

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

CANON U.S.A., INC. and	)	
CANON INC.,	)	
	)	Case IPR2023-00309
Petitioners,	)	
	)	Patent No.
vs.	)	7,290,864
	)	
SLINGSHOT PRINTING LLC,	)	
	)	
Patent Owner.	)	

The deposition of STEPHEN F. POND, Ph.D.,
taken in the above-entitled case, before Suzanne
Thalji, CSR and Notary Public in and for the
County of Cook and State of Illinois, on
October 11, 2023, at 9:06 a.m., at
110 North Wacker Drive, Suite 2800, Chicago,
Illinois.

1 APPEARANCES:

2 MORGAN LEWIS & BOCKIUS LLP
3 BY MR. JAMES J. KRITSAS
4 110 North Wacker Drive, Suite 2800
5 Chicago, Illinois 60606
6 312.324.1000
7 james.kritsas@morganlewis.com

8 on behalf of the Petitioners;

9 FITCH EVEN TABIN & FLANNERY LLP
10 BY MR. MARK A. BORSOS
11 120 South LaSalle Street, Suite 2100
12 Chicago, Illinois 60603
13 312.577.7000
14 mborsos@fitcheven.com

15 on behalf of the Patent Owner.

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I N D E X

WITNESS

STEPHEN F. POND, Ph.D.

EXAMINED BY	PAGE
MR. BORSOS	4
MR. KRITSAS	37

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1 (Pond Deposition Exhibits 1 and 2 were
2 marked for identification.)

3 (Witness sworn.)

4 STEPHEN F. POND, Ph.D.,
5 having been first duly sworn, was examined and
6 testified as follows:

7 EXAMINATION

8 BY MR. BORSOS:

9 Q. Good morning, Dr. Pond.

10 A. Good morning.

11 Q. Is it your understanding that you're
12 here today to testify about the declaration that
13 you submitted in an IPR proceeding relating to
14 U.S. Patent 7,290,864?

15 A. Yes.

16 Q. And is that challenged patent in front
17 of you marked as Exhibit 1?

18 A. Yes.

19 Q. And is your declaration relating to the
20 IPR proceeding and that '864 patent in front of
21 you marked as Exhibit 2?

22 A. Yes.

23 Q. Can you turn to claim 1 of Exhibit 1.
24 Is it your understanding that claim 1 is directed

1 to a heater chip for use in a printing device?

2 MR. KRITSAS: Objection to form.

3 A. Yes.

4 BY MR. BORSOS:

5 Q. And what is your understanding of the
6 word heater chip?

7 MR. KRITSAS: Objection, vague.

8 A. My understanding is that a heater chip
9 in the context of this patent refers to the
10 semiconductor substrate of a thermal inkjet
11 printhead.

12 BY MR. BORSOS:

13 Q. And is that a single piece of
14 semiconductor material such as silicon with other
15 elements built on it?

16 MR. KRITSAS: Objection to form.

17 A. The chip, the word chip, refers to the
18 piece of silicon that has multiple fabrication
19 processes applied to it.

20 BY MR. BORSOS:

21 Q. And the heater chip also includes a
22 first heater array, correct?

23 A. The claim claims such a chip.

24 Q. And what is the heater array?

1 MR. KRITSAS: Objection to form, vague.

2 A. In a thermal inkjet device, there is an
3 array of drop generators that generate droplets of
4 ink on command of the printer system, and within
5 each drop generator there's a resistive heater,
6 and so the array of drop generators has within it
7 an array of heaters. So that phrase, a first
8 heater array, is referring to that set of heaters
9 that's within the set of drop generators that's an
10 array, a column.

11 BY MR. BORSOS:

12 Q. And the claim also mentions an ink via,
13 correct?

14 A. Yes.

15 Q. And can you tell me what an ink via
16 means within the thermal inkjet printing industry?

17 MR. KRITSAS: Objection to form, vague.

18 A. An ink via is a location that supplies
19 ink to the drop generator array and is very close
20 to the heater array which is within the drop
21 generator array.

22 BY MR. BORSOS:

23 Q. And is that generally understood to
24 refer to a structure that supplies ink from below

1 the chip surface to features that are on the chip
2 surface?

3 MR. KRITSAS: Objection to form.

4 A. For a roof shooter style of a thermal
5 inkjet device, ink is supplied from at least a
6 little bit below the surface of the chip. So the
7 ink via would have at least part of itself below
8 the surface of the chip.

9 BY MR. BORSOS:

10 Q. And claim 1 also includes a second
11 heater array adjacent at least a portion of
12 another side of the ink via, correct?

13 A. Yes.

14 Q. And so claim 1 is describing a
15 structure wherein there is a passageway for ink
16 that extends at least somewhat below the surface
17 of the chip and an array of heaters on each side
18 of that via structure?

19 MR. KRITSAS: Objection to form,
20 mischaracterizes the document.

21 A. Yes.

22 BY MR. BORSOS:

23 Q. And, finally, claim 1 has a phrase
24 indicating that there is a bond pad that supplies

1 power to at least a portion of both the first
2 heater array and the second heater array, correct?

