

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

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⁵ JUUL LABS, INC., :

⁶ Petitioner, : C.A. No.:

7 vs. : IPR2024-00160

8 NJOY, LLC, : IPR2024-00161

9 Patent Owner. :

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13 Remote Videotaped Deposition of

14 ROBERT H. STURGES, PH.D.

15 Friday, August 9, 2024

16 9:46 a.m. (EDT)

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21 Job No. 144937

22 Pages: 1 - 77

²³ Reported by: Dana C. Ryan, RPR, GCCR

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August 9, 2024

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Remote Videotaped Deposition of ROBERT

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H. STURGES, PH.D., held via Zoom audiovisual

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platform, before Dana C. Ryan, Registered

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Professional Reporter, Certified Realtime

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Reporter, State of Georgia Certified Court

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Reporter and Notary Public.

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

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1 C O N T E N T S

2

3 EXAMINATION OF ROBERT H. STURGES, PH.D.: PAGE:

4 By Mr. Pepe 5

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8 E X H I B I T S

9 (Attached to the transcript)

10 JUUL DEPOSITION PAGE:

11 Exhibit 1001 U.S. Patent 11,497,864 19

12 Exhibit 1004 Xia Patent 38

13 Exhibit 1005 Wang Patent 47

14 Exhibit 1006 Fang Patent 60

15 Exhibit 1007 Robert H. Sturges, Ph.D. 16

16 Declaration

17 Exhibit 1015 Fuma v. R.J. Reynolds Vapor 25

18 Company Memorandum Opinion

19 And Order

20 Exhibit 1021 Fuma v. R.J. Reynolds Vapor 22

21 Company Plaintiff Reply In

22 Support Of Motion For

23 Summary Judgment

24

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1 P R O C E E D I N G S

2 THE VIDEOGRAPHER: We are now on the
3 record in the matter of Juul Labs, Inc. v. Njoy,
4 LLC. Today's date is August 9, 2024. The time is
5 9:46 a.m. Eastern Standard Time.

6 This is the video-recorded deposition
7 of Dr. Robert H. Sturges, Junior, Ph.D., being
8 taken remotely via Zoom video conference. I am
9 the camera operator. My name is Eric Vavrasek in
10 association with Trustpoint.One. The court
11 reporter is Dana Ryan, also in association with
12 Trustpoint.One.

13 All appearances will be noted within
14 the stenographic record.

15 At this time will the court reporter
16 please administer the oath and then we may
17 proceed.

18 *****

19 ROBERT H. STURGES, JUNIOR, PH.D.,
20 having been duly sworn, testified as follows:

21 *****

22 EXAMINATION BY COUNSEL FOR THE PETITIONER

23 BY MR. PEPE:

24 Q Good morning. Can you please state
25 your name for the record?



1 A Robert Harold Sturges, Junior.

2 Q All right. And do you understand that
3 you're here today for a deposition involving two
4 IPRs?

5 A I do.

6 Q Okay. And you understand that those
7 IPRs relate to U.S. patent number 11,497,864 and
8 U.S. patent number 10,334,881?

9 A Yes.

10 Q Okay. And you've submitted
11 declarations in both of those IPRs?

12 A I did.

13 Q All right. Dr. Sturges, you've been
14 deposed before; correct?

15 A I have.

16 Q All right. Approximately how many
17 times?

18 A At least 40 times --

19 Q Okay.

20 A -- in the last 30 years.

21 Q And when was the last time you were
22 deposed?

23 A Tuesday of this week.

24 Q All right. And was that for an IPR
25 proceeding?

1 A It was not.

2 Q Okay. Was that for a patent case?

3 A Yes.

4 Q Okay. At a high level, what -- what
5 technology was at issue?

6 A Electronic cigarettes.

7 Q All right. And in that deposition,
8 what -- what party are you representing?

9 A The -- ah, let me see. Which was that
10 now? Hold on just a second. PAX, LLC.

11 Q Okay. And was that for an ITC
12 investigation?

13 A It was.

14 Q Okay. All right. Now, since you've
15 been deposed a number of times, I'm not going to
16 go over too much of how things are going to go
17 today since I -- I understand that you should
18 understand how that works. You know, just a
19 couple of reminders, though. It's important that
20 we don't speak over each other, so I just ask if
21 I'm asking a question you wait until I'm done
22 asking before you answer, and I will likewise do
23 my best to wait until you're done answering before
24 asking a new question.

25 Does that sound fair?

1 A Yes.

2 Q All right. Now, if you don't
3 understand a question, please let me know and I'll
4 rephrase it and try to ask a better one.

5 Does that make sense?

6 A It does.

7 Q All right. And if you need a break at
8 any time, let me know and we can do that;
9 otherwise, I'll plan to take a break about once
10 every hour.

11 Does that sound good?

12 A It does.

13 Q All right. Is there any reason why you
14 couldn't testify truthfully today?

15 A No.

16 Q All right. And what did you do to
17 prepare for your deposition?

18 A I reread my declarations. I reread the
19 patents involved, and I met with counsel for Juul
20 yesterday.

21 Q All right. And how long was that
22 meeting?

23 A It was about five or six hours as I
24 recall.

25 Q Now, with respect to the patents that

1 we're here to talk about today, do you understand
2 that there's a -- an ITC investigation that's
3 currently pending involving those patents?

4 A I do.

5 Q Okay. Now, since you submitted your
6 declaration in these IPRs, have you reviewed any
7 of the materials from the ITC investigation?

8 A I have not.

9 Q Okay. Since you submitted your
10 declaration, have you reviewed any other evidence
11 or briefings or filings that relate to these
12 patents?

13 A I have not.

14 Q Okay. Now, you submitted two -- two
15 declarations, one in each of the IPRs; correct?

16 A I did.

17 Q Okay. And did you draft those
18 declarations?

19 A I provided the information for those
20 declarations after study of a lot of materials. I
21 had assistance from counsel handling Microsoft
22 Word and annotations of the figures that were
23 colored at my direction.

24 Q All right. And about how much time did
25 you spend preparing your declarations and the

1 opinions set forth in them?

2 A On the order of 40, 50 hours, I
3 believe.

4 Q Okay. 40, 50 hours each, or 40, 50
5 hours total?

6 A Total.

7 Q Okay. Now, you know, in preparing your
8 declarations, did you confer with anyone other
9 than the attorneys who are representing Juul in
10 this proceeding?

11 A I did not.

12 Q Okay. Now, I want to ask you some
13 questions about your background. Now, you -- you
14 became a professor in 1987; right?

15 A Correct.

16 Q Okay. And prior to that, you worked at
17 several companies as an engineer; is that right?

18 A Yes.

19 Q All right. And, so, according to your
20 CV, you worked at Charles Stark Labs; is that
21 right?

22 A Draper Labs, yes.

23 Q Okay. And what were your
24 responsibilities there?

25 A I was doing electrical and mechanical

1 design for the Apollo space program and later for
2 research in manufacturing assembly.

3 Q Okay. So I take it you weren't doing
4 any work related to electronic cigarettes there?

5 A No, that would have been prior to the
6 popularity of those devices.

7 Q All right. Did you do any work related
8 to any consumer products there?

9 A No.

10 Q All right. And then after you left
11 that job, you -- you moved to Westinghouse; is
12 that right?

13 A Correct.

14 Q All right. And what type of work did
15 you do at Westinghouse?

16 A I did product and process design for
17 consumer products and for industry products of a
18 commercial nature and for nuclear power.

19 Q All right. And what type of consumer
20 products did you work on at Westinghouse?

21 A Everything from elevators to toasters.

22 Q Okay. Did you do any work on
23 electronic cigarettes there?

24 A I did not.

25 Q And is it correct that after

1 Westinghouse is when you moved into academia and
2 became a professor?

3 A That's accurate.

4 Q All right. And you got a PHD in
5 mechanical engineering in 1986; is that right?

6 A That's right.

7 Q All right. And what -- what area did
8 you focus on for your PHD program?

9 A Dexterity.

10 Q Was there any specific application of
11 dexterity that you worked on?

12 A Yes, manufacturing products.

13 Q Any specific types of products?

14 A Those that would be assemblable either
15 by manual methods or by robotic methods.

16 Q All right. And then after you finished
17 your PHD, you became a professor at Carnegie
18 Mellon?

19 A I did.

20 Q Okay. And what types of classes did
21 you teach there?

22 A I taught manufacturing processes,
23 design, control theory. Those are the three big
24 ones.

25 Q And did you do any research while you

1 were a professor at Carnegie Mellon?

