Transcript of Michael Lebby, Ph.D.

Date: July 8, 2024
Case: Opticis Co., Ltd -v- Inneos, LLC (PTAB)

Opticis Co., Ltd
EXHIBIT 1018
IPR Petition for
U.S. Patent No. 7,198,416

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

OPTICIS CO., LTD.,

Petitioner,

vs.

INNEOS LLC,

Patent Owner.

_____

Case IPR2023-01256

U.S. Patent No. 7,198,416

_____

VIDEOTAPED DEPOSITION OF MICHAEL LEBBY, PH.D.

Conducted Virtually

Monday, July 8, 2024

12:00 p.m. EDT

Job No.: 541089

Pages: 1 - 321

Reported by: Monique Vouthouris, CCR, RPR, CRR

VIDEOTAPED DEPOSITION OF MICHAEL LEBBY, PH.D.

pursuant to notice, conducted virtually via Zoom Videoconference, before Monique Vouthouris, Certified Court Reporter, Registered Professional Reporter, Certified Realtime Reporter, and Notary Public in and for the States of New Jersey and New York.

A P P E A R A N C E S

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C O N T E N T S

EXAMINATION OF MICHAEL LEBBY, PH.D. PAGE

By Mr. Rawls 6

E X H I B I T S

(Attached to transcript.)

LEBBY DEPOSITION EXHIBITS PAGE

Exhibit 1 U.S. Patent Number 5,345,524, September 6, 1994, Optoelectronic Transceiver Sub-Module and Method for Making, Lebby, et als. 34

Exhibit 2 U.S. Patent Number 5,361,317, November 1, 1994, Assembly with Fixture Aligning and Affixing an Optical Fiber to an Optical Device, Hartman, et al. 41

P R O C E E D I N G S

THE VIDEOGRAPHER: Here begins video number 1 in the videotaped deposition of Dr. Michael Lebby in the matter of Opticis Co., Ltd. versus Inneos LLC, in the United States Patent and Trademark Office before the Patent Trial and Appeal Board, Case Number IPR2023-01256. 12:00:28 12:00:38 12:00:39 12:00:43 12:00:48 12:00:54 12:00:56

Today's date is July 8th, 2024. The time on the video monitor is 12:01 p.m. The remote videographer today is Charlie McGrath representing Planet Depos. 12:01:04 12:01:07 12:01:12 12:01:12

All parties of this video deposition are attending remotely. 12:01:15 12:01:17

Would counsel please voice-identify themselves and state whom they represent. 12:01:18 12:01:20

MR. RAWLS: This is Mark Rawls, I represent the petitioner Opticis. I'm from the firm Rothwell, Figg, and with me also is Michael Jones, also from Rothwell, Figg. 12:01:23 12:01:27 12:01:32 12:01:34

MS. RICHEY: Carrie Richey, I represent the patent owner Inneos LLC. I'm with Womble Bond 12:01:37 12:01:39

Dickinson LLP. 12:01:47

THE VIDEOGRAPHER: The court reporter 12:01:48

today is Monique Vouthouris representing Planet 12:01:49

Depos. 12:01:49

The witness will now be sworn. 12:01:52

(Oath Stipulation is read and agreed to by 12:01:52

Counsel.) 12:02:20

MICHAEL LEBBY, PH.D., 12:02:20

being first duly sworn or affirmed by the Notary, 12:02:20

testifies as follows: 12:02:49

EXAMINATION 12:02:49

BY MR. RAWLS: 12:02:54

Q Hello, Dr. Lebby. My name is Mark Rawls, 12:02:55

I'm with the law firm Rothwell, Figg. And as we 12:02:58

said, we're here today in the IPR captioned 12:03:01

IPR2023-01256, which is Opticis Co., Limited v. 12:03:05

Inneos LLC. If I refer to this as the inter partes 12:03:10

review, or the IPR, or the present matter, will you 12:03:14

understand what I'm referring to today? 12:03:17

A Yes, I will. 12:03:19

Q Have you ever been deposed before? 12:03:20

A Yes, I have. 12:03:24

Q About how many times, do you recall? 12:03:25
A Over 60 times. 12:03:30
Q And were some of those for District Court cases? 12:03:32
A That is correct. 12:03:35
Q Do you recall about how many were for District Court cases? 12:03:35
A I have no idea. I would have to check my CV. It's listed in -- 12:03:36
(Simultaneous speaking.) 12:03:38
A Sorry. It's listed in my CV. 12:03:40
Q Okay. And some of them were for PTAB or IPR cases, correct? 12:03:44
A That is correct. 12:03:44
Q Is it fair to say that you're fairly experienced at depositions at this point? 12:03:46
MS. RICHEY: Objection. Form. 12:03:49
A Certainly I've been in a number of different types of depositions and scenarios. My total count of depositions is over 60, so I don't know if that makes me experienced or not. 12:03:52
Q Okay. Well, you may know some of this 12:03:54
12:03:55
12:03:59
12:04:02
12:04:05
12:04:08
12:04:12
12:04:15
12:04:17

already, but I'm just going to go over a couple of the ground rules or basics, which you may have heard before. 12:04:20 12:04:24 12:04:26

I'm going to ask you a series of questions. If you don't understand the question, I would ask that you not answer it, you let me know and I'll clarify or rephrase. Is that agreed? 12:04:26 12:04:28 12:04:30 12:04:32

A That is fine. 12:04:36

Q And if you do answer a question, then I will assume that you did understand it. Is that agreed? 12:04:38 12:04:40 12:04:43

A That is fine. 12:04:44

Q And any time you need a break, just ask and we'll take one. I think we're all scattered on different time zones here. But if you do end up needing a longer break around your lunchtime, we can also accommodate that. 12:04:45 12:04:48 12:04:52 12:04:55 12:04:59

Now, according to the IPR rules, you're not permitted to speak with your attorney regarding the substance of your deposition until we're fully concluded unless it is about privilege issues. 12:05:01 12:05:03 12:05:05 12:05:08

Do you understand that? 12:05:11

A I understand. 12:05:12

Q And finally, you understand that you're under oath, correct? 12:05:13 12:05:16

A That is correct. 12:05:19

Q Now, because we're doing this deposition remotely, we're not in the same room, but did you bring any materials with you today? 12:05:20 12:05:22 12:05:25

A Yes, I did. 12:05:28

Q And what are those? 12:05:29

A I brought a clean copy of my declaration, which I'll hold up in front. Is it in focus? 12:05:30 12:05:34

Q I can't quite see that. Is that your -- I know you have I think two declarations in this case. Is that your first one or -- 12:05:39 12:05:42 12:05:44

A That's my first one. And then there's a clean copy of my supplemental declaration. 12:05:46 12:05:50

Interesting, the focus is not working. 12:05:53

Q Okay. And other than those two clean documents you just explained, are there any other materials you have? 12:05:55 12:05:59 12:06:02

A Yes, there's the -- this is the decision. I don't know if you can see it. This is PTAB 12:06:03 12:06:07

decision. And then there's a fourth document, and you can see all the tabs. I'm not sure if it's coming out that clearly. But this is a document that contains clean copies of some of the prior art that's being used in this case. 12:06:11 12:06:14 12:06:19 12:06:22 12:06:27

Q Okay. And you're -- you referred to the PTAB decision. Is that the institution decision you're referring to? 12:06:29 12:06:31 12:06:33

A That is correct. It's paper 15. 12:06:34

Q Okay. And other than those clean copies of the documents you just noted, is there anything else you have material-wise in front of you? 12:06:36 12:06:39 12:06:42

A No, there is not. 12:06:45

Q And you understand that today's IPR is related to U.S. Patent Number 7,198,416 to Ray, et al.? 12:06:49 12:06:57 12:07:05

A That is the patent that this -- today's deposition is concerned with, I would agree with you. 12:07:05 12:07:09 12:07:11

Q Now, if I refer to that as the '416 patent, will you understand what I mean? 12:07:11 12:07:15

A Yes, I will. 12:07:17

Q I may also refer to the invention, and unless I say differently, I will mean the invention described and claimed in the '416 patent. Does that make sense? 12:07:18 12:07:20 12:07:24 12:07:27

A Yes, I will understand. 12:07:28

Q Just so we're talking about the same thing, we can bring up a copy of that. It's Document A and it was previously marked in the IPR as Exhibit 1001. 12:07:30 12:07:32 12:07:35 12:07:39

THE TECHNICIAN: Please stand by. 12:07:43

Q And you recognize this as the '416 patent, Dr. Lebby? 12:08:00 12:08:03

A Yes, I do. 12:08:04

Q And you submitted, and I think you alluded to it before, but you submitted a number of declarations in this case relating to the '416 patent, correct? 12:08:07 12:08:09 12:08:12 12:08:15

A That is correct. 12:08:15

MR. RAWLS: Let's bring up Document C, which was previously marked as Exhibit 2003. 12:08:17 12:08:19

THE TECHNICIAN: Please stand by. 12:08:24

Q And up on the screen we see what is titled 12:08:49

"Declaration of Michael Lebby, Ph.D.," and it has the caption and the case number for the IPR we're discussing today. If we call this your first declaration, will that make sense to you? 12:08:52 12:08:57 12:08:59 12:09:02

A Yes, it will. 12:09:04

MR. RAWLS: And let's enter Document D, which was previously marked in the IPR as Exhibit 2049. 12:09:07 12:09:09 12:09:15

THE TECHNICIAN: Please stand by. 12:09:16

Q And that's up on the screen now and is titled "Supplemental Declaration of Michael Lebby, Ph.D." with the caption and case number for the IPR we're discussing today. And if we call this your supplemental declaration, will that make sense to you? 12:09:28 12:09:31 12:09:34 12:09:37 12:09:40 12:09:43

A Yes, it will. 12:09:43

Q All right. I'm going to ask you some questions now, Dr. Lebby, about your preparation for the deposition today. In answering I don't want you to reveal the substance of any conversations you may have had with your attorneys. Your counsel today may object, and unless you're not instructed to 12:09:44 12:09:48 12:09:52 12:09:55 12:09:58 12:10:01

answer, I would ask that you please answer the pending question. 12:10:03 12:10:05

Is that okay with you? 12:10:06

A That is fine. 12:10:07

Q How did you prepare for today's deposition? 12:10:09 12:10:11

MS. RICHEY: I just want to caution the witness, as Mr. Rawls already mentioned, not to reveal any communications, specific communications with counsel in answering. 12:10:12 12:10:14 12:10:19 12:10:22

A I met with counsel and read pertinent documents for this case. 12:10:26 12:10:30

Q Who did you meet with, the specific, I guess, names of the counsel? 12:10:31 12:10:35

A Carrie Richey, who is on the Zoom call today, plus one of the partners at Womble. I think Chris Mammen, or something like that. Maybe Carrie can help me with the name. 12:10:37 12:10:42 12:10:53 12:10:56

MS. RICHEY: That's correct. 12:10:58

Q Do you recall approximately how many meetings you had about the deposition? 12:10:58 12:11:00

A I had two face-to-face meetings and one 12:11:02

remote meeting. 12:11:05

Q And do you recall cumulatively 12:11:07

approximately how long that was? 12:11:10

A I think approximately two hours plus or 12:11:12

minus for each meeting. 12:11:16

Q And what materials did you review? 12:11:19

A I reviewed the institutional decision, the 12:11:24

first declaration, and the supplemental declaration 12:11:29

that I've submitted, plus the prior art. 12:11:31

Q Was there anything that you reviewed that 12:11:36

is not identified in your first or supplemental 12:11:40

declaration? 12:11:43

A I do not believe I reviewed anything 12:11:44

outside of my first or supplemental declaration. 12:11:54

Q Are you aware that one of the inventors, 12:11:59

Mr. Curtis A. Ray, was deposed in connection with 12:12:01

this IPR? 12:12:05

A I have an understanding that that 12:12:06

deposition took place. 12:12:09

Q Did you read -- excuse me. Did you review 12:12:10

the deposition transcript for Mr. Ray's deposition? 12:12:15

A I don't recall in detail. I would have to 12:12:18

check the materials that I've cited in my declaration and I don't recall those. 12:12:20 12:12:23

Q Other than reviewing the transcripts, are you otherwise familiar with any of the questions and answers from the deposition? 12:12:25 12:12:29 12:12:32

A I don't recall that level of detail. But I didn't see any problem as I reviewed my documents for this case. 12:12:35 12:12:38 12:12:42

Q Have you spoken with any of the inventors of the '416 patent? 12:12:44 12:12:47

A Not as far as I'm aware in the last 10 years. I may have spoken to them previous to 10 years, but I don't recall that level of detail. 12:12:49 12:12:52 12:12:57

Q What about any employee of any of the patent owner? 12:12:58 12:13:04

A Not as far as I'm aware. 12:13:05

Q And are you aware of any of the predecessors in interest of Inneos, I think Blaze and Aduro? 12:13:06 12:13:11 12:13:14

A I am not aware of any of that information. So I don't know if there was a question pending or not, but certainly I'm not aware of anything that 12:13:16 12:13:19 12:13:23

relates to the companies you mentioned. 12:13:27

Q Okay. And who have you discussed today's deposition with other than your counsel that you've already identified? 12:13:29 12:13:32 12:13:36

A Nobody. 12:13:37

Q All right. Now, I would like to learn a little bit about your technical experience. 12:13:44 12:13:47

It's your opinion that you are qualified as a POSITA at the time of the invention, correct? 12:13:50 12:13:52

A Yes, that's correct. 12:13:55

Q And I use the expression "POSITA," and I think it's in your reports, but by "POSITA" I mean person of ordinary skill in the art. Is that understood? 12:13:59 12:14:02 12:14:06 12:14:10

A That is, I understand that. 12:14:10

Q Now, I know the parties dispute exactly when the time of the invention was, so I'll ask you specifically were you qualified as a POSITA around July 17th, 2003? And I'll represent to you that that's the date the patent owner is contending the invention was conceived. 12:14:13 12:14:16 12:14:20 12:14:24 12:14:27 12:14:31

A Yes, I am qualified as a POSITA at that 12:14:33

time. 12:14:37

Q And generally for today's deposition, when I refer to the priority date for the '416 patent or the time of the invention, I would ask you to use that July 17th, 2003 date. And if you're referring to a different time period to let me know. Can you do that? 12:14:37 12:14:39 12:14:43 12:14:46 12:14:50 12:14:53

A Yes, I can. 12:14:53

Q And also generally for today's deposition when I ask you about a POSITA, such as what a POSITA would know, I'm referring to this time frame to the priority of the -- priority date of the '416 patent. 12:14:56 12:14:58 12:15:02 12:15:05

Does that make sense? 12:15:09

A Yes, it does. 12:15:12

Q Okay. With that, I'll move on to some specific statements about your background. And we can bring up Exhibit 2003, and I believe Section II of your declaration is titled "Professional Background and Qualifications." And just to orient you, Dr. Lebby, while that comes up, that spans paragraphs 8 through 25. And you provided this background in order to establish that you are an 12:15:13 12:15:16 12:15:19 12:15:25 12:15:28 12:15:32 12:15:35 12:15:42

expert in the field relevant to the '416 patent, correct? 12:15:44 12:15:48

A So in general, the background does establish my professional background and qualifications, as I indicate in my first declaration in paragraphs 26 and 27, I'm looking at this as the hypothetical person of ordinary skill in the art is presumed to be aware of the relevant art at the time of the invention, in this case the priority date. 12:16:28 12:16:30 12:16:34 12:16:38 12:16:43 12:16:47 12:16:50 12:16:52

And so, yes, I've detailed my experience, and it should be clear that at the time of the invention I am a person of ordinary skill in the art. 12:16:54 12:16:57 12:17:00 12:17:07

Q Okay. And so I had asked, actually, about whether the background establishes that you're an expert, and I think you answered about being a person of ordinary skill in the art. So I'll re-ask just to make sure I understand the question. 12:17:07 12:17:09 12:17:12 12:17:16 12:17:20

Does the background you provide establish that you're an expert in the field relevant to the '416 patent? 12:17:22 12:17:25 12:17:27

A Well, you'll have to define an expert. 12:17:29
But my understanding from the legal standpoint is 12:17:31
written in my first declaration in paragraphs 26 and 12:17:33
27, a person having ordinary skill in the art has to 12:17:36
be a hypothetical person in the same field as the 12:17:40
patent and presumed to be aware of the relevant art 12:17:44
at the time of the invention. 12:17:47
So my background here supports the fact 12:17:49
that I am a person of -- having ordinary skill in 12:17:53
the art at the time of the priority date of the 12:17:57
'416. If that means I'm an expert too, then we have 12:18:00
to accept that as an expert. But the bottom line is 12:18:04
that I'm a POSITA at the time of the invention. 12:18:09
Q Okay. That was helpful. Thank you. 12:18:11
Now, did you include parts of your 12:18:13
professional background and qualifications in this 12:18:15
section that you believed would be relevant to the 12:18:17
case? 12:18:20
A As you can see from my CV, which is 12:18:31
probably a hundred pages or thereabouts, the 12:18:34
background I've given in my first declaration on 12:18:36
paragraphs 8 to 25 is a summary of my experience 12:18:40

base. We can see from both my CV, as well as the precede of the summary of my professional background and qualifications, I'm a person of ordinary skill in the art at the time of the priority date of the '416, which is the 17th of July 2003. 12:18:46 12:18:51 12:18:53 12:18:56 12:18:58

Q All right. Now, turning to paragraph 9 of your declaration here, your first declaration, Exhibit 2003, do you see "I have worked in nearly every aspect of optoelectronics, including laser diodes, photodetectors, LEDs and fiber optics." 12:19:03 12:19:06 12:19:09 12:19:13 12:19:17

Is your experience with laser diodes relevant to your being a POSITA in the field related to the '416 patent? 12:19:21 12:19:23 12:19:26

MS. RICHEY: Objection. Form. 12:19:28

A I believe what I've listed here in terms of my work in the same field as the subject matter of the '416 patent, that's included in both in my CV as well as my professional background and qualifications, and some of the things I called out certainly are applicable and pertinent to what's being described in the '416 patent. 12:19:46 12:19:49 12:19:54 12:19:59 12:20:01 12:20:04 12:20:08

And in fact, I've used my experience in 12:20:12

the field to explain, at least from my perspective, for example, what an optical combiner is as indicated in the '416 patent. 12:20:15 12:20:18 12:20:22

And so I think as you go through my experience base, you can see from paragraphs 8 to 25 there's a number of different things that are noted there. But I've put them in perspective of what is needed to be a person of ordinary skill in the art at the time of the '416 priority date, which is the 17th of July 2003, and I believe that is all pertinent. 12:20:24 12:20:29 12:20:33 12:20:36 12:20:39 12:20:42 12:20:46 12:20:50

Q Okay. When you say you believe that is all pertinent, what do you mean by "all"? 12:20:53 12:20:55

A I believe my experience base is pertinent to become a person of ordinary skill in the art by the time of the priority date of the '416 patent. 12:20:59 12:21:02 12:21:05

Q Okay. And that includes the experience in paragraph 9 that you referenced related to laser diodes, correct? 12:21:09 12:21:11 12:21:16

A So I understand your question was on one particular optical component called laser diodes. But if you look at my professional background as a 12:21:20 12:21:23 12:21:27

whole, and in more detail in my CV, I've summarized it in paragraphs 8 to 25 of my first declaration. And I believe the experience as a whole, including things like laser diodes and other components, are pertinent to what's being taught in the '416 patent, and also to become a person of ordinary skill in the art, to use your words, to become an expert and review some of the patent and legal issues of the '416 patent as stated, the 17th of July 2003, which is my understanding of the priority date. 12:21:29 12:21:34 12:21:38 12:21:42 12:21:46 12:21:52 12:21:56 12:21:59 12:22:04 12:22:11

Q All right. Now, sticking with this same paragraph, paragraph 9, you state that you have "experience and expertise relating to epitaxial wafer growth, laser/photodetector device fabrication, implementation of these devices into packaging, and packaging materials such as plastics, metallic based, semiconductor based, and ceramic based." 12:22:16 12:22:19 12:22:22 12:22:26 12:22:30 12:22:33 12:22:38 12:22:40

And then you also refer to other experience designing "optoelectronic device packages (e.g., through-pin, surface mount, flip-chip, and various combinations thereof) for printed circuit 12:22:40 12:22:42 12:22:48 12:22:49

board mounting." And you say, "Many of the designed packages were implemented in modules and subsystem applications, i.e., fixtures in which optoelectronics packages are incorporated." 12:22:52 12:22:55 12:22:58 12:23:01

Do you see that in paragraph 9, Dr. Lebby? 12:23:04

A Yes, I do. 12:23:06

Q Does any of this experience related to packaging stated in paragraph 9 refer to experience before the priority date of the '416 patent? 12:23:07 12:23:10 12:23:14

A So if you look at my CV, as well as the summary of my CV, which is the professional background and qualifications that are listed in paragraphs 8 to 25 of my first declaration, you can see very clearly that I've had a 40-year career in this field. 12:23:27 12:23:31 12:23:34 12:23:37 12:23:41 12:23:45

So I certainly worked with a number of different aspects of data communications, telecommunications, optoelectronics, photonics, and certainly some of these experiences predate the priority date of the '416 patent, which is the 17th of July 2003. 12:23:46 12:23:48 12:23:52 12:23:57 12:24:01 12:24:07

And so the answer to your question is, is 12:24:09

certainly I've been active in the field for longer than the -- or previous to the priority date of the '416 patent. 12:24:11 12:24:16 12:24:21

Q And given that experience, you're aware that packaging for optoelectronic devices was known before the priority date of the '416 patent, correct? 12:24:25 12:24:27 12:24:31 12:24:34

MS. RICHEY: Object to form. 12:24:38

A So the '416 patent certainly -- I don't know if it particularly calls out the term "packaging," but the term "packaging" from a POSITA's standpoint is something that is used to protect the chips or semiconductor chips and components from the environment. Also, it allows optical and electrical connections. 12:24:43 12:24:47 12:24:50 12:24:56 12:25:00 12:25:05 12:25:09

So we really haven't defined what packaging is in general. But in a use of the term "packaging" means that it protects things like lasers and photodetectors and different optical components. 12:25:11 12:25:15 12:25:17 12:25:21 12:25:25

And as I look at the '416 patent, I can't -- obviously can't do a word search right now to see 12:25:25 12:25:28

if the word "packaging" was used. But certainly the '416 patent is, can be referred to as a package that has -- does protect components from the environment and does allow both electrical and optical connections to the outside world. 12:25:31 12:25:34 12:25:40 12:25:43 12:25:46

And so I don't know how you're defining packaging, but certainly I've got experience in protecting optoelectronic technology from the environment and providing electrical and optical connections. 12:25:49 12:25:53 12:25:56 12:26:00 12:26:03

And we can see from the '416 patent that's certainly the case, even though the term "package" may or may not be used in the actual patent. 12:26:03 12:26:07 12:26:09

Q Okay. So you mentioned two things in relation to packaging and I want to focus on them separately. 12:26:13 12:26:17 12:26:20

So first you had mentioned about protecting the components. Was it known prior to the '416 patent that packaging was important and helpful for protecting optical components? 12:26:21 12:26:22 12:26:28 12:26:30

A So as you can see from the '416 patent, it does have optical components as indicated, for 12:26:34 12:26:38

example, in and how I define what an optical combiner, for example, is. An optical combiner, as I defined it, has a number of different components, as I indicate on paragraph 59 of my expert report. And certainly as we've already indicated on record, the generic use of the term "packaging" is to protect these components, and the '416 certainly does that. 12:26:43 12:26:53 12:26:57 12:27:01 12:27:06 12:27:08 12:27:11 12:27:14

And so I think that's a good answer to your question. 12:27:16 12:27:21

Q Well, I appreciate the reference to the '416 patent, Dr. Lebby. I'm actually asking about prior to that. 12:27:22 12:27:24 12:27:28

So before the priority date of the '416 patent, would a POSITA have known that packaging of optoelectronic components would provide advantages, such as securing those components? 12:27:29 12:27:32 12:27:34 12:27:39

MS. RICHEY: Objection. Form. 12:27:43

A So as we can see from the '416 patent -- I don't know if the term "packaging" is actually used in the patent itself. But the packaging is a field of art that is used for both packaging electronic 12:27:44 12:27:47 12:27:51 12:28:05

components, as well as optoelectronic components. And certainly packaging was done to protect components from the environment. 12:28:10 12:28:13 12:28:16

As you can see, I've indicated in my CV over a 40-year career I've done different aspects of packaging, depending how you define it. 12:28:17 12:28:21 12:28:25

But as we can see in the '416 patent, the design, for example, that's shown on the front page of the '416 patent, some people can refer to that as a package, and so that is a package that is designed as per the specifications and the claims of the '416 patent, and I believe that type of package is quite novel. 12:28:27 12:28:32 12:28:35 12:28:39 12:28:42 12:28:46 12:28:49

But to answer your question, yes, there are packages, and I've certainly had the experience in packaging and protecting semiconductor diode, both electronic and optoelectronic. 12:28:50 12:28:52 12:28:54 12:28:58

But what we look at here is the '416 patent and that has, if you like, a novel and inventive package. 12:29:01 12:29:03 12:29:08

Q Now, the other thing you had mentioned is providing electrical and optical connections as 12:29:08 12:29:11

being one of the advantages of packaging. Was that known to a POSITA as of the priority date as an advantage of packaging? 12:29:13 12:29:16 12:29:20

A Packaging in general, as I've just indicated from the '416 patent, which is an innovative -- the title of the patent is an optical combiner device. Some people may look at that and call that a package in the industry. And so if we just want to use the term "package" for that optical combiner device, certainly protecting electronics and optoelectronics from the environment, and providing electrical and optical stimulus or connections is certainly -- as you can see, over the course of my 40-year career I've done all sorts of different types of protecting devices from the environment. Some people call that packaging. I mean, you're referring to that as packaging. I've used the term "packaging," as you can see in my summary of my professional background from paragraphs 8 to 25. 12:29:21 12:29:24 12:29:28 12:29:30 12:29:33 12:29:36 12:29:39 12:29:42 12:29:45 12:29:49 12:29:51 12:29:56 12:29:59 12:30:01 12:30:03 12:30:07 12:30:10

But what we're really looking at in this case is the '416 patent that has, if you like, if 12:30:12 12:30:15

you want to use that term, innovative and inventive packaging. 12:30:18 12:30:22

Q Okay. Now, other than those two advantages of protecting or securing the components and providing electrical and optical connection, were there any other advantages to packaging that a POSITA would have been aware of? 12:30:23 12:30:26 12:30:29 12:30:32 12:30:35

A There are many advantages to protect devices from the environment. I certainly didn't come into this deposition to give you a whole history of, you know, the background of packaging. 12:30:37 12:30:42 12:30:45 12:30:48

But certainly there's a whole number of different aspects of protecting these types of devices, so it's not the only two, as you indicate. 12:30:51 12:30:53 12:30:56

But as we look at the '416 patent, we can see, using your term, the package, or at least the title of the patent is called an optical combiner device, it certainly protects -- at least it protects the chips from the environment, plus it has other functions, too, and we certainly can go into the '416 functions, if you like. 12:30:59 12:31:02 12:31:05 12:31:09 12:31:12 12:31:16 12:31:19

Q Well, I want to actually ask you a 12:31:22

different question. 12:31:24

So in terms of packaging, was alignment an advantage that a POSITA would have been aware of that packaging could have assisted with prior to the priority date of the '416 patent? 12:31:25 12:31:29 12:31:32 12:31:35

A So in general, when you talk about alignment, it's -- certainly sort of comes into two buckets. It comes into one bucket called active alignment, which is -- and also comes into another bucket called passive alignment, and both of those alignments have been known for a long time. 12:31:43 12:31:45 12:31:49 12:31:54 12:31:56 12:32:00

Passive alignment is when things align optically and you don't have to turn the laser on to maximize the alignment in the optics. As you can probably see, optics is pretty small devices in general and it is difficult to align things. 12:32:04 12:32:04 12:32:07 12:32:13 12:32:17

And so the industry certainly started with active alignment, which is where you turn the laser on and you detect the light coming out of the system and you maximize that light to get optical alignment. That's active alignment. 12:32:19 12:32:22 12:32:26 12:32:29 12:32:29

Passive alignment is what the '416 12:32:32

teaches. It's at the time this was innovative and inventive. But there were passive alignment techniques, active alignment techniques that I've experienced over my 40-year career. But certainly the ideas and the designs that go into the '416 patent to do passive alignment were novel at the time. 12:32:34 12:32:38 12:32:42 12:32:46 12:32:49 12:32:54 12:32:57

Q Was passive alignment known prior to the priority date of the '416 patent? 12:32:58 12:33:01

A Both active and passive alignment were known techniques and were known previous to 2003. And I believe some of the patents I have that have been issued involve both active and passive alignment. 12:33:05 12:33:09 12:33:13 12:33:18 12:33:21

However, when you start looking at the '416 patent and you look at how that let's call it, quote/unquote, package has been designed, and you see the design of, for example, the optical combiner and the ferrule with the stop, and the design for passive alignment, certainly that was novel at the time. 12:33:21 12:33:23 12:33:28 12:33:31 12:33:35 12:33:40 12:33:40