3 A. The claim says that, yes.

4 Q. And so the bond pad is supplying power
5 to heater structures located on opposed sides of
6 the ink via?

7 MR. KRITSAS: Objection to form.

8 BY MR. BORSOS:

9 Q. Is that a fair characterization?

10 A. Yes, yes, yes.

11 Q. Now, in claim 1 the bond pad is part of
12 the heater chip, correct?

13 A. Yes.

14 Q. Let's turn to Exhibit 2, which is your
15 declaration, at page 23. Now, at page 23 you
16 begin discussing Ground 1 of the petition and
17 state that the Benjamin combination, which is two
18 patents both to inventor Trudy Benjamin, renders
19 the claims of the '864 patent obvious; is that
20 right?

21 A. Yes.

22 Q. And the first reference in that
23 combination is U.S. Patent 7,722,144 to Benjamin,
24 et al., correct?

1 A. Yes. Well, I mean the '144 is for
2 sure. I don't remember the other digits in my
3 head.

4 (Pond Deposition Exhibit 3 was
5 marked for identification.)

6 THE WITNESS: 7,722,144.

7 BY MR. BORSOS:

8 Q. And so the Benjamin '144 patent has
9 been placed in front of you as Exhibit 3, correct?

10 A. Yes.

11 Q. As you have discussed in your
12 declaration, you believe that Benjamin '144 shows
13 a fire line that supplies power to heaters on both
14 sides of an ink via; is that accurate?

15 MR. KRITSAS: Objection to form.

16 A. Yes.

17 BY MR. BORSOS:

18 Q. And if you turn to Figure 22 of the
19 '144 patent, can you confirm that it's your
20 position that 1704 is an ink via?

21 A. Yes.

22 Q. And 214A is a U-shaped fire line that
23 surrounds at least a portion of that ink via?

24 A. It serves -- electrically serves both

1 sides of the via. I don't know about the word
2 surround. Surround would be total, a total
3 enclosure. It goes along both sides of the via.

4 Q. Okay. And can you tell me what the
5 structures designated as 208 are? There's 208A,
6 B, C, D, E, F, G, and H.

7 A. I believe they're the data lines, but
8 let me look. Let's see if I say what they are.
9 They are data lines. I refer to them on page 34
10 of my declaration, paragraph 83.

11 Q. And are the data lines physically
12 separate from the fire line?

13 A. Yes.

14 Q. Can you turn to column 11 of the
15 Benjamin '144 reference. Now, at lines 9 through
16 12, the '144 patent states that the fire lines
17 214a through 214f are electrically coupled to
18 external supply circuitry by appropriate interface
19 pads. See Figs. 25A and 25B.

20 A. Yes, I see that.

21 Q. Can you tell me what your understanding
22 of interface pads is?

23 A. Interface pads are places on the
24 substrate which Benjamin calls 1700. So they are

1 places on substrate 1700 where the external supply
2 circuitry can be electrically interfaced by
3 bonding to the chip.

4 Q. And so it's your position that the
5 interface pad is on the substrate 1700?

6 A. Yes.

7 Q. And the sentence references Figures 25A
8 and 25B, correct?

9 A. It just directs you to see that, to
10 look there.

11 Q. Okay. Can you look at Figure 25A?

12 A. 25A, all right.

13 Q. Does 25A show an element marked 1700?

14 A. No.

15 Q. Do you believe that 25A shows the
16 substrate at all?

17 A. It doesn't show the substrate itself,
18 no.

19 Q. Okay. And --

20 A. The chip, we are talking about the
21 chip, 1700.

22 Q. Correct. With respect to 25B, does
23 that image show the substrate 1700?

24 MR. KRITSAS: Objection to form.

1 A. No, it doesn't.

2 BY MR. BORSOS:

3 Q. And does it show the chip at all?

4 A. No, it doesn't show the chip.

5 Q. Both of these figures show elements on
6 a flex circuit that would connect to a chip,
7 correct?

8 MR. KRITSAS: Objection to form.

9 A. The overall object 2000 is a flex
10 circuit material, a pattern flex circuit material.

11 BY MR. BORSOS:

12 Q. And it contains a number of pads 2002
13 that connect to external aspects of the printer,
14 right?

15 MR. KRITSAS: Objection to form.

16 A. Benjamin doesn't term -- you're
17 referring to the multisided circles, the ones that
18 are like -- I don't know -- 20 different --
19 decahedrons or whatever --

20 BY MR. BORSOS:

21 Q. Right.

22 A. -- circular areas? Benjamin calls
23 those contact areas, not pads. Benjamin doesn't
24 call those pads.

1 (Pond Deposition Exhibit 4 was
2 marked for identification.)

3 BY MR. BORSOS:

4 Q. Dr. Pond, you now have in front of you
5 a document marked as Exhibit 4. Is that U.S.
6 Patent No. 7,278,703 to Benjamin, et al.?

7 A. Yes.

8 Q. And can you confirm that this is the
9 second Benjamin reference in the so-called
10 Benjamin combination of Ground 1?

11 A. Yes.

12 Q. Can you turn to Figure 10. Now, there
13 is an element shown in a rectangle that's
14 identified as fire 706 in Figure 10, correct?

15 A. Yes.

16 Q. And if you turn to column 19 at about
17 line 45 to 47, does that element 706 appear to be
18 referred to as a fire line input pad?