2 A I did.

3 Q All right. In what areas did your
4 research focus on?

5 A In mostly manufacturing processes,
6 design, either through computer methods or more
7 conventional methods. I did research in controls.
8 I did research in biomechanics, especially related
9 to endoscopy. I already mentioned manufacturing.
10 Computer control of machine tools, things of that
11 nature.

12 Q All right. And while you were at
13 Carnegie Mellon, did you do any work related to
14 electronic cigarettes?

15 A I did not.

16 Q All right. And then after Carnegie
17 Mellon, you became a professor at Virginia Tech;
18 is that right?

19 A Yes.

20 Q All right. And did you teach the same
21 types of classes you had taught at Carnegie
22 Mellon?

23 A Yes, I did.

24 Q Okay. And did your -- did your
25 research focus change at all when you moved to

1 Virginia Tech from Carnegie Mellon?

2 A It did not.

3 Q Okay. And in your time at Virginia
4 Tech, did you do any work related to electronic
5 cigarettes?

6 A Not as an academic, no.

7 Q Okay. And you retired from Virginia
8 Tech in 2017; right?

9 A That's right.

10 Q All right. Have you continued to teach
11 classes there since?

12 A Not classes, no, but I've been
13 associated with other professors and grad students
14 on research projects.

15 Q Okay. What types of research projects?

16 A The manufacture and disassembly of
17 lithium ion batteries.

18 Q And have you continued to do research
19 aside from those projects since you retired from
20 Virginia Tech?

21 A I have not, no.

22 Q Now, you have previously served as an
23 expert in patent cases involving electronic
24 cigarettes; right?

25 A I have.

1 Q Okay. Is it correct that those first
2 cases were in the 2016-2017 time frame?

3 A They're -- it would have been earlier
4 than that, but I don't have my CV handy to check
5 that.

6 Q Okay. Do you recall the first patent
7 matter you worked on involving electronic
8 cigarettes?

9 A I believe it was Fontem Ventures v.
10 RJR.

11 Q All right. And I know you mentioned
12 you have a -- your declaration in front of you.
13 Actually, you have -- the binders we mailed --

14 MR. PEPE: Reza, I don't know if you
15 want to give them to him. I don't know if he has
16 them. It might be easier that way.

17 MR. DOKHANCHY: Sure. Which binder?

18 MR. PEPE: Let's go with the one that
19 is for the '864 patent on the cover, so
20 IPR2024-00160.

21 THE WITNESS: Thanks.

22 BY MR. PEPE:

23 Q All right. And, Dr. Sturges, that has
24 a number of the exhibits that we're going to walk
25 through today that are already in the record.

1 And, so, Exhibit 1007 in that binder is
2 your declaration from IPR2024-00160, and I believe
3 there's a copy of your CV at the end of your
4 declaration.

5 (JUUL Deposition Exhibit 1007 was
6 marked for identification and attached to the
7 transcript.)

8 THE WITNESS: There is.

9 BY MR. PEPE:

10 Q And, so, with reference to your
11 declaration, would that help you narrow down the
12 time frame of when you, I guess, first worked on a
13 patent matter involving electronic cigarettes?

14 A I'm not sure it would be there. I
15 submitted also a -- a document with the -- my
16 litigation support activities as a consultant.
17 That would have that particular information in it.

18 Q All right. Well, if that's not
19 appended to your declaration, I may not have that.

20 But, I guess, sitting here today, do
21 you have a general sense of when you first did
22 that consulting for RJR against Fontem?

23 A I'm not clear on that as I sit here
24 right now. I'd have to refer to that document.
25 There were quite a few cases spanning a pretty

1 wide time frame, so I don't recall.

2 Q Okay. And were those all IPR
3 proceedings?

4 A Primarily IPR proceedings. There may
5 have been one not IPR, but they're mostly all IPR
6 proceedings, yes.

7 Q Okay. And you were an expert on behalf
8 of RJ Reynolds in that; is that correct?

9 A Correct.

10 Q Okay. Now, prior to doing work on
11 those patent litigation matters, did you have any
12 direct experience with electronic cigarettes?

13 A I did not.

14 Q Okay. And since those matters
15 concluded per RJR against Fontem, have you ever --
16 have you done any work on electronic cigarettes
17 aside from litigation consulting?

18 A I have not.

19 Q Okay. And, so, with respect to
20 electronic cigarettes, your direct experience has
21 been focused in patent litigation consulting; is
22 that correct?

23 A Correct.

24 Q Okay. All right. So, then, it's fair
25 to say you've never designed an electronic

1 cigarette?

2 A That's correct.

3 Q Okay. And you've never consulted on
4 the design of one; is that right?

5 A Correct.

6 Q Have -- as part of your patent
7 litigation consulting concerning electronic
8 cigarettes, have you done any tear-downs of
9 e-cigarette products?

10 A I have not.

11 Q All right. Aside from tear-downs, have
12 you done any, you know, inspection of physical
13 e-cigarette products?

14 A I purchased a -- a Juul mod and battery
15 and examined it externally.

16 Q Okay. And do you recall when you did
17 that?

18 A Would have been about a year or so ago.

19 Q Okay. And was that something you just
20 did out of curiosity?

21 A I was getting involved in this case
22 that we're talking about right now, and I had
23 curiosity about it, yes.

24 Q Okay. Did you ever use the device?

25 A No.

1 Q But as part of your physical
2 inspection, you didn't disassemble it; correct?

3 A I did not.

4 Q Okay. And aside from the Juul device
5 that you inspected last year, have you ever
6 inspected any other brands or models of
7 e-cigarettes?

8 A I have been given instruction on the
9 process of changing out coils in mods. That was
10 done by an acquaintance that I had who was using
11 vaping instruments, and I was curious about it.

12 Q And, so, when you say you -- you have
13 been given instruction, you mean that an
14 acquaintance explained to you how he went about
15 changing a coil in a mod?

16 A Yes.

17 Q Okay. And when you say "mod," what
18 exactly are you referring to?

19 A The type of vaping instrument that
20 consists of a -- a tank and a -- a mouthpiece
21 rather than a cigalike.

22 Q Okay. All right. Now, if you take a
23 look at Exhibit 1001 in your binder.

24 (JUUL Deposition Exhibit 1001 was
25 marked for identification and attached to the

1 transcript.)

2 THE WITNESS: I'm there.

3 BY MR. PEPE:

4 Q And that is U.S. patent number
5 11,497,864; right?

6 A It is.

7 Q Okay. And if you turn to the second
8 page --

9 A I'm there.

10 Q -- you see there's a heading on the top
11 left that says Related U.S. Application Data?

12 A I see that.

13 Q Okay. You see on the first paragraph
14 underneath there's a reference to an application
15 that was filed on July 27, 2010.

16 Do you see that?

17 A Yes.

18 Q Okay. And underneath that, there's
19 reference to a number of provisional applications,
20 two of which were filed in 2009.

21 Do you see that?

22 A I see that.

23 Q Okay. So have you ever inspected
24 physical samples of e-cigarette products that were
25 available in the 2009-2010 time frame?

1 A I have not.

2 Q Okay. Do you know what e-cigarette
3 products were available in the 2009-2010 time
4 frame?

5 A I believe in that time frame, there
6 were cigalikes coming on the market with LEDs on
7 the ends and that mods were just becoming popular.

8 But beyond that, I do not know.

9 Q Okay. All right. And you haven't
10 inspected any of those cigalike products that you
11 just referenced that you believe would have been
12 available in the 2009-2010 time frame?

13 A I have not.

14 Q Okay. All right. So I'd like to now
15 ask you some questions about your declaration, so
16 if you go to Exhibit 1007 in the binder you have,
17 which is your declaration for IPR2024-00160.