But to answer your question, passive 12:33:43

alignment certainly was -- people were aware of that before. But when you look at the '416 patent, that was an innovative way to utilize passive alignment using a preform molded structure, we can call that a package, if you like, and that, to me, was innovative and inventive. 12:33:48 12:33:51 12:33:53 12:33:58 12:34:02 12:34:04

Q In terms of packaging, was it known that packaging could be used to provide for passive alignment prior to the '416 patent priority date? 12:34:06 12:34:09 12:34:12

A It sort of depends how you want to define the term "packaging." I've just gone on record to say that passive alignment, as well as active alignment, was certainly aware as tools to try and help engineers design systems that use optics and light. 12:34:18 12:34:21 12:34:24 12:34:26 12:34:31 12:34:37

Typically, active alignment was used because that was the guaranteed way to make sure you had light to go through. The tolerance for passive alignment was difficult, even though people knew it was available. 12:34:39 12:34:41 12:34:44 12:34:48 12:34:51

But when we look at the '416 patent, even though people were aware that both active and 12:34:51 12:34:54

passive alignment were tools in the toolbox for engineers, the inventiveness of the '416 to use passive alignment with a stop for the fiber to allow the optics to be aligned without turning the lasers on was actually novel at the time. 12:34:57 12:35:01 12:35:05 12:35:09 12:35:13

Q All right. Now, turning to page 143 of this declaration, Exhibit 2003, this is your CV, which is an appendix, and I'll give it a minute to come up on the screen. 12:35:20 12:35:25 12:35:35 12:35:38

You state on this page that you have over 230 issued utility patents with the USPTO on subjects such as electronics, optoelectronics, photonics, packaging, transceiver modules, and the list goes on -- 12:35:41 12:35:44 12:35:48 12:35:51 12:35:51

(Court Reporter clarification.) 12:35:51

Q I believe that's the second paragraph here on the screen. Do you see that, Dr. Lebby? 12:36:02 12:36:04

A I do see that. 12:36:06

Q Focusing on the packaging and the optoelectronic-related patents in this paragraph, do some of those patents predate the priority date of the '416 patent? 12:36:08 12:36:11 12:36:16 12:36:18

A I believe my first patent was in the early 1990s, so I would presume many of the patents predate the priority date of the 17th of July 2003. Certainly we have to look deeper into the CV to see when the issue dates were. But certainly I'm aware that a number of patents were issued in the 1990s decade. 12:36:23 12:36:26 12:36:29 12:36:34 12:36:37 12:36:40 12:36:43

Q All right. Well, I want to bring up one of -- one of these patents. 12:36:44 12:36:47

MR. RAWLS: So let's pull up Document O and we can mark that as Lebby 1. 12:36:48 12:36:51

THE TECHNICIAN: Please stand by. 12:36:54

(Lebby Exhibit 1 marked for identification.) 12:36:56 12:37:07

Q Now, Dr. Lebby, you are one of the inventors on this patent, which is U.S. 5,345,524, correct? 12:37:07 12:37:10 12:37:15

A It certainly looks that way. 12:37:17

Q Can you tell me when this application was filed? 12:37:20 12:37:23

A It's rather small on my screen, so I'm having difficulty reading it. 12:37:24 12:37:28

Q I think maybe if we zoom into item 22, it says filed May 20th, 1993. Do you see that? 12:37:32 12:37:37

A Yes, I can just make that out. 12:37:41

Q And the patent published on September 6th, 1994, correct? If we zoom back out, we can see that in the top right. 12:37:43 12:37:48 12:37:54

A It certainly looks like the 6th of September 1994 for the issue date of this particular patent where I am a co-author. 12:37:56 12:37:59 12:38:02

Q And both those dates, the filing date and the publishing date, are before the '416 patent's priority date, correct? 12:38:06 12:38:08 12:38:14

A I would agree with you that 1994 predates the 17th of July 2003, which is the priority date of the '416. 12:38:15 12:38:18 12:38:22

Q And this patent relates to optoelectronic devices, correct? 12:38:23 12:38:28

MS. RICHEY: Object to form. 12:38:29

A Well, I don't know exactly what the patent relates to. I can certainly see the title, it says "Optoelectronic Transceiver Sub-Module and Method for Making." But certainly it's been actually 30 12:38:32 12:38:35 12:38:39 12:38:43

years, if I calculate that correctly, since I've seen this patent. So I don't really know how to answer your question. 12:38:47 12:38:49 12:38:52

Q That's a fair point, Dr. Lebby. Maybe if we turn to column 1, and we can highlight lines 6 through 8, and those lines say "This invention relates, in general, to optoelectronic devices and, more particularly, lead to fabrication of optoelectronic transceiver submodules." 12:38:53 12:38:56 12:39:00 12:39:11 12:39:15 12:39:17

Do you see that? 12:39:19

A I do see that. 12:39:20

Q Okay. And so sitting here today, I understand it's been a while since you were involved with this patent, but you would agree that the invention relates to optoelectronic devices? 12:39:22 12:39:26 12:39:29 12:39:31

A Well, it certainly depends on how optoelectronic devices are defined in this patent versus how optoelectronic devices are defined in the '416 versus how optoelectronic devices are defined in my CV, and so there may be differences there. 12:39:35 12:39:40 12:39:44 12:39:48 12:39:52

But certainly from the standpoint of using that term "optoelectronic devices," that's certainly 12:39:56 12:39:58

present in the '524 patent, which you're showing me right now. But that may or may not be the same as optoelectronic devices that are contextually set up in the '416 patent as I'm looking at in front of me right now. 12:40:01 12:40:06 12:40:09 12:40:11 12:40:14

Q Okay. Let's turn to column 7 of this patent, and if we could highlight lines 57 to 60, and that says, "Moreover, the optoelectronic transceiver submodule also provides an advantage of accurate and precise passive alignment of an optical cable to core regions of optoelectronic transceiver submodule." Do you see that? 12:40:15 12:40:19 12:40:26 12:40:28 12:40:33 12:40:36 12:40:40

A No. Could you read out -- could you just tell me the line numbers again. 12:40:42 12:40:45

Q It's 57 to 60, and I think the tech can highlight those for you. 12:40:47 12:40:51

MR. RAWLS: If you scroll down to the bottom, the sentence starting "Moreover" at the bottom of the left column. 12:40:59 12:41:00 12:41:08

A I see it now. 12:41:10

Q And so passive alignment is one of the advantages of this optoelectronic transceiver 12:41:12 12:41:17

submodule that you developed prior to the '416 patent's priority date, correct? 12:41:21 12:41:25

MS. RICHEY: Objection. Form. 12:41:26

A So it certainly looks like passive alignment is certainly one of the perhaps -- I don't know if it's the inventive mechanism for this patent that you're showing me that I haven't read, but certainly it's mentioned in the specification that there is passive alignment. 12:41:28 12:41:30 12:41:34 12:41:37 12:41:40 12:41:43

And I would like to add that I just indicated on record both active and passive alignment were tools that engineers could use. 12:41:45 12:41:47 12:41:50

But as I relate this to the '416 patent, where really the field of endeavor is wavelength division multiplexing, I don't believe, unless you can show me, that this particular patent you're showing me has any wavelengths division multiplexing whatsoever. And we do know that the optical combiner device, as indicated from the claims, the figures and the specs of the '416 patent, has wavelengths division multiplexing. 12:41:53 12:41:57 12:42:01 12:42:04 12:42:06 12:42:10 12:42:13 12:42:17 12:42:21

I don't believe, unless you can show me, 12:42:26

that the patent that you brought up for the first time I've seen in 30 years, has wavelengths division multiplexing in it. But certainly it does use the term "passive alignment," and I've already indicated that on record, that that is a tool engineers were aware of. 12:42:28 12:42:30 12:42:34 12:42:37 12:42:39 12:42:43

Q So it's a tool that engineers were aware of. But specifically a POSITA as of the priority date would have been aware that it would be an advantage to utilize passive alignment, correct? 12:42:43 12:42:45 12:42:49 12:42:51

MS. RICHEY: Objection. Form. 12:42:54

A Both active and passive alignment were tools engineers could use to deal and design optical systems. Both active and passive alignment have both advantages and disadvantages. 12:42:58 12:43:03 12:43:07 12:43:10

Certainly you showed me in this patent the words "passive alignment." I haven't read the patent, I don't have it in front of me, so I can't really comment on whether passive alignment in this particular patent that I'm the inventor of 30 years ago, that I haven't seen for 30 years, is an invented part of this patent or not, but certainly 12:43:12 12:43:15 12:43:17 12:43:20 12:43:23 12:43:27 12:43:29

the words are there. 12:43:32

But as we look to the '416 patent, I mean, 12:43:34

one of the key design features of the '416 patent is 12:43:36

that it has an optical combiner, for example, it has 12:43:40

a package, to use your term, that utilizes passive 12:43:45

alignment with a fiber stop, and it's done this to 12:43:49

be able to manufacture and replicate these things in 12:43:53

high volume for the data communications market. 12:43:57

And so this using -- this '416 patent 12:44:00

using wavelengths division multiplexing to do that 12:44:04

is certainly inventive from my standpoint. But I'm 12:44:07

not aware, even though the term "passive alignment" 12:44:11

is given in this spec of this 30-year old patent, 12:44:13

whether wavelengths division multiplexing is even 12:44:18

contemplated. 12:44:21

But certainly you're correct, and I've 12:44:22

already stated on record passive alignment is a tool 12:44:24

that engineers could use and both has advantages and 12:44:27

disadvantages depending on how it's used. 12:44:32

MR. RAWLS: Okay. I want to pull up 12:44:35

Document P and we can mark that as Lebby 2. 12:44:36

THE TECHNICIAN: Please stand by. 12:44:36

MR. RAWLS: And that is -- while that comes up, that is U.S. Patent Number 5,361,317. 12:44:40 12:44:43

(Lebby Exhibit 2 marked for identification.) 12:44:58 12:45:11

Q Now, Dr. Lebby, are you one of the inventors on this patent? 12:45:11 12:45:13

A Yeah, this is the '317 patent. The full number is 5,361,317. It looks like I'm a co-inventor with Davis Hartman. And so, yes, I am a co-inventor of this patent. It was issued in 1994. 12:45:15 12:45:20 12:45:25 12:45:30

Q Okay. And if we can flip to column 1 and look at lines 8 through 12, and that explains that the present invention pertains to assemblies of optical fibers and optical devices, such as optical detectors and optical light generators, and it goes on. Do you see that? 12:45:33 12:45:39 12:45:45 12:45:48 12:45:52 12:45:55

A I do see that. 12:45:56

Q Does this patent relate to optoelectronic devices? 12:45:57 12:46:01

MS. RICHEY: Objection. Form. 12:46:02

A So this is a patent that deals with light and certainly deals with fiber optics. It deals 12:46:05 12:46:08

with different types of optical devices. And we certainly can see the field of endeavor this patent is related to optoelectronics and light. 12:46:12 12:46:16 12:46:20

And if we think about this from the '416 patent perspective, that also is an optical combiner device that deals with fibers, fiber stops, passive alignment, as well as different types of optoelectronic devices as we can see from the specification of the '416. 12:46:22 12:46:26 12:46:30 12:46:34 12:46:37 12:46:40

And so I haven't seen this '317 patent for 30 years. I certainly haven't flipped through it, and you just pointed out three lines in the first column. So I don't know anything about it. 12:46:41 12:46:46 12:46:49 12:46:52

But certainly I would be very surprised if this particular patent uses wavelengths division multiplexing as taught in the '416 patent, I very much doubt it. But certainly in the field of optoelectronics there are fibers, there are optical devices, there are detectors. And certainly, as we look to the '416, we can certainly see the '416 teaches the use of optoelectronic devices, and its inventive package that was -- has a priority date of 12:46:54 12:46:58 12:47:02 12:47:06 12:47:09 12:47:12 12:47:15 12:47:20 12:47:24

the 17th of July 2003. 12:47:28

Q And I want to focus your attention still 12:47:29

on column 1, but now down to lines 31 to 41 that are 12:47:33

at the bottom of the screen, now towards the middle, 12:47:40

and that states that "The process of aligning and 12:47:43

fixing an optical fiber to an optical device, while 12:47:46

satisfying all of the above criteria, can be very 12:47:50

costly. If the alignment is accomplished by a 12:47:53

procedure referred to in the art as active alignment 12:47:55

(i.e., monitoring of optoelectronically induced 12:47:59

signals while aligning) the cost is very high 12:48:01

because this procedure is labor intensive." 12:48:04

Do you see that? 12:48:08

A I do see that. 12:48:08

Q So it was known at least by 1994, when 12:48:09

this patent issued, that active alignment was costly 12:48:12

and labor intensive, correct? 12:48:15

A So the general question you're asking 12:48:19

aligns with what I've already said on record. Both 12:48:23

active alignment and passive alignment were tools 12:48:27

that engineers could use. Both had -- have both 12:48:29

advantages and disadvantages. 12:48:33

In this particular case, I haven't seen this patent for 30 years, but the section specification you're reading out to me indicates that at the time I certainly saw active alignment as a costly procedure, because you have to turn the laser on to get -- to make sure the light is maximized or it's correctly aligned. And certainly I have no reason to disbelieve this because I've already said this on record. 12:48:35 12:48:37 12:48:41 12:48:44 12:48:48 12:48:52 12:48:54 12:48:58 12:49:02

But as we look to the '416 patent, the '416 patent doesn't use active alignment. The '416 patent uses wavelengths division multiplexing and uses passive alignment of aligning the fiber passively with the fiber stop so that everything is aligned. And my understanding of the '416 patent was that passive alignment is done to keep costs under control. 12:49:03 12:49:07 12:49:12 12:49:13 12:49:17 12:49:19 12:49:22 12:49:27

What you've just shown me here is something that at the time active alignment certainly probably was costly and certainly was around and certainly was used. But I'm now looking at the '416 patent, not this, I think it's the '317 12:49:28 12:49:31 12:49:35 12:49:38 12:49:41

patent that you showed me for the first time in 30 years. 12:49:47 12:49:50

Q So you just said that "my understanding of the '416 patent was that passive alignment was done to keep costs under control." 12:49:51 12:49:53 12:49:56

But based on these two patents and your previous testimony, a POSITA would have known that before the priority date of the '416 patent, correct? 12:49:58 12:50:01 12:50:04 12:50:07

A So as I look at the '416 patent, certainly the use of passive alignment with wavelengths division multiplexing, plus the arrangement and the design of the integrated system in the '416 is certainly inventive and novel at the priority date of the 17th of July 2003. 12:50:07 12:50:13 12:50:17 12:50:20 12:50:23 12:50:27

What you're asking me here is was passive alignment available as a tool for engineers previous to the priority date of the '416, and I just indicated on record it was. I also indicated on record that the active alignment was also available to engineers. 12:50:31 12:50:34 12:50:38 12:50:42 12:50:45 12:50:47

But certainly when we look at the '416 and 12:50:49

put in all these tools together to form an integrated package, if you like, that has passive alignment with a fiber stop and an optical combiner certainly -- that did wavelengths division multiplexing was certainly novel at the time. 12:50:51 12:50:56 12:51:00 12:51:04 12:51:06

Q Does the fact that passive alignment was known and that it was known that passive alignment could help reduce costs was known affect your opinion in this case? 12:51:13 12:51:16 12:51:18 12:51:23

MS. RICHEY: Objection to form. 12:51:24

A So I've already established on record, you know, that passive alignment is a tool that engineers were aware of previous to the priority date of the '416 patent, which is the 17th of July 2003. 12:51:28 12:51:31 12:51:34 12:51:37 12:51:41

What we see in the '416 patent is the use of passive alignment techniques with the inclusion of the fiber stop, and the integrated optical components that include, for example, the optical combiner in various different embodiments as shown in the '416, that I view as inventive and novel. 12:51:42 12:51:46 12:51:51 12:51:56 12:51:58 12:52:01

And so yes, I will agree with you the '416 12:52:06

does use a passive alignment technique, it does use a tool, but it's designed it in a way that is novel in an integrated package, if you like, that includes things like an optical combiner. 12:52:09 12:52:12 12:52:15 12:52:19

Q And you referred to the packaging of the '416 patent being novel and inventive. Does that affect your opinion -- let me strike that and rephrase that. 12:52:23 12:52:25 12:52:29 12:52:33

You've referred to the fact that the packaging of the '416 patent was novel and inventive. Does that inform your opinion today? 12:52:35 12:52:36 12:52:40

MS. RICHEY: Objection. Form. 12:52:43

A I don't understand the question. 12:52:46

Q If the packaging of the '416 patent was not novel, would that change your opinion about the obviousness of the claims? 12:52:50 12:52:53 12:52:56

MS. RICHEY: Objection. Form. 12:52:58

A So when I say the '416 patent has an inventive and novel idea, it's certainly you have to look at what the patent teaches, and it's not just the package as your question asked. It's actually the features and the understanding that's written in 12:53:03 12:53:07 12:53:11 12:53:14 12:53:18

the specification and drawn out in the claims and shown in the figures. 12:53:21 12:53:23

So, for example, we have wavelengths division multiplexing, and so this is a novel way to do wavelength division multiplexing, put more than one fiber, more than one wavelength onto a fiber. In this case, for example, the embodiments show four wavelengths onto a fiber. You've got a passive aligned ferrule with a fiber stop. You have integrated lenses. You have an optical combiner. 12:53:25 12:53:27 12:53:31 12:53:34 12:53:39 12:53:40 12:53:44 12:53:46

And so when you look through the figures from 1 to 11 in the '416, you can see it's not just a package. There's many other features in the '416 that make it inventive and novel. 12:53:49 12:53:51 12:53:56 12:53:59

Q Okay. I want to switch gears a little bit. Are you familiar with the publication Photonics Spectra? 12:54:03 12:54:07 12:54:09

A Yes, I am. 12:54:11

Q And how are you familiar with them? 12:54:12

A I've seen various magazines over the years. I, obviously, I don't recall any of them in detail, but from time to time I do see some of their 12:54:14 12:54:18 12:54:22

magazines. 12:54:27

Q Have you ever published anything, to your recollection, in Photonics Spectra? 12:54:28 12:54:30

A I have no idea to the answer to that question. I certainly, as you can see from my CV, I've had lots of published articles in different types of journals and magazines. But I couldn't answer that question off the top of my head right now. 12:54:32 12:54:35 12:54:38 12:54:41 12:54:44 12:54:45

Q Let's bring up your CV as Exhibit 2003, and we can go to page 238. And if you look at item 240, that refers to an invited paper/article published in the Photonics Spectra magazine, correct? 12:54:46 12:54:52 12:55:10 12:55:16 12:55:20

A 240. It certainly looks like it was something that was published in Photonics Spectra. So I would agree with you, it looks like I do have something that I've co-authored that's been published in the Photonics Spectra magazine, it looks like it's item number 240, and it may have occurred on the 5th of August 2020, or thereabouts. 12:55:21 12:55:32 12:55:36 12:55:39 12:55:43 12:55:45 12:55:49

Q Do you consider Photonics Spectra to be a 12:55:51

reputable source? 12:55:56

MS. RICHEY: Objection. Form. 12:55:57

A Certainly in terms of your question I don't understand what you mean by reputable source. If you're -- if you're on the scale of sources that range from refereed journal papers to magazine articles, it's certainly not refereed as far as I'm aware, unless the editors refereed it. And so I don't know if the editor is qualified to be the referee or not. So I don't really know how to answer that question. 12:56:02 12:56:06 12:56:10 12:56:13 12:56:18 12:56:22 12:56:26 12:56:31 12:56:33

Q Okay. But you just testified earlier that you occasionally read articles from the Photonics Spectra magazine, correct? 12:56:34 12:56:37 12:56:42

A That is true, I did testify that I have seen Photonics Spectra magazine from time to time. I certainly review lots of different articles, including I do read a newspaper whenever I can get my hands on a physical newspaper these days. So whether that's a reputable source or not, I don't know. 12:56:42 12:56:45 12:56:49 12:56:51 12:56:54 12:56:57 12:57:01

Q But do you have any reason to believe that 12:57:01

it's not a reputable source? 12:57:03

MS. RICHEY: Objection. Form. He just 12:57:05

told you that. 12:57:06

Q Let me -- let me ask the question again, 12:57:09

because I think what you told me is you didn't know 12:57:11

what I meant by reputable. 12:57:15

I'm asking if you have any reason to 12:57:18

believe it is not reputable based on having read 12:57:20

articles in it and published at least one article in 12:57:23

the magazine? 12:57:25

MS. RICHEY: Objection to form. 12:57:26

A I certainly don't know how to define 12:57:28

reputable these days, and so I don't think I can 12:57:30

answer your question. I mean, when you listen to 12:57:34

Fox News, do you believe everything on Fox News 12:57:37

these days? Is that a reputable news source? So I 12:57:39

don't understand what reputable actually means. 12:57:44

Q When you select publications or sources 12:57:46

for magazines to publish your articles in, do you 12:57:49

have any standards in what you choose to publish in? 12:57:51

MS. RICHEY: Objection. Form. 12:57:54

A I never really thought about that question 12:57:59

or that subject before, so I don't know how to answer it. 12:58:02 12:58:06

Q Okay. And when you choose to read an article from a magazine or other source (indiscernible) -- 12:58:07 12:58:09 12:58:11

(Court Reporter clarification.) 12:58:11

Q When you choose to read an article from a magazine or another source, do you have any standards in what you select to read? 12:58:15 12:58:18 12:58:20

MS. RICHEY: Objection. Form. 12:58:22

A I don't know how to answer that question. 12:58:24

Q Okay. I want to skip down to page 254 of this exhibit. 12:58:29 12:58:35

THE TECHNICIAN: Sorry, Counsel, could you repeat the number of the page? 12:58:44 12:58:46

MR. RAWLS: 254. 12:58:49

Q And if you look at item 335 on this page, this appears to refer to you being an invited speaker at the Photonics Spectra Annual Conference for January 2023. Do you see that? 12:58:52 12:58:55 12:58:59 12:59:04

A I do see that. 12:59:07

Q And then if we go two pages down to page 12:59:08

256, item 344 refers to you being an invited panelist for s Photonics Spectra panel that appears to be for the same annual conference of January 2023. Do you see that? 12:59:11 12:59:22 12:59:26 12:59:31

A I do see that. 12:59:31

Q Do you recall if you believed Photonics Spectra to be a legitimate or reputable source when you accepted the invitation to be a speaker at their conference? 12:59:32 12:59:37 12:59:41 12:59:43

MS. RICHEY: Objection. Form. 12:59:44

A I certainly don't know what the calibration of these types of events are in terms of has anybody indicated they're reputable or not. 12:59:47 12:59:49 12:59:54

I mean, as I just indicated to you, I mean, when you listen to or tune into Fox News, do they give reputable news or not, is it the same when you listen to MSNBC, is it the same when you go to technical conferences and you get invited to give a talk. 12:59:58 13:00:00 13:00:04 13:00:09 13:00:13 13:00:16

I think what's here is a situation, in this particular case, I've been invited to talk to this particular conference, and people are there to 13:00:16 13:00:19 13:00:23

listen to what I say. Whether the conference itself is reputable or not I couldn't really answer, and I don't know the answer to that question. 13:00:28 13:00:31 13:00:34

Q Okay. Well, let me ask a different question. 13:00:35 13:00:38

If you were trying to understand more about optoelectronic devices, would you tune into Fox News or MSNBC? 13:00:38 13:00:41 13:00:44

MS. RICHEY: Objection. Form. Argumentative. 13:00:46 13:00:50

A So as you can see from my CV, I've got close to 40 years experience in the field and in different aspects of the field. 13:00:52 13:00:55 13:00:58

You're asking if I learn anything by tuning into Fox News. I certainly am a person that takes a lot of information in and I process it. Where the news source comes from is up to me and up to how I want to receive news. 13:01:00 13:01:03 13:01:06 13:01:09 13:01:12

But certainly, you know, when I was at primary school they taught me how to read English. I read English, and now I've read the '416 patent. And the '416 patent, I understand the patent, I'm a 13:01:14 13:01:18 13:01:22 13:01:25

person of ordinary skill in the art, at least at the time of the priority date, 17th of July 2003, and I believe I can speak and write English, and I understand the '416 patent. 13:01:26 13:01:29 13:01:33 13:01:35

The question you're asking I think is -- I don't know how to answer it, I'm sorry. 13:01:37 13:01:41

Q Okay. So you can't distinguish between Fox News and MSNBC on the one hand, and Photonic Spectra on the other hand, for the source of optoelectronic device information? 13:01:43 13:01:46 13:01:50 13:01:52

MS. RICHEY: Objection. Form. Asked and answered. That's not what he said, so... 13:01:54 13:01:56

A I think you're misconstruing what I'm saying. I certainly am aware of Photonics Spectra, and I'm certainly aware of other sources that provide optoelectronic information, including textbooks, including online videos, and lectures at universities. 13:02:00 13:02:03 13:02:06 13:02:10 13:02:13 13:02:19

So, yes, I'm very familiar with all the techniques that one would improve your skill base, including from an academic standpoint, as well as from a speaking standpoint, as well as from a 13:02:19 13:02:22 13:02:26 13:02:29

practical hands-on manufacturing and R&D standpoint. 13:02:31

I really don't know where you're coming 13:02:36

from with your analysis of do I get optoelectronic 13:02:38

information from Fox News or MSNBC. I really can't 13:02:40

recall if any of the articles have been related to 13:02:45

fiber optics and optoelectronics. I'm sure there 13:02:48

are some. I don't recall any right now. 13:02:52

But certainly as we look into this case, 13:02:54

which is a case that pertains to optoelectronic 13:02:56

devices, wavelengths division multiplexing, optical 13:02:59

combiners, passive alignment, these are the things 13:03:04

that are applicable to the '416 patent. And I'll 13:03:07

just state on record that I'm at least a person of 13:03:10

ordinary skill in the art by the time of the 13:03:13

priority date of this '416 patent, which is the 17th 13:03:16

of July 2003. 13:03:19

Q Okay. That was a very helpful answer. 13:03:23

Thank you, Dr. Lebby. 13:03:26

I'm going to actually change to a 13:03:27

different subject. And so since we have been going 13:03:30

for about an hour, you can let me know if you want 13:03:32

to take a break or keep going. 13:03:34

MS. RICHEY: Yup, go ahead. 13:03:38

A I would like a five-minute break, if that's possible. 13:03:39 13:03:41

MR. RAWLS: Okay. Let's go off the record then. 13:03:42 13:03:45

THE VIDEOGRAPHER: We are going off the record at 1:03. 13:03:46 13:03:48

(Recess 1:03 p.m. - 1:11 p.m.) 13:03:51

THE VIDEOGRAPHER: We are back on the record at 1:11. 13:11:41 13:11:47

BY MR. RAWLS: 13:11:50

Q Hi again, Dr. Lebby. 13:11:53

Were you familiar with the term "optical combiner" prior to seeing it in the '416 patent? 13:11:57 13:12:01

A I don't recall if I've used that term or not. Typically the term I use is a MUX, which I believe is what the inventors actually use. MUX is a term that is more common in industry and R&D. I don't actually recall if I've used the term "optical combiner." But certainly as it's defined in the '416 patent, and as I detail what an optical combiner is, that begins on page 59 of my first 13:12:06 13:12:10 13:12:15 13:12:19 13:12:23 13:12:26 13:12:31 13:12:34

declaration, and certainly written what I believe it is. 13:12:38 13:12:45

Q So I just want to make sure I understand that testimony. Your understanding is that MUX, M-U-X, is the typical industry term for optical combiner? 13:12:45 13:12:52 13:12:56 13:13:00

A No, I would not say that. Certainly the optical combiner, as taught in the '416 patent, is certainly defined, as you can see from paragraph 59 which I've written in my first declaration. What did I write here, "an integrated subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable," full stop. That's what the '416 teaches. 13:13:01 13:13:04 13:13:09 13:13:13 13:13:17 13:13:21 13:13:24 13:13:28 13:13:33 13:13:37

Now, I just indicated on record I don't know if I've actually used the term "optical combiner" previous to reading the '416 patent. I may have done. But certainly a term that I typically used for multiplying wavelengths or multiplexing wavelengths is MUX. Now, MUX is 13:13:38 13:13:39 13:13:42 13:13:49 13:13:52 13:13:54

completely different than what I've just described to you as the definition of optical combiner as per the '416 patent in paragraph 59 of my first declaration. 13:13:57 13:14:01 13:14:04 13:14:08

Q So I think I understand, but I just want to clear that up a little bit. 13:14:10 13:14:13

So I understand that you're saying that the '416 patent has a special definition for optical combiner. But I want to ask you outside the context of the '416 patent, just generally in the art, and, in fact, you can focus the time frame from prior to the priority date of the '416 patent, was the term "optical combiner" or MUX something you were familiar with prior to the priority date? 13:14:14 13:14:16 13:14:20 13:14:23 13:14:27 13:14:29 13:14:34 13:14:39

MS. RICHEY: Object to form. 13:14:42

A I believe I just indicated on record I don't recall if I've used the term "optical combiner" or not. I did indicate on record I've certainly used the term "MUX" for multiplying optical signals. But what we have to be careful of here is the term "optical combiner," and I've construed this in paragraph 59 to mean what the '416 13:14:44 13:14:47 13:14:49 13:14:53 13:14:57 13:15:00 13:15:04

teaches in its figures and its specifications and its claims. And in paragraph 59 what I say is, quote, an optical combiner is "an integrated subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable," full stop. 13:15:09 13:15:13 13:15:16 13:15:19 13:15:22 13:15:24 13:15:28

