which really doesn't show
4 bondpads, but yeah. I mean, they mention the
5 word bond pad somewhere in the specification
6 here.

7 Q. Sure. Well, let's -- yeah. Let's
8 take a look at that. Um, so let's take a look
9 at column 75 of Benjamin '144.

10 A. Yep.

11 Q. Starting at line, uh, 40.

12 A. Right, each of the lines is routed to
13 its respective data line group from a bond pad
14 located along the side of the printhead die
15 nearest the data line group in fire groups. (As
16 read).

17 Okay. So that's good. Yeah.

18 Q. Yeah. So you agree there's --
19 there's, um, one bond pad for each data line
20 group that we were just talking about, right?

21 MR. BORSOS: Objection to form.

22 THE WITNESS: Right. It doesn't say

1 that there's more than one. Yep.

2 BY MR. KRITSAS:

3 Q. Got it.

4 So -- so with respect to the data
5 lines, we have, you know, one contact 2006, for
6 example, for data line group one that connects
7 to a single bond pad on the edge of the chip.

8 Is that fair?

9 A. Yeah. It's not real explicit, but
10 yeah. I think that's fair.

11 Q. Well, it just says "bondpad," right?

12 A. It says a bond pad, yeah.

13 Q. Yeah.

14 A. Yeah. Yep. I think that's fair.

15 Q. So now, if we stick with column 75
16 and if we go down a little bit further, Benjamin
17 also talks about, uh, fire lines 214a through
18 214f, as well as fire groups 1702a through
19 1702f.

20 Do you see that?

21 A. Yes.

22 Q. So starting at line 48, Benjamin '144

1 states: "The conductive fire lines 214a-214f
2 are located along ink feed slots 1704, 1706 and
3 1708 to supply energy signals FIRE1, FIRE2 . . .
4 FIRE6 to fire groups 1702A through 1702F,
5 respectively."

6 Do you see that?

7 A. Yes, I do.

8 Q. Okay. So -- so what Benjamin is
9 telling us here is, you know, there are --
10 similar to the data lines, we have -- uh, we
11 have these, uh, fire line, uh, pads on the flex
12 circuit, right, that -- that will send fire
13 signals to those -- to similar contacts 2006 on
14 the flex circuit.

15 Is that fair?

16 A. Well, they don't -- they don't say
17 that here, but there are -- I mean, there are
18 fire lines on the flex circuit, um, but they
19 don't say that here. They just say -- they
20 do -- they're talking about the details of the
21 silicon layout in this paragraph.

22 Q. Right. So -- so what we're getting

1 here is, you know, we have six individual fire
2 groups that are, uh, disclosed in Benjamin '144,
3 or at least this embodiment of Benjamin '144?

4 A. Right.

5 Q. Okay. Um, and each of those fire
6 groups receives, um, an energy signal FIRE1
7 through FIRE6, right?

8 A. Right. And it's not -- it's not just
9 a constant voltage energy. It's a timed energy
10 signal. So there's timing and -- uh, and
11 voltage on these supply -- on these supply
12 lines.

13 Q. Yeah. So I think, um, if I
14 understand the reference correctly, fire line
15 214a, um, is part of fire group 1702a.

16 Is that right?

17 A. Correct. I just went up to look at
18 Figure 22, but yeah. Okay. Yes. And 17 --

19 Q. And so --

20 A. -- B is associated with 1702b and
21 vice versa to 214f and 1702f.

22 Q. And so fire line 214a within fire

1 group 1702a would receive, uh, energy signal
2 FIRE1.

3 Are you with me?

4 A. Yes. I'm with you.

5 Q. And so if we go to the next sentence
6 in paragraph 75, starting at line, uh, 60, it
7 states: "The highest amount of power is found
8 in the first fire resistor 52 of a fire group
9 1702a through 1702f as only a single firing
10 resistor 52 is energized, where the first firing
11 resistor 52 is the firing resistor 52 nearest
12 the bondpad receiving the energy signal FIRE1,
13 FIRE2 . . . FIRE6."

14 Do you see that?

15 A. I do.

16 Q. So -- so Benjamin '144 is -- is
17 telling us that each fire group receives a fire
18 signal from their respective bond pad.

19 Is that fair?

20 MR. BORSOS: Objection to form.

21 THE WITNESS: So the fire resistor
22 nearest the bond pad, yes, is receiving the fire

1 signal.

2 BY MR. KRITSAS:

3 Q. Got it.

4 So -- so each fire group within
5 Benjamin has their own bond pad.

6 Do you agree with me on that?

7 A. The -- um, no. I think that the
8 firing resistor 52 is on one side, so that
9 one -- what it's saying is that on one side,
10 it's nearest the bond pad, but we don't know
11 clearly, is it also equivalent on the other
12 side, right?

13 So you've got -- you have -- you
14 have, uh, parts of the fire group on each side
15 of the via, and 52 is -- uh, is only on the one
16 side.

17 Q. Well, but Benjamin's referring to the
18 entire fire group, correct?

19 A. Benjamin's referring to the entire
20 fire group, but the fire group might have, um,
21 bond pads that are closer to one side or the
22 other, um, in order to -- to balance the -- the

1 voltage there. I don't know. It doesn't -- it
2 really doesn't tell us anything about the
3 arrangement of the bond pads or the traces that
4 go from the bondpad to the -- the U-shaped fire
5 lines.

6 Q. So if you look, um, at paragraph 75
7 starting at line 58, so Benjamin says in this
8 sentence just before the one we just discussed,
9 that: "Energy variation is the maximum percent
10 difference in power dissipated through any two
11 firing resistors 52 in one of the fire groups."

12 Do you see that?

13 A. Yeah. I'm sorry. Give me a moment.

14 Q. Sure.

15 A. Okay. I'm sorry.

16 Exactly where -- where were you
17 again?

18 Q. Um, you know what?

19 Actually, I want to go back to -- to
20 one thing that you said earlier.

21 Um, so it's -- it's your opinion
22 that -- that Benjamin might have more than one

1 bondpad associated with each, um, fire group?

2 Is that what your opinion is?

3 A. It's -- it's possible. Yeah.

4 It's -- my opinion is, it's possible. They're
5 trying to balance the energy to these two sides.

6 Q. Is there anything in Benjamin that
7 would indicate to you that -- uh, that there
8 would be more than one bondpad for each fire
9 group?

10 A. So it's just -- you know, I think
11 we're -- we're right in this area here where
12 they're -- um, they're really trying to reduce
13 the parasitic resistance down the array length,
14 uh, along each side of the via. And so in so
15 doing, because they are separated by two sides
16 of a -- um, a via, they -- they -- they might
17 want to use two traces from that U-shaped fire
18 line to go to two bond pads, but it doesn't say
19 that, but it also doesn't say that there's one,
20 right?

21 And so I -- you know, it's -- it
22 doesn't say one or the other. So in trying to

1 reduce energy variation, they might want to do
2 that.

3 Q. Well, but Benjamin tells us in column
4 75, looking at line 63, it refers to "the
5 bondpad," right?

6 A. For that one side. For that one
7 side.

8 Q. Well, that's -- that's your
9 interp- -- interpretation that he's referring to
10 just one side?

11 A. Right. That's -- that's my
12 interpretation.

13 Q. Okay.

14 A. He could be referring to that one
15 side and to the closest bondpad to that side.

16 Q. But he could also be referring to the
17 closest bondpad of the entire group, couldn't
18 he?

19 A. It doesn't say, right?

20 So it could be -- it could be -- it
21 could be either. It's -- it's unclear. That
22 whole area is kind of left un- -- undetailed in

1 Benjamin '144, and I think it's a she. We'll
2 give her credit.

3 Q. Yes. Thank you. Trudy Benjamin.

4 A. Yes. A very smart electrical
5 engineer, I'm thinking.

6 Q. So when you have two arrays of the
7 heaters, one -- one array on each side of an ink
8 via, um, don't you always stagger the -- the
9 heaters such that, you know, they're not
10 directly, uh, parallel with one another?

11 MR. BORSOS: Objection to form.

12 THE WITNESS: Yeah. I think what
13 you're referring to is -- um, uh. They call it,
14 um, doubling, uh, resolution doubling. Um, uh,
15 there's an offset in the -- in the vertical
16 direction such that on one side, they're
17 one-half -- they're spaced -- they're aligned
18 one-half the pitch, um, between the heaters on
19 the other side, right?

20 So that they call it pitch -- pitch
21 doubling?

22 BY MR. KRITSAS:

1 Q. Yeah. So --

2 A. So they can get -- they get a
3 vertical resolution that is, um, twice the
4 resolution you'd get if you used only one side.

5 Q. Right. And that's a situation we
6 have in Benjamin '144, right?

7 We have -- we have heater arrays on
8 both sides of the ink via.

9 A. We -- we do, but I don't -- I don't
10 know if -- I didn't pay attention to whether or
11 not they use pitch doubling, but likely they do.
12 It's pretty -- pretty common.

13 Q. Yeah. And so -- so when you're pitch
14 doubling, I think you said there's an offset
15 between, uh, the horizontal orientation of the
16 nozzles or the heaters, uh, from one side to the
17 other.

18 Is that right?

19 A. Well, horizontal, I'd -- I'd say.

20 So in Figure 3, they do not show
21 pitch doubling. I mean, they show them --
22 they're aligned. So in any -- I just -- I would

1 say if -- by looking at what information they've
2 provided, they're not using pitch doubling in
3 Benjamin '144.

4 Q. So pitch doubling was common -- a
5 common technique at the time of the '864 patent?

6 MR. BORSOS: Objection to form.

7 THE WITNESS: Yes. I -- I would say
8 so, yes.

9 BY MR. KRITSAS:

10 Q. So -- so when we're -- we're pitch
11 doubling, uh, and you have, uh, heaters on both
12 sides of an ink via, um, aren't you always going
13 to have one -- uh, one heater that's closer to
14 the bondpad than on the other side?

15 MR. BORSOS: Objection to form.

16 THE WITNESS: I would say that, um,
17 if you are pitch doubling, one heater on one
18 side is closer to the bondpad than the other
19 side, but a miniscule and inconsequential
20 amount.

21 BY MR. KRITSAS:

22 Q. Got it.

1 A. Right?

2 We're talking about what?

3 You're talking about 20 microns
4 versus the distance to the bondpad is 2000 or
5 3000 microns.

6 Q. Let's take a look at, um, Figure 22
7 of Benjamin.

8 THE EXHIBIT TECHNICIAN: I'm sorry.
9 Counsel, which figure?

10 MR. KRITSAS: Figure 22.

11 BY MR. KRITSAS:

12 Q. So if -- Mr. Dietl, if we look at the
13 left side of Figure 22, um, we have fire line
14 214a that is depicted as part of fire group
15 1702a.