18 A I'm there.

19 Q All right. And, so, I would like you
20 to go to paragraph 29.

21 A Yes.

22 Q All right. Are you there?

23 A I am.

24 Q All right. And, so, you see you have a
25 sentence there that says, Aperture: On summary

1 judgment the plaintiff/patent owner asserted that
2 the claimed first aperture on the first end of the
3 cartridge housing is met by a single opening
4 inside the housing, where air entering the
5 cartridge converges at that opening to pass
6 through to the alleged airflow passageway.

7 Do you see that?

8 A Yes.

9 Q All right. And, so, then you cite to
10 Exhibit 1021 at pages 9 to 12.

11 Do you see that?

12 A I do.

13 Q Okay. And I'd like you to go to
14 Exhibit 1021, which should also be in your binder,
15 at pages 9 to 12.

16 (JUUL Deposition Exhibit 1021 was
17 marked for identification and attached to the
18 transcript.)

19 THE WITNESS: I'm there.

20 BY MR. PEPE:

21 Q All right. And so, you know, I'd like
22 to understand where exactly in pages 9 through 12
23 you believe that the plaintiff/patent owner made
24 the assertion that you -- you've noted in
25 paragraph 29 of your declaration.

1 A (Witness reviews document.)

2 I think that would be the picture that
3 you're showing on the screen right now at the top
4 right of the page, and to a better extent, the
5 picture at the lower part of the page which shows
6 the passage -- airflow passageway beginning at the
7 leftmost end of the anode -- the positive pin.

8 Q Okay. So it's based on the pictures on
9 page 9; is that correct?

10 A Yes, I think that shows it most
11 clearly.

12 THE VIDEOGRAPHER: Dr. Sturges, this is
13 the videographer. Would it be possible to move
14 the binder more in front of you? As you lean over
15 to your left, you're just getting cut out of frame
16 there.

17 THE WITNESS: Okay. Fine.

18 THE VIDEOGRAPHER: Thank you, sir.

19 THE WITNESS: Okay.

20 BY MR. PEPE:

21 Q Now, have you ever inspected a physical
22 sample of the Vuse Ciro device?

23 A No, I haven't. I'm relying on this
24 information.

25 Q Okay. And, so, you don't know what --

1 what the physical device would look like if you
2 looked at those particular features that are shown
3 on page 9 that we have displayed in Exhibit 1021?

4 A No, I think that's not accurate. I
5 think I would be able to determine what I
6 concluded by looking at the device itself. It's
7 more helpful to see a cutaway drawing of it, of
8 course, but from the device itself, which is
9 rendered in the 3D view up in the upper right, the
10 location of the aperture and the positive pin is
11 very clear.

12 Q All right. Now, subsequently in your
13 declaration, in paragraph 30 -- and that's on
14 page 30.

15 Do you see that?

16 A I'm there.

17 Q All right. And the first sentence you
18 said, The district court agreed with plaintiff and
19 explicitly held that the aperture internal to the
20 device at the beginning of the internal
21 passageway, i.e. the hole within the
22 internally-contained positive pin depicted above,
23 meets the requirement for a first aperture on the
24 first end.

25 And one of the things you cite is

1 Exhibit 1015 at pages 14 to 18.

2 Do you see that?

3 A Yes.

4 Q And you understand that that's the
5 district court's order; correct?

6 A Yes.

7 Q All right. And, so, I would like you
8 to go to Exhibit 1015 and pages 14 to 18.

9 (JUUL Deposition Exhibit 1015 was
10 marked for identification and attached to the
11 transcript.)

12 THE WITNESS: I'm there.

13 BY MR. PEPE:

14 Q All right. And can you identify for me
15 where the district court explicitly held that an
16 aperture internal to the device meets the
17 requirement for a first aperture on the first end?

18 A (Witness reviews document.)

19 The positive pin language is mentioned
20 several times in the -- in the document, among
21 them at second paragraph, middle of the page on
22 page 16, Air enters through an opening at the base
23 of the positive pin, for example. That
24 explicitly, in my view, mentions the positive pin
25 as the aperture internal to the device at the

1 beginning of the internal passageway. And there
2 are other -- couple of other places.

3 Q Okay. So your basis is the court's
4 reference to the positive pin; is that correct?

5 A As I read it, as I sit here today, yes.

6 Q Okay.

7 THE VIDEOGRAPHER: And, Dr. Sturges, if
8 you could just tilt your camera down just a little
9 bit.

10 THE WITNESS: Like that?

11 THE VIDEOGRAPHER: That's correct, sir.
12 Thank you very much.

13 BY MR. PEPE:

14 Q But the court did not say explicitly
15 that an aperture internal to the device is an
16 aperture on the first end; correct?

17 A (Witness reviews document.)

18 I -- I disagree. I think that language
19 is explicit about where the aperture is, and I
20 quoted appropriately that the positive pin which
21 is depicted was internally contained, and the
22 language of the -- "on the first end" is -- shows
23 up at least once on page 14, so I think I quoted
24 that in context.

25 Q And, so, on page 14, you're referring

1 to where -- where the order quotes language from
2 claim 1; is that correct?

3 A Yes.

4 Q Okay. And where does the court --
5 where, if anywhere, did the court use the word
6 "internal" in its analysis?

7 A The word "internal" is what one would
8 understand the structure of the device, the Ciro,
9 has; and the court noted that the physical
10 structure of that device is not in dispute.

11 Q Okay. So you can't identify anywhere
12 where the court described it as internal; is that
13 correct?

14 A The court did not use the word
15 "internal." The court referred to the structure,
16 and the structure was not in dispute, and the
17 structure viewed by someone looking at the picture
18 would see that the positive pin is inset from the
19 threaded portion of the device.

20 Q All right. Dr. Sturges, I want to ask
21 you some questions about the e-cigarette devices
22 that were known in the 2009 time frame, and you
23 refer to some of them as being cigalikes; is that
24 right?

25 A That's my best recollection, yes.

1 Q Okay. And is it your understanding
2 that some of those cigalike products had a -- had
3 one portion that was a power source and then a
4 detachable cartridge?

5 A I believe that the 510 appeared at
6 about that time, yeah.

7 Q The what?

8 A Oh, I'm sorry. The
9 detachable-screw-type connection between the
10 battery and the atomizer.

11 Q Okay. And, so, those are -- well, one
12 of those -- so one portion of that device would
13 have a battery and other electronics; correct?

14 A The distribution of the parts varied
15 between the devices that I became familiar with
16 through the literature --

17 Q Okay.

18 A And some of them had electronics in
19 with the battery and some did not.

20 Q Okay. And then there could be a -- a
21 separate cartridge that attached to the battery
22 portion; right?

23 A As far as my understanding is at that
24 time, yes.

25 Q Okay. And that -- that cartridge could

1 include a heating element and some type of
2 substance that included nicotine; right?

3 A At that time frame, I think nicotine
4 was the species most sought after and used, yes.

5 Q Okay. And that's -- that's a
6 configuration that's shown, for example, in figure
7 2 of the '864 patent, right, if you go look at
8 Exhibit 1001?

9 A (Witness reviews document.) Yes.

10 Q All right. And, so, when the -- the
11 nicotine source was used up, you could discard
12 the -- the empty cartridge and then, you know,
13 replace that with a fresh cartridge and attach it
14 to the power source that you had already been
15 using; correct?

16 A Yes.

17 Q Okay. But there were also e-cigarettes
18 as of 2009 that had a, you know, single unitary
19 structure that didn't have a detachable cartridge;
20 correct?

21 A Yes. That's right.

22 Q And in those, once the user used up all
23 the nicotine source, they would discard, you know,
24 the -- the battery and the whole device; correct?

25 A I believe that was the case. I'm not

1 sure when the refillable types became available.

2 I don't remember.

3 Q Okay. And as of 2009, there were also
4 e-cigarette designs that had three separate
5 portions that could be coupled to each other;
6 right?

7 A I recall that, yes. Uh-huh.

8 Q Okay. And, so, you -- you would have
9 one portion that had a battery, a second portion
10 that had the atomizer, and then a third portion
11 that had the nicotine source; correct?

12 A I am aware of them through the
13 literature, not in the flesh.

14 Q Okay. And, so, we look at figure 4 of
15 the '864 patent, that's an example of an
16 e-cigarette design that has three separate
17 portions; correct?