Now, that is what I've construed to be an optical combiner. And you can see in my first declaration in paragraph 59, all the way through to paragraph 70, I actually detail what an optical combiner is from the perspective of the '416 patent and what it teaches. 13:15:34 13:15:36 13:15:39 13:15:42 13:15:47 13:15:50

Q All right. I want to bring up your supplemental declaration now, which is Exhibit 2049, and we can turn to paragraph 27, which is on page 12. 13:15:55 13:16:00 13:16:03 13:16:06

THE TECHNICIAN: Please stand by. 13:16:11

Q And in this paragraph you say that the '416 patent "leaves a POSITA with no doubt what the inventors conceived of and claimed," and then you quote from the '416 patent, "The present invention 13:16:24 13:16:27 13:16:32 13:16:35

provides, for the first time, an inexpensive, injection molded, one-piece optical combiner capable of combining, separately collimating and focusing the output of multiple lasers into a single optical fiber with a uniform, high coupling efficiency," and then you also note that it can be a two piece combiner. 13:16:38 13:16:42 13:16:46 13:16:49 13:16:53 13:16:55 13:16:59

Do you see that in paragraph 27? 13:16:59

A I do. 13:17:01

Q And the statement you quote from the specification describes the present invention as being injection molded, correct? 13:17:01 13:17:03 13:17:06

MS. RICHEY: Objection. Form. 13:17:15

A So I have in paragraph 27 of my supplemental declaration used the term "injection molded" as part of what the present invention of the '416 provides. 13:17:37 13:17:42 13:17:45 13:17:51

I've also indicated that it's "an inexpensive, injection molded, one-piece combiner capable of combining, separately collimating and focusing the output of multiple lasers into a single optical fiber with a uniform, high coupling 13:17:53 13:17:56 13:18:01 13:18:06 13:18:07

efficiency." I've also indicated it could be a two piece combiner. 13:18:13 13:18:16

I will actually note that in the '416 patent in column 4, line 43 I believe it is, the inventors used the term "molded optics." And I will say on record there's more than one form of molding. I've given one of those forms, injection molding. I don't know if the inventors actually call out injection molding. But certainly they've used the term "molded material" and "molded optics" in column 4, lines 40 to 45. And so I would say that injection molding is certainly one technique. 13:18:16 13:18:20 13:18:24 13:18:28 13:18:34 13:18:39 13:18:41 13:18:44 13:18:46 13:18:50

Another technique that is popular in commercial industry is transfer molded where these are still molded parts. 13:18:54 13:18:57 13:19:00

Q Is molding required for an optical combiner, according to your construction? 13:19:02 13:19:06

A Which construction are you talking of? 13:19:13

Q So for the term "optical combiner," does that require molding? 13:19:18 13:19:24

A Well, certainly as I've interpreted the claims of this patent, I expect molding to be one of 13:19:28 13:19:31

the structures that can be included in the preamble for the claims, and then we can go into the preamble if you like. 13:19:38 13:19:41 13:19:44

But certainly one of the key features of the '416 patent is to do WDM, wavelengths division multiplexing, in a package, if you like, to use your term, that contains an optical combiner, which I've indicated in paragraph 59 an optical combiner can be construed as an integrated subassembly of optical components for multiplexing lights of different wavelengths, which includes an integrated pre-aligned connector with a stop to hold a single fiber optic cable. 13:19:44 13:19:48 13:19:54 13:19:57 13:20:01 13:20:05 13:20:09 13:20:11 13:20:13 13:20:19

And if you look at how I construed that, it's an integrated unit. An integrated unit can use molding. And the specification clearly teaches molded optics is being used. 13:20:20 13:20:22 13:20:27 13:20:31

And this is one of the reasons why this '416 patent is inventive. It was the first time you could make an integrated subassembly of parts with a passively aligned fiber assembly or fiber with a stop that was molded, and it could be replicated in 13:20:33 13:20:35 13:20:42 13:20:49 13:20:51

high volume so that you could do this at low cost. And certainly this is what the data communications industry was looking for. 13:20:54 13:20:58 13:21:01

Not what the telecommunications industry was looking for previously to the priority date of 17th of July 2003, where majority of the work in the telecommunications from an optics standpoint was actively aligned. And as you can see from one of my patents, I indicated that was costly. 13:21:02 13:21:05 13:21:09 13:21:15 13:21:20 13:21:23

And so this is an innovative way to use molded optics for high volume, low cost integrated subassemblies, and include passive alignment designed for the high volume data communications industry. 13:21:25 13:21:28 13:21:34 13:21:38 13:21:41

Q So, Dr. Lebby, yes or no, are optical combiners, as the term is used in the '416 patent, limited to molded devices? 13:21:41 13:21:47 13:21:50

MS. RICHEY: Objection. Form. 13:21:52

A If I look at what the claims of the patent show, and especially in the preamble that molding is certainly one of the manufacturing techniques, certainly the specification gives that as a 13:22:03 13:22:08 13:22:11 13:22:15

technique to provide an integrated assembly that includes an optical combiner with passive optics. 13:22:18 13:22:22

I don't believe this is the only solution to get integrated subassemblies or integrated packages. Certainly molded is one way to do that. I know -- I'm aware of other ways to do that. And so I don't believe the patent is limited to molded optics, but certainly that is called out in the specification and certainly one way the inventors taught it could be done to achieve an integrated subassembly that includes an optical combiner as construed in paragraph 59 of my first declaration. 13:22:28 13:22:30 13:22:35 13:22:38 13:22:41 13:22:44 13:22:48 13:22:51 13:22:54 13:23:00

Q Are there any embodiments that are described in the '416 patent that are not molded? 13:23:05 13:23:07

A So as I look at the '416 patent, and I look at column 4, lines 39 to 40, for example, the inventors anticipate that molding is a preferable way to manufacture the '416 optical subassembly, that includes an optical combiner, as per the definition of construed in paragraph 59 of my first declaration. 13:25:27 13:25:33 13:25:36 13:25:40 13:25:47 13:25:49 13:25:53

But the inventors also indicate, for 13:25:54

example, "The collimating lenses 321 to 324 are preferably molded into a single but separate monolithic block of molded material," and that continues, "so that the combiner 310 includes two separate molded optics." 13:25:56 13:26:03 13:26:06 13:26:10 13:26:14

And so when I read that sentence, that means that it's preferable, that the inventors would like to use molding, but they don't have to use molding. You could use different, for example, etching techniques. And so I don't believe the patent is limited to just molding and limited to molding techniques, such as injection molding or transfer molding. 13:26:16 13:26:18 13:26:21 13:26:24 13:26:28 13:26:30 13:26:33 13:26:36

But the inventors also anticipated that there are other manufacturing techniques that could be utilized that will provide the functions as detailed in the claims, the specification, and the figures of the '416. 13:26:38 13:26:41 13:26:44 13:26:47 13:26:49

Q Okay. While we have column 4 up, and we can bring it up on the screen, too, of Exhibit 1001, I want you to look at the key feature section, specifically column 4, lines 61 to 63 -- I'm sorry, 13:26:53 13:26:57 13:27:01 13:27:05

I gave you the wrong citation. 13:27:10

Column 4 line 46 to column 5, line 3 -- 13:27:15

one more try. I have a typo here. 13:27:25

It's column 4, line 66 to column 5, line 13:27:28

3, and that's referring to "Offset launch spots may 13:27:32

be focused on a section of the fiber which is offset 13:27:35

from the center of the fiber, thus creating an 13:27:39

offset launch condition," and the sentence goes on. 13:27:42

Do you see that, Dr. Lebby? 13:27:45

A I do see that. 13:27:46

Q Is the concept of offset launch important 13:27:47

to the invention of the '416 patent? 13:27:53

MS. RICHEY: Objection. Form. 13:27:54

A The concept of offset launch certainly 13:27:59

improves the performance, and certainly is an 13:28:02

inventive mechanism that supports the whole 13:28:05

performance of the '416 optical subassembly. And so 13:28:09

I haven't delved into the details of offset launch 13:28:15

coming into this deposition, but certainly good 13:28:21

control of offset launch will include the overall 13:28:23

optical performance of the optical subassembly. And 13:28:26

if you look at column 5, lines 2 to 3, the inventors 13:28:31

actually show that it is good to deal with optical modal partition noise. And so offset launch will reduce the overall noise effects and improve the optical performance of this optical subassembly. 13:28:41 13:28:44 13:28:49 13:28:52

So I would say, yes, certainly that is a key feature, and that's certainly a key feature of having an integrated subassembly that has a passive alignment and a ferrule with an endstop, that has a number of optical components as detailed in paragraph 59 of my first declaration where I construe what an optical combiner is. So certainly, yeah, I see this as an important factor. 13:28:56 13:28:58 13:29:02 13:29:06 13:29:10 13:29:14 13:29:17 13:29:20

And certainly I can see already, without doing any testing, through my own experience, that it will, if you get offset launch spots designed correctly, they will improve the performance of the whole optical subassembly. 13:29:24 13:29:27 13:29:30 13:29:36 13:29:41

Q Okay. So it's a key feature. But are optical combiners, as the term is used in the '416 patent, limited to devices having an offset launch? 13:29:43 13:29:46 13:29:49

A So in the '416 patent, line 66 in column 4 to column 5, line 3, the inventors teach about the 13:31:39 13:31:44

concept of offset launch spots, and they talk about a section of the fiber which is offset from the center of the fiber, creating an offset launch condition. 13:31:50 13:31:58 13:32:01 13:32:05

What I've already indicated on record is that knowing this type of technique can improve the optical performance that relates to optical modal partition noise of the overall performance of the optical subassembly, that includes an optical combiner, as construed in paragraph 59 of my first declaration. 13:32:05 13:32:09 13:32:12 13:32:17 13:32:21 13:32:24 13:32:28

But it also depends on the performance of all those optical parts in the design of the system. And so there could be designs here that doesn't require offset launch spots, and there could be designs that do include offset launch spots. 13:32:29 13:32:32 13:32:36 13:32:40 13:32:42

I see this as a key feature that is important to the design of the '416 subassembly. And I also see that the level of offset launching could be changed, depending on the overall performance. 13:32:46 13:32:50 13:32:55 13:32:59 13:33:03

So to answer your question, offset launch 13:33:03

is important, but there could be situations where the optical subassembly of all the components don't require offset launch, so I can also see that scenario, too. 13:33:05 13:33:08 13:33:13 13:33:16

Q Okay. Now I want to go up to column 1, line 67, the last line, I believe, through to column 2, line 5. I'll wait for the tech to get there. 13:33:18 13:33:22 13:33:26

If we can scroll up to columns 1 and 2, at line 67 through line 5 of column 2 it says, "Each laser output beam of the present invention therefore has the same degree of refraction as it passes through the focusing lens; this feature simultaneously creates a uniform coupling efficiency (as shown below) and prevents unwanted reflections back through the optical pathway to the input lasers." Do you see that? 13:33:48 13:33:52 13:33:56 13:33:59 13:34:03 13:34:05 13:34:09 13:34:12 13:34:15

A I do see that. 13:34:16

Q So this statement uses the -- well, it uses the term "the present invention," and if you look before the statement it's contrasting the present invention with the prior art Lee reference that is described in the Background and Brief 13:34:19 13:34:22 13:34:25 13:34:28 13:34:31

Summary of the Invention section of column 1 and 2. Is that correct? 13:34:34 13:34:39

MS. RICHEY: Objection. Form. 13:34:39

A And so what I understand your question is pertaining to is the inventors looked at some prior art, which is a very different device called an optical power combiner, that utilizes collimators and a focusing lens, as indicated in column 1, lines 55 to about 64, and certainly the inventors talk about this as prior art. 13:34:45 13:34:47 13:34:55 13:34:57 13:35:02 13:35:09 13:35:11

One of the problems with the prior art is dealing with unwanted optical reflections within the optical subassembly. And so what the inventors have done from lines 65 in column 1 to at least line 5 in column 2 is indicated that the present invention deals and addresses, this is the '416 patent, optical back reflections, and certainly has a design that includes the performance of those. 13:35:13 13:35:21 13:35:24 13:35:29 13:35:36 13:35:40 13:35:44 13:35:50

And optical back reflections are all dependent on the quality of the lasers that are used. Some lasers can go unstable if they get a certain level of back reflections and other lasers 13:35:52 13:35:56 13:35:59 13:36:03

are more immune to it. 13:36:06

But this '416 patent teaches that the 13:36:08

optical combiner and the optical subassembly, as 13:36:11

I've construed in paragraph 59 of my first 13:36:16

declaration, addresses this issue from an optical 13:36:19

standpoint, and compared to the prior art, which is 13:36:22

the '287 patent by Lee, has got a higher optical 13:36:24

performance. 13:36:30

Q And so the uniform coupling efficiency 13:36:32

that this statement refers to is important to the 13:36:37

patent, of the '416 patent, correct? 13:36:39

MS. RICHEY: Objection. Form. 13:36:42

Q And if it's helpful, Dr. Lebby, you can 13:37:00

look at paragraph 27 of your supplemental 13:37:02

declaration that we had up before. 13:37:05

A So I did use the term "uniform, high 13:37:17

coupling efficiency" in paragraph 27 of my 13:37:24

supplemental declaration, the second one. But what 13:37:28

you just pointed me to here is not high coupling 13:37:31

efficiency, but uniform coupling efficiency, which 13:37:35

is in column 2, line 3. 13:37:39

And so the present invention of the '416 13:37:41

certainly sets up a situation where coupling efficiency is uniform. But the key issue here is that the design, that includes coupling efficiency, actually prevents optical back reflections, at least mitigates optical back reflections from going back to the laser, depending on which lasers are being used. Each laser design has its own sensitivity to back reflections. As I've just indicated on record, some lasers can actually go unstable if they get a certain amount of back reflections going back into the laser. 13:37:44 13:37:48 13:37:51 13:37:55 13:38:00 13:38:04 13:38:08 13:38:12 13:38:15 13:38:19 13:38:22

And so this is a design feature that the '416 has put in place that certainly is improved upon when it's contrasted to the prior art, which is the '287 patent by Lee. And so I think uniform coupling efficiency is one of the design features that certainly the inventors were aware of and dealt with in the design. 13:38:23 13:38:27 13:38:32 13:38:34 13:38:39 13:38:42 13:38:45

Q Now, does the optical combiner that's claimed in the '416 patent require that each laser output beam have the same degree of refraction as it passes through the focusing lens? 13:38:46 13:38:50 13:38:53 13:38:57

A So laser devices send light out. And so light that comes out of a laser is generally at a certain wavelength, I believe. I don't know if the wavelengths are given in this particular case. 13:39:03 13:39:07 13:39:10 13:39:13

But certainly as those laser beams go into the '416 optical subassembly, they will experience different optical techniques. Refraction is certainly one of those. I certainly haven't seen the design to see if all the angles of refraction are exactly the same. 13:39:16 13:39:20 13:39:26 13:39:29 13:39:31 13:39:36

But the essence here is to reduce optical -- unwanted optical back reflections. As I've just indicated here, if you reduce that or you mitigate that, then you certainly help the lasers, or at least the choice of lasers that you use in such a system, and so I see this as part of the optical design. 13:39:37 13:39:42 13:39:46 13:39:49 13:39:53 13:39:55 13:39:59

Q I want to understand based on what we've just looked at from column 1, line 67, to column 2, line 5, where it refers to the present invention, and it says, "Each laser output beam of the present invention therefore has the same degree of 13:39:59 13:40:02 13:40:05 13:40:08 13:40:11

refraction as it passes through the focusing lens," is that a claim requirement of the claimed optical combiner? 13:40:13 13:40:16 13:40:18

MS. RICHEY: Objection. Form. 13:40:19

A Certainly this is one of the features that you indicate in your question of an optical combiner. 13:40:24 13:40:28 13:40:31

But if you look at what an optical combiner is, I've indicated that on paragraph 59 of my first declaration, I've construed it to be an integrated subassembly of optical components from multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable. And so this is what I've construed to be the optical combiner. 13:40:31 13:40:34 13:40:37 13:40:40 13:40:44 13:40:46 13:40:49 13:40:53 13:40:55

And in the design of an optical combiner, the inventors are calling out some of the design features, which are indicated in column 1, line 65, to column 2, line 5. And some of those features I've just indicated on record are to mitigate optical back reflections, light that goes back into 13:40:56 13:40:58 13:41:01 13:41:05 13:41:09 13:41:13

the laser. And as I already indicated on record, some lasers are sensitive to this more than others. And so certainly when you're designing these types of systems, you need to be aware of these types of optical issues. 13:41:16 13:41:19 13:41:22 13:41:25 13:41:28

And so it's not the only thing in an optical combiner, but it's certainly one of the things that is required to put an integrated subassembly of optical components for multiplexing light of different wavelengths together with an integrated, pre-aligned connector to -- with a stop to hold a single fiber optic cable. 13:41:29 13:41:31 13:41:35 13:41:38 13:41:42 13:41:46 13:41:49

Q So when you say it's certainly one of the things that is required to put an integrated subassembly of optical components for multiplexing light of wavelengths together with an integrated, pre-aligned connector with a stop to hold a single fiber optical -- optic cable, you mean the feature that we were just discussing from column 1, line 67, to column 2, line 5, that each laser output beam of the present invention therefore has the same degree of refraction, correct? 13:41:55 13:41:57 13:42:00 13:42:04 13:42:08 13:42:10 13:42:13 13:42:18 13:42:22 13:42:24

MS. RICHEY: Objection. Form. 13:42:27

A That's not what I said at all. 13:42:28

What I said was it's one of the optical 13:42:30
design features that's gone into the optical 13:42:33
combiner, and I've construed that in paragraph 59 of 13:42:36
my first declaration as an integrated subassembly of 13:42:40
optical components for multiplexing light of 13:42:44
different wavelengths. That includes an integrated, 13:42:47
pre-aligned connector with a stop to hold a single 13:42:54
fiber optic cable. 13:42:57

And so what I've indicated in an answer to 13:42:58
your previous question on paragraph -- sorry, column 13:43:00
1, line 65, to column 2, at least line 5, this is 13:43:03
one of the design -- optical design features that 13:43:08
goes into the optical subassembly. It's certainly 13:43:11
not the only one. It's certainly part of the 13:43:13
design, and I've already indicated on record it's 13:43:15
there to improve the optical performance of the 13:43:18
optical combiner, which is an integrated 13:43:20
subassembly. 13:43:25

Q Okay. And yes or no, are optical 13:43:26
combiners, as the term is used in the '416 patent, 13:43:27

limited to those that have this feature from column 1, line 67, to column 2, line 5? 13:43:31 13:43:34

MS. RICHEY: Objection. Form. 13:43:37

A I don't believe this is a yes or no answer. What we have here is an optical combiner construed in paragraph 59 of my first declaration, and in that construe -- construed section, I'm looking at what the '416 teaches, which is an integrated subassembly of optical components for multiplexing light of different wavelengths. That also includes the pre-aligned connector and a stop to hold the fiber optic cable. 13:43:41 13:43:44 13:43:47 13:43:50 13:43:59 13:44:02 13:44:05 13:44:08 13:44:11

But if we just focus for the moment on the first part of the optical combiner definition, which is an integrated subassembly of optical components, those optical components have to be designed in this particular case to mitigate optical back reflections. And so the inventors are showing that they really understand some of the optic issues that need to be optimized to improve the performance. 13:44:13 13:44:16 13:44:19 13:44:23 13:44:26 13:44:30 13:44:33 13:44:38

And as I've already indicated on record, it just depends on the choice of lasers. If the 13:44:40 13:44:43

laser is super sensitive to back reflections, then clearly they're going to have to take that more into account from the optical design versus lasers that are less sensitive to back reflections. It's all part of the optical design features of the '416. 13:44:46 13:44:49 13:44:54 13:44:57 13:45:00

Q All right. So I'm trying to understand, and it's still not clear from your answer, if it's a claim limitation if it's required by the claim, or if it's not a claim limitation, you mean it's not required by the claim. So I'll try another time to ask the question. 13:45:04 13:45:06 13:45:10 13:45:12 13:45:15 13:45:19

When you have an optical combiner, according to the '416 patent, where each laser output beam does not have the same degree of refraction as it passes through the focusing lens? 13:45:20 13:45:22 13:45:30 13:45:32

MS. RICHEY: Was that your question? 13:45:39

MR. RAWLS: Yes. 13:45:41

MS. RICHEY: Okay. Objection. Form. Asked and answered. 13:45:41 13:45:43

A So what we have here that is written in column 1, line 65, to column 2, line 5, as we've just gone through a number of times for the last 20 13:45:53 13:45:56 13:46:01

minutes, it is part of the optical design that the inventors have come up with that supports what an optical combiner is as construed in the '416 patent and also paragraph 59 of my first declaration. 13:46:04 13:46:08 13:46:13 13:46:17

So we can see as we go through my definition of what an optical combiner is, it's an integrated subassembly of optical components for multiplexing light of different wavelengths. 13:46:21 13:46:24 13:46:28 13:46:32

Now, I also go on to say it includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. But if we just focus on the integrated subassembly of optical components for multiplexing light of different wavelengths, we can see what is written in the bottom of column 1 and the top of column 2 is an optical design feature that the inventors have used to have good performance of this integrated subassembly of components. 13:46:34 13:46:39 13:46:40 13:46:44 13:46:47 13:46:50 13:46:53 13:46:57 13:47:01 13:47:04

And so what it does say here is that the design is made to reduce unwanted optical back reflections. That's light that goes back into the laser. And so what the inventors have done is, as 13:47:06 13:47:11 13:47:16 13:47:19

I've indicated to a person of ordinary skill in the art, that is a design feature that needs to be taken into account. And to me, that's part of the design of the '416 optical combiner, which is an integrated subassembly of optical components, et cetera. 13:47:24 13:47:26 13:47:29 13:47:32 13:47:37

Q All right. Thank you, Dr. Lebby. 13:47:41

MR. RAWLS: If we could go off the record for a moment. 13:47:43 13:47:45

THE VIDEOGRAPHER: We are going off the record at 1:47. 13:47:46 13:47:47

(Recess 1:47 p.m. - 1:53 p.m.) 13:47:49

THE VIDEOGRAPHER: We are back on the record at 1:53. 13:53:26 13:53:31

MR. RAWLS: Can we pull up Exhibit 2049, this is the supplemental declaration, and I want to turn to Section III A, which I think is around paragraph 14. Maybe that might be the end of it. So if we can scroll up to the beginning of this section. 13:53:35 13:53:39 13:53:43 13:53:51 13:54:04 13:54:06

BY MR. RAWLS: 13:54:13

Q So in Section III A, which looks like it's paragraph 6 through 14, Dr. Lebby, of your 13:54:13 13:54:17

supplemental declaration, you address the difference between integration and alignment, you refer to passive and active alignment, and I want to try to ask you a couple of questions just to understand what you mean by these terms. If you want to take a moment to look at these paragraphs now, you can, and let me know when you're ready. 13:54:19 13:54:21 13:54:25 13:54:28 13:54:31 13:54:33 13:54:38

A Okay. I'm ready. 13:55:59

Q And in paragraph 14 you state, "Passive alignment, on the other hand, is alignment when the laser or light is not being used. It includes the concept of pre-alignment." Do you see that? 13:56:00 13:56:02 13:56:06 13:56:09

A I do see that. 13:56:12

Q Can you explain how passive alignment, quote, "includes the concept of pre-alignment"? 13:56:13 13:56:16

A I've included an image from opposing expert's optical lab just to help the definition and explanation. So this image, paragraph 12 of my supplemental report, is actually a photograph of Dr. Willner's optical bench in his lab. And I'm surprised he didn't really define active and passive alignment very well, because if you look at this 13:56:45 13:56:52 13:56:55 13:57:01 13:57:06 13:57:10 13:57:13

image, you can see an optical bench, which is that silver thing with lots of screw holes spaced an inch apart, and on the optical bench you have a lot of optical mounts, some of them have lenses on the top and some of them have a fiber. You can see the fiber because it's the yellow cable. And the fiber is actually bolted down to the optical bench. 13:57:16 13:57:19 13:57:23 13:57:25 13:57:28 13:57:30 13:57:34

And so the reason you have to do that is because you have to actively align the fiber with the lenses, and he's got a whole setup there that does that. And in fact, if you look very carefully to the right-hand side of the image, about halfway up you see an XYZ translation stage, which is used to actually align the fiber, and you align the fiber so that you can maximize the light coming out, active alignment as soon as the laser is turned on. 13:57:37 13:57:40 13:57:44 13:57:47 13:57:50 13:57:54 13:58:00 13:58:03 13:58:06

Passive alignment is when you don't need to use an optical bench like this. I mean, if you're doing the practical implementation of Kurita, for example, you need an optical bench that's like Alan Willner has shown in his laboratory. The same thing for LaMarche, you need a big optical bench to 13:58:09 13:58:12 13:58:16 13:58:20 13:58:23 13:58:27

set everything up.

When you're doing passive alignment, on the other hand, as indicated in my paragraph 14 of my second declaration, you don't need the laser turned on. You've already realigned the fiber with the optical part and that allows you not to turn the laser on, and it's -- when it's pre-aligned, it automatically aligns. You don't have to use things like XYZ stages as indicated in the opposing expert's lab.

I mean, I've worked in labs exactly like this. It's really tricky to do this. It takes lots of time. And if you want to have something practical for commercial applications, you want to use passive alignment.

Passive alignment, as I've indicated in paragraph 14 of my second declaration, means there is enough tolerance to get good alignment without the need to perform active alignment with a light that is being shone through an optical part of the system. So it actually saves a lot of time and it saves a lot of cost.