16 Do you see that?

17 A. Yes.

18 Q. Um, and it's -- it's a generally
19 U-shaped fire line, um, I think is how it's
20 described in -- in the patent.

21 Is that right?

22 A. Yes, a U-shaped fire line.

1 Q. Um, and so what I -- what I want to
2 ask is if -- you know, if -- if we were to --
3 you know, if the bondpad for the fire group
4 1702a were placed, um, alongside 1700c at the
5 top of the page, and they were placed, uh, you
6 know, parallel with the left side of the -- uh,
7 the left heater array, wouldn't, uh, the first
8 heater on the left side of the array be close --
9 the closest firing resistor?

10 MR. BORSOS: Objection to form.

11 THE WITNESS: Wow. You're going to
12 have to help me here.

13 So you're saying somehow the -- the
14 interconnect for fire group 1, 170a [sic] is
15 making a connection over by 1700c?

16 BY MR. KRITSAS:

17 Q. Sure. Let's --

18 MR. KRITSAS: Um, Michelle, am I able
19 to write on this?

20 THE WITNESS: Or are you just saying
21 1700c is just a line that goes across the whole
22 thing? I'm confused.

1 THE EXHIBIT TECHNICIAN: I'm sorry.

2 Did you want to the write on this
3 document or just on this page here?

4 MR. KRITSAS: Am I allowed to write
5 on this page here or annotate it at all?

6 THE EXHIBIT TECHNICIAN: Yeah. Just
7 one moment.

8 You do have control now.

9 Can you try seeing if you can draw on
10 it?

11 MR. KRITSAS: Um --

12 THE WITNESS: Or even just use your
13 cursor.

14 THE EXHIBIT TECHNICIAN: Because this
15 is me and then --

16 MR. KRITSAS: Yeah.

17 Is there a annotate button?

18 THE EXHIBIT TECHNICIAN: The pen is
19 selected, so see if -- uh, you have remote
20 control, so see if it will let you.

21 MR. KRITSAS: I don't see it doing
22 anything.

1 THE EXHIBIT TECHNICIAN: Are you
2 moving your mouse?

3 MR. KRITSAS: Yeah.

4 I mean, I see it moving my mouse. I
5 just don't see it drawing on --

6 THE EXHIBIT TECHNICIAN: And -- oh,
7 wait. That's probably why. Okay. Yeah. Okay.
8 I have to resume share.

9 MR. KRITSAS: Okay. So . . .

10 BY MR. KRITSAS:

11 Q. Mr. Dietl, can you see the blue dot
12 that I've drawn at the top of Figure 22?

13 A. Yes.

14 Q. So I've annotated Figure 22 with a
15 blue dot, um, along the edge of the printer die,
16 along the edge 1700c.

17 Do you see that?

18 A. Okay. Yes.

19 Q. And I've drawn this blue dot, um, uh,
20 such that it is in line with, um, the heater
21 array that is on the left side of ink via 1704.

22 Do you see that?

1 A. Yes.

2 Q. And so -- so my question is if -- you
3 know, if, uh, Benjamin's bondpad for, uh, fire
4 group 1702a is located at this blue dot such
5 that I've located it, um, wouldn't -- wouldn't
6 we have a single heater within the entire group
7 that is the closest, uh, firing resistor or
8 closest heater?

9 MR. BORSOS: Objection, form.

10 THE WITNESS: Yeah. Yeah. I don't
11 think we -- we're not -- you're not talking
12 traces. You're just talking about distance.
13 There would be a heater that's closest to that
14 bondpad, yes.

15 BY MR. KRITSAS:

16 Q. Yeah. So I guess what I'm -- what
17 I'm getting at is, you know, in column 75,
18 there's a discussion of, you know, you know, a
19 first firing resistor 52 being the firing
20 resistor nearest the bond pad.

21 Um, and so you testified there would
22 need to be two bond pads, um, and I'm trying to

1 understand are there other situations where only
2 one bondpad would be required?

3 A. So -- so I didn't say there had to be
4 two bond pads. I said it's unclear on what
5 they -- what they do have because it's not
6 described in Benjamin '144, but you could have
7 two bond pads straddling the "a" over 214a. So
8 move your dot over here by the -- by the -- to
9 the left side of the "a" in 214a and put another
10 dot on the right side of 214a. Those would be
11 two bond pads. One could go to the left side
12 then. A trace could go to the left side, and a
13 trace could go to the right side, but I don't
14 know that. I'm just saying it could because
15 it's not -- because Benjamin hasn't described
16 it, you could do that in the attempt to try to,
17 uh, reduce parasitic resistance differences.

18 Q. So, Mr. Dietl, if you had two bond
19 pads, um, for fire group 1702a, how would a
20 person of skill in the art connect those two
21 bond pads to the -- the U-shaped fire line, uh,
22 214a?

1 A. Well, they would -- the two traces
2 that would go -- you know, if you're trying to
3 make them as low resistance as possible or just
4 equal resistance, they would be two traces that
5 were the same -- would have the same parasitic
6 resistance per side.

7 Q. But it's still connecting to, uh, a
8 single U-shaped fire line, though?

9 A. Sure. That's what -- that's what
10 Benjamin has disclosed, yeah. So it could
11 connect to that single U-shaped fire line.

12 Q. Wouldn't it be more beneficial to use
13 a single, slightly larger power trace than two
14 smaller power traces, though?

15 A. I don't --

16 MR. BORSOS: Objection to form.

17 THE WITNESS: I don't know. They --
18 either one would work, and Benjamin hasn't told
19 us what is on this device.

20 I mean, this is a schematic kind of
21 representation, right?

22 It's not a physical layout.

1 BY MR. KRITSAS:

2 Q. But you agree with me, though, that
3 there's at least some sort of structure between
4 fire line 214a and the fire line bondpad in
5 Benjamin, right?

6 A. Some sort of structure?

7 I don't --

8 Q. Well, you -- you said this is a
9 schematic representation, right?

10 A. Yes. Yeah.

11 Q. So there's -- so not all of the
12 structure of the chip is disclosed in the
13 schematic on Figure --

14 A. Right, right. But that U-shaped fire
15 line, you know, it's depicted as just a line.
16 You know, what's its -- we don't know its width.
17 We don't know much about it, where it lays in
18 respect to the -- the heaters and -- physically,
19 right?

20 So -- but you know what it --
21 schematically what -- what she's getting at
22 here.

1 Q. Right. But you would at least agree
2 with me that there's -- there's -- this would
3 need to be some sort of trace extending off of
4 the U-shaped fire line to connect fire line 214a
5 to, uh, the fire line bondpad of the chip,
6 right?

7 A. One -- one or more traces to one or
8 more bond pads.

9 Q. Right. Yeah. And that's really what
10 I'm trying to get at is --

11 A. Yeah.

12 Q. -- at is, um, there's something there
13 that a person of skill in the art would need to,
14 uh, utilize -- sorry.

15 So there's -- there's some sort of,
16 you know, trace, you know, either one or more,
17 uh, connected between fire line 214a and, um, at
18 least one bondpad for the fire line.

19 Is that fair?

20 A. Yes. They have to be electrically
21 connected. Sure. We just don't know the
22 details.

1 Q. And you agree it could -- it could be
2 one bondpad that's being utilized for fire line
3 214a, right?

4 A. Could be one bondpad, yep, or it
5 could be two bond pads, probably not three. I
6 don't see why you would do three. There's no
7 reason.

8 Q. And then do you agree with me that --
9 that, uh, the fire line bondpad for, uh, fire
10 group 1702a would be located along, uh, the side
11 1700c of -- of the printhead die?

12 A. Yeah. I -- yes. I agree that
13 bondpad or bond pads would be along that edge
14 1700c.

15 Q. And then, similarly, if we look at
16 the bottom of Figure 22, um, the bondpad for
17 fire line 214d, um, would be located along the
18 side 1700d of the printhead die.

19 Is that right?

20 A. Yeah. The bond pads for that side of
21 the data groups and the -- uh, and fire groups
22 would be along the edge of the die 1700d.

1 Q. And then similar to how we discussed,
2 um, with respect to fire line 214a, um, there
3 would need to be at least one trace connecting,
4 uh, the bondpad, the fire line bondpad to fire
5 line 214d, right?

6 A. Yes. I mean, unless you did
7 something really wacky like a wire bond all the
8 way to the fire -- U-shaped fire line, but I
9 don't think that that's reasonable.

10 Q. And why would it be unreasonable to
11 use --

12 A. Well, I think it's probably too far
13 away. You get -- when you do a wire bond, you
14 get a loop, and the length and the height are
15 kind of -- are related, so you don't want -- you
16 don't want anything high on the front face of
17 your ink jet device because that interferes with
18 your ink buildup and wiping, and things like
19 that, so it would be un- -- unlikely.

20 Q. So -- so you would agree it would be,
21 um, undesirable to try to connect, uh --

22 A. From the flex board all the way to

1 the U-shaped fire line with a wire bond.

2 You know, it's possible, but it's --
3 it would be undesirable.

4 Q. And it would be undesirable because
5 it would create additional unnecessary height on
6 the -- the chip surface.

7 Is that right?

8 A. Correct.

9 Q. And it would also interfere with, uh,
10 wiping of the nozzles.

11 Is that right?

12 A. Yes. You have to put adhesive over
13 all these connections when you're done, right?

14 What they call "encapsulate" or
15 "potting," it has to cover every conductive
16 material, uh, so that you don't have -- the ink
17 doesn't short to them, or that would be a mess.

18 Q. I want to turn back to your
19 declaration, um, and I want to look at page 35
20 of your declaration, which is Exhibit 2004.

21 A. Okay.

22 Q. Um, you know, actually, I think we

1 can move on.

2 Um, I want to talk briefly about, uh,
3 the other Benjamin reference that was cited, um,
4 and that's Exhibit 1006.

5 MR. KRITSAS: Michelle, would you
6 mind marking and admitting Exhibit 1006?

7 * * *

8 (Whereupon, Dietl Exhibit 4 was marked
9 for identification.)

10 * * *

11 BY MR. KRITSAS:

12 Q. And, Mr. Dietl, you looked at Exhibit
13 1006 as part of preparing your declaration,
14 right?

15 A. Yes, I did.

16 MR. KRITSAS: Uh, Michelle, let's --
17 let's move ahead to Figure 10 of the Benjamin,
18 uh, '703 reference.

19 BY MR. KRITSAS:

20 Q. Mr. Dietl, would you agree that
21 Figure 10 of the Benjamin '703 is depicting a
22 fire line bondpad, uh, connecting, uh, to a, um,

1 power trace, uh, on the edge of the circuit?

2 A. Yes. I would agree with that, yep.

3 Q. And so the fire line bondpad is, uh,
4 depicted as 706.

5 Is that right?

6 A. Correct. It's also depicting a data
7 line bondpad 704 and an ID pad, bondpad 702, and
8 I think 722 and 720 are test points for probing
9 whether you would have shorts in the connection.
10 So it's a testing -- testing probe points.

11 Q. And so in -- in this Figure 10, uh,
12 Benjamin, she's depicting, uh, a single power
13 trace 712 coming off of the bondpad 706.