19 A. Yes, I see that.

20 Q. And Benjamin '703 indicates that the
21 fire line input pad 706 is electrically coupled to
22 fire line 712 that is electrically coupled to
23 firing cells 120 in printhead die 40. Is that
24 accurate?

1 A. Yes, that's what it says.

2 Q. So fire line 712 is shown at least in
3 part in Figure 10, correct?

4 A. Yes.

5 Q. Does Benjamin '703 ever show the other
6 end of fire line 712?

7 A. I don't believe so.

8 Q. Does it identify the position of the
9 firing cells 120?

10 MR. KRITSAS: Objection to form.

11 A. I don't believe that Benjamin '703 by
12 itself, not considering all the references that
13 are incorporated into it, ever gives us a sense of
14 the layout of the circuitry.

15 BY MR. BORSOS:

16 Q. Is there any incorporation by reference
17 in Benjamin '703 that necessarily shows what fire
18 line 712 connects to?

19 MR. KRITSAS: Objection to form to the
20 extent it calls for a legal conclusion.

21 A. "Necessarily shows," I'm not sure I
22 understand what "necessarily shows" means.

23 BY MR. BORSOS:

24 Q. Is there an incorporation by reference

1 that indicates that a particular element in 706
2 called the fire line input pad in Benjamin '703
3 connects to a specific structure?

4 MR. KRITSAS: Objection to form, calls
5 for a legal conclusion.

6 A. I believe that a PHOSITA would read
7 Benjamin '144 and Benjamin '703 as a combined
8 reference, and they would realize that fire input
9 pad 706 is connected through run 712 to one of the
10 six U-shaped fire lines in the design.

11 BY MR. BORSOS:

12 Q. Is there anything in Benjamin '703
13 itself that indicates the fire lines are U-shaped?

14 MR. KRITSAS: Objection to form.

15 A. I don't believe so.

16 BY MR. BORSOS:

17 Q. Can you turn to paragraph 118 in your
18 declaration, which is Exhibit 2?

19 A. All right. I'm there at 118.

20 Q. And is it fair to say that the
21 discussion at 118 and the few paragraphs that
22 precede it and that follow it relate to your
23 discussion of claim 3 of the '864 patent?

24 A. This discussion relates to claim 3 that

1 I'm having here in 118 and 117.

2 Q. And if we look at claim 3 in Exhibit 1,
3 which is the '864 patent, claim 3 says that "The
4 heater chip of claim 1, wherein the bondpad
5 supplies power to the first heater array and the
6 second heater array portions by power traces
7 physically separated proximal to the bondpad."
8 Did you consider the meaning of the term
9 physically separated proximal to the bond pad in
10 your analysis of the Benjamin combination?

11 A. Yes.

12 Q. And how do you believe the Benjamin
13 combination shows power traces physically
14 separated proximal to the bond pad?

15 MR. KRITSAS: Objection to form.

16 A. I believe that the discussion in my
17 paragraph 119 and 120, 121, 122, 123, 124, and 126
18 explain my reasoning.

19 BY MR. BORSOS:

20 Q. Can you summarize for me your
21 understanding of the term physically separated
22 proximal to the bondpad?

23 MR. KRITSAS: Objection to form, vague.

24 A. Well, I consider that the power trace

1 starts at the bond pad and ends at the last heater
2 that power is supplied to. That's a length. And
3 then I look -- and then -- there are two such
4 power traces from the bond pad.

5 There's one that's going to leave the
6 bond pad and go down the left side of the ink via,
7 and there's another trace that's going to leave
8 the bond pad and go down the right side of the ink
9 via in Benjamin. And I then look at where those
10 two traces separate.

11 They're together as one at the bond
12 pad, and at some point they separate, one going to
13 the right and one going to the left. And then I
14 look at where that separation point is relative to
15 the start and the finish, the start being the bond
16 pad, and I conclude that that separation is closer
17 to the start than it is to the finish. So I
18 conclude that the separation point is proximal to
19 the bond pad, which is the start, rather than to
20 the distal point, which is the finish.

21 BY MR. BORSOS:

22 Q. So if we look at Figure 22 in Exhibit
23 3, which is Benjamin '144 --

24 A. Figure 22?

1 Q. Correct.

2 A. Figure 22, yes.

3 Q. Let's take fire line 214a as an
4 example. Does this show where the portions of
5 fire line 214a that are on opposite sides of ink
6 via 1704 separate?

7 MR. KRITSAS: Objection to form.

8 A. It shows a region where they separate.

9 BY MR. BORSOS:

10 Q. And where is that region?

11 A. In viewing it this way we are with the
12 orientation of the paper, the 214 U-shape has a
13 crossbar of the U at the top, and so the
14 separation will be somewhere along that crossbar.

15 Q. And just to be clear, the actual
16 separation is not shown in Figure 22, right?

17 MR. KRITSAS: Objection to form.

18 A. No. As I explain in my declaration, I
19 explain where the bond -- where a PHOSITA would
20 understand the bond pad to be based on the tab
21 interconnection fingers 2006 on the flex material
22 shown in Figure 25B and then annotated on this
23 drawing in my declaration on page 52, shown in
24 yellow, and further explained in the combination

1 with Benjamin '703 connecting to that straight run
2 712 that that's where the separation point would
3 occur.