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And you want to, as much as possible, avoid the optical bench scenarios like I've shown in the image in paragraph 12, which is opposing expert's optical lab. 13:59:34 13:59:38 13:59:43 13:59:45

Q All right. I think I understand that. 13:59:48

But just to try and distinguish between pre-alignment and passive alignment, can you -- can you have passive alignment without pre-aligned parts? 13:59:50 13:59:53 13:59:59 14:00:01

A You would need to pre-align to make sure you have an optical path. I think there might be a scenario that -- that doesn't require that if the tolerance is so big. But that's not practical. And so for the '416 patent, teaches the passive alignment, you insert a fiber into the ferrule, it has a stop, it's automatically aligned. And the tolerances are designed by the optical engineers so that you don't have to turn a laser on; it's automatically aligned. 14:00:03 14:00:07 14:00:11 14:00:15 14:00:19 14:00:25 14:00:28 14:00:32 14:00:35 14:00:38

Now, if you're saying -- your question is could you have passive alignment if it's not pre-aligned, well, you can certainly not turn the 14:00:40 14:00:42 14:00:43

laser on. Whether you'll get good alignment or not I couldn't tell you. And nobody would do it that way because how do you know if you're going to be aligned or not. Pre-alignment allows the optical part to be lined up correctly with the fiber. So you would need pre-alignment if you want to guarantee a passive alignment system without turning the laser on. And so I would say you really need pre-alignment. 14:00:47 14:00:51 14:00:54 14:00:56 14:00:59 14:01:02 14:01:05 14:01:07 14:01:11

But the '416 teaches that that pre-alignment is necessary with a fiber stop, and that guarantees that the optical part on laser through to the fiber is -- has high integrity and the optics will come through without any more alignment. So that means you're aligning it with not the laser turned on. 14:01:13 14:01:17 14:01:20 14:01:24 14:01:29 14:01:32 14:01:35

So, yeah, I would agree that pre-alignment is a necessary part of the '416 design. 14:01:37 14:01:39

Q All right. Now, paragraph 14 you also say, "Because the components are integrated and pre-aligned, the components are capable of being passively aligned." Do you see that? 14:01:43 14:01:46 14:01:48 14:01:52

A I do see that. 14:01:54

Q So for the components to be capable of being passively aligned, then it depends on at least two things, according to this paragraph; first, the components being integrated, and second, the components being pre-aligned. Is that correct? 14:01:56 14:01:59 14:02:02 14:02:05 14:02:07

A So one of the really nice inventive things about the '416 patent is that it's an integrated subassembly of optical components for multiplexing light of different wavelengths, and it includes an integrated, pre-aligned connector with a stop to hold the fiber optic cable. 14:02:10 14:02:17 14:02:20 14:02:25 14:02:26 14:02:28

And so one of the advantages of the '416 design is that you can insert a fiber, it's already aligned because it goes into the ferrule, it comes up to a fiber stop, so its position is well known both in the XY plane as well as the zed plane, or the Z plane. And now that fiber is aligned to the optical path of that integrated subassembly of optical components, or the optical combiner, and you don't have to use an optical bench to align the laser to the fiber, just like we see in the image of 14:02:30 14:02:33 14:02:37 14:02:40 14:02:45 14:02:49 14:02:53 14:02:57 14:03:00 14:03:04

opposing expert's lab, which is an optical bench where they do active alignment, there's no pre-alignment designs there that I can see. Fiber is fixed to a mount, it's bolted to an optical bench. There's XYZ translator stages. They are actually gray, you can actually see them on the right-hand side of the figure about halfway up. 14:03:07 14:03:11 14:03:14 14:03:18 14:03:22 14:03:27 14:03:29

That's the great thing about the inventiveness of the '416 patent; the passive alignment with pre-alignment means you don't have to go to an optical bench to actually put the optical subassembly or package together, and this allows you to replicate this integrated design in volume and reduce the costs. So it's -- it's a very important part of the optical design. 14:03:32 14:03:34 14:03:38 14:03:42 14:03:46 14:03:49 14:03:55 14:03:57

Q What is the difference between integration and pre-alignment? 14:03:59 14:04:01

MS. RICHEY: Objection. Form. 14:04:06

A So what we see is as you construe the optical combiner as part of the design of the '416 patent, you can see in paragraph 59 of my first declaration I've construed it as an integrated 14:04:07 14:04:10 14:04:15 14:04:19

subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 14:04:23 14:04:26 14:04:29 14:04:31

The integrated subassembly does all the pre-alignments for you. So you put all the components together in the integrated subassembly and everything is aligned. You don't have to turn a laser on to actually optimize or tweak the -- to maximize the light going through the system. Everything is pre-aligned. Everything can be manufactured in volume. And that's what the integrated subassembly actually means when you construe it from the '416 teachings. 14:04:33 14:04:36 14:04:39 14:04:41 14:04:44 14:04:48 14:04:51 14:04:55 14:04:56 14:05:00

You compare that to what opposing expert has shown. I mean, this is an image that he's got on his website, so it's a public image. It shows active alignment on an optical bench. That is exactly what you would do if you were doing the implementation of, for example, the prior art of Kurita, or the prior art of LaMarche, you would have to using an optical bench with active alignment. 14:05:03 14:05:06 14:05:10 14:05:14 14:05:17 14:05:19 14:05:23 14:05:29

Now, the fiber, as you can see on this optical bench, is fixed, but it's bolted down to an optical bench. It's not passively aligned. It's not even pre-aligned. You're going to have to tweak it, and you can see some knobs where you have to move the fiber and so you align it with the optical path. I mean, this is totally commercially impractical. 14:05:31 14:05:33 14:05:36 14:05:40 14:05:44 14:05:47 14:05:50 14:05:52

Q Can you have an integrated subassembly that is not pre-aligned? 14:05:53 14:06:01

(Court Reporter clarification.) 14:06:01

Q Can you have an integrated subassembly that is not pre-aligned? 14:06:01 14:06:03

MS. RICHEY: Objection. Form. 14:06:03

A So the '416 patent actually teaches the design of an optical combiner as construed in paragraph 59 of my first declaration, that is an integrated subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable. 14:06:06 14:06:09 14:06:12 14:06:15 14:06:18 14:06:21 14:06:24

And so the design of this is supposed to 14:06:28

be successful, supposed to allow the light to transverse from the lasers to the fiber without any alignment. 14:06:31 14:06:33 14:06:38

So your question is could you design one of these that is not pre-aligned? Certainly you could, but why would you do that. As a working engineer who designs optics, you wouldn't even think of doing that. 14:06:39 14:06:41 14:06:46 14:06:48 14:06:51

The advantage of having things like an integrated subassembly with the use of molded optics is that everything is pre-aligned, so when you just assemble it, it works first time. This is -- this is a way to design things efficiently with low cost and to do it at high volume, which supports the motivation that the inventors called out in the '416 patent. 14:06:52 14:06:55 14:06:59 14:07:02 14:07:05 14:07:09 14:07:13 14:07:20

Q All right. That's helpful. 14:07:20

So I want to turn back to your first declaration now, Exhibit 2003, and if we can bring up paragraph 113. 14:07:29 14:07:32 14:07:36

A Okay. I'm there. 14:07:48

Q All right. So in paragraph 113, and we 14:07:49

can wait a minute for them to bring it up on the screen here, you say that "Kurita discloses a free space, conceptual design that must be manually set up and aligned." Do you see that? 14:07:55 14:07:57 14:08:01 14:08:06

A I do see that. 14:08:07

Q What do you mean by a conceptual design? 14:08:08

A So as we go through the Kurita reference, all Kurita shows is unprotected chips, unprotected components, and doesn't give any teaching of how to put that system together. 14:08:12 14:08:18 14:08:24 14:08:27

In fact, what it is is it's a system that actually aligns really nicely with the image I've shown in paragraph 12 of my supplemental declaration. It's designed to go on an optical bench, and an optical bench just like the one that opposing expert has shown on his public website of his optical laboratory. 14:08:29 14:08:33 14:08:36 14:08:41 14:08:44 14:08:47 14:08:55

And in that image you can see what is required to realize Kurita. You've got components, black vertical components, which you can see in the upper right-hand corner of that image, that actually hold the lenses and are bolted to a metal table 14:08:57 14:08:59 14:09:06 14:09:09 14:09:12

called an optical bench. You can see on the right-hand corner an XYZ translation stage for aligning fiber, and so that's an active alignment. 14:09:17 14:09:19 14:09:25

And so Kurita is a conceptual design because it's an optical test bench design and that has to be manually set up and aligned. And you can see from that photograph of opposing expert's lab, it's going to take hours to set up and the size of it is going to be huge. 14:09:28 14:09:30 14:09:34 14:09:38 14:09:42 14:09:45

I mean, as you know, in my first declaration I do include what an approximate size of this optical bench setup would be, a meter by a meter by about a half meter. 14:09:45 14:09:47 14:09:50 14:09:53

And you look at that image from opposing expert's lab, you can see the size of those experiments stretch all the way across an optical bench, which is two meters wide and four meters long, so this is huge. This is nothing even like an integrated solution that is taught in the '416 patent, not even close. 14:09:55 14:09:58 14:10:00 14:10:03 14:10:06 14:10:10 14:10:13

Q So you said Kurita is a conceptual design because it's an optical test bench design. 14:10:15 14:10:19

Where in Kurita does it tell you it's an optical test bench design? 14:10:22 14:10:25

A Kurita is a solution that will fit onto an optical bench because that's the typical place where you would set up a chip like this that has light emitting portions, lens portions, and an optical system that is connected by a fiber. 14:10:32 14:10:37 14:10:41 14:10:44 14:10:48

Kurita does not teach if anything else than something that will fit onto an optical bench. If Kurita teach -- taught something to show that this wasn't the case, then I would have expected Kurita to show that. 14:10:50 14:10:53 14:10:57 14:11:00 14:11:03

But if you go through Kurita, it doesn't do that. It just says, as I've indicated in paragraph 113, it's an optical arrangement that can be used to input laser light into optical fibers that are used with multi-stage switching networks inside optical computers and switchboards and with optical communications, laser processing, et cetera. And so you can certainly do that on an optical bench. 14:11:04 14:11:07 14:11:11 14:11:14 14:11:16 14:11:20 14:11:24 14:11:26 14:11:30

Kurita doesn't teach how to protect the 14:11:30

devices. He does not teach how to, as you use your term, package these devices from the environment. And so there is no expectation that Kurita is anything else other than an optical test design that is huge in size, that will fit in, for example, the optical bench as shown by opposing expert's lab image in paragraph 12 of my supplemental report. 14:11:33 14:11:37 14:11:40 14:11:43 14:11:46 14:11:48 14:11:53

Q Would a POSITA have known as of the '416 patent's priority date how to integrate the components of Kurita into a subassembly? 14:11:57 14:12:00 14:12:01

MS. RICHEY: Objection. Form. 14:12:05

A Kurita doesn't teach any integration whatsoever. What Kurita does is looks at ways to reduce component count, and that's really all Kurita is trying to teach. And so it's an optical -- 14:12:08 14:12:11 14:12:15 14:12:19

Q Sorry. Let me re-ask because I think I may have had a confusing question. I wasn't asking about Kurita, you know, what Kurita says. 14:12:25 14:12:27 14:12:30

I was asking a little bit differently from the perspective of a POSITA. Would a POSITA as of the '416 patent's priority date known how to have taken the components of Kurita and integrated them 14:12:34 14:12:36 14:12:42 14:12:45

into a subassembly? 14:12:48

MS. RICHEY: Objection. Form. 14:12:50

A So I'm a POSITA at the time of the 14:12:51
priority date of the '416, which is the 17th of July 14:12:55
2003. And as you can see from my experience, I've 14:12:59
done a lot of different things within the field. 14:13:01
And certainly at that time I was not even 14:13:04
considering an integrated subassembly as defined 14:13:08
from paragraph 59 in my first declaration for an 14:13:11
optical combiner that has the functionality of 14:13:15
multiplexing different wavelengths down the same 14:13:19
fiber. 14:13:23

And so the '416, from my perspective as a 14:13:24
POSITA at the time of the priority date of the '416, 14:13:29
I was not aware that this could be done. And this 14:13:34
is why I believe this invention is quite inventive. 14:13:37
And you've already called up some of my patents, and 14:13:40
I don't believe any of my patents that predate this 14:13:44
talk about WDM. Maybe they do, maybe they don't. 14:13:47
But I don't believe that was something that I really 14:13:50
thought about at the time. 14:13:53

And so when you look at the inventiveness 14:13:54

of the '416, they utilize an integrated subassembly of parts with a passively aligned pre-aligned fiber connector to achieve what I've construed as an optical combiner, and I believe that is inventing of the '416. 14:13:57 14:14:03 14:14:08 14:14:14 14:14:18

Q So earlier today we talked about how packaging, that you just mentioned, was in an engineering toolbox, or is in a POSITA's toolbox. 14:14:18 14:14:20 14:14:24

Would a POSITA as of the '416 patent priority date have been able to take these components, the light source array, lens array and lens that are shown here in Figure 1, for example, or Figure 2 or Figure 3 of Kurita, and make them into a packaged optoelectronic device? 14:14:27 14:14:29 14:14:32 14:14:36 14:14:39 14:14:43

MS. RICHEY: Objection. Form. 14:14:46

A I think the inventiveness of the '416 to create an integrated subassembly of optical components that multiplex light of different wavelengths, wavelengths division multiplexing, that includes an integrated pre-aligned connector with a stop to hold a single fiber optic cable is very novel. And to do that in an integrated let's call 14:14:49 14:14:56 14:15:02 14:15:06 14:15:10 14:15:13 14:15:16

it, quote/unquote, subassembly or package, that was really, for me as a person of ordinary skill in the art on the 17th of July 2003, that was definitely inventive. 14:15:20 14:15:24 14:15:28 14:15:31

Now, as I've already indicated, when you look at Kurita, and you look at this is not an integrated solution at all. This is a free space solution that is ideally set up to be implemented, if you wanted to implement Figure 1 and Figure 2 and Figure 3, you would have to use an optical bench. An optical bench is as shown in paragraph 12 of my supplemental report, which is opposing expert's optical lab. I've certainly worked in labs just like that. 14:15:32 14:15:34 14:15:37 14:15:41 14:15:45 14:15:49 14:15:52 14:15:55 14:15:59 14:16:02

So to implement, for a POSITA to implement Kurita, they would have to put it on an optical bench. It would not be integrated. It's not integrated at all. It's a free space system that is a test bench setup. It doesn't even come close to what the '416 is teaching. 14:16:03 14:16:06 14:16:09 14:16:11 14:16:14 14:16:18

Q All right. So would a POSITA have known, for example, like we discussed before that packaging 14:16:21 14:16:24

was in their toolbox, that if you packaged the components of Kurita, that it would help improve their ruggedness and make them more protected? 14:16:26 14:16:30 14:16:33

A So a POSITA at the time of the priority date of the '416, which is the 17th of July 2003, as we've already indicated on our record, is certainly, somebody like myself, aware of optoelectronic technology, optical design. 14:16:39 14:16:43 14:16:48 14:16:51 14:16:56

But certainly I wasn't aware at that time to do an integrated package subassembly that meets the way I've construed optical combiner in paragraph 55 -- 59, sorry, of my first declaration to be an integrated subassembly of optical components that would actually allow wavelengths division multiplexing, or multiplexing light in different wavelengths that included an integrated, pre-aligned connector with a stop to hold the single fiber optic cable. That was novel in 2003. 14:16:57 14:17:00 14:17:04 14:17:09 14:17:15 14:17:18 14:17:21 14:17:24 14:17:27 14:17:31

And I certainly didn't come up with something like that, even though I've established on record I understand optical packaging and I understand different types of optical components. 14:17:33 14:17:35 14:17:37 14:17:40

And so when we compare that to this prior art, Kurita, Kurita is not integrated at all. It's a free space system that is -- as somebody that would read the Kurita patent, I would need an optical bench to set that up. There's no teaching whatsoever to design anything to put that into an integrated subassembly, there's no teaching whatsoever. It's just a free space system that is not integrated, and a POSITA wouldn't think that way for Kurita. 14:17:42 14:17:47 14:17:50 14:17:55 14:17:58 14:18:01 14:18:05 14:18:07 14:18:10 14:18:13

Q So is it your testimony that Kurita can only be implemented on an optical test bench? 14:18:14 14:18:17

A No, I did not say that. 14:18:21

I said a POSITA at the time would look at Kurita and see this is a test bench setup, and certainly put that on an optical bench. 14:18:23 14:18:27 14:18:30

Now, if they wanted to package it, then my guess is you could put a big box around it if you would like. The box would be fairly big. 14:18:33 14:18:36 14:18:40

But there's no teaching of a miniaturized integrated package assembly as construed -- as taught by the '416 and construed in paragraph 59 14:18:42 14:18:46 14:18:49

where I construe an optical combiner in my first declaration. 14:18:53 14:18:57

So a POSITA looking at Kurita, if they wanted to package it, they would put a box around all the free space parts, that would be probably the size of at least a half a meter or meter long. 14:18:57 14:19:00 14:19:03 14:19:06

For me, as a POSITA at the time of the priority date of the '416, that's totally commercially impractical. It's an R&D experiment at best. 14:19:09 14:19:12 14:19:16 14:19:20

Q All right. You mentioned free space a couple of times, and I think it was at paragraph 113 of your declaration also that we had looked at. 14:19:23 14:19:28 14:19:31

What do you mean by free space in reference to Kurita? 14:19:33 14:19:36

A Kurita, as indicated in my first report paragraph 113, and I do explain Kurita, that goes on to at least paragraph 120, if you look, for example, at Figure 1, the question pertains to free space is the light that travels through air between different optical functions. And so that is depicted with lines with arrows on in Figure 1, it's depicted with 14:19:40 14:19:44 14:19:49 14:19:54 14:19:59 14:20:02 14:20:07

lines with arrows on in Figure 2, and similar in Figure 3. 14:20:12 14:20:13

Free space means the light travels through air. It doesn't go through an integrated subassembly as the '416 teaches. So it's completely different. It's a different setup. It's designed to go on an optical bench, as indicated in paragraph 12 of my supplemental report, which shows an image of opposing expert's optical lab with his optical bench. So it's a huge system. It's not integrated at all. 14:20:15 14:20:18 14:20:20 14:20:24 14:20:27 14:20:30 14:20:34 14:20:38 14:20:41

And so that's where free space comes from. 14:20:41

MR. RAWLS: All right. If we can pull up Document K, which is Kurita, which was previously marked as Exhibit 1004. 14:20:45 14:20:52 14:20:55

(Court Reporter clarification.) 14:21:06

THE TECHNICIAN: Please stand by. 14:21:06

Q And this is a Japanese reference, and there's an English translation at the end of it. 14:21:22 14:21:24

If we can go to page 12. In the brief description of the drawings, Kurita describes the figures as being a conceptual configuration diagram. 14:21:27 14:21:36 14:21:40

Do you see that? 14:21:45

A I do see that. 14:21:46

Q Now, is it conceptual because it 14:21:48

illustrates a general concept without including 14:21:53

every possible engineering detail that a full 14:21:56

engineering schematic might contain? 14:21:59

MS. RICHEY: Objection. Form. 14:22:02

A So the question pertains to the definition 14:25:18

of the figures in Kurita, at least in the English 14:25:21

translation, and the word "conceptual." 14:25:28

The first thing I want to point out is 14:25:30

what I'm looking at is a translation of the 14:25:32

Japanese, so I don't know if my understanding of the 14:25:35

term "conceptual" is the same as what the translator 14:25:37

used. 14:25:40

But certainly as I indicate in my first 14:25:42

declaration paragraphs 113 to 120, Kurita, the 14:25:48

object of the invention of Kurita was to reduce the 14:25:58

cost by reducing a number of individual optical 14:26:04

components used in conventional multiplexes. 14:26:07

Kurita, as you can see from the teaching, 14:26:12

does not disclose an integrated compact optical 14:26:15

combiner that performs multiplexing. Kurita recognizes that as you increase the number of optical components, you know, if you actually decided to implement this into a commercial environment, it would take a lot more time to implement, and it could be really costly, and it would be basically impractical. 14:26:18 14:26:24 14:26:27 14:26:29 14:26:32 14:26:35 14:26:38

And so from what Kurita has taught so far, this system is nicely set up to go as an active alignment setup into an optical lab bench, and that means that it would take you a lot of time to set it up, even though Kurita has reduced the component count by using arrays of lasers and arrays of lenses. But it's not an integrated solution, it's a free space solution for an optical bench. It's not an integrated subassembly at all. 14:26:41 14:26:45 14:26:50 14:26:54 14:26:57 14:27:02 14:27:07 14:27:11 14:27:14

Q We heard earlier that active alignment is labor intensive and costly, and that's why passive alignment is one option in a POSITA's toolkit is because it can improve those features, it can be less costly and less labor intensive. 14:27:17 14:27:20 14:27:25 14:27:29 14:27:34

So would a POSITA understand that 14:27:37

integrating the components to use passive alignment would make the Kurita system less costly? 14:27:39 14:27:41

A It just depends. I mean, if Kurita's system is implemented in opposing expert's optical bench and opposing expert's optical lab, there would be no setup. There's no teaching. You wouldn't need to do any passive alignment. You just set it all up with active alignment because that's the only way you can do it. 14:27:47 14:27:52 14:27:55 14:28:00 14:28:02 14:28:05 14:28:08

You've got to align, in this case, nine lasers with nine lenses. That's really tricky to do. And so the implementation from a POSITA's standpoint is to look at Kurita and set it up into an optical lab. I don't think there's any teaching to do this into a passive scenario. Even though passive alignment was in an engineer's toolkit, this is an optical bench solution, that would be implemented in the typical optical bench scenario that opposing expert has in their image in paragraph 12 of my supplemental report. And I wouldn't expect a POSITA to even consider passive alignment when they start looking at Kurita, because Kurita is all 14:28:09 14:28:10 14:28:13 14:28:16 14:28:19 14:28:22 14:28:26 14:28:30 14:28:33 14:28:38 14:28:42 14:28:47 14:28:50

about the reduction of optical components, not how you align system. 14:28:54 14:28:57

Q I want to turn to your supplemental declaration, Exhibit 2049, at paragraph 54, and there you state, "A POSITA reading Kurita would understand the components are not integrated — the components are placed physically away from each other - so that it cannot be integrated at all." 14:28:58 14:29:01 14:29:09 14:29:12 14:29:15 14:29:18

Do you see that? 14:29:23

A I do see that. 14:29:23

Q What does the physical placement of the components away from each other -- sorry. Let me re-ask that. 14:29:24 14:29:26 14:29:28

Why does the physical placement of the components away from each other prevent their integration? 14:29:29 14:29:33 14:29:38

A So if you look at the '416 patent and you see how the patent is -- teaches integration in general, you can see from paragraph 59, which is how I define an optical combiner, it's an integrated subassembly of optical components that multiplex light of different wavelengths, that uses an 14:29:39 14:29:41 14:29:47 14:29:51 14:29:55 14:29:58

integrated, pre-aligned connector with a stop to hold the single fiber optic cable. 14:30:01 14:30:04

You can see that Kurita is completely different. Kurita uses free space that place physically away from each other. That's not integrated at all. That's not even an integrated subassembly. All it is is a laser chip. And if you look at Kurita's Figure 3, a laser chip has nine lasers on it set up in a linear array, and then the light from those lasers go into a linear array of optical lenses, which is placed at some distance away using free space. And the light that passes through that lens array 20 goes into some type of lens, which is also free space, which is physically a waste. 14:30:07 14:30:10 14:30:14 14:30:17 14:30:19 14:30:22 14:30:27 14:30:30 14:30:35 14:30:39 14:30:44 14:30:49 14:30:49

This is a huge system. This is not an integrated system as taught by the '416 patent, and as I've construed, for example, the optical combiner in paragraph 59 of my first declaration. 14:30:53 14:30:56 14:31:00 14:31:03

MR. RAWLS: Okay. Now I want to put two images up on the screen, if the tech can help with that. So the first is Figure 3 of Kurita, which is 14:31:07 14:31:10 14:31:12

the Exhibit 2004. 14:31:16

THE TECHNICIAN: Please stand by. 14:31:25

I'm sorry, do we have a letter for that exhibit? 14:31:35 14:31:38

MR. RAWLS: Document K, I believe. I'm sorry. Exhibit 1004, not 2004. So Figure 3 on one side, and then if we could pull up a diagram that's on page 128 of Exhibit 2003, the first Lebby declaration. 14:31:39 14:31:46 14:31:53 14:31:56 14:32:01

THE TECHNICIAN: Please stand by. 14:32:02

A What was the second figure, the paragraph? 14:32:19

Q I believe it's in a table, it's page 128 and it's labeled side view on Exhibit 2003. 14:32:22 14:32:25

MR. RAWLS: Just for the tech, that's page 128 of the 2003 exhibit. 14:32:53 14:32:55

Q So, Dr. Lebby, on the left-hand side of the screen we can see Figure 3 of Kurita, correct? 14:33:06 14:33:10

A Yes, we can. 14:33:16

Q And to the right of it we see the drawing from one of the '416 patent inventors, that's on page 128 of your first declaration, correct? 14:33:17 14:33:20 14:33:25

A That's not what I can see. 14:33:29

Q What do you see at the top right of the screen where it says side view? 14:33:33 14:33:37

A I'm on page 128 and I've got Exhibit 1009 Figure 3. Is that the right one? 14:33:40 14:33:48

Q I'm trying to pull up my electronic copy. There might be -- 14:33:55 14:33:59

MS. RICHEY: So he needs to see the page of the actual document. He's not looking at the PDF. 14:33:59 14:34:00 14:34:03

MR. RAWLS: Yeah. 14:34:03

Q So the actual document is 123, and if you look below that it says page 128 of 140. 14:34:04 14:34:08

A I do see it now. 14:34:14

Q Yeah. And the top of that page is the same that's shown on the screen here. That's a side view that was from one of the inventors of the '416 patent from one of their lab notebooks, correct? 14:34:16 14:34:18 14:34:23 14:34:27

A That is certainly a side view. It's certainly one of the pages. The inventors detailed this invention in a number of pages from their lab book is dated 17th of July 2003. But there are other diagrams that the inventors used to describe 14:34:33 14:34:35 14:34:39 14:34:45 14:34:48

the patent, not just this one. 14:34:54

Q All right. Now, in the drawing on the 14:34:55

right from the '416 patent in the inventors' lab 14:34:58

notebook, are the components, the lasers, 14:35:01

collimating lenses and focusing lens, placed 14:35:01

physically away from each other? 14:35:01

(Court Reporter clarification.) 14:35:01

Q In the drawing on the right from the '416 14:35:11

patent inventors' lab notebook, are the components, 14:35:14

that is the lasers, the collimating lenses, and the 14:35:17

focusing lens, placed physically away from each 14:35:21

other? 14:35:24

A So you have to look at the side view -- 14:35:25

MS. RICHEY: Sorry, I was on mute for some 14:35:28

reason. Objection. Form. 14:35:32

A So I'm looking at the figure which is on 14:35:35

page 123, paragraph 365, which is a perspective, a 14:35:39

side view perspective from the inventors' notebook, 14:35:46

and it looks like that is Exhibit 1002, page 79. 14:35:49

And this is part of the section in my first 14:35:54

declaration that starts in paragraph 360 and goes 14:35:57

all the way through to -- well, I guess it goes 14:36:04

through to paragraph 381, including 381. 14:36:15

What we're looking at here is a side view 14:36:19

that the inventors have drawn to show optically 14:36:22

what's going on between the optical path between the 14:36:28

laser and the fiber. But that has to be taken into 14:36:32

consideration with the other figure that the 14:36:35

inventors have used, especially the one on page 125 14:36:38

that shows how the optics is implemented into an 14:36:43

integrated subassembly. 14:36:47

And so if you look at the figure you've 14:36:49

called out, you have to include page 79, which is 14:36:52

actually page 122 of my first declaration, the two 14:36:57

figures on page 123, the two figures on page 124, 14:37:03

the integrated subassembly design that's shown on my 14:37:08

first declaration page 125, the two figures in 126, 14:37:12

and so to fully understand to what the inventors 14:37:17

were trying to do here. 14:37:21

So I don't believe this is a free space, 14:37:22

because if you look at everything together, then you 14:37:26

see it's an integrated subassembly as per an optical 14:37:29

combiner that I've construed in paragraph 59. And 14:37:33

just for completeness, and what that is is an 14:37:38

integrated subassembly of optical components, a WDM, or wavelengths division multiplexing, or multiplexing light with different wavelengths, that also includes a pre-aligned connector with a stop to hold the single fiber optic cable. 14:37:43 14:37:48 14:37:50 14:37:54 14:37:57

And that is what you see when you look at all of the figures from paragraph 363 to paragraph 381 of my first declaration. 14:38:00 14:38:02 14:38:07

Q Okay. So the components that we see in the side view are not placed physically away from each other, is that what you're saying? 14:38:09 14:38:12 14:38:15

A So what I've just indicated is, is you asked me a question on the figure on page 123 on the top, whether they are physically placed away from each other or not. 14:38:18 14:38:20 14:38:25 14:38:28

What I'm indicating to you is, as I read the lab notebook of the inventors from paragraph 363 to paragraph 381 of my first declaration, and look at all the figures that detail the invention, and I can see on page 125 of my first declaration that this is an integrated subassembly. 14:38:29 14:38:32 14:38:37 14:38:39 14:38:44 14:38:51

And as I've construed in paragraph 59 of 14:38:54

my first declaration of what an optical combiner is, I mean, it's an integrated subassembly of optical components for doing WDM, wavelengths division multiplexing, and so that's multiplexing aligned at different wavelengths, and it includes, this optical combiner includes an integrated, pre-aligned connector that has a stop that holds a single fiber optic cable, and that's what the inventors came up with. 14:38:59 14:39:04 14:39:07 14:39:11 14:39:15 14:39:18 14:39:21 14:39:24 14:39:29

I don't know what you're interpreting from the figure where you asked the question. But certainly that's what I see the '416 invention is. 14:39:29 14:39:31 14:39:34

Q Okay. I'm not sure that was actually the question I asked. I'll try again. I'm not asking about your definition of optical combiner. I'm not asking about a lot of things that were in your answer. 14:39:39 14:39:41 14:39:43 14:39:46 14:39:49

I was asking are the components that we see in this side view, that's on the right-hand side of the screen from the inventor lab notebooks, placed physically away from each other? 14:39:49 14:39:52 14:39:55 14:39:59

MS. RICHEY: Objection. Form. 14:40:01

A So I don't know how you're interpreting this figure. But the way I interpret this figure is very different than the way you do. 14:40:02 14:40:05 14:40:07

The way I interpret this figure is looking at all the figures from the inventors' notebooks that range from paragraphs 363 to 381 of my first declaration, and as I interpret as a person of ordinary skill in the art that the priority date of this invention, which is the 17th of July 2003, I don't see what you're saying in the question. 14:40:10 14:40:12 14:40:15 14:40:19 14:40:23 14:40:24 14:40:29

What I do see is an integrated subassembly of optical components that utilize WDM, which is wavelength division multiplexing, to multiplex lights of different wavelengths. And it also includes, this optical combine also includes an integrated, pre-aligned connector with a stop to hold the fiber optic cable, a single fiber optic cable. 14:40:32 14:40:35 14:40:39 14:40:42 14:40:45 14:40:48 14:40:51 14:40:55

I don't see what you're asking in your question. What I do see is what the '416 teaches. 14:40:56 14:40:57

Q Okay. I'm not sure that was an answer, but we can move on. 14:41:00 14:41:03

So in paragraph 57 of your supplemental declaration you say that a POSITA would understand how to reproduce the setup taught and create it using a traditional optical bench. 14:41:05 14:41:09 14:41:12 14:41:16

So would a POSITA have been able to use, to reproduce the setup taught in Kurita, using any sort of mechanical housing unit? 14:41:20 14:41:24 14:41:28

MS. RICHEY: Objection. Form. 14:41:30

A So when I look through Kurita, and I look at paragraph 57 of my supplemental report, what Kurita teaches me is, is an invention to reduce component count. Kurita doesn't teach anything else. 14:41:35 14:41:37 14:41:40 14:41:44 14:41:48

Kurita just teaches the use of integrated laser chips that have nine lasers on the chip. They are actually not integrated with the lenses whatsoever, and not integrated with a focusing lens whatsoever, and doesn't even teach how to take the light and put it into a fiber. Just shows that if you took the components as taught by Kurita and you put them into an optical bench, you could actually get that experiment to work. 14:41:49 14:41:52 14:41:56 14:41:58 14:42:02 14:42:05 14:42:10 14:42:13 14:42:17

But that would require active alignment, and it certainly would not require pre-aligned connector, and it certainly doesn't require any integrated optical subassembly, because Kurita is not concerned with that. 14:42:20 14:42:22 14:42:25 14:42:29 14:42:32