18 A Yes.

19 Q All right. And based on your prior
20 answer, you never inspected an e-cigarette product
21 that has three separate portions like shown in
22 figure 4?

23 A That's true.

24 Q Have you evaluated them via literature?

25 A Not that particular configuration, no.

1 Q No.

2 But you're generally familiar with them
3 through your work in other cases, that they
4 existed?

5 A I recall discussions and documents of
6 that kind in other cases, yes, but I can't put my
7 finger on them right now.

8 Q Okay. So sitting here, you don't
9 recall when -- when you learned about those types
10 of e-cigarettes that have three different portions
11 like shown in figure 4 of the '864 patent?

12 A I do not.

13 Q Would it have been after 2009 that you
14 learned about that?

15 A Very likely.

16 Q Okay. And I guess we talked about your
17 prior experience with Fontem and RJ Reynolds doing
18 patent litigation consulting.

19 Is it fair to say that that took place
20 after 2010?

21 A I believe it did.

22 Q Okay. But beyond that, you don't think
23 you could be more specific about when you started
24 doing that consulting work?

25 A No, I'd have to go back to my record

1 and take a look.

2 Q All right. All right. Dr. Sturges,
3 I'd like you to go back to the '864 patent, which
4 is Exhibit 1001, in your binder for IPR2024-00160.

5 A I'm there.

6 Q All right. And I'd like you to take a
7 look at claim 1.

8 A I'm there.

9 Q All right. And if you take a look at
10 claim 1, you see there's a limitation that says, A
11 heating element located in the interior of the
12 housing. The heating element extending
13 transversely to a central longitudinal axis of the
14 housing.

15 Do you see that?

16 A I see that.

17 Q All right. As part of your analysis in
18 these IPRs, did you come to an understanding of
19 what it means for the heating element to extend
20 transversely to a central longitudinal axis of the
21 housing?

22 A Yes.

23 Q Okay. What's your understanding what
24 it means for the heating element to extend
25 transversely?

1 A That it have a dimension across from
2 the -- at 90 degrees to the longitudinal axis.

3 Q Okay. And what do you mean by "a
4 dimension"?

5 A I mean by a significant extent, a
6 nontrivial amount of substance in that direction.

7 Q Okay. So to put it in other words, it
8 would require that a significant amount of the
9 heating element extend across a longitudinal axis;
10 is that correct?

11 A Consistent -- yes, consistent with the
12 discussion in the '864 patent that certain
13 arrangements of a heating element as shown, for
14 example, in figures 2 and figure 3 would be within
15 the scope of that language.

16 Q Okay. So your understanding of
17 extending transversely is that what's shown in
18 figure 3 of the '864 patent meets that definition?

19 A Yes, with the caveat that the -- the
20 heating element be located inside the -- the
21 passageway 214 analogous to what's found in
22 figure 2.

23 Q Okay. But in figure 3, the heating
24 element is not in the passageway; correct?

25 A That's right, but there is language in

1 the specification that specifically says that
2 the -- the word "transverse" include a number of
3 structural possibilities, including inside and
4 outside.

5 Q So is it your understanding based on
6 the specification that it transversely includes
7 structural configurations outside of the airflow
8 passageway?

9 A I remember language of that kind, and
10 I'm scanning the patent to find that particular
11 location, but I haven't reached it yet.

12 (Witness reviews document.)

13 Q All right. So I think what you're --
14 you're talking about is Exhibit -- or, I'm
15 sorry -- is starting at the bottom of column 6,
16 line 64.

17 A Thank you. Yes.

18 Q All right. Okay. And, so, based on
19 that passage, your understanding of extending
20 transversely encompasses heating elements that are
21 outside the airflow passageway; is that fair?

22 A Yes, it is.

23 Q And, so, turning back to figure 3 of
24 the '864 patent, would that meet -- would that
25 configuration of the heating element meet the

1 extending transversely limitation of claim 1 in
2 your opinion?

3 A Yes, according to the -- the
4 language -- although, the -- sorry -- according to
5 the language in column 664 and thereafter.

6 Although the word "transverse" doesn't
7 appear there, and it appears only in the claim,
8 that's my understanding of what that means.

9 Q Okay. And that's the understanding
10 that you applied to assess whether prior art met
11 the extending transversely limitation in the
12 claims at issue in the '864 patent and the '881
13 patent?

14 A Yes.

15 Q Now, earlier you talked about how you
16 purchased a Juul device to take a look at it.

17 Do you recall that?

18 A I do.

19 Q Okay. Did you do any inspection or
20 analysis of the heating element in that device as
21 part of your inspection?

22 A No analysis of it, no, just to locate
23 it.

24 Q Okay. And were you able to locate it?

25 A I was.

1 Q All right. So with respect to heating
2 elements and electronic cigarettes, is your
3 knowledge of them, you know, principally based on
4 the documents that you've reviewed as part of
5 these various litigation proceedings you've been
6 involved in?

7 A Yes, and that coupled with my
8 background in product and process design, yes.

9 Q Okay. And I think you mentioned you
10 did some work on toasters; is that right?

11 A I did.

12 Q Okay. And I take it some of those at
13 least had heating wires in them; is that fair?

14 A Yes, they did.

15 Q Okay. What other consumer products
16 have you worked on in your career that had, you
17 know, a heating wire in them?

18 A There was an activity briefly having to
19 do with what you'd call a calrod, a -- that's a --
20 an item that is a resistance heater for toaster
21 ovens, for example, dishwashers, other appliances
22 of that sort. It's another type of heater made
23 with ceramic materials.

24 Q And what type of resistance heater was
25 in the toaster you worked on?

1 A That would have been an alloy of nickel
2 chromium.

3 Q Okay. And that was -- were those
4 generally shaped into a coil?

5 A When viewed from a certain direction,
6 yes. In -- in a toaster, they tend to be a
7 flattened coil.

8 Q All right. Have you ever seen a
9 physical sample of a heating coil from an
10 electronic cigarette?

11 A In the inspection of a Juul device,
12 yes.

13 Q Okay. And that was -- that was a fully
14 assembled device, though; correct?

15 A That's right.

16 Q Okay. Aside from that one, have you
17 ever seen one?

18 A No.

19 MR. PEPE: We've been going about an
20 hour. I'm about to change exhibits, so it may be
21 time to take a ten-minute break or so if that
22 works for you.

23 THE WITNESS: It does. Thank you.

24 MR. PEPE: All right.

25 THE VIDEOGRAPHER: Off the record at

1 10:45 a.m.

2 (Recess -- 10:45 a.m.)

3 (After recess -- 10:57 a.m.)

4 THE VIDEOGRAPHER: Back on the record
5 at 10:57 a.m.

6 BY MR. PEPE:

7 Q All right. Dr. Sturges, welcome back.
8 I'd now like you to take a look at Exhibit 1004 in
9 your binder.

10 (JUUL Deposition Exhibit 1004 was
11 marked for identification and attached to the
12 transcript.)

13 THE WITNESS: I'm there.

14 BY MR. PEPE:

15 Q All right. And that's Exhibit 1004
16 from IPR2024-00160.

17 Do you know what this reference is?

18 A Yes, it's a patent to Haoran Xia.

19 Q Okay. So we'll go with your
20 pronunciation of Xia. I've personally been
21 confused about how to say it.

22 All right. So I'd like to ask you some
23 questions about the device disclosed in Xia.

24 MR. PEPE: And for the court reporter's
25 reference, that's just X-I-A.

1 BY MR. PEPE:

2 Q All right. And, so, the device
3 disclosed in Xia includes a controller portion and
4 a generator portion; right?

5 A It does.

6 Q All right. And those are shown in
7 figure 2; right?

8 A Yes.

9 Q All right. And then if we look at
10 figure -- figures 3 through 5, that shows that the
11 generator portion is comprised of three different
12 segments; right?

13 A Yes.

14 Q Okay. And, so, the segment shown in
15 figure 3 includes the portion of the generator
16 that will couple to the controller; correct?

17 A Yes, also includes part of the
18 controller.

19 Q Yes. Fair -- fair point.

20 And that's the segment that includes
21 the air inlet 702 that allows air to enter into
22 the generator portion; correct?

23 A Yes.

24 Q All right. And then figure 4 shows a
25 segment of the generator that includes the heater

1 and the secondary liquid storage; correct?