4 BY MR. BORSOS:

5 Q. And so your understanding of the term
6 physically separated proximal to the bond pad is
7 based on the relative distance from that crossbar
8 to the position where you believe the bond pad is
9 located versus the distance between the crossbar
10 and the ends of the U-shaped fire line, correct?

11 MR. KRITSAS: Objection,
12 mischaracterizes prior testimony.

13 THE WITNESS: Could you say that again
14 or could that be read back again, what he
15 just said.

16 (Question read.)

17 A. I would amend that to say the position
18 along the crossbar where I believe the separation
19 to occur. The distance from the position along
20 the crossbar to the bond pad versus the position
21 along the crossbar to the distal end of the power
22 line trace is how I'm defining proximal to the
23 bond pad.

24 BY MR. BORSOS:

1 Q. And so is it accurate to say that your
2 interpretation of the phrase physically separated
3 proximal to the bond pad depends on how far the
4 fire line extends along the heater array that's
5 adjacent the ink via?

6 MR. KRITSAS: Objection to form.

7 A. Well, the word proximal is a relative
8 term. It's a term -- usually I only find it in
9 things like patents. I hardly ever encounter it
10 in real life, and for it to have meaning, one does
11 have to put it into context of the entire distance
12 from point A to point B one is talking about.

13 So if you want to locate something in
14 between point A and point B and call it either
15 proximal to A or proximal to B, you need to have
16 an understanding of what you're talking about, the
17 path -- the full picture. So in that sense my
18 understanding and use in my declaration depends on
19 my understanding of the full picture.

20 BY MR. BORSOS:

21 Q. Did you consider whether physically
22 separated proximal to bond pad means whether the
23 separation of traces is closer to the bond pad
24 than it is to the heater arrays?

1 MR. KRITSAS: Objection to form.

2 A. That crossed my mind, but I didn't know
3 how to define the heater arrays. So I decided
4 instead that what the claim really is talking
5 about is the power trace. It's not talking about
6 the heater array. It's talking about the power
7 trace; where is the separation point on the power
8 trace proximal to the bond pad or not. So I
9 dismiss the heater array as a confusion of the
10 term.

11 BY MR. BORSOS:

12 Q. And why is it that you had trouble
13 defining the heater array?

14 MR. KRITSAS: Objection,
15 mischaracterizes prior testimony.

16 A. I had trouble with the concept of
17 proximal and distal when it's applied to something
18 like that, something that itself has proximal and
19 distal aspects to it. So I decided that the claim
20 was talking about the power trace, and the
21 explanation I just gave you of bond pad to
22 somewhere along the top of the U down to the end
23 of the power trace was what we're talking about.
24 That's the A and B that we're talking about.

1 BY MR. BORSOS:

2 Q. Isn't it pretty common in these inkjet
3 pads to generally show an array of heaters using a
4 rectangular area?

5 A. Yes.

6 MR. KRITSAS: Objection to form.

7 A. We talked about that a lot yesterday.

8 BY MR. BORSOS:

9 Q. So in Figure 21 --

10 A. Figure 21 of which patent?

11 Q. Of Exhibit 3, the Benjamin '144 patent.

12 A. All right, Figure 21.

13 Q. There's shown several boxes along the
14 sides of each ink via designated D1, D2,
15 et cetera, correct?

16 A. Yes.

17 Q. Would those generally represent heaters
18 that are controlled by the circuitry of this
19 printhead?

20 A. In Figure 21 Benjamin is encompassing
21 more -- a lot more than just heater arrays in
22 these boxes, the D1 box and so forth. She is
23 meaning to tell the reader that she is
24 incorporating these -- what does she call them,

1 fire cells? It's a lot more circuitry. It's
2 power driver switches -- I can't remember her
3 generic term for these things.

4 At any rate, she is talking about --
5 for example, all the stuff in Figure 6 for all the
6 heaters that are in a subgroup are in that D1 box.
7 So it's a much more extensive set of real estate,
8 of silicon real estate than a heater array.

9 Q. Let's take a look at Figure 3 of
10 Benjamin '144.

11 A. Of '144? Here we have heaters very
12 close to the edge of the ink via.

13 Q. And so those heaters are labeled 1, 2,
14 3, and on the other side m+1, m+2 --

15 A. Well, let me see what she actually says
16 those are. She may say those are drop generators.
17 Let's see, Figure 3.

18 Well, in the explanation of the
19 figures, she calls them drop generators rather
20 than heaters.

21 Q. And so your understanding of drop
22 generator is the structure shown in Figure 6?

23 A. No.

24 Q. Can you tell me what you believe a drop

1 generator includes?

2 A. A drop generator includes a heater
3 resistor, a chamber surrounding -- partially
4 surrounding the heater resistor, a nozzle directly
5 communicating with that chamber, an ink refill
6 pathway to supply ink to that chamber, and
7 potentially other structures that modify the fluid
8 flow dynamics in the immediate vicinity of the
9 heater resistor, other barrier, layer structures
10 that cause the fluid flow around the heater to
11 have a certain characteristic. That's what I
12 would constitute as a drop generator.