14 Is that fair?

15 A. That's correct. We just don't know
16 anywhere in Benjamin '703 where that goes,
17 right, in terms of a -- there's no description
18 of a U-shaped power line or the -- or even if
19 the fire line is addressing heaters on two sides
20 of the via or, um, on one side of the via, and
21 maybe a fire line is addressing the heater --
22 the heaters on the other side of the via. It

1 doesn't -- um, it doesn't go into that
2 description.

3 Q. Can we look at column 19 of Benjamin
4 '703?

5 And then if we look at line 42, uh,
6 Benjamin describes, uh, the interconnection of
7 the -- uh, the fire line input pad, uh, in the
8 fire line.

9 Do you see that?

10 A. Yes. Yes.

11 Q. So you at least agree, though, that
12 in Benjamin '703, they teach that the -- the
13 bondpad, uh, or the fire line input pad 706 is
14 coupled to the fire line 712 which it then
15 teaches is coupled to firing cells 120.

16 Do you see that?

17 A. Yes, I do.

18 Q. So -- so at the very least what
19 Benjamin '703 teaches us is, uh, utilizing, uh,
20 a fire line bondpad, uh, to provide -- to
21 provide power to, uh, firing cells 120 on a
22 printhead die, right?

1 A. Sure. Yes.

2 MR. KRITSAS: So I'm -- I'm ready
3 to -- to switch gears at this point, but I
4 didn't know if -- if we wanted to break for
5 lunch.

6 THE WITNESS: Could I make one other
7 comment regarding Figure 10?

8 BY MR. KRITSAS:

9 Q. Um, I --

10 A. Or would you prefer I don't?

11 Q. If you have a particular comment that
12 you want to make, um, I don't want to cut you
13 off.

14 A. Okay. I just wanted to point out
15 that the -- in Figure 10, the -- the arrangement
16 of the contacts there are data, fire, and ID in
17 that order. And when we go to Benjamin '144 and
18 you look at the -- you know, I traced the traces
19 from the contact areas down to the leads 2006,
20 um, in -- in Benjamin '144, and the order is
21 fire line, ID, data. So the ID is between the
22 fire line and the data. So it's really clear

1 that these are two different embodiments in '144
2 and the '703. Um, in what respects, you know,
3 in terms of the details of it, I don't know.
4 All I do know is that they're not the same.

5 Um, that's just one other piece of --
6 you know, which leads me to not be able to
7 conclude, um, much about the combination of
8 the -- you know, '703 adding much to the '144 so
9 -- because we don't know what it is.

10 Q. But Figure 10 of the '703 patent at
11 least teaches us that we can use one fire line
12 bondpad, uh, to provide power to a -- a group of
13 heaters.

14 Would you at least agree with that?

15 A. Yes, I do. I don't -- I don't think
16 that's -- that's novel. I mean, it's -- it's in
17 the prior art of King, right?

18 Q. Um-huh.

19 MR. KRITSAS: So, um, like I said,
20 why -- why don't we go off the record for a
21 moment?

22 * * *

1 (Whereupon, a lunch recess was taken.)

2 * * *

3 BY MR. KRITSAS:

4 Q. Welcome back, Mr. Dietl.

5 A. Thank you. You, too.

6 Q. Mr. Dietl, during the -- the lunch
7 break or any of the other breaks we've taken
8 today, did you, uh, have any conversations with
9 your counsel?

10 A. I did not.

11 Q. Um, so, Mr. Dietl, I want, uh, to
12 move the discussion to the Uenishi reference
13 now.

14 A. Okay.

15 MR. KRITSAS: And, Michelle, if we
16 could please admit, uh, Exhibit 1008?

17 * * *

18 (Whereupon, Dietl Exhibit 5 was marked
19 for identification.)

20 * * *

21 BY MR. KRITSAS:

22 Q. Mr. Dietl, are you familiar with

1 Exhibit 1008?

2 A. Yes, I am.

3 Q. So this is, um, the Uenishi
4 reference, uh, which is -- which -- which
5 includes Japanese patent number 11-245409.

6 And you discuss the Uenishi reference
7 in your declaration, don't you?

8 A. Yes, I do.

9 Q. Okay. So I want to direct your
10 attention to Figure 1 of the Uenishi reference.

11 A. Okay.

12 MR. KRITSAS: And, Michelle, if we
13 could scroll down to Figure 1 when you're ready,
14 too?

15 And, Michelle, there's actually a
16 larger Figure 1 if you could, uh, keep scrolling
17 down a little bit further.

18 Great. Thank you.

19 BY MR. KRITSAS:

20 Q. Uh, so, Mr. Dietl, Uenishi's Figure 1
21 depicts, um, at least one view of Uenishi's,
22 heater chip for an ink jet printer.

1 Is that fair?

2 A. Yes.

3 Q. And so Uenishi identifies, uh, five
4 common electrodes which are given the reference
5 numbers 23a through 23e.

6 Do you see that?

7 A. Right. And this is kind of like a
8 section view, right?

9 It's, um, the -- it's not the whole
10 printhead.

11 Layers are missing, right?

12 Q. So you would agree then that this is,
13 uh, a view of the printhead showing, um, one
14 layer of the printhead chip?

15 A. Yeah. It's -- you know, I'm not sure
16 how many layers are here, but there's a couple
17 missing. Let's put it that way.

18 Q. Well, what's -- what is missing from
19 Figure 1 that you notice?

20 A. There's a -- um, a material. It's
21 called the, um, partition material layer is
22 missing and the -- um, the nozzle. Let's see.

1 Partition material and thin-plate material 11 is
2 missing, and then they mention some adhesives
3 that they use to bond them. So those two layers
4 and any adhesives between them are missing.

5 Q. And so the -- the nozzle layer and
6 the partition layer and any additional
7 adhesives, those are placed on top of what we're
8 looking at in Figure 1(a)?

9 A. Yes. I believe so. Yep.

10 Q. So -- so what we see in Figure 1(a)
11 are, uh, five common electrodes identified as
12 23a through 23e.

13 Do you see that?

14 A. Yes, I do.

15 Q. And those common electrodes are used
16 to provide, uh, power to, uh, heaters associated
17 with, uh, their -- their respective heater
18 arrays.

19 Would you agree with that?

20 A. Yes.

21 Q. Um, and then connected to each common
22 electrode is what Uenishi refers to as an

1 electricity-feed terminal identified as 20- --
2 uh, 26a through 26e.

3 Do you see those?

4 A. That's correct. Yeah. I do see
5 those.

6 Q. Um, and do you see the -- uh, the
7 terminals next to each of the electricity-feed
8 terminals 20- -- 26?

9 MR. BORSOS: Objection, form.

10 THE WITNESS: The ones labeled 27a
11 through 27b and 27c and 27d, they're called
12 drive circuit terminals in the -- uh, the
13 glossary.

14 BY MR. KRITSAS:

15 Q. What's your understanding of the --
16 the purpose of these drive circuit terminals 27a
17 through 27d?

18 A. Um, I mean, I think they are to
19 connect to this -- uh, this silicon chip.
20 They're bond pads or something like a bondpad
21 that connects from the outside world into the
22 silicon chip.

1 Q. So you would agree that you're
2 connecting external circuitry some- -- somewhere
3 in the printer, um, to -- to these -- uh, to
4 these bond pads, uh, for the drive circuitry.

5 Is that fair?

6 A. Yes. I would agree.

7 Q. Um, and same with the electricity
8 feed terminals 26a through 26e.

9 Um, would these be connected to
10 external circuitry associated with the printer?

11 A. Well, um, it's -- this is where it
12 gets somewhat problematic in -- in this patent
13 and confusing. Um, although I -- you know, we
14 do know that electricity needs to get to this,
15 um, electricity supply -- um, electricity supply
16 element, common electrode, um, it's not clear if
17 26a is where that, uh, electricity, that supply
18 voltage comes in to this common electrodes
19 because -- so maybe there's something else which
20 connects to it, but when I look at the -- the
21 other figures and they describe this device,
22 the -- those locations are not accessible to

1 traditional tab or wire bonding or any other
2 interconnect technology. I know they're cov- --
3 they're covered, in other words.

4 Q. And what -- why do you believe that
5 the electricity-feed terminals, 26a through 26e
6 are covered?

7 A. Um, can we go to -- so if we go to
8 Figure 2 and then -- we'll go to Figure 2, and
9 then Figure 6. Both of those figures are
10 interesting. Figure 2, this is the -- the
11 nozzle plate, the thin plate material, um, that
12 they form the nozzle holes in that are adjacent
13 to the heaters, um, and it has this little tab
14 at the top which covers over the
15 electricity-feed terminal. If you, um, read in
16 the spec, this material is steel or possibly a
17 polymer, photo -- uh, photo-patternable polymer,
18 um, but it covers that -- that area.

19 And then if you go to Figure 6, um,
20 and you look at these, uh, (a) is showing the
21 layer of -- that's showing the electricity-feed
22 terminal that surrounds the ink via, and it

1 shows as, three labeled as the electricity-feed
2 terminal, and two labeled as the "common
3 electrode."

4 In view (b), the next layer that's
5 applied is the partition material. So this is a
6 photo-patternable polymer material which forms
7 what he calls a comb-like structure around the
8 heaters that allows the, uh, ink to travel into
9 the -- out of the ink via and into the -- uh,
10 the heater area where it's ejected. And you can
11 see that partition material is also covering
12 that tab, um, and it covers over the
13 electricity-feed terminal.

14 And then in (c), the nozzle plate,
15 um, which is called thin-plate material also has
16 the tab, and it's also labeled three
17 electricity-feed terminal, and then the -- um,
18 and that's covering over that contact.

19 So you can imagine the stack of
20 nonconductive materials are covering over this
21 little tab three. And so it's not accessible to
22 traditional interconnect methods, so I don't --

1 I don't know how they're connecting to the
2 common electrode, whether there's indeed another
3 bondpad somewhere that's off the side that they
4 can get to in this corner.

5 Is it one of these -- pad 7 that
6 possibly goes over?

7 I don't know, but I think that what
8 Uenishi has taught here is that's covered for
9 some reason. And, you know, it's very
10 explicitly so, right?

11 They did this -- these are like
12 engineering drawings, right?

13 They did this, um, on purpose to show
14 that, so I'm -- that's -- that's what leads me
15 to believe that the electricity-feed terminal is
16 not a -- not like a bondpad. It's something
17 else.

18 Q. Okay. So let's -- let's break that
19 down a little bit just so I can understand, um,
20 your logic here.

21 So Figure 6, this shows -- um,
22 showing like a prior art method of manufacture

1 for a, uh, uh, a heater chip.

2 Isn't that right?

3 A. It is referred to as prior art, but
4 then it's also shown in the non-prior art views
5 of, uh, Figure 2, which is the main and primary
6 embodiment.