2 A Yes.

3 Q And if you're looking in figure 4, at
4 the top and the bottom, that segment of the
5 generator includes a housing, right, those dark,
6 black lines?

7 A Those dark, black lines are not
8 identified in the -- in the patent in this
9 document, so I would not agree that they would be
10 called a housing.

11 Q Do you know what those dark, black
12 lines are -- what material they're made of?

13 A I recall that there was discussion
14 somewhere in the patent of them being made of
15 polymer. I'm not sure. I would have to review
16 the patents in detail to recall that.

17 Q All right. And then figure 5
18 illustrates a third segment of the generator that
19 includes a liquid storage chamber 12; right?

20 A Yes.

21 Q All right. And the Xia reference
22 describes that the left side of the liquid storage
23 chamber 12 is left open so that it can be filled
24 with liquid; correct?

25 A Yes.

1 Q And the liquid storage chamber 12
2 includes cotton fibers that absorb the liquid that
3 contains nicotine; correct?

4 A I recall that, yes.

5 Q Okay. And if you look at figure 5 on
6 the left side of liquid storage chamber 12, it's
7 basically a vertical straight line where it's
8 open; right?

9 A Yes.

10 Q All right. And after it's filled, you
11 know, the segment that's illustrated in figure 4
12 would be inserted into figure 5; right?

13 A Yes.

14 Q And then once you do that -- once you
15 insert the portion of figure 4 into figure 5, then
16 the left side of the liquid storage chamber 12
17 will -- will take the shape of the liquid guiding
18 mechanism; right?

19 A Yes.

20 Q All right. And if we look at figure 5,
21 there's a housing that's identified as 1301;
22 correct?

23 A Yes.

24 Q Okay. And Xia describes that that
25 housing is made of polypropylene; correct?

1 A Yes.

2 Q Okay. Now, if we go back to figure 2,
3 Dr. Sturges, I'm going to ask you some questions
4 about the -- the generator portion that's shown in
5 figure 2. And we already talked about the -- the
6 liquid storage chamber 12; right?

7 Do you see that?

8 A I do.

9 Q All right. And then there's a
10 secondary liquid storage chamber 10; correct?

11 A Yes.

12 Q And there's also a liquid guiding
13 mechanism 11; correct?

14 A Yes.

15 Q And one of the functions of the liquid
16 guiding mechanism 11 is to transfer liquid from
17 the liquid storage chamber 12 to the secondary
18 liquid storage chamber 10; correct?

19 A Yes.

20 Q And then after liquid is transferred to
21 the secondary storage chamber 10, it is then
22 transferred from the liquid storage -- the
23 secondary -- strike that. Let me start that over.

24 Once the liquid is in the secondary
25 storage chamber 10, it is transferred to the

1 heater 9 via the air flow that travels through the
2 airflow passageway that's within the secondary
3 storage chamber; correct?

4 A Yes.

5 Q All right. Now, as part of your
6 analysis, did you develop an understanding as to
7 why Xia has both a storage chamber 10 and a
8 second -- or, strike that.

9 Did you develop an understanding as to
10 why Xia has a storage chamber 12 and a secondary
11 storage chamber 10 in the device?

12 A Yes.

13 Q What's your understanding as to why
14 there are two different storage chambers?

15 A They perform different functions. 12
16 supplies the fluid through 11 to 10 where it's
17 picked up by the air stream, and the structures of
18 10 and 12 internally are different, and that would
19 be a good reason to have them separate.

20 Q All right. Now, I'd like to now go to
21 paragraph 50 of your declaration.

22 A I'm there.

23 Q All right. Actually, you can go to the
24 next page, on page 44 of your declaration,
25 Exhibit 1007, and that's from IPR2024-00160.

1 All right. And is it fair to say that
2 the figure we're looking at here in red provides
3 your understanding of how the air flows through
4 the Xia cartridge?

5 A It is.

6 Q Okay. Okay. And, so, to pass through
7 the housing of the Xia cartridge, the air first
8 passes through the air inlet openings on the side
9 that you've identified on the left side of this
10 figure; correct?

11 A Yes.

12 Q And the air then travels through a
13 passageway to the heater; right?

14 A Yes.

15 Q Okay. And then the air path -- after
16 passing through the heater, it goes around the
17 sides of the solution-holding medium; correct?

18 A Yes.

19 Q All right. And then it passes through
20 what's labeled as item 15 in Xia; right?

21 A Yes.

22 Q All right. And item 15 is -- is called
23 the liquid blocking tank; correct?

24 A Yes.

25 Q All right. And after it passes through

1 the liquid blocking tank, it will then pass
2 through item 17; correct?

3 A Yes.

4 Q And that's the liquid blocking sealing
5 cover; correct?

6 A Yes.

7 Q And then the air will then exit out of
8 what you've identified as the second aperture;
9 correct?

10 A Correct.

11 Q What is the function of the liquid
12 blocking tank 15 in Xia?

13 A That would be to prevent droplets in
14 the vapor from exiting the second aperture into
15 the mouth of the user.

16 Q Okay. And is it fair to say that it's
17 undesirable for the user to have droplets of the
18 liquid enter their mouth from the exit of the
19 device?

20 A Yes.

21 Q All right. And then what is the
22 function of the liquid blocking sealing cover 17
23 in Xia?

24 A To provide for the user a comfortable
25 place upon which to place one's mouth and lips and

1 draw through the device.

2 Q Okay. And the liquid blocking sealing
3 cover 17 also functions to prevent liquid from
4 being sucked into the mouth of the user; correct?

5 A It has that additional function, yes.

6 Q And we also talked earlier about the
7 liquid guiding mechanism 11.

8 Do you recall that?

9 A I do.

10 Q All right. And one of the functions of
11 the liquid guiding mechanism 11 is to transfer
12 liquid from liquid storage 12 to liquid storage
13 10; correct?

14 A Yes.

15 Q All right. But then another function
16 of liquid guiding mechanism 11 is to reabsorb
17 large droplets that are not vaporized by the
18 heater; correct?

19 A That is a possibility, yes.

20 Q Well, that's what Xia explicitly
21 describes that one of the functions of the liquid
22 guiding mechanism 11 is to reabsorb large diameter
23 droplets; correct?

24 A Yes.

25 Q And do you have an understanding as to

1 how the liquid guiding mechanism 11 does that in
2 Xia?

3 A Yes, it does so by its construction by
4 having openings for -- and surfaces for collecting
5 the droplets as well as passing the -- the fluid
6 in a leftward direction.

7 Q And the purpose of reabsorbing the
8 large diameter droplets is to help ensure they
9 don't end up in the user's mouth; correct?

10 A Yes.

11 Q Now, do you know if a user could get
12 sick if they ingested large droplets of the
13 liquid?

14 A I don't know to what extent that may
15 occur.

16 Q That's something you didn't evaluate?

17 A That's right.

18 Q Okay. But at the very least it would
19 create an unpleasant user experience if that were
20 to happen; is that fair?

21 A That's right.

22 Q All right. I'd like you to now take a
23 look at Exhibit 1005.

24 (JUUL Deposition Exhibit 1005 was
25 marked for identification and attached to the

1 transcript.)

2 THE WITNESS: I'm there.

3 BY MR. PEPE:

4 Q All right. And this is Exhibit 1005 in
5 both of the IPRs; right?

6 A I believe so, yes.

7 Q All right. And just to be clear, the
8 Xia reference we were just looking at was
9 Exhibit 1004 in both of the IPRs; correct?

10 A I haven't looked at the other binder,
11 but I'll take your word for it, yes.

12 Q All right. And with respect to
13 Exhibit 1005, have you ever had any conversations
14 with the named inventor on this?

15 A I have not, no.

16 Q But you reviewed a declaration he had
17 submitted in a different proceeding as part of
18 your assessment; right?

19 A I did.

20 Q Okay. Now, the device that's disclosed
21 in the Wang reference, Exhibit 1005, includes a
22 cigarette rod that can be coupled to a cigarette
23 holder; correct?

24 A Yes.

25 Q Okay. And the cigarette rod is the



1 portion of the device that holds the battery and
2 some other electronics; correct?