13 Q. And any drop generator includes a
14 heater resistor, right?

15 A. Yes.

16 Q. And so the heater resistors form a
17 column that's parallel to the ink via, right?

18 A. Yes.

19 Q. And it can be determined where the
20 first and last heater resistors of that column are
21 positioned, right?

22 A. What can determine it?

23 Q. By looking at an inkjet printing
24 device.

1 A. Yes. You can look at the inkjet
2 printing device and see where the first and last
3 heater are in a column.

4 Q. And so is it fair to say that that
5 would define the extent of the array looking at
6 the distance between the first heater resistor and
7 the last heater resistor in the column?

8 MR. KRITSAS: Objection to form, vague.

9 A. Yes. I would say that the extent of a
10 heater array is between its first and last heater.

11 BY MR. BORSOS:

12 Q. And so by looking at a device, you
13 could determine whether the traces that supply
14 power to the heaters are separating closer to the
15 bond pad or closer to the end of the heater array
16 to which it connects, correct?

17 MR. KRITSAS: Objection to form.

18 A. To either end of the heater array, to
19 anywhere in between, or what do you mean?

20 BY MR. BORSOS:

21 Q. To the closest end of the heater array.

22 MR. KRITSAS: Objection to form.

23 A. If you had the actual device to look
24 at, you could -- you could see all aspects of the

1 power trace, including that.

2 BY MR. BORSOS:

3 Q. And if you had detailed enough
4 drawings, you could see where the power traces
5 separate relative to the closest end of the heater
6 array and the bond pad, correct?

7 MR. KRITSAS: Objection to form.

8 A. Well, now we're into patent drawings,
9 and patent drawings are notoriously difficult in
10 terms of scale. So you'd have to make an
11 assumption about the scale of the drawing, and we
12 would probably have a big argument over that both
13 ways of interpreting it. So when you say you
14 could know, certainly I could know in my belief as
15 a PHOSITA.

16 BY MR. BORSOS:

17 Q. So are you saying it's not fair to
18 assume that the distances shown in a patent
19 drawing are representative of what the true
20 distance would be?

21 MR. KRITSAS: Objection,
22 mischaracterizes testimony.

23 A. I'm saying that the interpretation of a
24 drawing to be fair, if you want to use the word

1 fair, which you just did, you need PHOSITA
2 knowledge. And a PHOSITA would bring his or her
3 knowledge of the relative sizes of things to an
4 interpretation of the drawing, and then you would
5 get a fair interpretation of the drawing.

6 BY MR. BORSOS:

7 Q. And did you attempt to do that here
8 with respect to the distance between the
9 separation of power traces relative to the bond
10 pad that you believe is shown by Benjamin '144 and
11 the distance between the separation of power
12 traces and the nearest end of a heater array?

13 A. I did not form an opinion about the
14 separation relative to the heater array. I formed
15 my opinion based on the power trace.

16 Q. Do you have an opinion of the distance
17 between the separation of the power traces
18 relative to the bond pad and the heater array now?

19 A. No. The claims also have this word
20 portion in them, and that also to me means we
21 should discount that heater array as being what
22 we're focused on in interpreting the language.
23 The claims 1 say portions of the heater array or
24 whatever.

1 So it throws to me into question that
2 the heater array itself is an entity that can
3 define proximal versus distal. So, no, I don't
4 have an opinion about the heater array.

5 (Pond Deposition Exhibit 5 was
6 marked for identification.)

7 BY MR. BORSOS:

8 Q. Dr. Pond, do you now have in front of
9 you a document marked as Exhibit 4, which is a
10 translation of Japanese patent application number
11 Hei, H-e-i --

12 A. Mine is labeled five.

13 Q. Oh, five, excuse me, Exhibit 5.
14 Exhibit 5, which is Japanese patent application
15 number Hei, H-e-i, 11-245409 or at least an
16 English translation of that document?

17 A. Yes.

18 Q. And then the original Japanese is
19 towards the back of the document, correct?

20 A. Yes.

21 Q. How did you become aware of this
22 document?

23 MR. KRITSAS: Objection to form.

24 A. I believe Morgan Lewis brought this to

1 my attention. I subsequently noticed that it was
2 referenced in some of the other patents in the
3 controversy between Morgan Lewis and Slingshot. I
4 subsequently noticed that it was something
5 referenced in one of the file histories, but it
6 first came to my attention from Morgan Lewis.

7 BY MR. BORSOS:

8 Q. If we look at Figure 1 of this Japanese
9 patent application, can you tell me what the
10 structures marked as 26a, 26b, 26c, 26d, and 26e
11 are?

12 A. Those are electricity feed terminals.

13 Q. And can you tell me what is meant by
14 electricity feed terminal?

15 MR. KRITSAS: Objection to form.

16 A. That means a bond pad.

17 BY MR. BORSOS:

18 Q. And can you tell me what the structures
19 denoted as 27a, 27b, 27c, and 27d are?

20 A. Those are drive circuit terminals.

21 Q. And can you tell me the difference
22 between those two structures?

23 MR. KRITSAS: Objection to form, vague.

24 A. They're both bond pads. So they serve

1 different -- they interface different functions of
2 the printing mechanism and the chip, but they're
3 both bond -- they're all bond pads.