7 Q. Yeah, yeah. But I think, as a
8 baseline --

9 A. Yeah.

10 Q. -- Figure 6 is showing a prior art,
11 um, you know, heater chip, and I -- and -- but I
12 believe Uenishi explains that, you know, the
13 same steps, general steps of manufacturing would
14 be applicable to, um, what's shown in Figure 1.

15 Is that fair?

16 A. Yeah. I think that's fair.

17 Q. Okay. So -- so Figure 6(a) shows,
18 um, a common electrode which is identified as
19 two in the figure, and then an electricity-feed
20 terminal identified as three, right?

21 A. That's -- that's correct.

22 Q. So -- um, and then if we look at

1 what's shown in Figure 6(b), um, there's a
2 traditional layer nine which is referred to as
3 partition material --

4 A. Yes.

5 Q. -- and that covers the -- it looks
6 like it covers the entirety of the common
7 electrode two, as well as the common
8 electricity-feed terminal three.

9 Is that your understanding?

10 A. Yeah. No. No. I don't think so. I
11 think it covers -- on one side it covers the
12 entirety of the, um, common electrode.

13 And I think this view is like a one
14 color version, right?

15 It doesn't show all the multiple
16 colors together, so there's only one driver
17 logic area, and only one set of heaters on one
18 side of a via, right?

19 Um, and so on the left side, the
20 partition material covers right up to the edge
21 of the via. On the right side, and you can see
22 down here in the cross-section view, there's a

1 flat section, a planer, um, that are -- that are
2 underneath the nozzle plate, but there's no
3 partition material there. And then you get to
4 this 9.2, which is described as a comb structure
5 which then provides the chambers, the firing
6 chambers and -- for the ink to come into each
7 heater, and then there's another strip of
8 partition material outside of that that seals
9 this off so it doesn't -- you know, so it can
10 seal off to the nozzle plate and not leak,
11 right?

12 Q. I see.

13 So -- so for, um, the embodiment of
14 Figure 1, um, if we're looking at, you know,
15 some of the common electrodes that are in the
16 middle of the chip, would you have this -- this
17 honeycomb or the comb material on both sides of
18 the ink via?

19 A. Yeah. Yes. I -- I -- I believe so.
20 I mean, he doesn't show that. Yes, I believe
21 so. In the section (b), (c), and (d), you would
22 have this kind of open area and then the comb

1 structure and then the heaters.

2 Q. Got it.

3 And then if we move to Figure 6(c),
4 uh, we have what's shown as the -- the
5 thin-plate material 11 with -- uh, with nozzle
6 ports, uh, 13, um, overlaying that -- that
7 comb-body portion.

8 Is that right?

9 A. That's correct.

10 Q. So -- um, so it's your opinion then
11 that based on these -- these drawings here, that
12 the electricity-feed terminal cannot be
13 connected to an external structure then because
14 of the, um, partition material 9 and the
15 thin-plate material 11?

16 MR. BORSOS: Objection to form.

17 THE WITNESS: It's my opinion that it
18 can't be connected at that point, or I don't
19 know how they do it, right?

20 It's not -- they've left it unclear
21 on how that connection is made, but the typical
22 techniques of tab or wire bonding or flip-chip

1 bonding would not work in this case, um, and so
2 it's not clear where that connection would be
3 made.

4 BY MR. KRITSAS:

5 Q. So if -- if the partition material 9
6 and thin-plate material 11 did not cover, uh,
7 the electricity-feed terminal, um, could you
8 use, uh, some sort of bonding procedure to
9 attach external circuitry to that
10 electricity-feed terminal?

11 MR. BORSOS: Objection to form.

12 THE WITNESS: If they prepared that
13 surface properly with the -- the right
14 properties for bonding, you know, I don't know
15 whether or not that would be a challenge or not,
16 but, yes. I think that you -- if they did not
17 cover them, it's -- it would be more likely that
18 you could connect at that point, yes.

19 BY MR. KRITSAS:

20 Q. Got it.

21 So I want to direct your attention to
22 paragraph 11 of Uenishi.

1 A. Uh-huh.

2 Q. Uenishi talks a lot about this, uh,
3 manufacturing method in the --

4 A. Yeah. I understand.

5 Q. So if you look at paragraph 11, it
6 starts, um, with reference to Figure 6(c) and
7 7(c).

8 A. Yes.

9 Q. We were just talking about 6(c)
10 earlier, and it states that, you know: "Figs.
11 6(c) and 7(c) show the state immediately after
12 steps 5 and 6, described above, are completed."

13 Um, and then it goes on. It says:
14 "In other words, thin-plate material 11 covers
15 all the region except the drive circuit 6 and
16 the electricity feed terminals 3 and 7."

17 Do you see that?

18 A. I do, yeah.

19 Q. So -- so isn't Uenishi telling us
20 that, in the written description, that those
21 electricity-feed terminals are not meant to be
22 covered?

1 A. Yeah. There's -- there's clearly a
2 conflict between the drawings and what he says
3 here in chapter -- in the paragraph 11. And so
4 I -- I -- you know, I see that conflict.

5 I -- you know, which one do you defer
6 to? I don't know.

7 And, um, but then if I go to
8 paragraph 10 and they talk about the -- the step
9 immediately preceding that, um, of the partition
10 material, um, they -- they don't show that being
11 removed or being not over the electricity-feed
12 terminal.

13 So left with still seeing this device
14 that has partition material over the
15 electricity-feed terminal, if indeed it's
16 somehow not there in paragraph 11 after that
17 steps five and six, the partition material's
18 there after step four.

19 Q. Well, wouldn't you agree the purpose
20 of not covering the electricity-feed terminal
21 with thin-plate material 11 is so you could bond
22 external circuitry to it?

1 MR. BORSOS: Objection to form.

2 THE WITNESS: Yeah.

3 It's not -- it's not clear whether or
4 not that's the purpose of that or if there's
5 some other means of connecting the
6 electricity-feed terminal. That's unclear.

7 BY MR. KRITSAS:

8 Q. Well, I mean, as a person of skill in
9 the art, you know, how would you -- how would
10 you connect, uh, external power circuitry to
11 electricity-feed terminal in Uenishi?

12 A. Well, I mean, I'd have to speculate
13 to -- you know, either it could extend off the
14 edge somehow that we're not seeing there. There
15 could be, um, another bond pad like -- that's
16 described in seven over to the left of three,
17 um, but it's not -- it's not shown, so that
18 would -- it would have -- I would have to
19 speculate on how they do that.

20 Q. I mean, isn't it -- isn't it possible
21 that there's just an error in the Uenishi
22 drawings, uh, showing that the electricity-feed

1 terminal is covered?

2 A. It doesn't seem like an error, you
3 know?

4 It's so explicit. In every view of
5 every figure, it shows that. You know,
6 that's -- that's not an error. That's not a
7 typo. It's explicit. So I -- I don't know why.
8 I can't -- you know, but it doesn't seem like an
9 error to me.

10 Q. So you don't think it's an error to
11 cover a terminal with thin-plate material when
12 the specification tells you not to?

13 A. I think it's an error of omission of
14 describing more about what this -- how this
15 device is constructed and how they make the
16 connection, um, that's -- I mean, it's every
17 view has the same thing, you know, and so
18 it's -- it's not -- it's not a typo. It's not
19 an error. It's explicit. They drew that in
20 there for a reason. I just don't know what the
21 reason is.

22 Q. But you'd at least agree with me,

1 though, that in paragraph 11, Uenishi explicitly
2 tells us not to cover the electricity-feed
3 terminal with thin-plate material 11, right?

4 A. With 11, yeah. I agree that that's
5 what paragraph 11 says, yes.

6 Q. You're just -- you're not sure
7 whether it also tells us not to cover the
8 electricity-feed terminal with partition
9 material 9.

10 Is that -- is that what you're
11 saying?

12 A. That's -- that's what I'm saying.

13 Q. But -- so then if -- let me ask you
14 this then: You know, what would be the purpose
15 of, uh, not covering the electricity-feed
16 terminal with thin-plate material 11, yet still
17 covering it with, uh, thin-plate material or
18 partition material 9?

19 A. They -- they possibly could have a
20 purpose of trying to protect it, right, from,
21 um, ink intrusion, right?

22 You don't want to short it out. And

1 so the partition material, that -- that is one
2 of its key functions is to keep -- is a barrier
3 material of ink shorting onto metal or
4 conductive parts of the device.

5 Q. Let me ask you this: Um, do you --
6 do you at least agree, though, that, you know,
7 an electricity-feed terminal, uh, receives
8 electricity?

9 A. It's -- it's part of the common
10 electrode, and the common electrode is a -- is a
11 supply -- is a metal supply line to the heater.
12 So as much as they're all one plane, they all
13 get -- they all have electricity, yes.

14 Q. Yeah, but isn't -- isn't Uenishi
15 telling us that it's -- electricity is fed from
16 that terminal?

17 MR. BORSOS: Objection to form.

18 THE WITNESS: We don't know that it's
19 fed from that terminal has a bond pad, right?

20 So it's -- there could be another
21 bond pad that's show -- not shown on there. We
22 don't -- that feeds over to that, that we can't

1 see, just like -- just like in, um, the -- you
2 know, if you look at the -- um, I forget what
3 they're called, the seven, right, number seven,
4 uh, data terminals, drive circuit terminals,
5 there's no -- there's no, um, traces shown to --
6 from them onto the -- to the drive circuit area.
7 And, um, so there -- you know, there might be
8 traces that go to a different location where
9 there's a bond pad. I don't know. It's unclear
10 to me what's going on here with Uenishi.

11 BY MR. KRITSAS:

12 Q. Well, drive circuit terminals, you
13 know, if you look at Figure 1, for example --

14 A. Um-huh.

15 Q. -- you know, those are all clearly
16 labeled, um, as items 27a through 27d.

17 A. Understood, but I -- what I'm saying
18 is there's no traces from them over to the logic
19 area shown, right?

20 Maybe one of those traces, um, or
21 some series of traces goes over to the
22 electricity-feed terminal. Maybe one of those

1 pads is a pad -- a bond pad over there. I don't
2 know. I mean, they colored -- they colored them
3 black. Those are black, and the other one's
4 this crosshatch design. Um, you know, I --
5 they're implying a difference there, and I don't
6 know what -- why that -- what that difference
7 is, but they're implying a difference.

8 Q. Well, it -- in your experience, isn't
9 a crosshatch pattern meant to show a common
10 material?

11 A. Sure. But they -- they could have
12 shaded that 26a black, right, to -- or they
13 could have done an explode to show that it was,
14 uh, you know, connecting to a bond pad. They
15 didn't. They left -- they left all that out,
16 and it's unclear how that interconnect is made
17 to that common electrode.

18 Q. Well, maybe I'm misunderstanding you.
19 So you're saying it's -- if you look
20 at Figure 1, it's not clear how the
21 electricity-feed terminal is connected to the
22 common electrode?

1 A. No. It's -- it's not clear how the
2 electricity-feed terminal is connected to the
3 outside world, to the -- to the board or
4 whatever technique they use here to connect to
5 this chip.