3 A Yes.

4 Q All right. And the cigarette holder
5 includes a heater and the nicotine source;
6 correct?

7 A Correct.

8 Q All right. And the cigarette holder is
9 what you would consider the cartridge of the
10 device; correct?

11 A Yes, that terminology is fair.

12 Q Okay. Now, if we look at figure 1 of
13 the Wang reference, Exhibit 1005.

14 A I'm there.

15 Q All right. And when the cigarette rod
16 and the cigarette holder are coupled to each
17 other, that's what's shown in figure 1; correct?

18 A Yes.

19 Q All right. And in the assembled
20 device, air will enter via the inlet 115 in the
21 cigarette rod; correct?

22 A Yes.

23 Q Okay. And then the air will travel
24 through the cigarette rod via what Wang describes
25 as an internal gap; correct?

1 A Yes.

2 Q All right. And the internal gap is the
3 space around the battery; is that correct?

4 A Yes.

5 Q And then the air will exit the
6 cigarette rod via opening 108; correct?

7 A Yes.

8 Q All right. And the air will then enter
9 the cigarette holder via opening 106; correct?

10 A Yes.

11 Q All right. And after the air flows
12 through the opening 106, it will enter into a
13 space between component 107 and where the organic
14 fiber 105 begins; correct?

15 A Yes.

16 Q All right. And then it's your opinion
17 that the air will then pass through a central
18 passageway that's in the middle of fiber 105;
19 correct?

20 A Correct.

21 Q All right. And, so, I'd like to go to
22 paragraph 143 of your declaration, which is on
23 page 95 -- numbered page 95.

24 A I'm there.

25 Q All right. And in paragraph 143,

1 you've annotated one of the figures from Wang;
2 right?

3 A Indeed.

4 Q Okay. And this is your understanding
5 of how the air would flow through the cartridge
6 portion; correct?

7 A Correct.

8 Q All right. And, so, you -- you've
9 added what you've identified as an air flow
10 passageway in green; correct?

11 A I have.

12 Q All right. And you've also added what
13 you've identified as first and second apertures in
14 purple; correct?

15 A Yes.

16 Q Okay. But the passageway in green and
17 the aperture in purple were not explicitly shown
18 in the figures of Wang; correct?

19 A I would disagree with that and refer to
20 the upper portion of figure 5 of that document in
21 which the rolled up material is shown with a
22 circular opening at its center.

23 Q Now, does the text in Wang describe
24 that there's a circular opening in the center that
25 you believe is there in figure 5?

1 A No, but Mr. Wang confirmed that his
2 solution-holding medium surrounds a complete
3 central air passageway.

4 Q Okay. So your understanding of
5 figure 5 is based on what Mr. Wang said in his
6 declaration; is that correct?

7 A Mr. Wang's declaration supports what I
8 have observed in figure 5.

9 Q But figure 5 does not show what the
10 bottom looks like; correct?

11 A Correct, but one would scarcely believe
12 it would be different than the top.

13 Q Okay. And, so, your understanding is
14 that the bottom of figure 5, what's not shown,
15 would look identical to the top of figure 5; is
16 that correct?

17 A Yes.

18 Q Okay. Okay. And, now, if we go back
19 to your figure in paragraph 143 of your
20 declaration, you agree that after the air would
21 pass through what you identified as a second
22 aperture, there would -- it would then pass
23 through a gap between the second aperture before
24 you get to the outlet of the cartridge which is
25 101; correct?

1 A Yes.

2 Q Okay. And, now, what's your
3 understanding of what the organic fiber 105 is
4 comprised of?

5 A Just what it says, a fiber or paper
6 that's rolled up.

7 Q Okay. And you'd agree that air could
8 also flow through that fiber; correct?

9 A To a very limited extent, yes.

10 Q And if there are gaps in the layers of
11 the fiber as it's rolled up, air would also pass
12 through those gaps; correct?

13 A Presuming that there are gaps, yes, but
14 I have reason to suspect that there aren't any.

15 Q Now, that fiber 105 is soaked with
16 liquid that contains nicotine; correct?

17 A Correct.

18 Q Okay. Now, is your understanding that
19 it would be soaked with nicotine before it's
20 rolled up or after it's rolled up?

21 A Either would work. I have no
22 particular opinion on that.

23 Q Do you know how these types of devices
24 were typically put together in that time frame?

25 A I can see how they were put together by

1 the diagram.

2 Q Okay. But you don't know if the fiber
3 105 would be soaked with the liquid before or
4 after it's rolled; correct?

5 A I don't know that for a fact, but
6 handling a strip of organic fiber that's wet and
7 then rolling it up would be significantly more
8 difficult to manufacture than rolling it first and
9 then applying the liquid to it.

10 Q Okay. So you expect that it would be
11 rolled up first and then soaked; is that right?

12 A Just being logical, yes.

13 Q Okay.

14 A And that's also why I suspect there are
15 no gaps because the fluid is traveling radially in
16 order to replenish the material that is drawn out
17 through the airflow passageway, and gaps would
18 impede that flow.

19 Q Okay. So your belief is that the fiber
20 would be rolled so tightly that it would be
21 airtight in between the layers of the fiber; is
22 that correct?

23 A Practically airtight compared with the
24 airflow through the passageway in the central
25 portion of the roll, yes.

1 Q All right. And then the passageway
2 that you believe would be present, the diameter of
3 that would be defined by the diameter of the
4 heater; right?

5 A No. It would be at least as large as
6 the heater and possibly greater.

7 Q And then the air that would flow
8 through the passageway that you believe would be
9 present would flow inside the heater coil;
10 correct?

11 A At least inside the heater. And if the
12 heater were of a smaller diameter, as pictured in
13 figure 3, than the air flow passageway, then the
14 air would also travel around the periphery of the
15 heater coil.

16 Q Okay. But Wang itself doesn't describe
17 the diameter of the passageway relative to the
18 diameter of the coil; correct?

19 A No, that would be inferred from, first
20 of all, the figure that I mentioned, and the logic
21 of having a heater within that open space.

22 Q Now, in the 2009 time frame, were you
23 aware of e-cigarettes that had, you know, organic
24 fibers that held a, you know, nicotine-containing
25 liquid that allowed air to flow through the

1 fibers?

2 A I'm not sure whether the material was
3 an organic fiber, but I do recall a device in that
4 time frame made of a porous ceramic that performed
5 the same function.

6 Q And the air flowed through the porous
7 ceramic; is that your understanding?

8 A Yes.

9 Q And which device was that?

10 A My best recollection is that it was a
11 patented device by Lik Hon.

12 Q Okay. And, you know, with respect
13 to -- if we take a look at figure 3 of the Wang
14 reference in Exhibit 1005, I'll take you -- give
15 you a minute to get there.

16 A I'm there.

17 Q All right. And you see there is a --
18 the heater 104; right?

19 A Yes.

20 Q Okay. And is that heater 104 extending
21 transversely to a central longitudinal axis of the
22 housing?

23 A Yes, according to the expression made
24 in the patent we just talked about, the '864
25 patent.

1 Q Okay. And that's based on that -- that
2 passage at the bottom of column 6 into column 7 of
3 the '864 patent that we looked at earlier?

4 A Yes, that and the figure 3 of that
5 patent.

6 Q Okay. And, now, if you took heater 104
7 and rotate it at 90 degrees, that would still
8 extend transversely in your opinion; correct?

9 A Yes, it would by the figure 2 of the
10 '864 patent.

11 Q Okay. Now, if you change the
12 orientation of figure 4 -- or, strike that.

13 If you change the orientation of heater
14 104 as shown in figure 3 such that it matched
15 figure 2 of the '864 patent that you just
16 referenced --

17 Are you with me?

18 A Yes.

19 Q All right.

20 -- you'd agree that that would make it
21 more difficult to wrap the fiber around the heater
22 as described in Wang; correct?

23 A No. One would have to make the
24 additional assumption that the -- not only was the
25 heater axis rotated, but the length along that

1 axis remained the same which, of course, is not a
2 requirement.

3 Q When you say the "length along the
4 axis", what are you talking about?

5 A In figure 3 of Wang, there is a
6 notional aspect ratio to the heater 104 in which
7 the length is about four or five diameters long.
8 But that, of course, is an embodiment, and it is
9 notional without a requirement that it have that
10 aspect ratio.