4 BY MR. BORSOS:

5 Q. Now, can you tell me what the structure
6 designated as 23 is on Figure 1, so 23a, 23b, 23c,
7 23d, and 23e?

8 A. Uenishi calls -- the translation of
9 Uenishi calls them common electrodes.

10 Q. And is the common electrode 23 separate
11 from the electricity feed terminal 26?

12 MR. KRITSAS: Objection to form.

13 A. They're formed at the same time.
14 They're contiguous pieces of metal.

15 BY MR. BORSOS:

16 Q. And would they be in the same layer
17 on --

18 A. Yes, yes.

19 Q. Did you give any consideration to
20 whether the common electrode 23a, for instance,
21 could be deemed a power trace within the meaning
22 of the '864 patent?

23 A. Did I give any consideration to the
24 possibility that 23a could be power traces within

1 the meaning of the '864 patent? Is that your
2 question?

3 Q. Correct.

4 A. Yes, I gave that consideration.

5 Q. And did you consider whether the term
6 power trace has a specific meaning?

7 MR. KRITSAS: Objection to form, vague.

8 A. Well, the word specific I don't know.
9 It has a meaning to any thermal inkjet PHOSITA.

10 BY MR. BORSOS:

11 Q. And what would a PHOSITA in the inkjet
12 industry believe that power trace refers to?

13 A. A conductor that ran along the chip and
14 you could tap into to get power.

15 Q. So is it your understanding that the
16 term trace does not have any meaning with respect
17 to the size of the power conductor relative to
18 other parts of the printhead?

19 MR. KRITSAS: Objection to form.

20 A. Yes, that's my opinion. The word trace
21 does not convey any geometrical information.

22 BY MR. BORSOS:

23 Q. So is it fair to say that in your view
24 power trace and power conductor are synonymous?

1 MR. KRITSAS: Objection to form.

2 A. Yes.

3 BY MR. BORSOS:

4 Q. Does the common electrode 23 directly
5 contact the heaters of the printhead shown in
6 Figure 1 here?

7 A. A portion of it does.

8 Q. And can you tell me what portion that
9 would be?

10 A. On page 141 of my declaration, I have
11 an annotated Uenishi Figure 7, and in this
12 annotated Uenishi Figure 7, one can see -- five
13 heater resistors are shown in the drawing, and the
14 five heater resistors are called out as 5, and in
15 the orientation in my declaration that we're
16 looking at, the brown-colored lead to the left of
17 each heater resistor connects to the blue-colored
18 common electrode portion, and in actual fact those
19 brown leads are the same layer, just patterned
20 fingers, of the common electrode 2.

21 So when I say a portion of the common
22 electrode directly connects to the heater
23 resistors, I mean those fingers of the common
24 electrode connect to the heater resistor.

1 Q. So is it your opinion that the common
2 electrode separates into fingers that are shown in
3 brown in this drawing on page 141 of your
4 declaration?

5 A. Yes.

6 MR. KRITSAS: Objection to form.

7 Just give me a second to object,
8 okay?

9 BY MR. BORSOS:

10 Q. And can you tell me why in your opinion
11 those fingers separate proximal to the bond pad in
12 this patent?

13 MR. KRITSAS: Objection to the form of
14 the question.

15 A. I don't have that opinion.

16 BY MR. BORSOS:

17 Q. Okay. Do you have any opinion that
18 power traces in this Japanese application marked
19 as Exhibit 5 separate proximal to bond pads?

20 A. Yes, I believe they do.

21 Q. And can you explain your reasoning with
22 respect to the physically separating proximal to
23 the bond pad?

24 A. Well, that's claim 3. So in my

1 declaration on page 142, I explain why I think the
2 Uenishi common electrodes 23a through e fit that
3 claim limitation, physically separated from one
4 another proximal to the bond pad. So I could read
5 that for you if you'd like.

6 Q. Instead of reading what you have
7 written there, can you tell me at what point you
8 believe that the common electrode separates into
9 power traces?

10 A. Well, looking at Figure 1 -- do you
11 have Figure 1 there?

12 Q. Yes.

13 A. All right. So let's look at common
14 electrode 26b -- or, rather, 23b instead of 23a
15 because 23b supplies power to both a heater array
16 on its left side and its right side. So the power
17 comes into the bond pad 26b from a tab connection
18 to a flex circuit cable and the current will
19 separate -- if you take the bond pad width, the
20 26b, the electricity feed terminal's width as a
21 unit, I would say the traces separate about two of
22 those width distances from the bond pad, maybe
23 one. One or two of those width distances from the
24 bond pad is where the traces separate.

1 Q. And can you identify the point of
2 separation?

3 A. There isn't a point of separation. The
4 current has to flow through a volume of metal.
5 There can't be a point.

6 Q. Can you tell me where the area that the
7 traces separate is located?

8 A. I just did. An area about one bond
9 pad -- take that 26b rectangle and replicate it
10 one unit down, and that's about where the region
11 of separation of the current will occur.

12 Q. And are you referring to the area where
13 there is an open portion --

14 A. I don't know --

15 Q. -- in the middle of the common
16 electrode?

17 MR. KRITSAS: Objection to form.

18 A. No.

19 BY MR. BORSOS:

20 Q. Here, I am going to hand you a red pen.
21 Can you circle on your copy of the reference the
22 area where you believe that the power traces
23 separate in this Uenishi reference?