6 Q. Well, do you -- do you at least
7 agree, though, that it's the electricity-feed
8 terminal, uh, is where a person of skill in the
9 art would expect electricity to feed from, to
10 the common electrode?

11 A. Yes, but it could originate from
12 another contact point over -- on Figure 1 over
13 to the left of 26, but it's not -- but it's not
14 shown, but that would still -- that would still
15 feed electricity into the common electrode.

16 Q. So you're suggesting there might be a
17 different bond pad that connects to the
18 electricity-feed terminal?

19 A. It's possible. It's not shown. I'd
20 have to -- you know, I would have to speculate,
21 but it's just not -- it's not clear that that's
22 designed to be a bond pad location because it's

1 confusion around the coverage with the partition
2 material and the nozzle-plate material.

3 Q. So isn't it also possible, though,
4 that the electricity-feed terminal just isn't
5 covered, and that there's an error in the
6 drawing?

7 A. It's -- it's possible, but I -- you
8 know, one would have to speculate.

9 Q. Um, in your declaration, uh, you
10 also, uh, include a discussion about whether
11 Uenishi meets the proximal to the bond pad
12 limitation.

13 Do you recall, uh, that analysis?

14 A. Yes.

15 Q. So, um, and why is it that you
16 believe Uenishi's electricity-feed terminal, um,
17 doesn't, um, include a separation off of it
18 that's proximal to the bond pad?

19 A. Well, you know, when I look at -- um,
20 when I look at Uenishi, you know, I -- this is
21 not -- it's a very different approach, right?

22 Instead of using traces which connect

1 to a different part of the die, they use this,
2 what's almost like a supply plane, right?

3 It goes across the entire device.
4 There's all this -- uh, this racetrack of supply
5 plane, very, very wide, um, almost like they're
6 using it for planerization of a device. Um, you
7 know, it's in spots where there is actually no
8 heaters and nozzles on both ends, um, and
9 it's -- um, so, you know, I -- I really don't
10 look at the -- this racetrack as being analogous
11 as to a trace, right?

12 It's almost like, uh, a floating
13 supply plane. Um, and then really the only
14 separation from the side happens right there at
15 the heater when you go into, um, I think it's
16 Figure 7. You can see how the metal leads come
17 off that, uh, common electrode and then feed
18 over to the heater, and you have that on both
19 sides. So where it's -- where it's coming off
20 of this plane onto the -- um, the array is
21 actually right at the heater. So it's not --
22 it's not proximal to the edge of the -- the edge

1 of the die, whether or not you consider 26 a
2 bond pad or not. It's out here in the array
3 itself.

4 Q. Let's -- let's look at Figure 1
5 again, um, so we can get on the same page.

6 So if we look at, just to pick one,
7 electricity-feed terminal 26b up at the top, um,
8 you know, I think we agree that 26b is -- is
9 attached to the common electrode 23b at the top
10 of the page.

11 You would agree with that?

12 A. Correct.

13 Q. So -- and then from there the
14 electricity-feed terminal, uh, connects both to
15 a heater array on the left side of the ink via
16 and a heater array on the right side of the via,
17 right?

18 A. Correct.

19 Q. Um, but you disagree that there's a
20 split next --

21 A. Right. There is no --

22 Q. -- next to the common elec- -- or

1 next to the electricity-feed terminal.

2 Is that -- is that what you're
3 saying?

4 A. I disagree there's a split at all,
5 right?

6 It's just one common -- that's why
7 they call it a common electrode, right?

8 There's no -- there's no split in
9 this entire racetrack, and I can't understand
10 where that split would be. So the only place
11 that -- where -- where it splits out is right at
12 the heater, which isn't shown in this -- in this
13 figure.

14 Q. So the claim requires that the power
15 traces are physically separated, right?

16 And we can look at --

17 A. Which claim are we talking about?

18 Q. Uh, let's see. Claim 3, for example,
19 of the '864 patent.

20 A. Okay.

21 Q. So claim 3 requires -- and I'm just
22 looking at the last limitation that we're

1 discussing. Um, it requires "power traces
2 physically separated proximal to the bondpad."

3 Right?

4 A. That's correct.

5 Q. And so when we look at Uenishi,
6 you're saying the portions on the left and right
7 side of the common electrode are not physically
8 separated from one another?

9 A. To me, it -- it looks like all one
10 trace, right?

11 It's a -- it's a plane. I don't
12 think it's separated at all.

13 Q. Well, what about the cutout portion
14 in the middle of the common electrode?

15 Isn't that a physical separation?

16 A. Um, I don't know. I mean, it comes
17 around the bottom and loops around it. It seems
18 like it's all one common voltage throughout this
19 entire -- entire plane. So I would be hard
20 pressed to draw a separation line. I don't know
21 where it is.

22 Q. So if we look at paragraph 71 of your

1 declaration, which is Exhibit 2004, it appears
2 like you're providing a construction for power
3 traces.

4 Do you see that?

5 A. Okay. Yeah. I see paragraph 71,
6 yeah.

7 Q. Yeah. So your declaration states,
8 um: "The 'power traces' of the '864 patent are
9 relatively narrow structures."

10 Right?

11 A. Yes.

12 Q. And then you refer to Figure 3 of the
13 '864 patent?

14 A. Correct.

15 Q. So -- but didn't we discuss earlier
16 that Figure 3 doesn't tell us what the widths
17 are of those power traces?

18 A. It doesn't show what width -- what
19 we've talked about was, it doesn't show a width
20 difference that is used to manage parasitic
21 resistance. It does show that they're
22 relatively, uh, thin in respect to the bond pad.

1 I mean, that's what the -- that's what they talk
2 about in -- in the patent, and that's what they
3 show in Figure 3.

4 Q. Well, isn't this just a block diagram
5 showing the paths of the power traces?

6 A. It is but then he --

7 MR. BORSOS: Objection, form.

8 THE WITNESS: -- he talks about it in
9 the specification that -- um, that these traces
10 by, um, making them narrow, you could put
11 them -- uh, and having them extend from the bond
12 pad, you could put them very close together and
13 -- uh, and use them to balance the voltage in
14 the device.

15 BY MR. KRITSAS:

16 Q. So where in the '864 patent does --
17 does -- does the patent state that the power
18 traces are required to be narrow?

19 A. So if we start in, um, column 5, line
20 64, um, it says: Further, as shown in the
21 exemplary embodiment of FIG. 3, the power traces
22 are physically separated as they meet the bond

1 pad. As shown, it may be advantageous to
2 utilize two separate power traces from a single
3 bond pad to efficiently balance the series
4 resistance of the power traces. This ensures
5 adequate power balancing to the heater arrays.
6 Additionally, the on-chip routing of power
7 traces from a single bond pad may also be
8 positioned close together, and more closely than
9 conventional power traces stemming from
10 different bond pads. (As read)

11 So this is where, you know, they show
12 in Figure 3, they come off with the same pad;
13 they're within that same constraint of width;
14 they're close together and, uh, because
15 they're -- they're able to follow that same
16 space allocation from the bond pad in order to
17 achieve these two separate paths to -- uh, to
18 arrays which are farther away from -- one
19 farther away than the other from the bond pad.

20 Q. So are you telling me you're --
21 you're construing the power trace based on
22 the -- the embodiment that you just read to me

1 from the '864 patent?

2 MR. BORSOS: Objection to form.

3 THE WITNESS: That's part of it. I
4 mean, it's -- I'm using Figure 3 to -- to inform
5 me of -- you know, that they -- they show they
6 come off -- coming off of each pad in the
7 constraint of the width of that bond pad, and
8 also that they're talking about spacing them
9 closely together and -- uh, and it allows them
10 to be positioned more closely than stemming from
11 different bond pads so that they're -- you know,
12 they're tightly packed together within that
13 constraint.

14 BY MR. KRITSAS:

15 Q. So do the claims themselves include
16 any sort of width requirement for the power
17 traces?

18 A. I don't believe so.

19 Q. Um --

20 A. No. I don't see any -- anything in
21 the claim that says that a specif- -- a limit on
22 the power trace width.

1 Q. In order to infringe, uh, this
2 particular claim limitation, would -- would a
3 product need to have power traces that are, uh,
4 narrower than the bond pad in your
5 interpretation?

6 MR. BORSOS: Objection to form.

7 THE WITNESS: Yeah.

8 I'm not -- that's a legal question.
9 I'm -- I don't know if I would, uh, want to
10 comment on the term "infringe."

11 BY MR. KRITSAS:

12 Q. Okay. Um, so I'll ask it a different
13 way, then.

14 Um, do the claims cover -- um, the
15 claims only cover power traces that are narrower
16 than the bond pad?

17 MR. BORSOS: Objection to form. It
18 calls for a legal conclusion.

19 THE WITNESS: So, you know, I -- as a
20 person having ordinary skill in the art, my
21 interpretation of these claims is that the --
22 the traces are narrower than the bond pad as

1 they come off there because, you know, they --
2 they have to optimize space. There's not a lot
3 of space for other -- for the other traces that
4 are adjacent to them, and they use that -- um,
5 by separating those traces proximal to the bond
6 pad, they're able to balance the parasitic
7 resistance of the -- of the trace lengths. And
8 so being narrow, at least within the width of a
9 bond pad, is an advantage, and is an advantage
10 that is -- um, that is claimed -- but that is
11 described by this patent.

12 BY MR. KRITSAS:

13 Q. So is it your position then that if
14 the power trace -- the power trace is wider than
15 a bond pad, it wouldn't be covered under the
16 claims of the '864 patent?

17 A. Um --

18 MR. BORSOS: Objection to form, and
19 calls for a legal conclusion.

20 THE WITNESS: Yeah. I don't know. I
21 think we have to -- you have to be specific
22 around the case you're talking about.

1 BY MR. KRITSAS:

2 Q. Well, I -- I just asked you.

3 I mean, if -- if a power trace is
4 wider than a bond pad that it connects to, is it
5 your position that that power trace would not be
6 covered under claim 3 of the '864 patent?

7 MR. BORSOS: Objection to form, calls
8 for a legal conclusion, asked and answered.

9 THE WITNESS: I don't think it fits
10 under claim 3. You need -- you need the -- the
11 trace to fit within the width of the bond pad in
12 order to -- to separate them proximal to the
13 bond pad because that's the space you're --
14 you're working in, so it's implied.

15 BY MR. KRITSAS:

16 Q. And your opinion is based on your --
17 your reading of Figure 3 and the written
18 specification description of Figure 3 of the
19 '864 patent?

20 A. Yes. That's correct.

21 Q. Okay. Um, let's take a look at
22 Uenishi's Figure 7, which is Exhibit 1008.

1 You know, I think I understood
2 earlier you were -- it was your opinion that the
3 physical separation, um, for Uenishi's common
4 electrode occurs, um, with respect to each
5 individual heater, uh, that the common electrode
6 is connected to.