11 Q Now, when you're referring to -- you're
12 referring to the length of the heating coil; is
13 that correct?

14 A The aspect ratio being the quotient of
15 the length and the diameter.

16 Q Okay. And, so, what you're -- is it
17 fair that you're saying that if you were to rotate
18 the Wang heater by 90 degrees, you would make --
19 you would reduce the length of the heater when you
20 did that; is that right?

21 A Yes.

22 Q Okay. And if you did that, that would
23 reduce the surface area of the heater; correct?

24 A Incorrect. By changing the aspect
25 ratio, one could have precisely the same amount or

1 length of heating wire in one coil versus another.

2 Q Okay. So if you change the
3 orientation, your opinion is that you would reduce
4 the length of the heating coil but you would
5 increase its diameter to effectively maintain the
6 same overall surface area; is that correct?

7 A That would be one possible geometry,
8 yes.

9 Q Okay. But just by changing the
10 orientation, you wouldn't necessarily change the
11 surface area of the heater; correct?

12 A In your hypothetical, correct.

13 Q Okay. And, so, I guess another way of
14 changing the -- if the only thing you changed was
15 the orientation of the heater such that it looked
16 like figure 2 of the '864 patent, it wouldn't
17 change the surface area of the heater; correct?

18 A Under that hypothetical, correct.

19 Q Okay. And if you changed the
20 orientation of Wang's heater such that it looked
21 like figure 2 of the '864 patent, it also wouldn't
22 change the overall length of the cartridge;
23 correct?

24 A Well, you just defined it as the only
25 thing you do is rotate. So then, yes, it wouldn't

1 change anything else because you've said so.

2 Q Let me ask it a different way. In
3 order to change the length of the cartridge --
4 well, strike that.

5 Changing the orientation of the heater
6 alone would not change the overall length of the
7 cartridge; correct?

8 A Under your hypothetical, yes.

9 Q In order to change the length of the
10 cartridge, you would likely also need to change
11 the length of the solution holding medium;
12 correct?

13 A I think the two are fairly independent
14 subject only to the constraint that the gaps at
15 either end of the solution holding medium be
16 retained at some length.

17 Q All right. Dr. Sturges, can you go to
18 Exhibit 1006.

19 (JUUL Deposition Exhibit 1006 was
20 marked for identification and attached to the
21 transcript.)

22 THE WITNESS: I'm there.

23 BY MR. PEPE:

24 Q All right. And Exhibit 1006 is the
25 Fang reference; correct?

1 A Yes.

2 Q Now, if we take a look at figure 1,
3 based on your review of Fang, does it include a
4 cartridge that's detachable from the power source?

5 A (Witness reviews document.)

6 It is not described as detached, but to
7 one of skill in the art, it would be detachable.

8 Q Okay. So a person of ordinary skill
9 would understand that Fang has a cartridge that is
10 detachable from a portion that includes the
11 battery?

12 A Yeah. Understanding that Fang didn't
13 specifically say that, yes.

14 Q Okay. And, so, looking at figure 1,
15 where would a person of ordinary skill understand
16 that the cartridge detaches from the portion of
17 the device that includes the battery?

18 A That it would be most easily detachable
19 just below the O-ring seal at about the center of
20 the figure 1.

21 Q Okay. And looking at the numbers on
22 the right side of figure 1, where is -- where
23 exactly are you referring?

24 A Laterally across from numeral 4.

25 Q But that's not described in the text?

1 A It is not.

2 Q Okay. So is it your understanding that
3 when somebody uses up the nicotine source in the
4 device in figure 1 of Fang that they would be able
5 to remove the cartridge and replace it with a
6 fresh cartridge?

7 A Not as Fang describes it, no, but it
8 would require a modification of Wang -- of Fang in
9 order to do that.

10 Q Okay. So your understanding of the
11 Fang device as disclosed in figure 1 does not
12 include a detachable cartridge; is that correct?

13 A No, I'm being careful with my language
14 and saying that it is through modification
15 detachable, not that Fang shows it as detached.

16 Q Okay. But you would need to make
17 modifications to the device in figure 1 for the
18 cartridge to be detachable; is that correct?

19 A Yes, such as would have been disclosed
20 in Wang or Xia.

21 Q Okay. So the Fang device as disclosed
22 in the reference, though, does not include the
23 modification that you're referring to that would
24 allow you to detach the cartridge; correct?

25 A Correct.

1 Q Okay. So your understanding of Fang as
2 disclosed is that it is a, you know, single-piece
3 device that the entirety of which is disposed when
4 the nicotine source is depleted; correct?

5 A Correct.

6 Q Okay. Okay. Now, I think we talked
7 about Wang earlier. The solution holding medium
8 in Wang is an organic fiber that's wound around
9 the heater; correct?

10 A Yes.

11 Q Okay. And in Fang it describes that
12 the solution holding medium includes a cotton yarn
13 or sponge material; right?

14 A Yes.

15 Q Okay. And that -- that material is not
16 wound around the heater in Fang's device; correct?

17 A One would assume that winding is
18 possible, certainly, because a material of that
19 kind could certainly be wound. But it is not
20 explicitly called out by Fang nor is it ruled out.

21 Q Okay. But more specifically, Wang
22 never -- strike that.

23 More specifically Fang never describes
24 that the sponge material is wound around the
25 heater; correct?

1 A Correct.

2 Q All right. Now, I'd like to --

3 MR. PEPE: Hey, Dana, did we lose
4 somebody?

5 THE COURT REPORTER: I don't think so.
6 I think maybe you just took the exhibits off.

7 MR. PEPE: Oh, okay.

8 THE COURT REPORTER: I don't know.
9 Well, Eric, I'm not seeing my videographer up
10 there. We might have lost our videographer. Do
11 you want to go off the record?

12 MR. PEPE: We've been going about an
13 hour. Why don't we take a five or ten-minute
14 break. Why don't we go off.

15 (Recess -- 11:54 a.m.)

16 (After recess -- 12:09 p.m.)

17 BY MR. PEPE:

18 Q All right. Do you have figure 1 of
19 Fang in front of you, Exhibit 1006?

20 A I do.

21 Q And in the Fang reference, there is an
22 oil conservator 7; correct?

23 A Yes.

24 Q All right. And then there's also an
25 oil storage device 14; correct?

1 A Yes.

2 Q And you've identified those two
3 features as the solution holding medium; correct?

4 A I believe so.

5 Q Okay. And do you have an understanding
6 as to why in Fang's device it has both an oil
7 conservator 7 and an oil storage device 14?

8 A (Witness reviews document.)

9 Fang doesn't explain why, but the
10 existence of two devices follows the pattern in
11 Xia having two such devices, so it is not
12 surprising.

13 Q Okay. But as part of your analysis,
14 did you develop an understanding as to why there
15 are two separate ones in the Fang device?

16 A I did not.

17 Q All right. I'd like you to take a look
18 at paragraph 361 of your declaration, and that's
19 on -- it's numbered page 174.

20 A I'm there.

21 Q All right. And you've identified first
22 and second apertures and an air flow passageway in
23 that figure in paragraph 361; right?

24 A I have.

25 Q All right. What is your understanding

1 as to where -- where air enters into Fang's
2 device?

3 A Fang is not specific about where it is,
4 but it would be below the O-ring seal.

5 Q And what number is the O-ring seal?
6 And you can -- you can go back to figure 1 of Fang
7 if you'd like to?

8 A The O-ring seal is not labeled. It is
9 shown in the diagram, however, and it is near
10 to -- laterally to the left of the numeral 12.

11 Q Okay. And I'm -- we've lost our
12 videographer. I'm going to share my screen so we
13 can make sure we're on the same page here.

14 All right. Can you see figure 1 of
15 Fang up on the screen?

16 A I can.

17 Q All right. And, so, when you say you
18 believe that the air would enter laterally to the
19 left of number -- number 12 --

20 Is that what you said?

21 A No, sir. Let me reiterate. To the
22 left of the numeral 12 and slightly down the page,
23 there is shown a cross-section of an O-ring seal
24 and two circles opposite at the far edges of the
25 interior of the shell. And the air entering the

1 first aperture would necessarily come from some
2 opening to the -- lower than where the O-ring seal
3 is shown.