In fact, Kurita teaches you don't want to do it with single components. You want to do it with a chip with nine lasers on it and another chip with nine lenses on it, that's what Kurita teaches. 14:42:33 14:42:36 14:42:40 14:42:45

Kurita does not teach anything about integration, because Kurita shows there's free space between the laser chip and the lens chip and the focusing lens number 30. 14:42:47 14:42:49 14:42:53 14:42:55

So a POSITA looking at Kurita wouldn't even think about an integration perspective. But, actually, if they wanted to implement it, it's going to take them a long time to put that on an optical bench, set it up, it's going to be huge, it will take hours to get everything aligned. 14:42:57 14:43:00 14:43:05 14:43:09 14:43:12 14:43:15

But, yes, it could be done, but it certainly wouldn't be an integrated subassembly of optical parts with a passively aligned connector 14:43:17 14:43:20 14:43:21

that allows the WDM, wavelength division multiplexing, as I've indicated and construed the optical combiner in paragraph 59 of my first declaration. 14:43:23 14:43:27 14:43:31 14:43:35

Q Okay. I want to move away from Kurita for just a bit and pull up Document L, which was previously marked as Exhibit 1006, and this is the Lemoff reference. 14:43:35 14:43:40 14:43:44 14:43:49

THE TECHNICIAN: Please stand by. 14:43:55

MR. RAWLS: Are we having an issue with document L? 14:45:17 14:45:19

A I have it in front of me, if needed. 14:45:24

Q Sure. Maybe we can resolve that on a break. 14:45:26 14:45:29

If you look at column 6, lines 12 to 15, of Lemoff, it says, "Optical signal emitter 200 also includes housing 230, which secures receptacle 260, optical imaging element 220 and substrate 140 and which holds them in alignment with each other." 14:45:29 14:45:35 14:45:41 14:45:46 14:45:51

Do you see that, Dr. Lebby? 14:45:53

A I do see that. 14:45:54

Q And a couple of lines down on lines 33 to 14:45:55

36 of the same column 6, Lemoff says that "housing 230 may be any device, apparatus or material that secures receptacle 260, optical imaging element 220 and substrate 140 and that holds them in alignment with each other." Do you see that? 14:45:59 14:46:04 14:46:07 14:46:12 14:46:16

A I do see that. 14:46:20

Q So Lemoff teaches that the housing is not limited to the particular form of housing 230 shown in the figure, but, rather, it can be any device, apparatus or material that secures the components and holds them in alignment, correct? 14:46:21 14:46:25 14:46:27 14:46:31 14:46:34

A Well, the alignment in Lemoff is very different than the '416 patent. For example, Lemoff is all about not having an optical combiner, not having a multiplexer to multiplex wavelengths from lasers into a fiber. In fact, Lemoff teaches away from that. 14:46:37 14:46:53 14:46:55 14:47:02 14:47:06 14:47:09

In fact, if you look at Figure 1B, fiber is actually ran on top of the lasers, so there's no optics at all. In Figure 2 there is an imaging lens, I believe that's what it's called, 220. 14:47:10 14:47:14 14:47:17 14:47:20

But Lemoff doesn't teach that it makes any 14:47:24

sense to do any optical combiner as construed in the '416 and paragraph 59 of my first declaration. And certainly indicates, as you indicate in column 6, lines 16 to 23, was different types of designs that Lemoff could use for 220. 14:47:27 14:47:30 14:47:34 14:47:38 14:47:46

But Lemoff doesn't teach collimation. Lemoff doesn't teach the use of an optical combiner. And so Lemoff wants to avoid that because it wants to reduce the costs, and sees that as a huge problem, a huge problem both with alignment and cost. And so Lemoff actually teaches away from all the things that have been taught in the '416. 14:47:50 14:47:55 14:47:58 14:47:59 14:48:02 14:48:05 14:48:08

Q Does Lemoff teach that its components can be housed or packaged together? 14:48:11 14:48:14

A So if I look at the way I've construed optical combiner in paragraph 59 of my first declaration, first of all, Lemoff doesn't design with an optical combiner, it actually teaches away from that. 14:49:06 14:49:09 14:49:12 14:49:16 14:49:20

And so the question is, is the optical combiner as construed in the '416 is an integrated subassembly of optical components for multiplexing 14:49:21 14:49:25 14:49:30

light of different wavelengths. Lemoff achieves the different wavelengths without the use of a multiplexer. But then Lemoff doesn't use pre-aligned fiber connector with a stop to hold a single fiber optic cable. 14:49:33 14:49:38 14:49:41 14:49:44 14:49:47

And I would agree with you that the lens 220 seems to be attached to what most people would call in the industry a housing. And so the lens 220 in Figure 2 of Lemoff does -- is attached to a housing, but certainly does not achieve the elements of the design that the '416 patent gives, as I've construed in paragraph 59, and it's not an integrated subassembly of optical components. It certainly doesn't have a collimating lens. It certainly doesn't have an optical combiner, because Lemoff tries to avoid all of that, tries to go directly from the laser to the fiber, as indicated in Figure 1B. And so although there is a housing and the housing actually holds lens 220, it's still quite different. 14:49:50 14:49:53 14:49:57 14:50:02 14:50:07 14:50:11 14:50:15 14:50:18 14:50:21 14:50:24 14:50:28 14:50:31 14:50:33 14:50:37 14:50:42

Q Are the components in Lemoff integrated into a subassembly? 14:50:44 14:50:47

MS. RICHEY: Objection. Form. 14:50:50

A I believe that lens 220 in Figure 2 of 14:51:00
Lemoff is certainly held by the housing, as you can 14:51:04
see from the 230, but it's not an integrated 14:51:07
subassembly of optical components that multiplex 14:51:11
light in different wavelengths that includes a pre 14:51:15
-- an integrated, pre-aligned connector with a stop 14:51:19
to hold a single fiber optic cable -- 14:51:21

(Simultaneous speaking.) 14:51:25

Q -- you're missing the question. 14:51:26

MS. RICHEY: Well, are you going to 14:51:28
withdraw your question or let him finish? Because 14:51:30
there is a question pending. 14:51:30

Q I'll withdraw the question. I will re-ask 14:51:32
it in a different way. Because I notice, Dr. Lebby, 14:51:35
you have a habit of answering a lot of things that 14:51:39
I'm not asking. And so I would like you to listen 14:51:41
carefully to the question and focus on what I'm 14:51:44
asking you. 14:51:46

Would you try to do that, please? 14:51:48

A I will. 14:51:50

Q Okay. So are the optical components in 14:51:51

Lemoff integrated into a subassembly, and that's all I'm asking about, are they integrated into a subassembly? 14:51:55 14:51:59 14:52:02

MS. RICHEY: Objection. Form. 14:52:03

A As I've already indicated in previous answers, the way I've construed the '416, and I've used the term "integrated subassembly" in paragraph 59 of my first declaration, and, you know, as I look at the '416, it's an integrated subassembly of optical components that multiplex light. But let's just stop there for a second. 14:52:07 14:52:10 14:52:14 14:52:18 14:52:22 14:52:26 14:52:29

Lemoff doesn't multiplex light, doesn't use an optical combiner. It just actually uses an individual laser that passes through an imaging lens to the fibers, so it's very different from that standpoint. 14:52:31 14:52:35 14:52:39 14:52:42 14:52:44

And certainly if you look at the next part of how I construe the optical combiner, which is an integrated, pre-aligned connector with a stop to hold a single fiber optic cable, Lemoff doesn't even do that. It's not even close to that. 14:52:44 14:52:46 14:52:51 14:52:53 14:52:57

So when you ask the question is it an 14:52:59

integrated subassembly of optical components as construed as taught by the '416 patent, no, it isn't. But is the lens 220 connected to the housing through 230, yes, it is. So the lens is certainly connected to the housing. 14:53:03 14:53:06 14:53:10 14:53:14 14:53:18

But as I've construed an optical combiner in paragraph 59 of my first declaration of the '416 patent, it's not an integrated subassembly as I see it, as I understand the '416 patent. 14:53:19 14:53:23 14:53:27 14:53:31

Q And in fact, we just saw at lines 33 to 36 of column 6 of Lemoff, that Lemoff is pretty expansive about what the housing can be, right, any device, apparatus or material? 14:53:34 14:53:39 14:53:44 14:53:44

MS. RICHEY: Objection. Form. 14:53:47

A So when I look at column 6, lines 33 to 35, or actually 36, I will agree with you that Lemoff actually in the specification gives a very broad overview of what potential embodiments could entertain. 14:54:21 14:54:25 14:54:31 14:54:35 14:54:41

But as a person of ordinary skill in the art, when I look at column 6, lines 32 to 36, what I see is, is what's been taught in Lemoff. Lemoff is 14:54:42 14:54:43 14:54:47

all about getting rid of the optical combiner, or the MUX. In fact, if you look at Figure 1B, you take the fiber right up to the lasers, you don't even want to use it at all, because Lemoff argues that it saves cost and time and alignment if you just take the fiber straight up to the laser. In Figure 2 Lemoff does put a lens. But certainly doesn't teach the multiplexing of different wavelengths to the fiber. 14:54:51 14:54:56 14:54:59 14:55:02 14:55:03 14:55:06 14:55:10 14:55:15 14:55:18

In fact, because of the location of the lasers, the lasers all go to different spots at different -- at different location at the end of the fiber. So it's not even close to what the '416 is teaching. 14:55:22 14:55:24 14:55:28 14:55:31 14:55:35

And so while, yes, as a POSITA, I look at column 6, lines 32 to 36, and see that embodiments could have a broad appeal or broad approach, there's no teaching. And in fact, Lemoff teaches away from the use of optical subassemblies that optically combine different wavelengths of light. And as well, it doesn't even have a pre-aligned fiber connector that's passively aligned with an endstop, 14:55:36 14:55:39 14:55:45 14:55:49 14:55:52 14:55:56 14:55:59 14:56:04

so that's not even included. So that's quite different. 14:56:07 14:56:10

Q Could a POSITA have used any of the devices, apparatus and materials that Kurita teaches that were known in the art for housing optical components to house the optical components in the device we saw in Kurita? 14:56:10 14:56:12 14:56:16 14:56:19 14:56:21

MS. RICHEY: Objection. Form. 14:56:23

A Are we -- are we talking about Lemoff or Kurita now? 14:56:25 14:56:28

Q We're talking about the teaching in Lemoff that they can use any device, apparatus or material for housing that secures the components and holds them in alignment. 14:56:30 14:56:33 14:56:36 14:56:39

And the question is could a POSITA have taken that teaching, that knowledge of the devices, apparatus and material that can do the housing of an optoelectronic device, and applied it to the components in the Kurita device? 14:56:40 14:56:42 14:56:46 14:56:51 14:56:52

MS. RICHEY: Objection. Form. 14:56:54

A Well, I think I discuss this in part of my motivation to combine in my first declaration 14:56:57 14:57:01

between Kurita and Lemoff. I don't remember the page. 14:57:04 14:57:07

But what I do remember on the top of my head is, is if you think about Kurita, I mean, that's a huge optical setup, one by one meter by a half a meter, it's huge. And Lemoff is talking about a housing that's one centimeter by one centimeter by one centimeter. 14:57:08 14:57:11 14:57:13 14:57:18 14:57:21 14:57:26

And so your question is, is could you take the teaching of Lemoff in a very small housing and implement that with Kurita. Well, I would say it's a very different problem, it's a very different size, it's very different optics. And I don't think that could be done that easily. I don't know if a person could actually do it. 14:57:27 14:57:29 14:57:33 14:57:36 14:57:39 14:57:42 14:57:45

But, you know, Lemoff teaches away, he basically says forget the optical combiner, as I've construed in paragraph 59 of my first declaration, we don't need that. We're just going to have lasers directly coupled to fibers. Well, if that's the case, how is he going to implement that with Kurita? It's just impossible, because Kurita says you have 14:57:47 14:57:50 14:57:55 14:57:57 14:58:01 14:58:04 14:58:07

to have collimating lenses. Lemoff doesn't even talk about collimating lenses, doesn't even come up with the idea of collimating lenses. In fact, if you tried to implement collimating lenses into Lemoff, probably wouldn't work. You don't have the size big enough to do it. 14:58:11 14:58:13 14:58:13 14:58:16 14:58:19 14:58:22

Lemoff is trying to work away from that, because it's the goal of Lemoff to get rid of the MUX, get rid of the optical combiner. And certainly both Lemoff and Kurita themselves, they don't even teach a pre-aligned fiber connector with an endstop. And so it doesn't even come close to addressing what is being taught in the '416, even if you tried to combine them somehow. 14:58:23 14:58:26 14:58:30 14:58:33 14:58:37 14:58:41 14:58:46 14:58:51

Q Okay. You mentioned a couple of times comments relating to the size of the Kurita device. Does Kurita teach the size of optical components? 14:58:52 14:58:55 14:58:57

A Kurita does give a person of ordinary skill in the art a really good idea of the size. 14:59:05 14:59:08

Now, I'm a person of ordinary skill in the art, and if I wanted to implement Kurita, then I would look at Figures 1, 2 and 3, which is the key 14:59:11 14:59:13 14:59:19

figures of Kurita, and I would see that you have free space connection between the laser array and the lens array, and there's free space between the lens array and the lens, and there's more free space between the lens and the fiber. And that's going to take a lot of space for Figure 1, Figure 2 and Figure 3. 14:59:25 14:59:28 14:59:32 14:59:36 14:59:39 14:59:41 14:59:45

And you can implement that on an optical bench, as opposing expert has shown in the photograph on his website, that's an optical bench in paragraph 12 of my supplemental report, and you can see it's going to be huge. You're going to have to bolt the laser array on one of those black columns down to the metal bench. And then at some distance away, probably two, three, four, five inches away, you're going to have to bolt the lens array to the lines. 14:59:45 14:59:48 14:59:50 14:59:53 14:59:56 14:59:58 15:00:02 15:00:05 15:00:09 15:00:12

And you can look in that image of opposing expert's optical bench, in the top right-hand corner you can see lenses, you can see lenses on black columns that have been bolted to the bench. And then you're going to have to put the fiber in an XYZ 15:00:13 15:00:16 15:00:18 15:00:21 15:00:23

translation stage. It definitely is not going to be pre-aligned. It's definitely not going to be passive aligned. You're going to have to actively align those nine lasers with nine lenses that go through the lens onto an optical fiber, and that's going to take hours. 15:00:29 15:00:34 15:00:34 15:00:36 15:00:37 15:00:39

So as a POSITA looking at Kurita, it's very difficult to implement, and it's going to be much, much bigger than Lemoff. 15:00:41 15:00:44 15:00:47

Q You used the range four or five inches away in your response. How do you know that it would have to be four or five inches away? 15:00:50 15:00:54 15:00:58

A Well, I gave that as a -- as a working number. You can look, take a look at the image that the opposing expert has on their optical bench. So let's go to paragraph 12, and if we look at that really closely, you can see an optical experiment setup, and you can see in the top right-hand corner all the optical components on black columns, and they're all positioned it could be a couple inches, could be three inches, some of them are four or five inches. But generally, they're all positioned in 15:01:01 15:01:05 15:01:12 15:01:16 15:01:19 15:01:21 15:01:24 15:01:27 15:01:30 15:01:33

the inches column, not in the microns column. 15:01:36

And so you can see that optical 15:01:41

experiment, I will admit it may not be the same 15:01:43

experiment as Kurita, but that's typically how an 15:01:46

optical bench works. 15:01:50

And so yes, I will agree with you I don't 15:01:52

have an actual number for four, five inches, but 15:01:52

this is typically what it looks like in an optical 15:01:55

bench. 15:01:59

Q So your estimate is based on the lab 15:01:59

workbench that you had a photograph of in paragraph 15:02:03

12 from Dr. Willner, correct? 15:02:05

MS. RICHEY: Objection. Form. 15:02:10

A So the answer I gave of the amount of free 15:02:11

space between the components certainly can change. 15:02:14

They certainly on the record gave a number of four 15:02:17

to five inches as an example. I've certainly on 15:02:20

record shown that's typically how optical benches 15:02:21

are setup. 15:02:25

I mean, obviously, there is a different 15:02:26

range of spacing between components. You can see 15:02:27

from the image in paragraph 12 of my supplemental 15:02:30

report, if you've got an optical bench setup, then things are spread out quite far apart. 15:02:34 15:02:38

And so the question on the table is, is could they be closer together? Yes, they could. But if you put this on an optical bench, you're going to have to space these parts apart and align them actively, which is not even close to what the '416 is teaching in terms of what an optical combiner is as construed in paragraph 59 of my first declaration. 15:02:41 15:02:44 15:02:46 15:02:49 15:02:53 15:02:57 15:02:58 15:03:01

Q So this seems to presuppose we're talking about an optical bench. If you were to implement the device of Kurita with a housing or with packaging, could you use smaller components? 15:03:02 15:03:05 15:03:08 15:03:10

MS. RICHEY: Objection. Form. 15:03:14

A Well, the whole goal of Kurita is to reduce the number of optical components. So instead of using individual components like in LaMarche that uses individual components, Kurita actually uses nine lasers on a semiconductor chip. And so Kurita is teaching that that is the essence of the prior art, that is the essence of his invention or her 15:03:26 15:03:28 15:03:33 15:03:36 15:03:39 15:03:43 15:03:47

invention is that instead of using nine lasers, as indicated in Figure 4 and Figure 5, which is what the prior art was doing. 15:03:50 15:03:53 15:03:57

Well, Kurita, Kurita is saying you know what, I can get nine lasers on one semiconductor chip and then I'm happy. Kurita does not teach anything like the '416 teaches, does not teach an optical combiner as construed in paragraph 59 of my first declaration, not even close to it. 15:04:00 15:04:01 15:04:05 15:04:09 15:04:13 15:04:16

Kurita just wants to integrate lasers on a chip and still use his free space, which is not an integrated solution. 15:04:18 15:04:21 15:04:25

Q I understand your comment about optical combiner. That's not my question here. 15:04:26 15:04:29

My question is if a POSITA were implementing the device of Kurita in a housing or packaging, could they utilize smaller components for the optical components than what you just described? 15:04:31 15:04:33 15:04:36 15:04:40

MS. RICHEY: Objection. Form. 15:04:43

A I don't know the answer to that question. I haven't done the experiment. But if I was going to do the experiment, I would set it up on an 15:04:46 15:04:48 15:04:51

optical bench and I would use optical bench components, as indicated by the opposing expert in the opposing expert's optical bench, which is a typical scenario to set that up. 15:04:55 15:04:59 15:05:01 15:05:04

And as I've just indicated on record, Kurita doesn't teach anything about miniaturization, just teaches that you can reduce the component count by putting more lasers on a chip and more lenses on a chip. Kurita doesn't teach anything about size or miniaturization. It's only concerned with actually doing reducing component count. 15:05:06 15:05:09 15:05:12 15:05:15 15:05:19 15:05:24 15:05:26

And so I would actually implement that on an optical bench. Whether lens 30 could be small or large depends on how the setup of the optical train or the optical path is between laser and fiber. But certainly this is a lab test I would set up. 15:05:28 15:05:31 15:05:37 15:05:41 15:05:44

Q Now, if a POSITA wanted to implement the Kurita devices as a commercial system, would a POSITA still use an optical bench? 15:05:47 15:05:51 15:05:54

MS. RICHEY: Objection. Form. 15:05:59

A If somebody wanted to commercialize the Kurita invention, they've got to figure out how much 15:06:06 15:06:09

time they want to dedicate to active alignment. So they couldn't actually commercially -- it would be commercially impractical, both from the size and from the fact that everything has to be actively aligned. There's no teaching in Kurita of how to get the cost out of it other than reducing the component count. 15:06:13 15:06:17 15:06:18 15:06:21 15:06:23 15:06:27 15:06:30

Kurita doesn't teach what the '416 patent teaches. Kurita doesn't teach the fact that the fiber is pre-aligned and passively aligned in a single ferrule. Kurita doesn't teach that the optical subassembly, as I've construed in paragraph 59, of optical components multiplex light from different wavelengths that includes an integrated, pre-aligned connector with a stop to hold a single fiber cable. 15:06:31 15:06:33 15:06:37 15:06:42 15:06:47 15:06:51 15:06:54 15:06:57 15:06:59

If somebody wanted to try and commercialize this -- I don't think it's ever been done because it's a free space system -- they could try, but the cost of actively aligning all those parts is going to be prohibitive. And Kurita doesn't teach anything that will make it 15:07:00 15:07:02 15:07:04 15:07:07 15:07:10 15:07:14

commercially practical at this point. 15:07:16

Q Now, if a POSITA were worried about the cost of actually aligning the components and implementing the commercial system, could they passively align the components, as we saw was an option in a POSITA's toolkit earlier? 15:07:18 15:07:21 15:07:24 15:07:26 15:07:30

MS. RICHEY: Objection. Form. 15:07:35

A There's no teaching of Kurita to actually address the passive alignment of optical components. And I would agree with you on the point that would an engineer, at the time of the invention of the '416, have passive alignment as a tool in the toolbox, as well as active alignment, just like myself, yes. 15:07:36 15:07:38 15:07:42 15:07:45 15:07:50 15:07:53 15:07:56

But Kurita doesn't teach an integrated subassembly of optical components, as construed by the '416, called an optical combiner to multiplex or wavelength division multiplex light in different wavelengths that includes an integrated pre-aligned connector with a stop to hold a single fiber optic cable. Kurita doesn't teach any of this, and it's not even designed to do that, because as a POSITA, 15:07:57 15:08:01 15:08:04 15:08:09 15:08:12 15:08:15 15:08:19 15:08:23

when I look at Kurita, I would implement this onto an optical lab bench. 15:08:25 15:08:28

Q Now, in paragraph 1 of Kurita, and we can turn to Exhibit 1004 at paragraph 1 if that's helpful to you, Kurita discloses that its optical arrangement can be used to input laser light into optical fibers that are used with multistage switching networks inside optical computers and switchboards, and with optical communication laser processing, et cetera. 15:08:33 15:08:37 15:08:42 15:08:46 15:08:49 15:08:52 15:08:55 15:08:59

So would a POSITA understand that the disclosed optical arrangement that is used inside with multistage switching networks inside optical computers are really limited to being implemented on an optical workbench? 15:09:01 15:09:03 15:09:07 15:09:12 15:09:15

A So let's take the term in paragraph 1 of Kurita on optical computers. When I was at Bell Labs, I worked at optical computers on an optical lab bench. 15:09:18 15:09:23 15:09:26 15:09:30

To my knowledge, we don't have optical computers today. They're too big, they're too expensive, they're too bulky, they're difficult to 15:09:31 15:09:33 15:09:37

align optically. 15:09:37

Are people doing research on optical 15:09:41

computers? Yes. But I'm not aware of any optical 15:09:43

computer that is commercially available today. In 15:09:46

fact, optical -- the computers everybody sees today 15:09:48

are actually electronic computers that are 15:09:52

interconnected with optical interconnects. They are 15:09:54

certainly not optical computers. 15:09:57

And when I look at Kurita, I see a design, 15:09:59

at least as a person of ordinary skill in the art in 15:10:02

2003, the 17th of July 2003, this is an optical 15:10:05

computant invention. And as far as I'm aware, from 15:10:10

a commercial standpoint, there's no optical 15:10:14

computers on the marketplace, at least as far as I'm 15:10:17

aware. And so I would automatically look at 15:10:20

implementing this, if I was asked to implement this 15:10:24

on an optical bench as per the opposing expert 15:10:27

witness's lab, which is paragraph -- the image in 15:10:32

paragraph 12 of my supplemental report. 15:10:35

Q I want to pull up Exhibit 1001 now, which 15:10:39

is the '416 patent, Document A. And if we can look 15:10:44

at column 4, line 39, and there are two sentences 15:10:48

here starting with "The collimating lenses 321" and all the way through to "deleted in the interest of brevity." 15:10:57 15:11:01 15:11:04

And while that comes up, the patent here states that "The collimating lenses 321 through 324 are preferably molded into a single but separate monolithic block of molded material so that the combiner 310 includes two separate molded optics. The focusing lens 350 is supported in its position shown in Figure 10 by means known to those skilled in the art which are deleted in interest of brevity." 15:11:07 15:11:09 15:11:13 15:11:19 15:11:19 15:11:24 15:11:26 15:11:29 15:11:33

Do you see that? 15:11:34

A I do see that. 15:11:34

MS. RICHEY: Can I just interrupt for a second? Sorry, you have a question pending, we'll let you finish. But we did switch to another reference. It's 12:11 here. So maybe it's a good time to break for lunch, just -- 15:11:35 15:11:37 15:11:39 15:11:42 15:11:46

MR. RAWLS: I just have a couple questions here and then I thought it would be a good time to break. 15:11:48 15:11:50 15:11:53

MS. RICHEY: Okay. 15:11:53

A Could you repeat the question, please? 15:11:55

Q Sure. So I had read the two sentences 15:11:58
starting at column 4, line 39, from the patent that 15:12:02
are up, and I just asked if you saw those. 15:12:06

A Yes, I saw those. 15:12:09

Q Okay. Now, what are some of the means 15:12:11
known to those skilled in the art by which focusing 15:12:13
on 350 may be supported in its position shown in 15:12:16
Figure 10? 15:12:20

A So when I look at column 4, lines 35 to 15:12:22
53, which describe Figures 10 and 11 of the '416 15:12:29
patent, what I see as a person of ordinary skill in 15:12:33
the art is some of the details of the optical 15:12:37
subassembly. But as the inventors indicate, because 15:12:45
of brevity, they haven't shown the complete exploded 15:12:51
diagram of everything. 15:12:55

But what I have to do is, as a person of 15:12:56
ordinary skill in the art, I look through the 15:12:59
figures and the specification that's being taught in 15:13:01
the '416 from Figure 1 to Figure 9 included, and 15:13:04
that tells me that while only part of the exploded 15:13:08

figure was shown in Figure 10 and 11, I understand that the optical combiner as construed in paragraph 59 of my first declaration, which is an integrated subassembly of optical components, it actually multiplex, wavelengths division multiplex light of different wavelengths and include an integrated, pre-aligned connector with a stop to hold a single fiber optic cable is all part of the preferred embodiment. 15:13:13 15:13:17 15:13:21 15:13:24 15:13:28 15:13:33 15:13:37 15:13:39 15:13:43

But I would agree with you that in Figure 10 and Figure 11 that that part of the optical combiner is not shown, and that's what I believe the inventors meant when they said in the interest of brevity they didn't need to complicate Figures 10 and 11 with all the other things that have already been taught in the patent in Figures 1 to 9, and so that's what I see. 15:13:44 15:13:47 15:13:51 15:13:53 15:13:57 15:14:02 15:14:05 15:14:09

There's no need to have overly complexed optical combiner integrated assembly figures, because the key essence here is, is where does the light go and how does the light get into the fiber, and that's what's shown in Figure 10 and 11. 15:14:10 15:14:13 15:14:19 15:14:24 15:14:26

Q When you say that part of the optical combiner is not shown, referring to Figure 10, what part of the optical combiner are you talking about? 15:14:29 15:14:31 15:14:35

A So if we look at Figure 10, and we look at 310, and 310 is shown generally, which means it doesn't show all the exploded diagram of an optical combiner, and it certainly doesn't show the pre-aligned integrated, pre-aligned connector with the stop to hold a single fiber optic cable. That's not shown in Figure 10 or Figure 11. 15:14:48 15:14:51 15:14:57 15:15:03 15:15:07 15:15:11 15:15:14

And also, lens 350 on both Figure 10 and Figure 11, that's only shown as basically in the optical path, but it's certainly not shown as an integrated assembly of optical components because it's already been taught in Figures 1 -- Figures 1 to Figure 9 in the '416 patent. 15:15:17 15:15:21 15:15:25 15:15:29 15:15:31 15:15:35

So as a person of ordinary skill in the art, that level of detail was not necessary in Figures 10 and 11 clearly understand the essence of the invention and the preferred embodiments, in this case Figures 10 and 11 showing the fourth embodiment of the invention. 15:15:38 15:15:40 15:15:43 15:15:46 15:15:50 15:15:53

Q And so how -- just to make sure I understand, how would focusing lens 350 be supported in its position in this embodiment? 15:15:55 15:15:58 15:16:01

MS. RICHEY: Objection. Form. 15:16:04

A So focusing lens 350, as indicated in column 4, lines 35 to 53, is being taught to be part of an optical combiner, is taught to be part of an integrated subassembly of optical components that multiplex different wavelengths of light, and that includes, which is not shown, an integrated pre-aligned connector with a stop to hold a single fiber optic cable. 15:16:06 15:16:10 15:16:16 15:16:20 15:16:24 15:16:28 15:16:31 15:16:35

So if we look at the figures in the earlier part of the patent, which are Figures 1, Figures 2, Figures 3, Figures 4, Figures 5, Figures 6, these all show the essence of the optical combiner. And even though in Figures 10 and 11, because of brevity, as indicated by the inventors in line 45 of column 4, there's no need to show all that, because as a person of ordinary skill in the art on the 17th of July 2003, I would have understood, and I still understand today, that the 15:16:38 15:16:39 15:16:42 15:16:44 15:16:48 15:16:53 15:16:57 15:17:00 15:17:03 15:17:08