7 Is that -- is that fair?

8 A. Yeah. If indeed there is a --
9 a sep- -- a separation, um, this is where the
10 separation is shown by -- by each heater with
11 this -- um, I'm trying to find the -- what the
12 metal material's labeled here, but that leads
13 from the common electrode 2 over to the heater 5
14 in the Figure 7(a).

15 Q. So Figure 7(a) is showing, uh, the
16 common electrode identified as 2 in this figure,
17 um, connecting to resistors 5.

18 Do you see that?

19 A. Yes, I do.

20 Q. And so the common electrode needs to
21 provide power to each of those individual
22 resistors to -- in order for them to fire.

1 Is that fair?

2 A. Yes. That's fair.

3 Q. Um, how is -- is what's shown in
4 Uenishi's Figure 7(a) different from how -- how
5 other heating resistors are powered, um, from a
6 power trace?

7 A. Um --

8 MR. BORSOS: Objection to form.

9 THE WITNESS: Yeah.

10 I don't know what this -- this line
11 is in Uenishi that kind of sits on top of the
12 common electrode 2 and leads over to 5, but
13 typically, um, you know, there's a -- there's a
14 metal layer, a metal level that runs along the
15 length of the array with metal that feeds up
16 into -- into heaters. That's -- that's typical.
17 I just -- but I -- this looks like there's
18 something different here, but I'm not quite sure
19 what it is. Seems like maybe it's a second
20 metal level or something.

21 BY MR. KRITSAS:

22 Q. So in your experience, when you need

1 to connect a power trace to an array of heat
2 resistors, um, how -- how are those heating
3 resistors typically connected to the power
4 trace?

5 A. The power trace is basically -- is
6 shaped so that, you know, a section of it goes
7 up into the area of the heater resistor and
8 overlays -- overlays that -- that heater
9 resistor on one -- on one side, on the -- on the
10 power-feed side.

11 Typically, what they do is it goes
12 all the way across the heater resistor, and then
13 it's etched to expose the heater, so that the
14 return line 4 is also, um, then provided at that
15 same time.

16 Q. So you would have the power trace
17 that would be coupled to, um, the array of
18 resistors, um, and then you would etch away
19 material to separate them from one another.

20 Is that fair?

21 A. And also to uncover the resistor,
22 right?

1 If you cover a resistor with metal,
2 then it's not a resistor anymore, right?

3 It's conductive.

4 So what they do is they -- they form
5 the resistor in the semiconductor using, you
6 know, traditional CMOS processes. They put
7 metal over the entire surface of it, and then
8 they etch out that size of the -- that they want
9 the resistor size to be, which then kind of, uh,
10 helps determine the -- the firing energy, right?

11 The resistance of the heater
12 resistor.

13 Q. Got it.

14 Um, and in that situation, all the
15 material would be, I assume, of the same -- same
16 metal or same type of material that's laid down?

17 A. Yeah. I think it's done -- it's done
18 different ways, but it can be the same metal
19 layer that supplies -- that supplies the supply
20 line going across the front of the heaters and
21 also the metal layer that connects into the
22 heaters, or it could be a second metal in a via

1 that does that.

2 Q. But wouldn't -- um, so wouldn't there
3 also be separations off of the -- the power
4 trace to each individual, uh, heating resistor,
5 uh, in the -- in the structure that you just
6 described?

7 A. Yes, there would be.

8 Q. And is that -- is that typical of a
9 structure you might see in the '864 patent, for
10 example?

11 A. It -- you know, they don't describe
12 it, um, but it's typical construction of devices
13 that were made at the time of the '864 patent.

14 Q. Got it.

15 So -- so Uenishi is showing
16 separations for each heating resistor, similar
17 to the way, you know, a typical printhead chip
18 might -- might show separations for each heating
19 resistor.

20 Is that fair at least?

21 A. Well, except for the fact that
22 they -- they show a different box around each

1 one of those leads, right?

2 And I don't -- that -- that implies a
3 separate metal layer. That wouldn't necessarily
4 be what they would do at the time of, um, the
5 '864. You like to keep it in the same metal
6 layer.

7 Q. Um, now, do you see the -- the common
8 hash marks between the common electrode 2 and,
9 uh, those -- those lines running to the heating
10 resistor?

11 MR. BORSOS: Objection to form.

12 THE WITNESS: You know, they both
13 have hash marks, but then there's like a box
14 around the sleeves which is -- is odd, right?

15 It implies, like, there's metal
16 laying on metal, doesn't it?

17 You know, that's how it looks to me.

18 Q. So it --

19 A. They don't -- they don't show it in
20 the cross-section below very well.

21 Q. But you would agree that in -- when
22 you're looking at an engineering drawing, uh,

1 common hash marks indicate that structures are
2 made of the same material, right?

3 MR. BORSOS: Objection, form.

4 THE WITNESS: Not always. You don't
5 put a box around them like that.

6 BY MR. KRITSAS:

7 Q. Well, I'm simply asking about common
8 hash marks.

9 So when you -- when you look at an
10 engineering drawing and you have common hash
11 marks between two structures, doesn't that
12 indicate that those structures are made out of
13 the same material?

14 MR. BORSOS: Objection, form.

15 THE WITNESS: Not -- not always.

16 BY MR. KRITSAS:

17 Q. In what situations are you aware of
18 where you would use the same hash mark to
19 indicate different materials?

20 MR. BORSOS: Objection, form.

21 THE WITNESS: I think that here's a
22 case right here where it does -- you know, it

1 looks like they put a box around it, a -- so it
2 implies a different layer. It might be the same
3 material, right?

4 They might both be aluminum, but
5 one's at a different layer than another, but
6 they put a box around it which implies that
7 they're, uh, at the different levels.

8 BY MR. KRITSAS:

9 Q. So do you at least agree with me,
10 though, that the structure shown in Figure 7(a)
11 with common hash marks are made out of the same
12 material?

13 MR. BORSOS: Objection to form.

14 THE WITNESS: Yeah.

15 I don't know.

16 BY MR. KRITSAS:

17 Q. Do you have any reason to believe
18 that --

19 A. I can go back and look at the -- look
20 at the specifications to see what he says.

21 So they -- they refer to that as a
22 wiring electrode, right?

1 Um, in paragraph 31, right?

2 And in paragraphs 29 through 32, they
3 kind of repeat the same thing, that the heater
4 resistor is formed connected thereto to one side
5 of the individual wiring electrode between the
6 drive circuit and the first common electrode.

7 (As read)

8 So it says it's a different thing,
9 right?

10 It doesn't say what material it is.
11 It just says it's a different thing. So, I
12 mean, it -- typically, in these type of devices,
13 they're -- you know, it's a -- it's a highly
14 conductive metal. It could be aluminum. It
15 could be gold.

16 Q. So, um, I think you had read from --
17 let me see.

18 So if we look at paragraph 30 of
19 Uenishi --

20 A. Right.

21 Q. -- I think you were reading here
22 which says: "a resistor 25-4 is formed

1 connected thereto on the other side via the
2 individual wiring electrode 24-4 between the
3 drive circuit 22b and the third common electrode
4 23c."

5 So do you see that there?

6 A. I do. And it says that multiple
7 paragraphs of different -- you know, for
8 different sections of the die, yeah.

9 Q. So if we go back to Figure 7, if we
10 look at Figure 7(a), isn't what that paragraph
11 is describing is the connection between the
12 resistor and the drive circuitry which are
13 identified as items 5 and, um, item 6?

14 A. So it's a connection between item 2
15 and item 6, right?

16 And it's called a wiring electrode,
17 and it refers to it -- to something that
18 connects the common electrode through the heater
19 to the -- to the, um, drive electronics or
20 whatever they're referring to number 6 as.
21 Sorry.

22 Q. So where does the Uenishi reference

1 state that the wiring electrode is connected to
2 the common electrode?

3 A. Right there in the paragraph you just
4 read, paragraph 30. When you start with
5 paragraph 29 -- any one of those paragraphs,
6 right, 29 through 31?

7 Paragraph 29: To the first drive
8 circuit 22a, a resistor 21 -- 25-1 is formed
9 connected thereto on one side via the individual
10 wiring electrode 24-1 between the drive circuit
11 and the first common electrode 23a, while
12 resistor 25-2 is formed connected thereto on the
13 other side via individual wiring electrode 25 --
14 24-2 between the drive circuit 22a and the
15 second common electrode 23b. (As read)

16 So it's this thing called an
17 individual wiring electrode that connects
18 between the common electrode and the drive
19 circuit.

20 Q. And so I guess for -- for purposes of
21 what I'm -- I'm trying to understand.

22 So you said that these might be on

1 different metal layers?

2 A. Right. Different metal levels, yeah.

3 Q. How would you connect the common
4 electrode to the individual wiring electrode if
5 they're on different metal layers?

6 A. With a via, elect- -- electric via.
7 So there's a -- you know, each metal layer goes
8 down. It gets a barrier, oxide layer or
9 whatever put over it so that it's insulative,
10 and then you have to put a via between that
11 insulative layer and any other metal layers that
12 you put over it to make the connection.

13 So it's a different kind of via than
14 the ink via, but they use the same term
15 unfortunately in the art. Sorry about that
16 confusion.

17 Q. I won't hold you to it.

18 A. No. It didn't come from me.

19 Q. Is it common to connect a power trace
20 to a heating resistor using, uh, a, uh,
21 electrical via like you described?

22 A. I don't know if it --

1 MR. BORSOS: Objection to form.

2 THE WITNESS: Yeah.

3 I don't know if it's common.

4 BY MR. KRITSAS:

5 Q. Have you ever seen it done in your
6 experience?

7 A. Uh, I'm not a hundred percent sure,
8 but it could be done, and it looks like that's
9 what Uenishi's doing.

10 Q. Does Uenishi state anywhere in -- in
11 the written description that it utilizes a
12 different metal layer to connect the common
13 electrode to the individual wiring electrode?

14 A. Not that I'm aware of. I -- I don't
15 think so.

16 Q. Is it possible that the common
17 electrode and the individual wiring electrode
18 are both created at the same time as part of
19 Uenishi's manufacturing process?

20 MR. BORSOS: Objection to form.

21 THE WITNESS: It's possible, but it's
22 odd that they drew it the way they drew it

1 and -- and then they refer to it as a different
2 thing, right?

3 As -- instead of an extension of the
4 common electrode, they call it a wiring
5 electrode. So it tends to -- to signify to the
6 reader that it's a different -- it's a different
7 thing.

8 BY MR. KRITSAS:

9 Q. Um, when -- when we look at, um, the
10 '864 patent, um, for example, Figure 3, um, are
11 the -- in your experience, you know, would --
12 would the bond pad 328 and, uh, power traces 326
13 be made out of the same metal material?

14 A. I've seen both. I've seen both, um,
15 where the bond pads are on one metal layer, and
16 then there's -- there's immediately vias that
17 are very close to the bond pad, and the traces
18 then go up to a different metal layer because
19 there's other traces that are going side to side
20 down by the bond pad area, and they have to get
21 over them.