24 THE WITNESS: Should I do that?

1 MR. KRITSAS: (Indicating.)

2 A. (Witness complies.)

3 BY MR. BORSOS:

4 Q. And is it fair to say that your
5 characterization of this separation is based on
6 the electrical current and at what point it can go
7 to one side of the ink via versus the other?

8 MR. KRITSAS: Objection to form,
9 mischaracterizes testimony.

10 A. I chose the place I put my circle by
11 thinking through how the electron flow would go
12 and where it would separate for electrons going to
13 the left and electrons going to the right, and
14 somewhere in that vicinity -- I can't be
15 precise -- that separation is going to be going
16 on.

17 MR. BORSOS: That's all the questions
18 that I have for now.

19 THE WITNESS: Okay.

20 MR. KRITSAS: I would like to take a
21 break, maybe 15 to 20 minutes just to go over
22 my notes, go to the bathroom.

23 MR. BORSOS: That's fine.

24 (Recess taken.)

EXAMINATION

BY MR. KRITSAS:

Q. Good morning, Dr. Pond. Could you please turn your attention to Exhibit 1, which is the '864 patent.

A. All right.

Q. And I want to direct your attention to claim 1 of the '864 patent.

A. Okay.

Q. Does claim 1 include any limitation related to the location of the ink via?

A. No.

Q. Okay. And then earlier today you were also asked questions about the claim limitation power traces physically separated proximal to the bond pad. Do you recall that?

A. Yes.

Q. Okay. Can I turn your attention to claim 9 of the '864 patent, and claim 9 reads, "The heater chip of claim 8, wherein the at least two traces are physically separated proximal to the bondpad." Do you see that?

A. Yes.

Q. Okay. Does claim 9 include any

1 reference to the heater arrays? Maybe I should
2 rephrase. Does claim 9 include any reference to
3 the heater arrays in the context of the limitation
4 physically separated proximal to the bond pad?

5 A. Well, because claim 9 depends on claim
6 8, it does have a relationship to the heater
7 arrays in that the traces are operatively
8 connected to the first heater array and the second
9 heater array.

10 Q. And with that understanding in mind --
11 let me ask you about claim 9. Does claim 9
12 require that the power traces be physically
13 separated proximal to the bond pad -- let me ask
14 that again.

15 I believe you testified earlier that
16 the claim phrase physically separated proximal to
17 the bond pad was the relationship between the
18 overall length of the trace and the location of
19 the separation to the bond pad; is that right?

20 MR. BORSOS: Objection to form.

21 A. Yes, that's what I testified.

22 BY MR. KRITSAS:

23 Q. And does claim 9 of the '864 patent
24 require that that separation occur with respect to

1 a heater array?

2 MR. BORSOS: Objection to form.

3 A. Well, claim 9, which descends from
4 claim 8, is different from claim 3 where I made
5 that opinion because it doesn't even require it to
6 be a power trace. The word power doesn't occur
7 anywhere in claim 8 or in claim 9. So when I
8 interpreted this -- it says operatively connected.
9 So who knows what operatively connected means, and
10 who knows whether the traces are power traces. It
11 doesn't even say that.

12 So when I considered this claim, I
13 considered it as if it meant the same thing as
14 claim 3, but it doesn't have those words in it.

15 BY MR. KRITSAS:

16 Q. Let's go back to claim 1 of the '864
17 patent -- actually, let's look at claim 3 again.
18 So the claim requires wherein the bond pad
19 supplies power to the first heater array and the
20 second heater array portions by power traces. Do
21 you see that?

22 A. Yes.

23 Q. Does claim 3 require that the power
24 traces be directly connected to the heater arrays?

1 A. No.

2 Q. Okay. You can put the '864 patent down
3 for now.

4 Would you please open Exhibit 3, which
5 I believe is Benjamin '144, and can you turn to
6 Figure 25A and 25B?

7 A. Okay.

8 Q. And specifically looking at 25B, what
9 is identified as item 2006?

10 A. 2006 refers to what are known as Kapton
11 fingers. They are extensions of the metallization
12 of the flex material. So the flex material, which
13 is 2000, is a high-temperature plastic film,
14 usually Kapton, a polyimide film, on which one or
15 more metal layers are laminated, and then those
16 metal layers are photopatterned into the series of
17 shapes you see in this drawing.

18 And then in order to enable bonding to
19 the chip, the underlying supporting plastic
20 material, the Kapton or the polyimide, is removed
21 from beneath, part of the pattern, and that area
22 is indicated by the rectangular shape that kind of
23 is reminiscent of a double-edged razor blade.

24 And so after removing the Kapton

1 support from beneath these ends of the traces, of
2 signal traces, you have a cantilevered finger of
3 metal, and that's what is being indicated by 2006.
4 I believe Benjamin terms them contacts. 2006 she
5 calls contacts. So that's what 2006 is.

6 Q. Dr. Pond, I'm sorry. You were looking
7 up --

8 A. I was just confirming that Benjamin
9 calls 2006 -- uses the term contacts which provide
10 coupling to the printhead die.