'416 patent teaches those parts of the optical subassembly or the optical combiner as construed in paragraph 59 of my first declaration, that knowledge is already there, so there's no need to actually show it in detail in the figures. 15:17:12 15:17:15 15:17:20 15:17:24 15:17:26

And in fact, you know, a lot of patent specifications can have embodiments where there are no figures, you don't have to have a figure. And even if the figures don't show everything, there's no need for the figures to show everything, because as a POSITA, I already understand how lens 350 is positioned correctly in the optical path to do the function of the optical combiner. 15:17:29 15:17:32 15:17:35 15:17:38 15:17:41 15:17:44 15:17:48 15:17:51

Q Now, the embodiment of Figure 10 was a two-piece embodiment and the focusing lens 350 was separated -- or was supported in its position by means known to those skilled in the art, would those means known to those skilled in the art be available to support the optical components in Kurita? 15:17:54 15:17:58 15:18:02 15:18:05 15:18:08 15:18:10

MS. RICHEY: Objection. Form. 15:18:14

A So a POSITA looking at the '416 patent and looking at the integrated optical combiner as 15:22:32 15:22:35

construed in paragraph 59 of my declaration, a POSITA would not look to the system designed in Kurita because it discloses an optical system comprising of separate components that must be manually aligned and more costly and too large in size. 15:22:39 15:22:43 15:22:46 15:22:51 15:22:53 15:22:57

Kurita, further, doesn't disclose any teaching integrating its optical components into a single subassembly. And so as a POSITA, a POSITA wouldn't even think about doing what you're suggesting in your question because it's a system that's designed for an optical computer and it's a system that's designed for an optical bench. 15:22:57 15:23:00 15:23:03 15:23:07 15:23:11 15:23:15 15:23:18

Now, hypothetically, could an expert or a POSITA implement what the '416 teaches into Kurita? I don't know the answer to that. But what I do know is, is the optical system is different, and it certainly doesn't have a passive alignment connector for a fiber with an end step. 15:23:21 15:23:25 15:23:30 15:23:33 15:23:36 15:23:39

And so I don't believe that Kurita teaches anything that would actually allow a POSITA to even try and emulate what's already been taught in the 15:23:42 15:23:46 15:23:50

'416 patent. 15:23:54

MR. RAWLS: Okay. We can go off the record and take a break here. 15:23:57 15:23:59

THE VIDEOGRAPHER: We are going off the record at 3:24. 15:24:03 15:24:04

(Recess 3:24 p.m. - 4:13 p.m.) 15:24:06

THE VIDEOGRAPHER: We are back on the record at 4:13. 16:13:36 16:13:40

BY MR. RAWLS: 16:13:43

Q So, Dr. Lebby, in connection with your declarations in this case, you reviewed the laboratory notebooks that were disclosed in the prosecution history of the '416 patent, correct? 16:13:46 16:13:49 16:13:52 16:13:55

A I believe that is correct. And under my first declaration from paragraph 360 to 381 is I believe where I reviewed them. 16:14:07 16:14:09 16:14:15

Q And in particular, and I think maybe in that section you just cited, you have an opinion that the inventors conceived of each and every claim limitation by July 17th, 2003, correct? 16:14:17 16:14:22 16:14:24 16:14:28

A Yeah, what I did in paragraphs 360 to 381 of my first declaration is aligned the inventors' 16:14:36 16:14:41

notebook entries with at least the elements of Claim 1, probably that is correct. 16:14:45 16:14:52

Q Okay. And so I want to look at -- look at that. I think it's a table format in that section. So, for example, on pages 122 to 123, under the preamble of Claim 1 you cite to one page of the prosecution history which shows some handwritten notes and a side view diagram. Is that correct? 16:14:56 16:14:59 16:15:04 16:15:11 16:15:15 16:15:19

A The first element I do show entry from Exhibit 1002, page 79, and certainly there's two figures for the first claim element, if that's your question you're asking, on page 122 and 123 of my first declaration. 16:15:30 16:15:35 16:15:41 16:15:44 16:15:47

Q Right. Just to make sure I'm looking at the same thing, so for the claim preamble I believe it's just one figure, the side view, and then underneath it for the plurality of collimating lenses there's a separate figure. Is that what you mean? 16:15:55 16:15:58 16:16:00 16:16:04 16:16:08 16:16:10

A So for the preamble it looks like I put in two figures from the inventors' notebook, one is on page 122 and one is on the top of page 123. 16:16:33 16:16:37 16:16:42

Q Okay. I think I understood. When you say two figures, the first one is the handwritten notes on page 122, correct? 16:16:48 16:16:51 16:16:54

A Well, the inventors' notebook is handwritten, so on page 122 there's a handwritten note, and on the top of page 123 is a handwritten note, and both of those are in the table under the preamble of the Claim 1, as far as I'm aware. 16:16:58 16:17:02 16:17:05 16:17:08 16:17:13

Q Okay. I think I'm following what you're saying. And so on page 123 under a plurality of n collimating lenses, you cite another page of the prosecution history, and that shows a different diagram, correct? 16:17:18 16:17:21 16:17:29 16:17:32 16:17:34

A Underneath the next section of the claim element, which is the first claim element that begins "a plurality of collimating lenses," I've actually cited one inventors' notebook entry on the bottom of page 123 of my first declaration, and also another figure on the top of page 124 of my first declaration. 16:17:36 16:17:42 16:17:44 16:17:48 16:17:53 16:17:57 16:18:02

Q Correct. And so focusing on the figure on page 123 first, is this diagram showing the same 16:18:04 16:18:08

device that we saw above it on page 123 that was labeled "side view"? 16:18:13 16:18:18

A So what you have to do is you have to look at all the entries of the notebook to really understand what the invention is. You can't just piecemeal it out like you're trying to do here. You have to look at all the entries, which I've already indicated on record. 16:18:30 16:18:32 16:18:35 16:18:38 16:18:41 16:18:44

So if we look to the entries of the inventor notebook from paragraph 360 to 381, you've got a number of different figures that have been hand-drawn, including one on page 125, which I believe is computer modeled, and so you have to look at all of them. 16:18:44 16:18:46 16:18:50 16:18:55 16:18:58 16:19:00

So I don't know if I can answer your question by looking at things individually, when you put them all together and then you get the invention of the '416. 16:19:01 16:19:03 16:19:06 16:19:09

Q Well, however it helps you to look at them I think is fine, Dr. Lebby. I'm just asking are they generally referring to the same device? 16:19:10 16:19:13 16:19:16

MS. RICHEY: Objection. Form. 16:19:22

A All these figures from the inventors' notebook that have been written in hand, with the exception of the one on page 125 in my first declaration, enable the invention and for the 17th of July 2003. 16:19:24 16:19:28 16:19:31 16:19:37 16:19:43

So as I look at all these entries, and then I see the invention of the '416, your question is, is do you see the invention, just one of them. Well, you have to look at all of them, not just one of them. 16:19:44 16:19:47 16:19:50 16:19:54 16:19:56

Q I'm not sure that's my question. So I'll try to ask it a little bit more carefully so you can understand better. 16:19:57 16:20:00 16:20:03

I'm asking if looking at these figures that you cited in support of Claim 1 in the dependent claims also, is it showing one device, or are there -- in other words, do the figures line up as showing the same device, or are they showing different things? 16:20:04 16:20:07 16:20:11 16:20:16 16:20:18 16:20:22

MS. RICHEY: Objection. Form. 16:20:22

A The figures from paragraph 360 to 381 of my first declaration show the '416 invention, and 16:20:27 16:20:31

they show what the inventors entered into their logbook. As you can see, there's different parts of the pages that are copied out. But if you put all the figures together, then you get the invention of '416. 16:20:35 16:20:38 16:20:43 16:20:45 16:20:48

So I don't know what your question is about individual figures. You've got to look at all of them and then you get the invention. This is what I did and this is my understanding. Some of these are hand-drawn and others are not hand-drawn. It looks like they have been computer-generated, like, for example, the one on 125, where you put them all together and you get the invention of the '416. 16:20:49 16:20:52 16:20:54 16:20:57 16:20:59 16:21:03 16:21:05 16:21:09 16:21:12

So in conclusion, I believe the conception date of the 17th of July 2003 is correct, and the '416 is enabled to that priority date and is enabled. 16:21:13 16:21:15 16:21:19 16:21:23

Q Is there a reason you put only some of the figures for asserting claim elements? 16:21:25 16:21:28

MS. RICHEY: Objection. Form. 16:21:31

A I believe I put enough figures in my 16:21:33

document to support my opinion that this patent is enabled as of the priority date of the 17th of July 2003, and I've indicated that in my first declaration from paragraph 360 to 381. 16:21:36 16:21:40 16:21:43 16:21:48

Q Okay. And on page 124, at the top we see a citation to Exhibit 1002 at page 126, and on the left there's an image that looks like it has above it 2D VSCEL array. Do you see that? 16:21:51 16:21:59 16:22:03 16:22:07

A I do see that. 16:22:13

Q What does that mean, 2D VSCEL array? 16:22:14

MS. RICHEY: Objection. Form. 16:22:19

A So when I look at all these figures I put in my first declaration from paragraph 360 to 381, I entered all the entries that I thought would be appropriate to enable the '416 patent for the priority date of the 17th of July 2003. 16:22:24 16:22:28 16:22:34 16:22:37 16:22:40

Your question pertains to a notation on the top of page 124. 2D generally refers to is two-dimensional, and VCSEL typically refers to vertical-cavity surface-emitting laser, and array is an array, and what you can see there is an array of four lasers. 16:22:44 16:22:47 16:22:54 16:22:59 16:23:02 16:23:05

Q It shows, in particular, a two-by-two array of four lasers, correct? 16:23:06 16:23:09

A So the handwritten notes that are in my first declaration on a number of different figures from paragraph 360 to 381 show when you put all the figures together, is the invention of the '416. 16:23:17 16:23:23 16:23:25 16:23:30

What we're talking about here is the figure on the top of page 124, there is a notation that as 2D VCSEL array, that stands for two-dimensional vertical-cavity surface emitting laser array. It certainly looks like the inventors were thinking about an array of four lasers. They're certainly arranged in a two-by-two format, and there are Greek signs by each laser, lambda 1, lambda 2, lambda 3 and lambda 4, it's the Greek sign for L, and those represent different wavelengths. 16:23:33 16:23:35 16:23:40 16:23:45 16:23:49 16:23:52 16:23:55 16:23:59 16:24:06 16:24:07

So this indicates to me that the '416 invention is an invention that, you know, includes an optical combiner, which I've construed on page 59 of this document -- sorry, paragraph 59 of this document, and it also shows the wavelength of light coming out of each laser is actually different. 16:24:10 16:24:14 16:24:17 16:24:22 16:24:26 16:24:30

And so it does tell me, as a person of ordinary skill in the art, that the '416 invention, as described by the figures from paragraph 360 to 381, does depict an optical subassembly utilized for wavelength division multiplexing, as well as, as you see from page 125, we have an integrated pre-aligned connector with a stop to hold a single fiber optic cable. 16:24:33 16:24:35 16:24:39 16:24:44 16:24:48 16:24:52 16:25:03 16:25:03

And so what we have here in total, as per my paragraph 59, is an integrated subassembly of optical components that are used for multiplexing light of different wavelengths as indicated by lambda 1, lambda 2, lambda 3, lambda 4, that is coming out of this particular style of semiconductor laser. 16:25:07 16:25:10 16:25:13 16:25:17 16:25:22 16:25:22 16:25:26

Q And that was with respect to the figure on the left. If we look at the one next to it on the right, underneath there's a handwritten note that appears to say "2D lens array." Do you see that? 16:25:26 16:25:28 16:25:31 16:25:34

A I do see that. 16:25:38

Q Does that show a two-by-two array of -- sorry, a two-by-two array of collimating lenses? 16:25:39 16:25:44

A Certainly the label for the figure on the top of 124 says by the inventors' handwriting "2D lens array," I would understand that to be a two-dimensional lens array. And certainly from the depiction in the picture, it looks like a two-by-two array of optical lenses. 16:25:50 16:25:53 16:25:59 16:26:02 16:26:05 16:26:10

But this has to be put in context with all the other figures as I've shown by the inventors' notebook from paragraph 360 to 381 in my first declaration that look at what the inventors were doing in terms of forming the invention of the '416, and I'm happy to report that I believe the invention is enabled as of the priority date of the 17th of July 2003. 16:26:12 16:26:16 16:26:21 16:26:25 16:26:28 16:26:32 16:26:37 16:26:42

Q And so in particular because those two images we looked at are listed under the claim element on page 13 that says "a plurality of n collimating lenses," among other things you cite, those two images support the conception of that claim element, correct? 16:26:42 16:26:45 16:26:49 16:26:54 16:26:56 16:27:00

A So not only that figure supports the conception of that claim element, the figures in 16:27:03 16:27:06

total from paragraphs 360 to 381 of my first declaration that have a number of different figures, if you put them all together, they support at least Claim 1, which is the table I've looked at, both through computerized images, for example, on page 125, as well as hand-drawn images on the other pages, and they enable the '416 invention and the priority date of the 17th of July 2003. 16:27:09 16:27:12 16:27:16 16:27:19 16:27:22 16:27:27 16:27:30 16:27:37

Q Okay. And on page 124 and 125 under the focusing means element there are two diagrams. The first is cited -- citing the prosecution history at page 79, I believe is a cropped or zoomed-in view of the side view that you had provided earlier. Is that correct? 16:27:40 16:27:44 16:27:49 16:27:53 16:27:59 16:28:08

A Certainly the figure I've used on the bottom of page 124 looks like an enlargement of the figure I've used on the top of page 123, and certainly is the right-hand side of that figure, so I would agree with you on that. 16:28:08 16:28:11 16:28:15 16:28:18 16:28:20

Q And then the second looks like it may be a computer-generated drawing. Is that correct? 16:28:22 16:28:25

A The figure I cited from the inventors on 16:28:27

page 125 certainly looks like a computer-generated drawing, I would assume that. But equally, it could have been done by hand, but it is my understanding it was computer-generated on the 17th of July 2003. And when I look at all these inventor entries, they have to be put together to form and enable the '416 invention and the priority date of the 17th of July 2003. 16:28:31 16:28:35 16:28:37 16:28:41 16:28:46 16:28:53 16:28:58 16:29:01

Q And in particular, under focusing means element, there's a requirement that said focusing means having n separate radial sectors on the surface. And is it your opinion that the conception of that element is shown in this table on pages 124 and 125? 16:29:02 16:29:07 16:29:10 16:29:13 16:29:15 16:29:19

A So the quick answer to that question is, is absolutely. If you look at Figure 125, you have, as I've indicated on paragraph 59, which actually construes the optical combiner, you have an integrated subassembly of optical components, they're certainly for multiplexing light of different wavelengths, which is included on page 24. We just established that on record. 16:29:23 16:29:34 16:29:38 16:29:42 16:29:46 16:29:50 16:29:54 16:29:58

It also includes on page 125 an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. And it certainly looks like that integrated, pre-aligned connector is actually cylinder-like. And so when I look at that on page 125, I certainly see that it can support the claim element of radial sectors, and it's certainly a radial design. 16:29:59 16:30:03 16:30:06 16:30:10 16:30:16 16:30:19 16:30:24 16:30:28

And so I don't see any issue with the alignment of the figures on page 124 and the figures on page 125 that support the claim element in the table I produced on page 124. And I also see that this enables the '416 patent to its priority date of the 17th of July 2003. 16:30:29 16:30:32 16:30:37 16:30:43 16:30:48 16:30:53

Q And so based on what we're seeing here then, this is an example of a device that has a two-by-two array of lasers and a two-by-two array of collimating lenses that results in the focusing means having n separate radial sectors on its surface, correct? 16:30:54 16:30:56 16:30:59 16:31:03 16:31:07 16:31:11

A So what we see in paragraph 360 to 381 of my first declaration is an embodiment of the 16:31:12 16:31:16

invention that supports the claims. An embodiment of the invention certainly is entitled to the priority date of the 17th of July 2003. And in this embodiment, certainly the inventors drew an embodiment with four lasers and four lenses. And certainly from my standpoint the lasers are putting out different wavelengths, so they actually enable wavelengths division multiplexing. 16:31:20 16:31:24 16:31:27 16:31:31 16:31:36 16:31:39 16:31:42 16:31:46

And so this integrated subassembly of optical components includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. And the preferred embodiment has four lasers and four lenses, but it's not limited to that. It could be more, it could be less. 16:31:48 16:31:51 16:31:57 16:32:00 16:32:05 16:32:09

But certainly I'm comfortable with what I've seen from the inventors' notebook to enable this invention. 16:32:10 16:32:12 16:32:16

Q Okay. And if we look at Claim 2 of the '416 patent for a moment, Claim 2, and let me know if you need it pulled up on the screen, but I can read it for you also while you pull it up. 16:32:18 16:32:22 16:32:26 16:32:28

Claim 2 requires that said four lasers and 16:32:31

four collimating lenses are each formed in a two-dimensional two-by-two array. Do you see that? 16:32:34 16:32:39

A I do see that. 16:32:41

Q Do any of the figures of the '416 patent support Claim 2's requirement that the lasers and collimating lenses are formed in a two-dimensional two-by-two array? 16:32:42 16:32:45 16:32:50 16:32:50

A Claim 2 of the '416 patent is dependent on Claim 1. Claim 1 has the value of n, and n is not given an integer, so n could be any integer number. Claim 2, which is dependent on 1, n is given a value of 4, where there are in Claim 2 four lasers and four collimating lenses that are formed in a two-dimensional array. 16:33:11 16:33:14 16:33:25 16:33:30 16:33:34 16:33:37 16:33:40

If I look at the figures from 360 to 381, I see, for example, four lasers. I see a two-dimensional two-by-two array. So I see that this '416 patent is enabled through the inventors' notebooks on the 17th of July 2003. 16:33:42 16:33:45 16:33:49 16:33:53 16:33:57

Q Okay. And if we could look at the patent in the column 3, lines 45 to 49, that says, "The invention is usable with n lasers and n collimating 16:34:00 16:34:05 16:34:09

lenses. The embodiment shown on Figures 1 through 4 illustrates the case of n equals 4. Furthermore, Figures 1 through 4 utilize a two-dimensional two-by-two array of input lasers as well as collimating lenses." 16:34:13 16:34:16 16:34:20 16:34:23 16:34:26

Do you see that? 16:34:29

A Yes, I do see that. 16:34:29

Q And looking at Figure 4, are the collimating lenses shown in Figure 4 formed in a two-by-two array? 16:34:30 16:34:34 16:34:39

A Figure 4 of the '416 patent is a cross-sectional isometric side view of the optical combiner that is dictated and taught in Figures 1 to 3. In Figures 1 to 3 it certainly looks like there's a two-by-two array of lenses, I think they are labeled 21, 22, 23 and 24. 16:35:09 16:35:12 16:35:15 16:35:19 16:35:24 16:35:28

But column 3 of the '416 also says there are other embodiments that could have n lasers and n collimating lenses. So it's not necessarily limited to the case of n equals 4; n could be another integer number, which is given through the claims as Claim 2 is dependent on Claim 1, Claim 2 says n 16:35:32 16:35:36 16:35:40 16:35:43 16:35:47 16:35:50

equals 4, and in Claim 1 there's no integer number 2 n. And so I see this as just one embodiment of the invention where n can vary. 16:35:54 16:35:59 16:36:03

Q And the focusing lens that's shown in Figure 4 meets the requirement of Claim 1 of said focusing means having n separate radial sectors on its surface. Is that correct? 16:36:05 16:36:08 16:36:12 16:36:15

A I certainly see the design of the '416 optical combiner as an integrated subassembly of optical components for multiplexing light in different wavelengths, and includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable certainly enabled through the claims. And I certainly see that through the specification and the figures, and especially the inventors' notebook figures from paragraph 360 to 381 of my first declaration. 16:36:27 16:36:34 16:36:39 16:36:42 16:36:45 16:36:48 16:36:50 16:36:54 16:36:59 16:37:03

So the answer is yes. 16:37:05

Q And just to be clear, the answer is yes that Figure 4 meets the specific requirements said focusing means having n separate radial sectors on its surface? 16:37:06 16:37:10 16:37:14 16:37:18

MS. RICHEY: Object to form. And actually, I objected to the last question, but I was on mute, so... 16:37:18 16:37:20 16:37:23

A When I look at the '416 patent and I look at the figures and I look at the spec and I look at the claims, I see that everything is enabled, and this patent is entitled to a priority date of the 17th of July 2003. 16:37:35 16:37:39 16:37:42 16:37:44 16:37:47

I certainly have detailed the inventors' notebook entries from paragraph 360 to 381, and I am comfortable that this invention is enabled. 16:37:49 16:37:53 16:37:57

I think your question pertains to just the Figure 4. Well, I have to look at not just the Figure 4, I have to look at all the figures. And, clearly, if you read the spec on 3, lines 45 to 50, says Figure 4 is based on Figures 1 to 3. 16:38:00 16:38:03 16:38:07 16:38:10 16:38:15

So as a person of ordinary skill in the art, I'm not only looking at Figure 4, I'm looking at the other figures. I'm looking at what the spec says in terms of a preferred embodiment, as well as other embodiments, and I'm also looking at the claims, and I'm quite comfortable about it. 16:38:19 16:38:21 16:38:25 16:38:28 16:38:31 16:38:34

Q Okay. So I think the answer is yes, Figure 4 encompassing and also Figures 1 to 3, disclose and show that said focusing means having N separate radial sectors on its surface. Is that correct? 16:38:36 16:38:38 16:38:43 16:38:46 16:38:50

MS. RICHEY: Objection. Form. 16:38:50

A So I just indicated three or four times to a similar question I'm comfortable that this patent is enabled. I'm comfortable that the '416 patent is enabled. I'm comfortable the inventors with their entries on the 17th of July 2003 have enabled the patent with the design that's being taught in the specification, of which some of the figures are shown in the figures from 1 to 11. And in particular, if I look at column 3, lines 45 to 50, is one of the embodiments that is being discussed. 16:38:51 16:38:57 16:39:00 16:39:05 16:39:08 16:39:11 16:39:13 16:39:17 16:39:20 16:39:25

And I'm comfortable that the answer to your question about three questions ago is that this -- this patent, this '416, is enabled with what's written in the claims. 16:39:28 16:39:31 16:39:36 16:39:40

Q Well, I'm glad that you're comfortable with that, Dr. Lebby. You're actually answering a 16:39:42 16:39:44

different question, because I'm not asking is the patent enabled. I'm asking specifically about what Figure 4 shows. 16:39:47 16:39:49 16:39:53

So if you can focus on -- and we can include 1 to 3 with the first embodiment Figures 1 through 4, if that makes you more comfortable. 16:39:54 16:39:57 16:40:00

But for Figures 1 through 4, the first embodiment of the invention, does that show that said focusing means having n separate radial sectors on its surface? 16:40:03 16:40:05 16:40:08 16:40:12

MS. RICHEY: Objection. Form. 16:40:14

A So you're just asking me to look at one figure, which is a perspective figure, and doesn't show all the details of what this invention is. So what you have to do is you have to look at what the specification says and teaches in terms of your question on separate radial sectors on the surface. And I am comfortable that the specification and the claims and the figures that are shown teach me that. 16:40:15 16:40:18 16:40:23 16:40:26 16:40:29 16:40:34 16:40:38 16:40:40

And so I do believe that this patent is enabled, and there is enough teaching in the '416 patent to address your question on separate radial 16:40:43 16:40:47 16:40:52

sectors on the surface. Whether you can actually see that in Figure 4 from the perspective of how it's drawn is up for interpretation. 16:40:54 16:40:56 16:40:59

But I'm certainly, when I look at the specification and what's taught in the patent, I'm comfortable that that issue of separate radial sectors are there, and that's part of the invention, and the invention is enabled, and it's actually rightfully due a priority date of the 17th of July 2003. 16:41:02 16:41:05 16:41:09 16:41:13 16:41:15 16:41:18 16:41:23

Q Okay. Let's move down in column 3 of the '416 patent to lines 54 to 60, and that discusses the second embodiment. It says, "Similar to the embodiment described in Figures 1 through 4, the embodiment shown here utilizes a two-dimensional array of four lenses 121, 122, 123, 124," and it goes on. 16:41:25 16:41:28 16:41:32 16:41:36 16:41:39 16:41:42 16:41:48

Do you see that sentence in column 3, Doctor? 16:41:49 16:41:52

A I do, I do see that. 16:41:53

Q Now, are the collimating lenses in Figure 6 formed in a two-by-two array? 16:41:55 16:41:59

A I don't understand your question. 16:42:11

Q Are the collimating lenses in Figure 6 of the '416 patent formed in a two-by-two array? 16:42:14 16:42:17

MS. RICHEY: Objection. Form. 16:42:21

A Well, Figure 6 shows an isometric cross-sectional view of the second embodiment of Figure 5, and both those show a preferred embodiment as a two-by-two array of lenses 121, 122, 123, and 124. 16:42:31 16:42:37 16:42:40 16:42:44 16:42:51

So I'm not really understanding where your question is coming from. But certainly from my standpoint when I look at the figures and I look at the specification, I see that the '416 patent teaches and enables this -- this integrated subassembly of optical components for WDM and includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable, I see all those factors of this invention enabled. And certainly it should be given its correct priority date of 17th of July 2003. 16:42:51 16:42:54 16:42:57 16:43:00 16:43:03 16:43:08 16:43:13 16:43:17 16:43:20 16:43:23 16:43:26

Q Are the collimating lenses 121 through 124 shown in Figure 6 offset in a radial direction with 16:43:28 16:43:33

respect to the focusing lens 130? 16:43:38

MS. RICHEY: Objection. Form. 16:43:41

A So if you look at the embodiment in Figure 5 and in Figure 6, these are radial embodiments. So we have a radial cylinder to hold a fiber, that cylinder or ferrule has a fiber stop, and that's in a radial design. 16:43:47 16:43:50 16:43:54 16:43:58 16:44:01

And then you've got 110, which is also in a radial design. You have a design here that is two-by-two and that's clearly in a radial design. And so I think that the issues that you're talking about in Claim 1, which is radial sectors and radial design, I think that's absolutely enabled. And I believe that this patent is entitled to its priority date of the 17th of July 2003. 16:44:02 16:44:05 16:44:10 16:44:12 16:44:14 16:44:20 16:44:23 16:44:26

Q Okay. Looking at your first declaration, Exhibit 2003, at paragraph 155, you say that Kurita's optical lenses are integrated in rows and are not integrated in a radial alignment. 16:44:31 16:44:33 16:44:40 16:44:44

Do you see that? 16:44:47

A I do see that. 16:44:48

Q Does the integration of the lenses in 16:44:49

rows, as you state in this paragraph, mean they are not integrated in a radial alignment? 16:44:53 16:44:56

MS. RICHEY: Objection. Form. 16:45:00

A If you look at Figures 1, 2 and 3 of Kurita, as we've already indicated on record, this is an optical bench setup. This is a setup that will go on an optical bench, as per paragraph 12 of my supplemental report, opposing expert's optical bench is shown there in an image, and you can see that this is ideal, this is an optical computing setup for an optical bench, which is, for the most part, commercially impractical. I don't believe there's anything out there today that uses this type of design. 16:45:21 16:45:24 16:45:27 16:45:31 16:45:34 16:45:39 16:45:42 16:45:44 16:45:47 16:45:50 16:45:53

If you look at Figure 1 and Figure 2, this tells a person of ordinary skill in the art there's nothing radial about this design. You've actually got a linear array of lasers, a three-by-three linear array of lasers, and you've got a linear array of optical lenses in item element number 21. This is not a radial design at all. 16:45:54 16:45:57 16:46:00 16:46:03 16:46:07 16:46:11 16:46:14

And so when I look at this as a person of 16:46:18

ordinary skill in the art, I don't see Kurita as a radial design whatsoever. In fact, it's a linear design, and that aligns with -- with many of the designs that you find for laser arrays, they generally are designed in linear row column arrangements, just like I've indicated in my declarations. 16:46:22 16:46:24 16:46:27 16:46:29 16:46:34 16:46:38 16:46:40

Q I want to focus on -- you mentioned Figures 1 and 2 of Kurita. I want to focus on Figure 3 of Kurita right now. Is that okay with you? 16:46:41 16:46:43 16:46:47 16:46:50

MS. RICHEY: Objection. Form. 16:46:50

A When you look at Kurita, I don't believe that's the correct way for a person of ordinary skill in the art to look at Kurita. Certainly Figure 3 has a two-by-two array that looks like it's set up in a linear format or linear arrangement. But you have to put that in context with Figures 1 and 2. And you also have to put that in context that there is no packaging, there's no design of how these things can be put together, other than the fact it goes on an optical bench. 16:46:54 16:46:57 16:46:59 16:47:01 16:47:05 16:47:11 16:47:13 16:47:17 16:47:20 16:47:23

So when you look at Figures 1, 2 and compare that to 3, a person of ordinary skill in the art would look at Figure 3 and say this is not a radial design, this is a linear design, because Figures 1 and 2 show a linear design. 16:47:26 16:47:28 16:47:31 16:47:34 16:47:37

Q So when you say Figure 3 is showing a linear format or linear arrangement, what do you mean by linear format or linear arrangement? 16:47:40 16:47:43 16:47:47