4 Q Okay. And why would it necessarily
5 enter through there?

6 A Because you would need to develop a
7 differential pressure between the atmosphere and
8 the second aperture. Without that seal, that
9 would be very difficult to do.

10 Q Okay. And looking at figure 1 of Fang,
11 I just want to make sure I understand where we
12 are. You see there's -- there's a number 12, and
13 that has a leader that goes to -- let's get our
14 terminology correct.

15 All right. So number 12 is identified
16 as a switch circuit board; correct?

17 A Yes.

18 Q Okay. And do you see the leader that
19 goes to the switch circuit board 12?

20 A I do.

21 Q Okay. And is the O-ring seal you're
22 referring to above the switch circuit board 12?

23 A Yes.

24 Q Okay. And where is the O-ring seal
25 relative to what you've identified as the first

1 aperture in your declaration?

2 A It is upwards on the page from the
3 first aperture, and it is shown schematically as a
4 pair of cross-hatched circles.

5 Q Okay. And it's just to the left of
6 number 12 but just slightly down, right, are those
7 two circles on either side of the center of Fang
8 figure 1?

9 A Yes, sir.

10 Q Okay. And, so, going back to that,
11 your interpretation of Fang is that the air would
12 enter into the device below the O-ring seal;
13 correct?

14 A Correct.

15 Q Okay. And where exactly below the
16 O-ring seal would it enter?

17 A Fang is not specific nor does he need
18 to be.

19 Q Okay. So you just know based on your
20 analysis that it's somewhere below the O-ring seal
21 but you don't know exactly where?

22 A Correct.

23 Q Okay. And the air would enter through
24 an opening in the side of Fang's device; correct?

25 A Not necessarily. It could enter the

1 lower end.

2 Q Okay. So you're saying looking at
3 figure 1, air could enter through the bottom of
4 the device where number 18 is?

5 A If -- if there were a passageway
6 through there, yes.

7 Q Okay.

8 A It's not shown, however.

9 Q Okay. But if it didn't enter through
10 18 where -- at the bottom of the device where 18
11 is, air would have to enter the device through the
12 side of the housing; correct?

13 A Yes, one would expect that.

14 Q Okay. And why is it again that it
15 would need to enter below the O-ring seal?

16 A In order to develop a pressure
17 difference between the atmosphere and the user's
18 mouth at the second aperture.

19 Q Why couldn't it develop that pressure
20 change if the opening was above the O-ring seal?

21 A Because there would be the -- a
22 possibility that the air would go directly to the
23 second aperture rather than through the heater
24 area and the atomizer.

25 Q Well, as long as the air enters

1 underneath the heater, it would travel through the
2 heater; correct?

3 A Not necessarily. The -- there may be a
4 way to get the -- the air to leak around the
5 components shown above the seal.

6 Q But it could be designed for air to
7 enter above that seal -- correct? -- and travel --
8 then travel over the heater; correct?

9 A I'm not sure because I haven't looked
10 at that possibility, and it was plain to me, based
11 on my experience, that the reason for the seal and
12 its location was to ensure that the air was going
13 to enter the first aperture.

14 Q Okay. But the Fang reference itself --
15 does it describe the function of the seal?

16 A It does not.

17 Q Is the seal described anywhere in the
18 text of Fang?

19 A It is not.

20 Q And is what you've identified as the
21 first aperture described anywhere in the text of
22 Fang?

23 A No.

24 Q And the text of Fang doesn't explicitly
25 describe where the air enters the device; correct?

1 A Correct.

2 Q All right. Now, as of 2000 -- well,
3 strike that.

4 In the 2009-2010 time frame, were you
5 aware of any electronic cigarettes that did not
6 use some type of heating element in them?

7 A I was not.

8 Q Okay. Were you aware of any electronic
9 cigarettes that were not powered by a battery?

10 A I was not.

11 Q And was it your understanding that any
12 electronic cigarette in the 2009, 2000 time -- '10
13 time frame was intended to deliver vapor to a
14 user's mouth by air flow?

15 MR. DOKHANCHY: Objection. Vague.

16 THE WITNESS: Could you please repeat
17 the question?

18 BY MR. PEPE:

19 Q Sure.

20 Was it your understanding that in the
21 2009-2010 time frame all electronic cigarettes
22 were intended to deliver vapor to a user's mouth
23 via air flow?

24 A No, because I was very likely not aware
25 of the universe of electronic cigarettes so that I

1 would be able to qualify that.

2 Q Okay. So you're not sure one way or
3 the other?

4 A Correct.

5 Q Okay. All right. Let's take a look at
6 paragraph 62 of your declaration in Exhibit 1007.

7 MR. DOKHANCHY: Excuse me. Chris,
8 which Exhibit 1007?

9 BY MR. PEPE:

10 Q From your declaration in IPR2024-00160,
11 so for the '864 patent.

12 A I'm there.

13 Q All right. So here you say that Xia,
14 Wang and Fang were all -- were also all published
15 within the same 11-month period and were all from
16 Chinese inventors.

17 Do you see that?

18 A Yes.

19 Q Okay. And, so, is it your opinion that
20 the fact that they were published within one year
21 of each other provides a motivation to combine
22 them?

23 A I think being contemporaneous they
24 were -- is an indication that they were attacking
25 the same objectives.

1 Q Now, if you go to paragraph 97 of
2 Exhibit 1007 --

3 A I'm there.

4 Q -- you have some discussion of the
5 sound detector of Xia; right?

6 A I do.

7 Q Okay. And that component is used to
8 detect when a user inhales on the device; correct?

9 A Yes.

10 Q Okay. And in your declaration, you
11 provide the opinion that it would have been
12 obvious to replace that detector of Xia with a
13 pressure sensor; right?

14 A That's right.

15 Q Okay. And one of the reasons you
16 indicated that it would have been obvious is that
17 the sensor disclosed in Xia could inadvertently
18 trigger; right?

19 A Yes.

20 Q Okay. And I guess my question is
21 what -- what evidence are you aware of that this
22 inadvertent triggering that you describe in
23 paragraph 97 would have been a known problem in an
24 electronic cigarette in 2009?

25 A The fact that Xia has a sound detector

1 for the purpose of initiating a -- a heating
2 cycle, and the sound detector -- detection device
3 in Xia is indicated by the features of that device
4 to be sensitive to sound; and because it's
5 sensitive to sound, that extraneous sounds would
6 have a high chance of triggering the device.

7 Q And extraneous pressure changes could
8 likewise trigger a pressure sensor; correct?

9 A Yes, but extraneous pressure
10 differences are a very different frequency and
11 highly unlikely in my view.

12 Q You never studied how pressure changes
13 in electronic cigarettes can inadvertently trigger
14 the device; correct?

15 A Yes, I have. I didn't mention it in my
16 report, however, but I did make a study of
17 pressure changes in electronic cigarettes during a
18 draw cycle.

19 Q When did you do that?

20 A In my work earlier with the Fontem v.
21 RJR activities.

22 Q And what exactly did you study?

23 A I studied the pressure and flow
24 characteristics of a user of an electronic
25 cigarette.

1 Q Was that in the context of an IPR?

2 A I don't recall.

3 MR. PEPE: Dr. Sturges, I don't have
4 any further questions for you.

5 MR. DOKHANCHY: No questions for me.
6 We're all set. Thank you, Dr. Sturges.

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8
9
10 (Signature having not been waived, the
11 Remote Videotaped Deposition of ROBERT H. STURGES,
12 PH.D., ended at 12:33 p.m.)
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1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2 I, Dana C. Ryan, Registered Professional
3 Reporter, Certified Realtime Reporter, the officer
4 before whom the foregoing proceedings were taken
5 do hereby certify that the foregoing transcript is
6 a true and correct record to the best of my
7 ability of the proceedings; that said proceedings
8 were taken by me stenographically and thereafter
9 reduced to typewriting under my supervision; and
10 that I am neither counsel for, related to, nor
11 employed by any of the parties to this case and
12 have no interest, financial or otherwise, in its
13 outcome.

14 IN WITNESS WHEREOF, I have hereunto set
15 my hand and affixed my notarial seal this 13th day
16 of August 2024.

17 My Commission expires:

18 August 31, 2025

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21

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