22 So -- so those other traces could be

1 up in a -- in a -- in an above-metal layer, or
2 they could be in a below-metal layer, right, and
3 you have to -- um, you have to manage that in a
4 layout of your device. So I've seen both.

5 Q. Is there any requirement within the
6 '864 patent that, uh, the power traces and the
7 bond pad be on the same metal layer?

8 A. I don't believe so, but I'd have to
9 look more carefully.

10 Q. Um, going back to Uenishi's Figure 1,
11 I believe you testified earlier that, um, the
12 common electrode of Uenishi only has a single
13 power trace.

14 Is this correct?

15 A. That's -- that's what I -- it appears
16 to me, yes. This is all one common trace, or
17 I'm not even sure I would call it a trace. I
18 would just call it a supply plane.

19 Q. If, uh, the bottom portion of
20 Uenishi's common electrode, you know, the -- all
21 of the parts below the ink via were removed,
22 would that change your opinion as to, um,

1 whether the physical separation of the common
2 electrode is located at the top of the ink via?

3 A. It would still be -- it would still
4 be a common electrode, so I -- I still wouldn't
5 be able to tell you where the separation is, you
6 know. It's one big planer thing that surrounds
7 that ink via.

8 Q. No, but my question is if -- if the
9 common electrode didn't surround the ink via,
10 you know, that if the portion below the ink via
11 at the bottom of Figure 1 were removed --

12 A. Right.

13 MR. BORSOS: Objection to form.

14 BY MR. KRITSAS:

15 Q. Now, you have something that -- now,
16 you have something that looks like a tuning
17 fork, for example.

18 A. Um-huh.

19 Q. Um, wouldn't the physical separation
20 occur at the top of the page?

21 A. I said --

22 MR. BORSOS: Objection, form.

1 THE WITNESS: I don't look at it as
2 having a separation. Even in that case. It's
3 still one -- one tuning fork, right, as you
4 said. It's just, where's the separation?

5 BY MR. KRITSAS:

6 Q. So what's --

7 A. You know, it's one -- it's one thing.

8 Q. How is that different from -- I guess
9 I don't understand what you mean by it's just
10 one electrode.

11 Can you elaborate on -- on -- on your
12 reasoning for that?

13 A. So just -- you know, it exists in a
14 plane on this device. Whether it goes around
15 the bottom of the via or not, it's just this big
16 plane. I don't have a -- I have a hard time
17 saying that there's two traces. It's -- it's
18 one thick U-shaped electrode.

19 Q. So -- so is your opposition to
20 Uenishi really based on the fact that you don't
21 think that those are traces shown for the common
22 electrode?

1 A. That's -- that's, one of them is --
2 um, well, that it's more of a supply plane
3 rather than a trace. I wouldn't really call
4 them a trace, but I would also say my objection
5 to Uenishi, um, is that the lack of clarity in
6 the bond pad and, um, that feeds -- that feeds
7 voltage to the two arrays. That's not -- that's
8 not well defined, so those are the two primary
9 things.

10 Q. And what's the difference between a
11 power trace and an electrical plane?

12 A. So as we talked about, uh, earlier,
13 you know, the traces in my definition in claim
14 construction is a relatively narrow thin piece
15 of metal that extends from the bond pad and, uh,
16 goes out to supply voltage to the heaters in the
17 array. Uh, and this doesn't match my definition
18 of a trace for that claim construction.

19 Q. So if the -- so let me ask you this,
20 though: So if -- you know, Uenishi's, uh,
21 common electrode were designed such that each
22 leg of the common electrode were narrower than

1 the electricity-feed terminal, would you then
2 agree that the separation, the physical
3 separation between those two legs occurs, um, at
4 the top of the ink via shown in Figure 1?

5 MR. BORSOS: Objection, form.

6 THE WITNESS: Yeah.

7 I don't know what that would look
8 like.

9 So you're saying that the -- the
10 thick section at the top would remain, but then
11 thin along each side of the via, but it still
12 would have that thick section up at the top.
13 I -- I -- I don't know. It's still -- I think
14 maybe those sections that go along the via I
15 would consider a trace, but not the top section.

16 BY MR. KRITSAS:

17 Q. So I have, uh, no more questions for
18 you, Mr. Dietl, at this time.

19 MR. KRITSAS: So I'll -- uh, I'll
20 pass the witness.

21 MR. BORSOS: Thank you. I just have
22 a few questions.

1 * * *

2 EXAMINATION

3 * * *

4 BY MR. BORSOS:

5 Q. Um, Mr. Dietl, at the beginning of
6 this deposition, Mr. Kritsas asked you, um,
7 about whether you were provided a draft of your
8 declaration.

9 Uh, is there anything in your
10 declaration, uh, that you do not agree with?

11 A. No.

12 Q. And was your declaration created in
13 conjunction with your counsel based on
14 conversations that you had with your counsel?

15 A. Yes.

16 Q. Uh, when Mr. Kritsas asked about
17 points of novelty with respect to the '864
18 patent, do you have any specific understanding
19 of what the term "point of novelty" is intended
20 to mean?

21 A. I don't have legal training, and so
22 if there's a legal definition of "points of

1 novelty," I would say I don't know what that
2 definition is.

3 My assumption meant -- it meant the
4 claims, what is claimed.

5 Q. And in your answers, were you
6 referring to any specific claim if you did not
7 mention, uh, a claim by number?

8 MR. KRITSAS: Objection to form.

9 THE WITNESS: No, I wasn't. I was
10 gen- -- I was generalizing, and I probably
11 shouldn't have.

12 BY MR. BORSOS:

13 Q. Can you turn to, um, what was marked
14 in the IPR documents as 1001, which is the '864
15 patent?

16 And I -- I believe it's marked as --
17 as Dietl 1 for purposes of this definition or,
18 uh, deposition. Excuse me.

19 And there was discussion about Figure
20 3 of this document.

21 If we could turn to Figure 3?

22 In this illustrated embodiment there

1 are bond pads such as 328 that have two traces,
2 326 extending from them.

3 Is the patent limited to bond pads
4 that have only two traces?

5 MR. KRITSAS: Objection to form.

6 THE WITNESS: No, it is not. It also
7 mentions that it could have three traces or
8 more, um, and I think there's a dependent claim
9 also that claims more than two traces from a
10 bond pad.

11 BY MR. BORSOS:

12 Q. And so when discussing how those
13 traces connect to heater arrays on opposite
14 sides of the ink vias, would it be possible to
15 have two traces to each, uh, array so that one
16 trace on the right side, uh, extends only to a
17 limited group of heaters on the right array, and
18 then the second trace, uh, going to the array on
19 the right connects to a different groups of
20 heaters that's further inboard?

21 MR. KRITSAS: Objection to form.

22 THE WITNESS: Um, I -- I have seen

1 that in some, uh, other art, and that has --
2 that could be done, yes.

3 BY MR. BORSOS:

4 Q. And if you turn to column 6, starting
5 at line six, uh, do you see that it says:
6 "Although not illustrated, it should also be
7 appreciated that a single power trace may extend
8 from the bondpad 328, and then branch into two
9 or more traces that extend to respective heater
10 arrays"?

11 A. Yes, I see that.

12 Q. Okay. And so does this confirm that
13 there could be more than two traces extending to
14 the two heater arrays?

15 A. Yes.

16 Q. And at the top of column five, uh,
17 starting at line three, do you see that it
18 describes that, uh: "In exemplary embodiments
19 of the present invention, these 320 heaters may
20 be grouped and/or addressed in blocks of 20 to
21 40 heaters each, although alternative groupings
22 with varying numbers of heaters may also be

1 utilized"?

2 A. Yes, I see that.

3 Q. And to one of ordinary skill in the
4 art, would that indicate that there could be
5 separate traces extending to each of those
6 blocks within a single array?

7 MR. KRITSAS: Objection to form,
8 leading.

9 THE WITNESS: Um, it could -- it
10 could. I'm not sure I've seen it in physical
11 devices, but, uh, it certainly could. You have
12 multiple leads for each 20 to 40 heaters.

13 BY MR. BORSOS:

14 Q. And could we turn to Exhibit 1008,
15 the Uenishi patent, which was the last exhibit
16 marked in this deposition, uh, and marked as
17 Dietl 5?

18 There was some questioning relating
19 to Figures 1 and 2, as well as Figure, uh, 6.

20 And do you recall that Figure 6 is
21 identified in this reference as a prior art
22 process, whereas Figures 1 and 2 are described

1 as the, uh, inventive embodiments?

2 A. Yes, I do recall, and I think I
3 mentioned that earlier in this deposition.

4 Q. And you were asked about the language
5 at paragraph 11?

6 A. Right.

7 Q. If we can turn to that paragraph?

8 THE EXHIBIT TECHNICIAN: I'm sorry,
9 Counsel.

10 Can you repeat which paragraph?

11 MR. BORSOS: Uh, paragraph 11.

12 THE WITNESS: Page four.

13 MR. BORSOS: Thank you.

14 BY MR. BORSOS:

15 Q. Now, is it fair to say that, uh,
16 paragraph 11 relates to the prior art embodiment
17 in Figures 6 and 7?

18 MR. KRITSAS: Objection, form.

19 THE WITNESS: Yes, it is.

20 BY MR. BORSOS:

21 Q. And you were asked about language
22 starting at the, uh, second -- the end of the

1 second line in this paragraph which states: "In
2 other words, thin-plate material 11 covers all
3 the region except the drive circuit 6 and the
4 electricity-feed terminals 3 and 7."

5 Uh, is that an accurate, uh, reading
6 of, uh, paragraph 11?

7 A. Yes.

8 Q. And if we turn now to paragraph 36,
9 which is at page seven of the same document?

10 MR. BORSOS: And if we could zoom out
11 a bit so that we can see, uh, all of paragraph
12 36?

13 BY MR. BORSOS:

14 Q. I'll ask whether paragraph 36 appears
15 to refer to Figure 2 showing a different
16 embodiment than Figures 6 and 7?

17 MR. KRITSAS: Objection to form.

18 THE WITNESS: I -- I -- I believe
19 that Figure 2 relates to the inventive
20 embodiment, right, and which includes, uh, all
21 the -- um, the sharing of the drive electronics
22 to, um, multiple side, to multiple arrays that

1 are, uh, between ink vias. So it's a multicolor
2 device, which Figures 6 and 7 are, uh, basically
3 a single -- single colored chip. So it's
4 definitely a different embodiment, and it's --
5 and it's referred to as the -- the exemplary
6 embodi- -- embodiment.

7 BY MR. BORSOS:

8 Q. And in this paragraph, if you look
9 at, uh, the description of the orifice plates
10 being applied to the -- uh, uh, the, uh,
11 printhead, uh, starting four lines from the
12 bottom, the reference states that the "five
13 orifice plates 32," uh, and then in parentheses,
14 "(32a, 32b, 32c, 32d, and 32e) are affixed on
15 top of them, except where the drive circuits 22
16 (22a-22d) are installed, as shown in Figs. 1(a)
17 and 1(b)."