A Figure 3 is a smaller version of Figure 1 and a smaller version of Figure 2. So Figure 3 in terms of the laser chip or the laser array and the lens array are just smaller versions of what has been shown in Figure 1 and Figure 2. 16:47:50 16:47:54 16:47:59 16:48:03 16:48:06

So a person of ordinary skill in the art looking at Kurita would not think of anything radial at all. They actually would look at the three figures and see what Kurita teaches is a linear arrangement of lasers and a linear arrangement of lenses. And certainly there's nothing in Kurita that actually indicates anything is radial at the outset. So somebody like myself looking at Kurita would not even think about a radial solution, 16:48:09 16:48:10 16:48:14 16:48:17 16:48:21 16:48:23 16:48:26 16:48:29 16:48:33

because arrays like this, three-by-three arrays are quite common, and even four-by-four arrays are common. They're done in a linear format, not a radial format. Radial format is very unusual. 16:48:37 16:48:40 16:48:45 16:48:46

Q Are the collimating lenses in the '416 patent embodiments integrated into rows? 16:48:50 16:48:54

A So one of the embodiments in the '416 patent is a two-by-two array, and one could argue a two-by-two array of lasers could be in a linear format just like in Kurita. 16:49:09 16:49:12 16:49:17 16:49:21

But you see the integrated optical subassembly in the '416 patent is readily designed coupled with an integrated ferrule that is also circular. And so if you look at Figures 5 and 6, these are radial design solutions. As you compare this to Kurita, Kurita does have a two-by-two array, but you've got to put that in context with the other figures it teaches, Figure 1 and Figure 2. These are not radial design, these are linear designed, and there doesn't seem to be any type of package that is related -- related to Kurita. In fact, there's nothing. This is an optical bench setup. 16:49:23 16:49:26 16:49:30 16:49:35 16:49:39 16:49:42 16:49:46 16:49:50 16:49:53 16:49:56 16:49:59 16:50:02

There's nothing in Kurita that even indicates anything to a POSITA that this is a radial design. 16:50:05 16:50:08

I will admit a two-by-two can be considered both radial and linear. But you have to also put Kurita in the context of the other two figures, and the other two figures show a linear design, not a radial design. 16:50:11 16:50:14 16:50:17 16:50:21 16:50:24

Q When you say a two-by-two can be considered both radial and linear, what do you mean by that? 16:50:26 16:50:27 16:50:32

A In the '416 patent we have radial design, and we look at Figures 5 and 6, it has a two-by-two array of lenses which we can see in Figures 5 and 6. Those two-by-two array of lenses are in a radial designed integrated optical subassembly that has a subassembly of optical components for multiplexing light in different wavelengths, and that also includes an integrated, pre-aligned connector, which is cylinder-like, which is radial-like, and it has a stop to stop the single fiber optic cable. 16:50:32 16:50:35 16:50:40 16:50:43 16:50:47 16:50:56 16:50:59 16:51:02 16:51:06 16:51:09

And so the optical combiner in the '416 is certainly radially designed. And so the two-by-two 16:51:11 16:51:16

there, I would as a person of ordinary skill in the art see that as not a linear setup, but a radial setup. 16:51:19 16:51:22 16:51:26

Now, comparing to Kurita, which also has a two-by-two chip, that's in a linear setup. You just have to put it in context with Figure 1 and Figure 2. It's not radial at all. There's nothing in Kurita that even indicates to a person of ordinary skill in the art that it is a radial design. It is not. It is a linear design. 16:51:26 16:51:30 16:51:33 16:51:37 16:51:39 16:51:43 16:51:44

Q So looking at Figure 3 of Kurita, the two-by-two example, where do the collimating beams from the two-by-two array 20 column hit from the lens 30? 16:51:50 16:51:54 16:51:59 16:52:07

MS. RICHEY: Objection. Form. 16:52:08

A I didn't hear the question. 16:52:11

Q Sure. So in the two-by-two example of Kurita, which is Figure 3, where do the collimating beams from the two-by-two array, which is reference numeral 20 in Figure 3, where do they impinge on the lens 30 of Figure 3 of Kurita? 16:52:13 16:52:15 16:52:19 16:52:24 16:52:27

MS. RICHEY: Objection. Form. 16:52:30

A I don't understand the question. 16:52:34

Q All right. So the collimating lenses from 16:52:39

the lens array 20 are going to impinge somewhere on 16:52:44

lens 30 in the system of Kurita, correct? 16:52:48

MS. RICHEY: Objection. Form. 16:52:52

A So when you look at Kurita, you can't just 16:52:56

look at Figure 3, you've got to look at Figure 1 and 16:52:58

Figure 2 as well. And so if you look at Figure 1 16:53:02

and Figure 2, you've got a linear array of lasers 16:53:05

that go through a linear array of optics, and the 16:53:10

optical path certainly goes through lens 30, and 16:53:11

then those optical paths get focused onto an optical 16:53:14

fiber 40. That's shown in all three figures, Figure 16:53:20

1, Figure 2, and Figure 3. 16:53:23

Q Okay. Now, let's take each of those in 16:53:25

turn then. So Figure 1, where do the -- where does 16:53:28

the light from the collimating lenses impinge on 16:53:33

lens 30 for each of the lenses? 16:53:38

MS. RICHEY: Objection. Form. 16:53:41

A So Kurita doesn't give a perspective of 16:53:41

the lens like it does with the perspective of 10, 16:53:45

the laser array, that's in an isometric perspective, 16:53:47

and lens array 20 is in an isometric perspective in Figure 1, Figure 2, and Figure 3. 16:53:51 16:53:57

Unfortunately, lens 30 is not drawn in an isometric perspective, so it's not clear what shape that lens is. So given that I don't know what that shape lens is, I have to assume that this is a linear system, and as dictated by the linear laser array and the linear lens array in Figure 1, similarly for Figure 2, and similarly for Figure 3, and so that's how I interpret that, those three figures. 16:53:57 16:54:02 16:54:04 16:54:06 16:54:10 16:54:14 16:54:18 16:54:21 16:54:21

And so I can't really answer your question because it's not -- there's not enough information that's given in Kurita to say otherwise. 16:54:24 16:54:28 16:54:32

Q How would the shape of the lens affect whether it's a linear system or not? 16:54:33 16:54:37

MS. RICHEY: Objection. Object to form. That's not what you asked. 16:54:39 16:54:45

A I don't understand the question. 16:54:47

Q You said that you don't know the shape of the lens, so you have to assume it's a linear system. What does the shape of the lens have to do 16:54:48 16:54:51 16:54:54

with your assuming it's a linear system? 16:54:57

A It's a linear system because you've got a 16:55:01

linear array of lasers and a linear array of optical 16:55:04

lenses. There's nothing radial about this system at 16:55:08

all. 16:55:08

And you've just asked a question about the 16:55:11

lens. There's not a lot of information about that 16:55:13

lens. All that lens does is, is take those 16:55:16

collimated beams that comes out of the lens array 16:55:19

and focuses on a fiber. There's no isometric 16:55:22

drawing of that lens. 16:55:25

And so when I look at that system in 16:55:26

Figure 1 and Figure 2 of Kurita, I do not see any 16:55:29

radial design whatsoever. In fact, I see a linear 16:55:32

design. And that's normal for these types of rays 16:55:36

of lasers, linear is typically the way you see them 16:55:38

and the way they're manufactured. So if you wanted 16:55:42

to buy one, you typically would buy one in a linear 16:55:44

setup, not a radial setup. 16:55:48

Q So just looking at Figure 1 again, we have 16:55:57

the three-by-three array of collimating lenses, they 16:56:02

are lens elements 21 of the array 20. Would you get 16:56:07

a pattern on the focusing lens 30 that looks roughly like the three-by-three array of lenses that you see on collimate 20? 16:56:11 16:56:16 16:56:20

MS. RICHEY: Objection. Form. 16:56:23

A I don't understand the question. 16:56:25

Q Would the collimating beams, collimated beams that are output from lens array 20 impinge on lens 30 in the system of Kurita in generally the same pattern that you see on lens 20 how they are arranged in a three-by-three array? 16:56:27 16:56:31 16:56:35 16:56:39 16:56:44

MS. RICHEY: Objection. Form. 16:56:47

A So Kurita doesn't detail exactly the design of lens 30. All Kurita shows from Figures 1, 2 and 3 is the function of lens 30 is to focus those collimating beams down to the fiber. There is not a lot of information that is given by Kurita about the type of lens that is used. 16:57:01 16:57:04 16:57:10 16:57:14 16:57:18 16:57:21

But we can see from Figures 1, 2 and 3 this is a linear system with a linear array of lasers and a linear lens array. But the detail of lens 30 is not given. So I would expect those nine devices or nine lasers to be focused on that fiber 16:57:24 16:57:27 16:57:30 16:57:35 16:57:38

and be wavelength division multiplexed in that fiber, because that's what Kurita is all about. Kurita is all about a WDM solution for less components. 16:57:48 16:57:51 16:57:53 16:57:57

And you can see from Figure 4 and Figure 5, the previous solution that Kurita talks about is an individual laser going through a lens 120, which doesn't give much information other than it's drawn as an optical lens and then there's optical fibers, and so there's not a lot of information here. But the whole goal of Kurita has nothing to do with the lens, it's all to do with the reducing component count by putting more lasers on the chip. 16:57:57 16:58:00 16:58:03 16:58:07 16:58:12 16:58:17 16:58:19 16:58:22 16:58:25

Q What does a collimating lens do, Dr. Lebby? 16:58:27 16:58:30

A So as we can see from the '416 patent, the '416 patent actually teaches the use of a collimating lens, and a collimating lens can be seen in a number of the figures in the '416 patent. It uses -- it's a function to collimate light as part of the optical path, and that is taught quite clearly in the '416 patent. 16:58:33 16:58:37 16:58:41 16:58:44 16:58:48 16:58:51 16:58:56

And if we -- and it's also collimating lenses are part of the optical combiner, and that's part of the, as I construe in paragraph 59 of my declaration, that's an integrated subassembly of optical components that multiplex light for different wavelengths -- 16:58:57 16:59:01 16:59:04 16:59:07 16:59:10 16:59:13

Q I know you -- 16:59:15

(Simultaneous speaking.) 16:59:16

Q So I know you like to go back -- 16:59:16

MS. RICHEY: Wait, wait. Let him finish. Just let him finish. 16:59:18 16:59:20

MR. RAWLS: Okay. He can finish. He's not answering my question, though. 16:59:22 16:59:23

MS. RICHEY: That's okay. You can say that after he's done. 16:59:24 16:59:26

A So continuing, that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 16:59:28 16:59:32 16:59:33

Q Okay. I know you like to go back to that definition, an optical combiner in the '416 patent. I'm not asking about any of that right now. 16:59:37 16:59:40 16:59:43

I'm asking about a collimating lens. And 16:59:46

if you want an example, we can look at Kurita, Kurita Figure 1 has collimating lens element array 20 with 21 being the lens elements. What is the function of the collimating lens here in Kurita? 16:59:47 16:59:49 16:59:55 16:59:58

MS. RICHEY: Objection. Form. 17:00:02

A Well, if we look at the Kurita design as a whole, what Kurita is trying to do is reduce the number of optical components. And so instead of having individual laser chips, it has a number 10, element 10 that has nine laser chips on a chip, on a semiconductor chip as per Figure 1 and Figure 2. Those nine laser beams go through a lens array. The lens array, as you can see from element 20, collimates the divergent laser beam that comes out of the laser. That collimating beam allows the lens, whatever that is, that focuses those beams down to a fiber to be positioned in free space far away from the lens array. 17:01:17 17:01:20 17:01:23 17:01:27 17:01:30 17:01:35 17:01:39 17:01:43 17:01:46 17:01:50 17:01:54 17:02:00 17:02:04

So one of the functions that the collimating beams in Kurita does is allow this experimental setup to be put on an optical bench and so that you can spread the components apart, use 17:02:05 17:02:06 17:02:11 17:02:16

free space to connect element 10, the laser array, to element 20, the lens array, to element 30 to the lens. And that's why I've indicated this is going to be a large test lab setup, as indicated in my supplemental report in paragraph 12, the image of opposing expert's optical bench, it's exactly designed to do that. 17:02:19 17:02:23 17:02:27 17:02:30 17:02:36 17:02:38 17:02:42

And in fact, the motivation for Kurita is optical computing, which is exactly these types of experiments. This is commercially impractical. 17:02:43 17:02:46 17:02:50

And so I believe I've answered your question. In this case of Kurita, the collimating lens that allows the space between the different component parts and so that it can operate in a larger volume. 17:02:52 17:02:54 17:02:58 17:03:03 17:03:07

Q Is one purpose of a collimating lens to prevent the output collimating beam from diverging significantly? 17:03:10 17:03:14 17:03:20

MS. RICHEY: Objection. Vague -- I mean form. 17:03:21 17:03:24

A So in the case of Kurita, if you want to spread the components out, which is what Kurita does 17:03:26 17:03:29

using free space, then the light beam coming out of element 10, as you can see that it is diverging, it is separating, so depending on where you place the lens array, it may diverge a lot or it may not diverge at all. 17:03:32 17:03:36 17:03:40 17:03:42 17:03:47

But if you want to design the lens to be far away from the lens array, then in the case of Kurita, you would use a collimating beam. And so the collimated beam that comes out of element 20 in Kurita certainly allows for a large design to be on an optical bench. 17:03:48 17:03:50 17:03:53 17:03:56 17:03:59 17:04:04

So this is an optical test setup. And the fact that it's designed to be in an application of optical computing, it sort of fits the profile. This is the type of thing you would do an optical bench in an optical lab. This is not something that's designed to be reduced in size. And clearly, there's no integrated assembly or integrated subassembly in Kurita. It's not even applicable to the '416 patent. I don't even know why it's being here as prior art in the first place. 17:04:04 17:04:08 17:04:13 17:04:15 17:04:17 17:04:21 17:04:24 17:04:27 17:04:31 17:04:35

Q Do the placement and location of the 17:04:39

collimating lenses here in the lens array 20 of Kurita tell you anything about where on the lens 30 the output collimated beams are going to impinge on lens 30? 17:04:41 17:04:47 17:04:50 17:04:54

MS. RICHEY: Objection. Form. 17:04:55

A When I look at Kurita, I see a linear system with a linear array of lenses in Figure 1 and Figure 2. That linear array of lenses produces light, you can see the light diverges, it goes into element 20. Element 20 is a lens array, and that collimates that divergent light, and certainly aims it at the lens, of which there is not much detail and there's no isometric drawing. But the lens function optically is take these collimating beams and focus them down to 40, which is the optical fiber. 17:04:58 17:05:02 17:05:06 17:05:09 17:05:12 17:05:16 17:05:20 17:05:24 17:05:27 17:05:27 17:05:31

Kurita, as we already know, is an application for optical computing. That's not even the same as the application that the '416 teaches. And Kurita only really is doing this invention to reduce component count. And so really the inventive part of Kurita is to use a laser array as opposed to 17:05:32 17:05:35 17:05:38 17:05:42 17:05:45 17:05:50

individual lasers as shown in Figure 4 and Figure 5, which is the prior art. 17:05:55 17:05:58

Q Okay. So let's focus on Figure 3 of Kurita, and there's four collimating lenses. One of the collimating lenses you see let's say in the bottom left of the array, do you have any understanding, based on your reading of Kurita and looking here at Figure 3, where the output beam from that collimated lens on the bottom left is going to go on lens 30? 17:06:01 17:06:05 17:06:09 17:06:11 17:06:15 17:06:18 17:06:22 17:06:25

MS. RICHEY: Objection. Form. 17:06:27

A So if you look at paragraph 14 of Kurita, it says, quote, lens array 20 to remain into parallel beams, which is what we are calling collimating beams, which are subsequently converged into one point with the lens 30 and entered into one end of optical fiber 40. 17:07:05 17:07:07 17:07:12 17:07:15 17:07:17 17:07:21

Kurita doesn't actually detail any details about lens 30 other than the fact it has an optical function. Kurita doesn't even show an isometric drawing of lens 30, just shows a generic optical shape, which is indicative of a traditional lens 17:07:24 17:07:28 17:07:32 17:07:35 17:07:40

shape. So Kurita teaches that it's a linear system with a linear array of lasers that go through a linear lens array that generate parallel or collimating beams that are focused down into a fiber. There's not a lot of detail in Kurita to say otherwise. 17:07:44 17:07:48 17:07:51 17:07:55 17:07:58 17:08:02

And so when I look at Kurita, it is an optical bench setup that has free space, it is not integrated, it doesn't have any pre-aligned connector with a stop to hold a single fiber optic cable. It's not even close to the '416 patent. And it is not an integrated subassembly of optical components at all. 17:08:02 17:08:06 17:08:10 17:08:15 17:08:19 17:08:25 17:08:29

Q So you don't have an opinion, in other words, regarding the pattern of collimated beams on lens 30 in Figure 3 of Kurita. Is that correct? 17:08:31 17:08:33 17:08:38

MS. RICHEY: Objection. Form. 17:08:41

A I just indicated to you in the previous answer a laser light comes out the array, the linear array of three-by-three laser beams in Figure 1 of Kurita, they pass through the linear array of lenses element 20, and those collimating beams hit lens 30, 17:08:44 17:08:47 17:08:51 17:08:55 17:09:00

and the function of the optical lens 30 is to take those collimated beams and focus them down to the fiber. That's what Kurita teaches as a person of ordinary skill in the art as I understand. I don't understand your question. 17:09:04 17:09:09 17:09:13 17:09:20 17:09:20

But clearly, Kurita is not really applicable prior art. I mean, it's an optical computed patent, and it's a patent that really is all based on reducing component count from individual lasers in Figure 5 and Figure 4 to a chip, a laser array of lasers, and so that's what it does. 17:09:21 17:09:24 17:09:26 17:09:29 17:09:33 17:09:37 17:09:43

Q Okay. So I'm referring specifically to the pattern of the collimated beams on lens 30. So let me ask again maybe more clearly. So you said you didn't understand my question. I want to make sure you understand it this time. 17:09:43 17:09:46 17:09:50 17:09:52 17:09:55

So referring to Figure 3 of Kurita and lens 30, do you have an opinion regarding the pattern of the collimated beams on lens 30? 17:09:57 17:10:00 17:10:02

A There's nothing in Kurita that teaches that the pattern of the beams that are coming out of 17:10:11 17:10:16

the laser are changed in any way. 17:10:19

In fact, if you look at Kurita, Kurita is 17:10:21

about optical computing, so it's not even applicable 17:10:25

from a field of endeavor. It's an optical computing 17:10:29

solution for a test bench setup. And what Kurita is 17:10:32

all about is reducing component counts, so instead 17:10:34

of using individual lasers in Figure 4 and Figure 5, 17:10:39

prior art now uses a laser chip with nine lasers on 17:10:41

the chip, they are arranged in a linear format, in a 17:10:44

three-by-three linear format. 17:10:48

And I don't really understand this 17:10:50

questioning. But that linear format goes into 17:10:52

element 20, which is a lens array, which is also in 17:10:55

a linear format. And that lens array sends out 17:10:58

collimated beams that impinge lens 30, of which 17:11:02

there is not much detail, and lens 30, as indicated 17:11:06

by the Kurita spec, focuses those collimated beams 17:11:10

onto the ends of the optical fiber, so those beams 17:11:14

go into the optical fiber. That's what Kurita 17:11:18

teaches. 17:11:22

It's not really applicable to the '416 17:11:22

patent because it's not an integrated subassembly 17:11:25

and it certainly doesn't have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 17:11:28 17:11:29 17:11:33

Q So the pattern of lens 30 is a three-by-three lens array of collimated beams. Is that what you're saying? 17:11:33 17:11:36 17:11:39

MS. RICHEY: Objection. Form. 17:11:40

A No, I think I've answered this question. 17:11:43

Q Okay. So let me ask again. The pattern on lens 30 is a three-by-three array of beams. Is that correct? 17:11:48 17:11:52 17:11:57

A No, that's not correct. What it is is it's a linear array of three-by-three, not radial at all, it's linear. And so if you look at Kurita, which is all about optical computing and free spaced optical computing, it's basically a setup for a test bench in an optical lab, as per paragraph 12 of my supplemental report. 17:11:57 17:12:00 17:12:04 17:12:08 17:12:11 17:12:14 17:12:18

If you look at the Figure 1 of Kurita, you see a laser chip array, a linear array of three-by-three lasers that actually generate light, they diverge light to go into a three-by-three 17:12:19 17:12:22 17:12:26 17:12:29

linear array of optical lenses, which produce a linear array of collimated beams of which impinge lens 30, and lens 30 takes those beams and focuses them into the optical fiber, as taught by paragraph 14 and even, I believe, 15 and 16 in Kurita. 17:12:33 17:12:37 17:12:42 17:12:46 17:12:49

So linear -- Kurita is all about a linear design. And this doesn't even come close to what the '416 teaches, and the '416 teaches an integrated subassembly of optical components. That's certainly not present in Kurita. And certainly what else isn't present is a pre-aligned connector with a stop to hold a single fiber optic cable. 17:12:55 17:13:00 17:13:04 17:13:09 17:13:12 17:13:14 17:13:18

Q And so focusing specifically on Figure 3, which is the two-by-two array, not a three-by-three array, is it your opinion that in Figure 3 the pattern on lens 30 is a two-by-two linear array of collimated beams? 17:13:19 17:13:22 17:13:27 17:13:30 17:13:34

MS. RICHEY: Objection. Form. 17:13:35

A As I've already indicated on record a number of times, you have to look at Figure 3 in the context of Figure 1 and Figure 2 of Kurita. And Figure 3 I would agree with you is a two-by-two 17:13:38 17:13:40 17:13:43 17:13:47

array of different wavelength lasers in a chip 10A, that sends out diverging different wavelengths -- optical beams into element 20, which is a lens array, which is also in a two-by-two. 17:13:50 17:13:54 17:13:57 17:14:01

But the design of Kurita is not radial. You can see that from Figure 1 and Figure 2 where it's very clearly a linear system, because there's a linear array of light emitters in element 10, and there's a linear array of lenses in element 20. And so this is not a radial system at all, even though Figure 3 has as part of its embodiment a two-by-two array of lasers. 17:14:03 17:14:06 17:14:09 17:14:13 17:14:17 17:14:21 17:14:25 17:14:30

This is a linear system, and certainly this is not prior art to the '416. And certainly this is a piece of prior art that's in a different field of endeavor, it's called optical computing, and it's all about the reduction of component counts, and that's why you see Figure 4 and Figure 5 with individual lasers and Figure 1 and Figure 2 and Figure 3 with a laser chip with a number of lasers on them that range from 4 to 9. 17:14:31 17:14:32 17:14:36 17:14:39 17:14:43 17:14:46 17:14:50 17:14:53 17:14:55

Q So specifically in the context of Figure 17:14:59

3, the pattern of collimated beams is what you call a linear, linear I'm saying, two-by-two array. Is that correct? 17:15:01 17:15:05 17:15:12

A That's not -- that's not quite correct. That's not exactly what I said and you're misconstruing what I said. 17:15:12 17:15:15 17:15:17

Figure 3 is -- you understand Figure 3 because it's drawn in terms of a two-by-two array, you have to figure out if Figure 3 is actually a radial design or a linear design, and to do that you have to look at Figure 1 and Figure 2, and you can clearly see it's not a radial design at all. 17:15:19 17:15:21 17:15:25 17:15:27 17:15:32 17:15:34

It's actually a linear design, because Figure 1 and Figure 2 have an array of three-by-three lasers and three-by-three lenses, so this is a linear design. This is -- this is a patent or a patent application that is based on optical computing. It's not integrated. It's a free space system. It's designed for an optical lab setup. 17:15:38 17:15:38 17:15:41 17:15:43 17:15:46 17:15:49 17:15:53 17:15:56

And the whole goal of this patent is to actually reduce component count and put all the 17:15:56 17:15:59

lasers on one chip. And so it's not even closer to an integrated subassembly of optical components that multiplex light, and it certainly doesn't have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 17:16:02 17:16:05 17:16:09 17:16:14 17:16:17

Q Do you agree that lens 30 in Kurita, and specifically in Figure 3, that lens 30 is a focusing lens? 17:16:19 17:16:24 17:16:28

A In paragraph 15 of Kurita, if you look at line 6, it actually talks of a lens 30 for focusing the lights on the individual lens portions 21, and an optical fiber 40. And so I think one of the functions of lens 30 is to focus the light to the fiber, because as you can see from Figure 1, or if you want to look at Figure 3, which is much smaller, the collimated -- at least from this cartoon it looks like the widths of the collimated beam that comes out of element 21 is actually wider than the fiber itself. Whether that's accurate or not I couldn't tell you. 17:16:52 17:16:56 17:17:01 17:17:04 17:17:09 17:17:12 17:17:17 17:17:20 17:17:23 17:17:26 17:17:30 17:17:33

But certainly the Kurita does teach in paragraph 15 that those collimated beams have to 17:17:34 17:17:37

reach the end of the fiber. 17:17:40

Q Okay. I just want to clarify one of the previous responses about the pattern on lens 30. 17:17:50 17:17:54

So the focus of Figure 3, the two-by-two embodiment of Kurita, the pattern of beams in lens 30 is the same as the pattern coming out of the array lens array 20. Is that correct? 17:17:57 17:18:00 17:18:04 17:18:07

MS. RICHEY: Objection. Form. 17:18:11

A There is no teaching in Kurita that actually manipulates the light coming out of lens 20 that is sourced from element 10, which is the laser array. It certainly looks like it's a collinear system or a linear system. At least from what I've seen in the Kurita patent in Figure 1, Figure 2 and Figure 3, it looks like those beams are in a linear format of three-by-three, and so that's how I would expect those beams to impinge whatever lens 30 is. And after those beams penetrate lens 30, they will be focused on the end of the fiber 40, as indicated in Kurita's paragraph 15 of the application. 17:18:16 17:18:20 17:18:23 17:18:26 17:18:30 17:18:34 17:18:39 17:18:42 17:18:45 17:18:49 17:18:54 17:18:57

Q I think your answer was yes. I just wanted to clarify. 17:19:04 17:19:06

So the pattern of beams that are impinging on lens 30 is the same as is coming out of the lens array 20? 17:19:08 17:19:12 17:19:17

MS. RICHEY: Objection. Form. 17:19:18

A So as I look at Kurita, it is a linear system, it is based on a reduction of component parts, and so you have a laser chip array, and in Figure 1 you have a three-by-three array that sends out laser beams, assuming all laser beams were turned on, those nine laser beams would actually align with the lens array element 20, which, by the way, is extremely difficult to align in an optical bench setup, it requires active alignment. And those beams, presumably once it's properly aligned, and there's no rotations, there's no X, there's no Y, there's no Z, there's no tilting, would actually hit and impinge lens 30 in the same linear format. And once they penetrate lens 30, they will be focused onto the fiber, as Kurita's system, it is a free space system. It is not an integrated subassembly of optical components. It certainly does multiplex light because it sends different 17:19:21 17:19:25 17:19:28 17:19:32 17:19:35 17:19:39 17:19:42 17:19:46 17:19:50 17:19:52 17:19:56 17:20:00 17:20:02 17:20:06 17:20:10 17:20:14 17:20:18 17:20:21

wavelengths of light down the same fiber. But it certainly does not include an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. So it doesn't really qualify as prior art of the '416. 17:20:23 17:20:26 17:20:30 17:20:34 17:20:36

Q So you gave your answer in terms of Figure 1. Is it the same for Figure 3? 17:20:38 17:20:41

MS. RICHEY: Objection. Form. 17:20:44

A Figure 1 is a linear array of three-by-three lasers and three-by-three lenses. And so Figure 3 is a two-by-two array of lasers and a two-by-two array of lenses. The optical function is similar. 17:20:47 17:20:51 17:20:55 17:20:58 17:21:03

But, again, this is a linear system, because you have to look at Figure 3, the two-by-two array in the context of Figure 1 and Figure 2, there's nothing in Kurita that does indicate or teach that it's a radial system. Therefore, it's not prior art to the '416. 17:21:04 17:21:07 17:21:11 17:21:14 17:21:16 17:21:19

Further, it's an optical computing prior art which requires a test lab demonstration, as I've already indicated before on record. And certainly 17:21:21 17:21:24 17:21:28

the whole goal of Kurita is not to make an integrated subassembly as taught by the '416, but actually just to reduce the number of lasers and put them all on one chip. You can see that from the prior art Figures 4 and 5. 17:21:30 17:21:34 17:21:39 17:21:42 17:21:45

And so Kurita doesn't even have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. And so I'm not even sure why this prior art is here. It's not even close to the '416. 17:21:47 17:21:51 17:21:53 17:21:56 17:21:59

Q So just to be clear, in Figure 1 you said there's a three-by-three pattern. In Figure 3 is there a two-by-two pattern on lens 30? 17:22:01 17:22:03 17:22:07

MS. RICHEY: Objection. Form. 17:22:11

A Well, one of the difficulties of Kurita because it's a lab setup using free space between individual components, it's just going to take a lot to align all these parts. To actually align the three-by-three laser array in Figure 1 with the three-by-three lens array in element 20 in Figure 1 with a lens 30 and fiber 40 is going to take probably hours on an optical bench. So that's 17:22:29 17:22:33 17:22:37 17:22:40 17:22:43 17:22:47 17:22:50 17:22:55

really, really tricky, it's not really commercially practical, and it's aimed for optical computing, which we've already established on the record is not commercial today. 17:22:58 17:23:01 17:23:05 17:23:08