11 Q. Thank you. If we look back at Figure
12 25B, you referenced an outline that I believe you
13 said looked like a double-sided razor blade,
14 right?

15 A. Yes. I don't know what else -- I don't
16 know what word to use for that shape.

17 Q. What does that shape represent?

18 A. That shape represents a window of the
19 flex circuit material, a cutout of the flex
20 circuit material so that this circuit material can
21 be laid down on top of the thermal inkjet die and
22 it's -- the upper surface of the thermal inkjet
23 die can come up through that window, and the bond
24 pads on that thermal inkjet die can align with

1 those fingers 2006 where they will be
2 thermosonically bonded to the bond pads.

3 That's what that shape is. It's not
4 identified in the patent, but a PHOSITA would
5 understand that that's the way a flex package of a
6 thermal inkjet roof shooter chip is done.

7 Q. Thank you. And then you can put that
8 aside.

9 Can you turn to Exhibit 5, which is the
10 Uenishi reference?

11 A. Okay.

12 Q. If you look at Figure 1 -- on your copy
13 I believe you put a mark on Figure 1 of your copy.

14 A. Yes. I put a red mark on electrode --
15 common electrode 26b.

16 Q. And I think you identified the location
17 where the current common electrode splits between
18 one side and the other; is that right?

19 A. Yes. It will be in that region of my
20 red circle. It's not a point. It's a distributed
21 region.

22 Q. And why do you believe the current
23 would split at that location of the common
24 electrode 23 where you identified in Figure 1?

1 A. Well, a PHOSITA would understand that
2 current flow is somewhat like water flow and so if
3 you could -- a current flow is the movement of
4 electrons, and in this particular situation of a
5 thermal inkjet chip done the way of Uenishi,
6 electrons are going to be flowing up from ground
7 through the individual wiring electrodes 4 that we
8 saw in the figure, into the common electrode,
9 which has been set at a high voltage by the
10 electricity feed terminal 26b attached to the
11 printer, has made the potential of that electrode
12 high relative to ground. So electrons are
13 attracted to that bond pad, to that 26b bond pad.

14 And if you just imagine how -- if you
15 had a drain, imagine that that 26b is a drain and
16 water is flowing toward the drain from two
17 sources, two streams, a stream on the left and a
18 stream on the right. I'm imagining where it would
19 join to flow into the drain.

20 Q. Okay.

21 A. And that's why I drew that circle where
22 I did. And that's the functional separation of
23 the power traces, and that's actually all the
24 shape has to be to work. It can have any other

1 shape, extraneous shape, that doesn't actually
2 influence how it works, but at least it needs to
3 come together there. Those corners don't
4 participate, for example. Those upper corners are
5 superfluous.

6 Q. Is your understanding of where the
7 current flow separates impacted at all by the
8 physical shape of the common electrode 23b?

9 A. Yes. I'm imagining -- the two arms is
10 the first thing and the fact that the shape as
11 given in the drawing gives me enough highway -- it
12 gives me more or less equal highway to the left
13 and right of my little circle. It tells me that
14 the flow would be more or less equal on left and
15 right.

16 MR. KRITSAS: Okay. Thank you,
17 Dr. Pond. I have no further questions for you at
18 this time.

19 MR. BORSOS: I have no further
20 questions. We can go off the record.

21 MR. KRITSAS: Before we go off the
22 record, I just wanted to reserve the right to read
23 and sign.

24 (Witness excused.)

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

CANON U.S.A., INC. and	)	
CANON INC.,	)	
	)	Case IPR2023-00309
Petitioners,	)	
	)	Patent No.
vs.	)	7,290,864
	)	
SLINGSHOT PRINTING LLC,	)	
	)	
Patent Owner.	)	

I, STEPHEN F. POND, Ph.D., being first
duly sworn, on oath say that I am the deponent in
the aforesaid deposition taken on October 11,
2023; that I have read the foregoing transcript of
my deposition, consisting of pages 1 through 46
inclusive, and affix my signature to same.

Corrections have been submitted
No corrections have been
submitted

STEPHEN F. POND, Ph.D., Deponent

Subscribed and sworn to
before me this day of
 , 20__

Notary Public

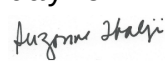
1 STATE OF ILLINOIS)
2) SS.
3 COUNTY OF C O O K)

4 I, SUZANNE THALJI, CSR and Notary Public
5 in and for the County of Cook and State of
6 Illinois, do hereby certify that on October 11,
7 2023, at 9:06 a.m., at 110 North Wacker Drive,
8 Suite 2800, Chicago, Illinois, the deponent
9 STEPHEN F. POND, Ph.D., personally appeared before
me.

10 I further certify that the said STEPHEN
11 F. POND, Ph.D., was by me first duly sworn to
12 testify and that the foregoing is a true record of
13 the testimony given by the witness.

14 I further certify that the deposition
15 terminated at 10:43 a.m.

16 I further certify that I am not counsel
17 for nor related to any of the parties herein, nor
18 am I interested in the outcome hereof.

19 In witness whereof, I have hereunto set
20 my hand and seal of office this 19th day of
21 October, 2023. 

22
23 Notary Public

24 CSR No. 084-002337 - Expiration Date: 5/31/25