18 Uh, is there any reference that you
19 can see in paragraph 36 to exempting the areas
20 with electrical terminals from coverage by the
21 orifice plates?

22 A. There is not.

1 Q. Okay. And so that appears to be a
2 distinction between, uh, the description of
3 Figure 2(a) and, uh, 2(b) versus Figures 6 and
4 7?

5 A. That's -- yes. That's correct.

6 MR. BORSOS: I have no further
7 questions.

8 MR. KRITSAS: I have a few follow-up
9 questions.

10 * * *

11 EXAMINATION

12 * * *

13 BY MR. KRITSAS:

14 Q. So, Mr. Dietl, let's -- um, let's
15 take a look at Uenishi again, and we'll go back
16 to, uh, the same paragraph we were just looking
17 at, paragraph 36.

18 So paragraph 36 tells us that, um,
19 "Fig. 2(a) is a plan view that shows the state
20 described above in a similar manufacturing
21 process to the prior art head shown in Figs. 6
22 and 7."

1 Do you see that?

2 A. Yes, I do.

3 Q. So -- so what's being described in
4 the invention in Uenishi, um, is manufactured
5 under a similar manufacturing process as --
6 which was described with respect to the prior
7 art Figures 6 and 7.

8 Do you at least agree with that?

9 A. Yes.

10 Q. Um, and if we look further down in
11 the paragraph, it states, um: "The partition
12 material 31 is laminated, as shown in Fig. 2(b),
13 over part of the common electrodes 23."

14 Um, do you see that as well?

15 A. Yes.

16 Q. So -- so you would agree that, um,
17 portions of common electrode 23 are not covered
18 by the partition material 31 according to
19 this --

20 A. So this --

21 Q. -- sentence?

22 A. This is the -- um, the discussion we

1 had earlier in the deposition where you can see
2 there's a section, uh, underneath the nozzle
3 plate adjacent to the ink via where, um, ink can
4 flow from the via over to the -- um, the
5 comb-like structure in the partition material
6 under the nozzle plate. That's the partial
7 section that they're referring to.

8 You know, we talked about that
9 earlier in the deposition that -- you had
10 mentioned that, well, the partition material was
11 in the same pattern, in the same shape as the
12 common electrode and -- and I pointed that out;
13 that, no, it's narrow in that area to allow ink
14 to flow over to the comb-like structure and into
15 the heater array. So I believe that that's what
16 they're referring to.

17 And I -- I would also say that the
18 "similar manufacturing process" does not
19 necessarily mean the same, you know, similar
20 masks and dies and configuration, right?

21 It's the steps of the process,
22 so . . .

1 Q. So if we -- and also, I want to look
2 at, um, paragraph 76 of your declaration.

3 A. Okay.

4 Q. So I want to pull up your
5 declaration, paragraph 76, Exhibit 2004.

6 THE EXHIBIT TECHNICIAN: I'm sorry,
7 Counsel.

8 Which -- which paragraph?

9 MR. KRITSAS: Uh, 76. It's on page
10 46.

11 Uh, Michelle, could we just zoom in a
12 little on paragraph 76?

13 Thank you.

14 BY MR. KRITSAS:

15 Q. So in paragraph 76 you state, "the
16 separation of traces in Uenishi occurs very
17 close to the heating resistors. And then you go
18 on to say: "Although Figs. 6 and 7 of Uenishi
19 are described as showing prior art, they show
20 the steps of manufacturing the 'heating heads'
21 of the embodiment above that is described as
22 Uenishi's invention."

1 Do you see that?

2 A. Yes.

3 Q. So is it your position that Figures 6
4 and 7 don't describe the steps of manufacturing
5 Uenishi's invention now?

6 A. I didn't say that.

7 MR. BORSOS: Objection to form.

8 BY MR. KRITSAS:

9 Q. So what -- which one is it,
10 Mr. Dietl?

11 Is it Figure 6 and 7 show the steps
12 of manufacturing Uenishi's invention, or does it
13 -- does it not show those steps?

14 MR. BORSOS: Objection to form.

15 THE WITNESS: It shows the steps of
16 manufacturing the head, but it doesn't show the
17 same configuration, right?

18 The processing steps, the order --
19 order of the layers and how the thing is
20 constructed are the manufacturing steps.
21 Clearly, if you look at the device in 6 and 7,
22 it's a -- it's a monochrome, single-color

1 device; where, in Figure 1 and Figure 2, which
2 are the exemplary embodiment, uh, it is a
3 multicolor device of which this patent is really
4 focusing on, uh, describing how to do that with
5 efficient sharing of the drive electronics, um,
6 between -- between colors.

7 And so there's a difference between
8 manufacturing process and the configuration, the
9 mask levels, the mask designs. So they're the
10 same manufacturing process but a different
11 configuration.

12 BY MR. KRITSAS:

13 Q. But doesn't Uenishi utilize the same
14 common electrode in both the prior art and its
15 inventive embodiment shown in Figures 1 and 2?

16 MR. BORSOS: Objection to form.

17 THE WITNESS: I don't know if it's
18 exactly the same, but it's similar.

19 BY MR. KRITSAS:

20 Q. And so -- so it's your position,
21 though, that Uenishi is using a different
22 manufacturing process for purposes of -- of

1 creating the common electrode and placing the --
2 uh, those layers on top of the common electrode
3 between the prior art and its invention?

4 A. No. I --

5 MR. BORSOS: Objection to form.

6 THE WITNESS: I -- I have already
7 answered this question. I didn't say they're
8 using a different manufacturing process. I said
9 they're using a different configuration, which
10 is different masks.

11 BY MR. KRITSAS:

12 Q. So in -- when the prior art version
13 describes not covering the common electrode, um,
14 you think that's only relevant for the prior art
15 and not for Uenishi's invention that you're
16 referencing in paragraph 76?

17 A. No. It appears to be --

18 MR. BORSOS: Objection, form.

19 THE WITNESS: It appears to be the
20 case in terms of what they've disclosed in
21 Figures 1 and 2.

22 BY MR. KRITSAS:

1 Q. I see.

2 So -- but, um, when we're referring
3 to, uh, the individual wiring electrodes in the
4 heating resistors 5 and those connections of the
5 common electrode, is it your position that the
6 manufacturing process would be the same?

7 A. As far as I know. They didn't say
8 they're different.

9 Q. Where did -- where did Uenishi say
10 the structure of its common electrode and its,
11 uh, electricity-feed terminal is different
12 between the prior art and the, uh, inventive
13 aspect in Figure 1?

14 A. In paragraph 36, they -- they go on
15 to say here that the "five orifice plates 32
16 (32a, 32b, 32c, 32d, and 32e) are affixed on top
17 of them, except where the drive circuits 22
18 (22a-22d) are installed," as shown in Figures
19 (a) and (b) [sic].

20 And that differs from paragraph 11
21 which says: except where the drive circuits are
22 installed, and the electricity-feed terminal.

1 So they -- they left that out.

2 Q. Where -- where in paragraph 36 does
3 the reference state that the orifice plates are
4 affixed on top of the electricity-feed
5 terminals?

6 A. It's shown in Figure 2(a), when you
7 look at the plan view in Figure 2(a).

8 Q. But it only describes in paragraph 36
9 affixing the orifice plates on top of the common
10 electrodes.

11 Isn't that right?

12 A. Right, and then they show it having
13 that extension, which covers the
14 electricity-feed terminal.

15 Q. So your -- your -- your opinion is
16 based solely on what's shown in the figures.

17 Is that -- is that fair?

18 A. No. It's also base- -- based on
19 what's in the specification. We just read in
20 paragraph 36, it -- it left that out that it
21 was, uh, removed in paragraph 36. It makes no
22 mention of it, uh, in paragraph 36 regarding the

1 partition material because that's -- but in --
2 uh, well, it makes no reference to the partition
3 material and shows -- there's no figure showing
4 the partition material plan view in Figure 2.

5 Q. Well, paragraph 36 doesn't reference
6 the electricity-feed terminal at all, does it?

7 A. It references the attachment of the
8 orifice plate, and then Figure 2 in the image
9 shows the tab which covers the electricity-feed
10 terminal.

11 Q. Mr. Dietl, that's not my question.
12 My question was: Does paragraph 36
13 call out an electricity-feed terminal?

14 A. No. It references the common
15 electrodes but not the electricity-feed
16 terminal.

17 Q. Thank you. I don't have any more
18 questions, uh, for you at this time.

19 MR. BORSOS: We can go off the
20 record.

21 THE COURT REPORTER: Can I just
22 understand what your orders are on this

1 transcript, Counsel, what you'd like to see and
2 when?

3 Mr. Kritsas?

4 MR. KRITSAS: Um, I'd like a rough
5 draft.

6 And do we have a standard order for
7 final transcripts?

8 THE COURT REPORTER: I don't happen
9 to know what that is, but do you happen to know
10 what you'd like, and then I can check that.

11 MR. KRITSAS: Two weeks is fine for
12 me.

13 THE COURT REPORTER: Okay. Thank
14 you.

15 And how about for you, Mr. Borsos?

16 MR. BORSOS: Standard delivery. I --
17 just a no-frills, uh, PDF.

18 THE COURT REPORTER: Would you like
19 the rough draft?

20 MR. BORSOS: No, no rough draft.

21 THE COURT REPORTER: Okay. Very
22 good.

1 Thank you so much. Have a wonderful
2 evening and weekend and holidays.

3 * * *

4 (Whereupon, the deposition was
5 concluded at approximately 3:50
6 p.m. EST)

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DEPOSITION ERRATA SHEET

Our Assignment No. 517961

Case Caption: Canon U.S.A., Inc. and Canon,
Inc. vs. Slingshot Printing, Inc.

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that I offer these changes as if still under
oath.

Signed on the _____ day of
_____, 20____.

STEVEN J. DIETL

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1 C E R T I F I C A T I O N

2 I, REBECCA KLANDERUD, Registered
3 Professional Reporter, Certified Shorthand
4 Reporter, certify:

5 That STEVEN J. DIETL, the witness whose
6 deposition is hereinbefore set forth, was duly sworn by
7 me before the commencement of such deposition and that
8 such deposition was taken before me and is a true record
9 of the testimony given by such witness.

10 I further certify that the adverse party,
11 PATENT OWNER, was represented by counsel at the
12 deposition.

13 I further certify that the deposition of
14 STEVEN J. DIETL occurred via Zoom videoconference on
15 Tuesday, December 19, 2023, commencing at 8:00 a.m. to
16 3:50 p.m.

17 I further certify that I am not related to
18 any of the parties to this action by blood or marriage,
19 I am not employed by or an attorney to any of the
20 parties to this action, and that I am in no way
21 interested, financially or otherwise, in the outcome of
22 this matter.

1 IN WITNESS WHEREOF, I have hereunto set my
2 hand this 2nd day of January, 2024.

3
4
5
6
7 

8 Rebecca Klanderud

9 Registered Professional Reporter

10 Certified Shorthand Reporter

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