The whole goal of Kurita is to reduce the number of individual lasers and put them on a chip. So when you look at Figure 1, Figure 2 and Figure 3, the question pertains to Figure 3, there's no difference optically, but it's still going to be extremely difficult to align. It's still going to require active alignment. And it is not an optical combiner as construed as I understand from the '416 patent. It's not an integrated subassembly of optical components. 17:23:09 17:23:12 17:23:14 17:23:17 17:23:20 17:23:23 17:23:28 17:23:30 17:23:35 17:23:37

It certainly does multiplex light. Figure 3 multiplex four different wavelengths compared to Figure 1, which is nine different wavelengths. And it certainly does not have an integrated, pre-aligned connector with the stop to hold a single fiber optic cable. 17:23:39 17:23:42 17:23:45 17:23:49 17:23:51 17:23:55

Q We're focusing on what I'm asking you, and because you said that Figure 3 is not different 17:23:56 17:23:59

optically, are you saying that there's a two-by-two pattern of output beams on lens 30 in the Figure 3 embodiment? 17:24:03 17:24:05 17:24:09

MS. RICHEY: I didn't hear that last part. 17:24:11

Q The question is, are you saying, Dr. Lebby, that there is a two-by-two pattern of output beams on lens 30 in the Figure 3 embodiment of Kurita? 17:24:14 17:24:16 17:24:19 17:24:23

MS. RICHEY: Objection. Form. 17:24:26

A I believe I've answered. I believe I've answered this question. 17:24:27 17:24:30

Q Can you give me a yes or no answer so I understand what your testimony is, please? 17:24:31 17:24:35

A I've answered this question. 17:24:36

Q And your testimony is that there's a two-by-two pattern of output beams on lens 30 in Figure 3, correct? 17:24:39 17:24:41 17:24:45

MS. RICHEY: Objection to form. 17:24:46

A I've answered this question before. 17:24:47

Q Are you not willing to answer my question now, Dr. Lebby? 17:24:50 17:24:53

A I've previously answered it. 17:24:54

Q And the answer is yes. Is that correct? 17:24:56
MS. RICHEY: Objection. Form. 17:24:59
A I've answered your question. 17:25:02
Q How did you answer it? Because I'm confused. 17:25:04
17:25:06
A Well, just go read the record. 17:25:07
Q Are you not capable of answering? 17:25:11
MS. RICHEY: Objection. Form. 17:25:13
A I've just given you -- I've just given you many answers to this series of questions. 17:25:14
17:25:17
Q Okay. And to confirm, it is my understanding of your testimony -- you can tell me if I'm right or not -- but my understanding is that you're saying there's a two-by-two pattern of output beams on lens 30 in the Figure 3 embodiment figure of Kurita. Is that correct? 17:25:21
17:25:23
17:25:26
17:25:28
17:25:32
17:25:36
MS. RICHEY: Objection. Form. 17:25:38
A I already answered the question. 17:25:39
Q My question now is actually about my understanding and whether my understanding is correct. I don't think you've answered that. 17:25:41
17:25:44
17:25:45
MS. RICHEY: Objection. Form. 17:25:47

A I've answered this question many times, so I think we should move on. 17:25:51 17:25:54

Q We'll move on. 17:25:57

MR. RAWLS: I'll note for the record that the witness is being nonresponsive. 17:25:58 17:25:59

Q So, Dr. Lebby, so just to confirm, the answer is yes, that there's a two-by-two pattern of output beams on lens 30 in figure -- 17:26:12 17:26:15 17:26:19

A I've answered the question. I think we should move on. 17:26:24 17:26:25

MS. RICHEY: I have objected many times for form as asked and answered. 17:26:26 17:26:28

Q Okay. We'll understand your answer to be yes, and then we'll move on. 17:26:32 17:26:35

MR. RAWLS: We can take a break now, Carrie. 17:26:37 17:26:38

MS. RICHEY: Okay. 17:26:39

MR. RAWLS: Five minutes is fine with us. I don't know if you guys need anything else. 17:26:43 17:26:49

MS. RICHEY: Five is fine. 17:26:54

THE WITNESS: Five minutes is fine. 17:27:07

(Recess 5:27 p.m. - 5:34 p.m.) 17:27:07

THE VIDEOGRAPHER: We are back on the record at 5:34. 17:34:21 17:34:22

BY MR. RAWLS: 17:34:26

Q So, Dr. Lebby, I would like to turn to paragraph 59 of your declaration, which I think you've referred to a couple of times here, about your definition of optical combiner as being construed as an integrated subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable, and I want to ask you some questions about some of those pieces to make sure I understand what you mean. 17:34:27 17:34:30 17:34:33 17:34:37 17:34:40 17:34:44 17:34:47 17:34:50 17:34:53 17:34:56 17:35:01

So looking at the expression "an integrated subassembly of optical components," what do you mean by an integrated subassembly of optical components? 17:35:01 17:35:03 17:35:06 17:35:14

A I detail the optical combiner in paragraphs 59 of my first declaration to paragraph 70, and I go into quite a bit of detail of what the integrated subassembly of optical components are. 17:35:37 17:35:42 17:35:47 17:35:53

So if you want me to go through those paragraphs, I'm happy to do that. 17:35:57 17:35:59

Q I don't think I need you to go through the paragraphs. 17:36:01 17:36:03

But let's start with integrated. So if I have optical components that are in a package, we talked about packaging earlier, that are (audio disruption). 17:36:04 17:36:08 17:36:11 17:36:11

(Court Reporter clarification.) 17:36:37

THE VIDEOGRAPHER: We are going off the record at 5:36. 17:36:37 17:36:38

(Recess 5:36 p.m. - 5:40 p.m.) 17:36:40

THE VIDEOGRAPHER: We are back on the record at 5:41. 17:40:54 17:41:01

BY MR. RAWLS: 17:41:04

Q So, Dr. Lebby, before we had a brief technical break, we were looking at your definition of optical combiner, and as part of that definition there's the expression of "integrated subassembly of optical components." Is there a definition of integrated that you're applying here? 17:41:04 17:41:07 17:41:11 17:41:15 17:41:19 17:41:22

MS. RICHEY: Objection. Form. 17:41:30

A Well, certainly I detail my definition in my first declaration from paragraphs 59 to paragraph 70. 17:41:34 17:41:37 17:41:43

Q Can you tell me what integrated means? 17:41:45

A So if we go through the paragraphs, we can go through one by one if you would like, in paragraph 60 I indicate that the patent specification makes clear that the patented invention is covering an integrated device with integrated optical components. 17:41:49 17:41:52 17:41:56 17:41:58 17:42:01 17:42:04

Now, if you want me to paraphrase from paragraph 60 to paragraph 70, I'm happy to do that, but it's going to take a long time. 17:42:06 17:42:09 17:42:12

Q I don't think reading it will help. 17:42:14

But when you say that the specification is clear that the patented invention covers an integrated device with integrated optical components, what does that mean when they are integrated? What are you meaning by the word "integrated" here? 17:42:18 17:42:19 17:42:20 17:42:24 17:42:27 17:42:29

A So I detailed that in paragraph 59 to 70 of my declaration, and so we can go through the 17:42:31 17:42:35

sections if you'd like. 17:42:38

Q Is there a way for you to tell me what you mean by the word "integrated" other than telling me everything that's written in these paragraphs? 17:42:40 17:42:43 17:42:48

A Oh, sure, I can paraphrase paragraph 60. It's an integrated -- the patent, the '416, is an integrated device with integrated optical components. And we know that the specification can be, at least the integrated device can be a constructed in various ways. It could be a single piece or a single part. It also says it could be used in molded technology for replication, and it could be two or more parts, that's at least to say the same function is accomplished. And the specification discusses forming various optical components as part of the combiner. 17:42:50 17:42:54 17:42:59 17:43:02 17:43:06 17:43:10 17:43:16 17:43:19 17:43:22 17:43:26 17:43:29 17:43:32

But this is only in paragraph 60, but, you know, I also detail it in 61 and 62 and 63. 17:43:34 17:43:36

But one of the things I want to bring up is that this specification of the '416 describes the benefits of the patented invention, and that stem from an integrated optical combiner. It is not what 17:43:40 17:43:44 17:43:47 17:43:51

your expert, opposing expert, Dr. Willner says, this is not discrete optical components, there must be many aligned, just like we talked about in Kurita all afternoon. 17:43:55 17:44:01 17:44:04 17:44:08

And so if we look at paragraph 61, it's an inexpensive, injection-molded -- molded optics as indicated by the '416, a one- piece combiner. It's capable of separately collimating and focusing the output of multiple lasers onto a single optical fiber. And we went through this before with the uniform, high coupling efficiency. It also is an integrated subassembly that has an integrated, pre-aligned connector with a stop. 17:44:09 17:44:11 17:44:16 17:44:20 17:44:24 17:44:28 17:44:32 17:44:34 17:44:39

And so if we look at some of the things I've listed in paragraph 63, I think that also supports your question of an integrated subassembly of optical components. I don't know if you want me to go through 63 or 64, but happy to do so. 17:44:40 17:44:43 17:44:47 17:44:51 17:44:54

Q Maybe I'll clarify, I'm not asking about what an optical combiner here is. I'm asking specifically about what you mean by the term "integrated." 17:44:57 17:45:01 17:45:05 17:45:07

So you mentioned the expression "discrete components" a moment ago. Does integrated mean that the components are not discrete components? 17:45:10 17:45:15 17:45:18

MS. RICHEY: Objection. Form. 17:45:21

A So I think you misconstrued what I said in my last answer. That's also in paragraph 62 when I said the '416 specification describes the benefits of the invention, which we all know, and that stems from an integrated optical combiner, which I actually construe in detail in paragraphs 59 to 70 of my first declaration. 17:45:25 17:45:28 17:45:32 17:45:38 17:45:41 17:45:45 17:45:48

What I indicated there was that your expert, Dr. Willner, thinks integrated means -- the integration means discrete optical components that must be manually aligned or actively aligned, as in the prior art. I mean, like Kurita is discrete optical components that must be manually aligned because there's free space between them. It certainly is not that. 17:45:50 17:45:54 17:46:00 17:46:05 17:46:09 17:46:12 17:46:15 17:46:19

And so your question was is my comment about your expert, I believe your expert would know better, is a member of the National Academy of 17:46:20 17:46:22 17:46:22

Engineering, and knows the difference between what's integrated and what is discrete. And certainly I disagree with what your expert is saying. 17:46:31 17:46:32 17:46:35

What we have here is an integrated subassembly of optical components, and I detail that in paragraph 60, 61, 63, 64. And then I talk about some of the functions of this integrated subassembly that include the passive and pre-alignment with the stop for a single fiber. That's all part of the integrated subassembly of optical components, which is under the definition of optical component as I construe for the '416 patent. 17:46:38 17:46:40 17:46:44 17:46:51 17:46:55 17:46:59 17:47:03 17:47:06 17:47:10

Q So in your answer you referred to the difference between what's integrated and what's discrete. Can you tell me what that is, the difference between what's integrated and what's discrete? 17:47:13 17:47:15 17:47:18 17:47:22 17:47:25

A Well, the best example is, is what's integrated is the '416 patent. What is discrete is the Kurita patent application. The Kurita patent application are discrete components that are manually aligned or actively aligned, those are 17:47:25 17:47:28 17:47:31 17:47:34 17:47:36

discrete optical components, they are not integrated at all. And so I do not agree that discrete optical components, as noted by your expert, makes up an integrated subassembly of optical components for multiplexing light for different wavelengths, which also includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable -- 17:47:41 17:47:46 17:47:51 17:47:56 17:48:01 17:48:03 17:48:20

(Court Reporter clarification.) 17:48:20

A -- includes an integrated, pre-aligned connector with a stop to hold the single fiber optic cable, which is what I construed in paragraph 59. 17:48:20 17:48:20 17:48:24

This is not what your expert is saying. What your expert is saying is Kurita is an integrated solution. It is not. Kurita is discrete optical components that are manually aligned on an optical bench using active alignment and they are not integrated at all. 17:48:27 17:48:30 17:48:34 17:48:38 17:48:42 17:48:48

Q Okay. And just to be clear, I'm asking specifically about what you're saying and what you mean by integrated. 17:48:49 17:48:51 17:48:53

Let me ask it differently for you, Dr. Lebby. Other than giving an example of the '416 17:48:55 17:48:57

patent, do you have a working definition of what integrated means? 17:49:02 17:49:05

MS. RICHEY: Objection. Form. 17:49:07

A Well, I think the definition in the '416 patent is actually quite adequate, I mean, very clearly teaches what integrated is. And so if you look at, for example, the optical combiner, an integrated subassembly of optical components, and the function of that integrated subassembly is to multiplex different wavelengths of light, that also includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. I think that is a great definition for what your question is about. 17:49:10 17:49:13 17:49:16 17:49:20 17:49:23 17:49:26 17:49:30 17:49:33 17:49:38 17:49:41 17:49:46

What it is not, it's not discrete optical components as taught by Kurita that are manually aligned using active alignment on an optical bench, not even close to that. And so I disagree with your expert on that position. And the really good definition of integrated is actually taught by the '416. 17:49:46 17:49:50 17:49:55 17:49:58 17:50:01 17:50:05 17:50:08

Q Can you provide a definition of what you 17:50:10

mean by integrated without using the word "integrated"? I'm finding that confusing. 17:50:12 17:50:16

MS. RICHEY: Objection. Form. 17:50:20

A So when I look at the optical combiner, which I've given my summary of in paragraph 59, which is an integrated subassembly of optical components for multiplexing light of different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 17:50:23 17:50:28 17:50:34 17:50:37 17:50:40 17:50:43 17:50:45

I've also discussed in my first declaration, also my second declaration, but I haven't called up those figures or paragraphs yet, in paragraph 59 to paragraph 70, and I detail the question you're asking, which is integrated subassembly of optical components, your question pertains is if you don't use the word "integrated," well, there's something I've written down in paragraph 63, and as you can -- already have heard, and I've said many times on the record, the optical combiner is an integrated subassembly of optical components, plus it has other things too. 17:50:45 17:50:49 17:50:53 17:50:58 17:51:02 17:51:04 17:51:07 17:51:11 17:51:13 17:51:18 17:51:21 17:51:25

But the term "subassembly" is how a person of ordinary skill in the art would refer to these combined components have been subassembled into a single device or formed as a single piece. And so I go into a little bit more detail here. 17:51:28 17:51:32 17:51:34 17:51:37 17:51:42

So I can't answer the question, I can't answer it without using the word "integrated." But it does -- I have taught that it can be done in paragraph 63 of my -- of my initial declaration. 17:51:44 17:51:46 17:51:49 17:51:53

Q Can two discrete components be combined so that they're integrated? 17:51:57 17:52:02

A Well, if you look at what an optical combiner is, as defined in paragraph 59 of my first declaration, it's an integrated subassembly of optical components. I also indicate it's a multiplexing light of different wavelengths, and it also includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 17:52:23 17:52:27 17:52:31 17:52:35 17:52:37 17:52:40 17:52:43

So for argument's sake, if you take Kurita, which is discrete optical components that must be manually aligned, you've got a laser array. You've got a lens array. You've got a lens. 17:52:45 17:52:49 17:52:53 17:52:57

Now, if you think about what the '416 is teaching, it's got optical components, but it integrates them in an innovative way. And so if the pre-aligned connector wasn't connected to the subassembly that is being taught in the '416, and there was free space in between, one could actually say that was a discrete optical component. But it isn't, it's not. It's actually integrated. As you can see from the front page of the '416, if you look at Kurita, the components of Kurita in Figures 1, 2 and 3 are all discrete, they're on their own. They're separated by free space. They all have to be manually aligned. Kurita is not even close to being integrated. It isn't integrated. And so I object to Dr. Willner's position on this. 17:53:01 17:53:04 17:53:07 17:53:13 17:53:16 17:53:20 17:53:23 17:53:26 17:53:30 17:53:33 17:53:38 17:53:42 17:53:46 17:53:50 17:53:52

Q Okay. That's fine. I want to be clear that I'm not asking about Kurita right now. I'm not referring to Dr. Willner. 17:53:54 17:53:58 17:54:01

I'm asking a very specific question. If you have two discrete components, can they be combined so that they're integrated? 17:54:02 17:54:04 17:54:07

MS. RICHEY: Objection. Form. 17:54:14

A So it's the same answer as I gave in my last answer, and I'll only give one more because it's taking me a long time to give these answers. 17:54:15 17:54:18 17:54:22

Dr. Willner believes Kurita, as an example, is discrete optical components that must be manually aligned. It's not. What Kurita is, is discrete optical components that are actively aligned. 17:54:25 17:54:27 17:54:31 17:54:36 17:54:38

What the '416 patent teaches is that is an integrated subassembly of optical components that actually wavelengths division multiplex light in different wavelengths, also include an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 17:54:39 17:54:41 17:54:45 17:54:49 17:54:52 17:54:55

What I said in my last answer is if the pre-aligned connector was separated by free space, which it isn't, it could be viewed as a discrete optical component just like then in Kurita. But it isn't. 17:54:56 17:55:00 17:55:05 17:55:10 17:55:14

And so what the '416 teaches is, is that the integrated optical subassembly of optical components, they're not discrete components at all. 17:55:14 17:55:17 17:55:20

They're actually components that are integrated together using the construed phrase in paragraph 59. And I actually define what integrated is in paragraphs 59 to 70 in my first declaration. 17:55:23 17:55:27 17:55:32 17:55:35

I don't consider the optical components to be discrete. What we have in Kurita is discrete optical components. That's very different. But in the '416 I don't consider the optical components in the integrated subassembly to be discrete at all as they're integrated. 17:55:39 17:55:42 17:55:48 17:55:50 17:55:53 17:55:57

Q Now, again, I'm not asking about Kurita. 17:55:59

The question I'm asking is if two optical components are discrete and then you combine them, are they now integrated? 17:56:04 17:56:06 17:56:09

A I just answered that question. I've answered that question three times, so I think we're done on that. 17:56:12 17:56:14 17:56:18

Q I'm not quite sure I agree with you, Dr. Lebby, so let me rephrase the question because maybe you're confused about what the question is. 17:56:20 17:56:23 17:56:26

So if there are two discrete optical components that you combine, are they integrated? 17:56:29 17:56:33

MS. RICHEY: Objection. Form, vague, and it's an incomplete hypothetical. So I think the problem with your question is that it's super vague and he feels like he's answered it, so... 17:56:36 17:56:37 17:56:42 17:56:45

MR. RAWLS: I think that's verging into a speaking objection, Carrie. The witness can tell me if he doesn't understand the question. 17:56:51 17:56:52 17:56:56

A I understand the question. I've just answered the question three times. I know exactly what the question is. And you keep asking the same question and I keep giving you the same answer. So either we move on or we just sit here. 17:56:59 17:57:00 17:57:03 17:57:05 17:57:09

Q Well, I'm not going to move on. I'll ask it in a different context and maybe you can understand. 17:57:11 17:57:14 17:57:17

Let's look at the '416 patent, and we can look at Figure 10 and Figure 11 of the fourth embodiment. The '416 patent explains that the lens 350 in this embodiment is separately molded from the collimating lenses, correct? 17:57:18 17:57:20 17:57:25 17:57:29 17:57:33

A No, it doesn't teach that at all. I mean, you're misconstruing what Figure 10 or Figure 11 are 17:57:39 17:57:43

being taught in the '416 patent. And so we've already gone through this time and time again in this deposition. All Figure 10 and Figure 11 are are partially exploded figures of what the '416 teaches, and we've already indicated that the inventors decided not to have a full exploded diagram, but used the initial figures and the specification in the '416 to really teach and describe what's going on in Figure 10 and Figure 11. So I completely disagree with your position on this. 17:57:47 17:57:49 17:57:52 17:57:55 17:58:00 17:58:02 17:58:06 17:58:10 17:58:15 17:58:18

Q Okay. I want to turn to column 4, lines 35 to 39, where it says -- or 36 to 39, it says -- and it's referring to the fourth embodiment of Figures 10 and 11. It says, "In this embodiment the combiner shown generally as 310 includes a two-piece molded module including a separately molded output lens 350 and separately molded collimating lenses 321 through 324." 17:58:21 17:58:26 17:58:28 17:58:31 17:58:34 17:58:37 17:58:40 17:58:44

So my previous question, that I'll re-ask, in this embodiment is the lens 350 separately molded? 17:58:48 17:58:51 17:58:54

MS. RICHEY: Objection. Form. 17:58:55

A So we've already indicated what the optical combiner is in my initial declaration from paragraphs 59 to 70. And I actually detail this in not only in paragraph 59, but in paragraph 60 where I indicate that the specification describes that the integrated device can be comprised of a single piece or a single part module constructed in various ways. 17:59:09 17:59:11 17:59:14 17:59:19 17:59:23 17:59:26 17:59:30

I also indicate in paragraph 60 that the specification also states that the molded device can be constructed of two or more parts that can be combined to accomplish the same function. 17:59:33 17:59:36 17:59:40 17:59:45

And I also indicate that the specification also discusses forming various optical components that are part of the combiner. The optical combiner is an integrated subassembly of optical components. What is shown in Figure 10 and 11 is just partially exploded figures just showing where the optical path is. 17:59:48 17:59:50 17:59:53 17:59:56 17:59:59 18:00:03 18:00:07

And so but the specification actually teaches, both in the other figures in the '416, as well as the specification, what you need to do, what a person of ordinary art needs to do to enable the 18:00:07 18:00:09 18:00:13 18:00:16

invention. 18:00:21

So I disagree with your position on that. 18:00:21

And this is my interpretation and I've given that 18:00:24

very clearly in paragraphs 59 to 70 in my expert 18:00:27

report of the first declaration. 18:00:31

Q So you agree, then, that separately molded 18:00:34

components can be integrated? 18:00:36

MS. RICHEY: Objection. Form. 18:00:39

A What I agree to is that the optical 18:00:44

combiner is an integrated subassembly of optical 18:00:47

components that multiplex light of different 18:00:52

wavelengths, and can include an integrated, 18:00:54

pre-aligned connector with a stop to hold a single 18:00:58

fiber optic cable. I actually detail this in 18:01:01

paragraph 59 of my first declaration. 18:01:04

But as I just indicated in a similar 18:01:07

answer to a similar question is that in paragraph 60 18:01:10

the patent specification of the '416 teaches that 18:01:14

the integrated device can be comprised of a single 18:01:20

piece, a single part module. It could be 18:01:24

constructed in various ways. It also states that 18:01:27

this molded device can be constructed of two or more 18:01:29

parts that are combined to accomplish the same function. And also the specification teaches the forming of various optical components that are part of the combiner. 18:01:33 18:01:37 18:01:39 18:01:43

And so when I look at what you just called out in column 4, I see that the specification actually teaches there are a number of embodiments here that can practice the invention. 18:01:44 18:01:46 18:01:48 18:01:53

Q Okay. So yes or no, this specific question, yes or no, can separately molded components can be integrated? 18:01:56 18:02:00 18:02:05

MS. RICHEY: Objection. Form. 18:02:06

A I don't think this is a yes or no answer. 18:02:10

Q So you're not prepared to say yes or no whether separately molded components can be integrated? 18:02:14 18:02:17 18:02:20

A Well, I've just given my previous answer twice on record. It's not a yes or no question. I've just given you a pretty detailed answer, and my first declaration in paragraphs 59 to 70, and I particularly call out what I've written in paragraph 60. So if you want me to do that again, I'm happy 18:02:21 18:02:23 18:02:26 18:02:31 18:02:34 18:02:38

to do that. But this is not a yes/no answer. 18:02:41

Q How can you integrate separately molded components? 18:02:44 18:02:50

MS. RICHEY: Objection. Form. 18:02:53

A Well, the specification clearly teaches to me that this is possible, and I've detailed that in paragraphs 59 to 70. If you don't understand it, that's your issue. 18:02:54 18:02:58 18:03:00 18:03:03

Q Okay. Other than your reading of the specification, are there any other ways you can think of where you can integrate separately molded components? 18:03:04 18:03:09 18:03:11 18:03:16

MS. RICHEY: Objection. Form. 18:03:16

A I don't understand -- sorry. 18:03:17

MS. RICHEY: Objection. Form, just to make that clear. 18:03:20 18:03:22

A I don't understand how you don't understand this. I mean, if you've been working on this case, clearly I would have thought you'd have had a better understanding, unless this is a trick question. 18:03:23 18:03:25 18:03:27 18:03:29 18:03:32

But I go back to my previous answer. The 18:03:32

optical combiner here is an integrated subassembly of optical components for multiplexing light, different wavelengths, includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. And certainly the specification teaches that molding is certainly part of the manufacturing processes that could be used for the forming of this optical combiner. And I certainly detail the various embodiments that the specification teaches in paragraph 60 of my first declaration. 18:03:34 18:03:39 18:03:42 18:03:44 18:03:47 18:03:50 18:03:54 18:03:56 18:03:59 18:04:03 18:04:06

Q So referring now to Kurita, if the individual optical components in Kurita were brought together, would they then be integrated? 18:04:08 18:04:13 18:04:16

MS. RICHEY: Objection. Form. 18:04:18

A Kurita is not an integrated solution at all. Kurita is discrete optical components that have to be manually aligned. There's no teaching that you could bring Kurita's stuff together. Even if you brought it together, it's not even clear that it would make a successful integrated subassembly of optical components for multiplexing light of 18:04:25 18:04:28 18:04:32 18:04:35 18:04:39 18:04:42 18:04:46

different wavelengths, which includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 18:04:47 18:04:53 18:04:54

It is a design for an optical computer. It is a design for an optical bench. It uses free space. 18:04:54 18:04:56 18:05:00

And so certainly I have not thought about or designed the Kurita invention to see if it could be integrated or not. But certainly what's been taught is not integrated, and certainly the motivation for Kurita wasn't integration. The motivation for Kurita was to reduce component count. 18:05:00 18:05:04 18:05:09 18:05:11 18:05:14 18:05:17

Q Okay. And so if the components of Kurita were put together in a packaging, for example, would that mean that the components were integrated? 18:05:23 18:05:27 18:05:30

MS. RICHEY: Objection. Form. 18:05:33

A We have to look -- we have to construe integrated as per the '416 patent. And as we see right now, Kurita is not even close to being prior art for the '416 patent. It is discrete optical components with free space that have to be manually aligned. It doesn't have a pre-aligned integrated 18:05:36 18:05:42 18:05:45 18:05:49 18:05:54 18:05:58

connector with a stop to hold a single fiber optic cable. It doesn't have integrated subassembly of optical components. It's a completely different design for a different application called optical computing. And the whole motivation for Kurita is actually reduce component count. 18:06:04 18:06:07 18:06:10 18:06:13 18:06:17 18:06:20

But if you and your expert want to go off and redesign Kurita to see if they can make it fit into the '416 and what the '416 teaches, that's your call. But I don't see it. It's not even a related piece of prior art. 18:06:22 18:06:25 18:06:28 18:06:33 18:06:37

Q Do you have an opinion about whether if you did bring the pieces of Kurita together and housed them or packaged them together, would they be integrated? 18:06:38 18:06:40 18:06:43 18:06:47

MS. RICHEY: Objection. Form. 18:06:47

A I don't have an opinion about the integration if we use integration in terms of what I've construed in the '416 and how that applies to Kurita. 18:06:48 18:06:51 18:06:55 18:06:59

Certainly I don't see Kurita being an integrated solution at all. It is not designed for 18:06:59 18:07:02

integration. It's designed for an optical computer in an optical bench, that's probably a hundred times bigger than what the '416 is designed. There's not even close to what is being taught by the '416, and it certainly doesn't have an integrated subassembly of optical components, and it's not even clear right now if you could integrate them hypothetically anyway. Certainly, it doesn't teach about an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 18:07:05 18:07:09 18:07:12 18:07:16 18:07:20 18:07:24 18:07:27 18:07:31 18:07:34 18:07:35

And so I don't even see Kurita being anywhere close to being what's being taught by the '416 patent in terms of using the concept of integrated subassembly of optical components. 18:07:38 18:07:40 18:07:44 18:07:48

Q Okay. Can you tell me what a WDM multiplexer is? 18:07:53 18:07:57

A So as we look at the '416, we can see that the '416 teaches the multiplexing of different wavelengths of light that eventually end up going down a single fiber. And so the process of multiplexing, as taught by the '416, is to take more than one different wavelength of light and put it 18:08:01 18:08:05 18:08:10 18:08:14 18:08:17 18:08:22

into the same fiber, and the '416 teaches that in terms of its optical combiner, which I construe in paragraph 59 of my initial declaration. 18:08:25 18:08:30 18:08:33

Q Paragraph 223 of your first declaration, Exhibit 2003, you state that "Lemoff's optical signal emitter emulates a WDM multiplexer." 18:08:38 18:08:41 18:08:46

When you say that it emulates a WDM multiplexer, you mean that Lemoff's optical signal emitter functions as a WDM multiplexer. Is that correct? 18:08:51 18:08:53 18:08:57 18:09:04

A I didn't catch the paragraph. Could you repeat the paragraph again, please. 18:09:04 18:09:06

Q Sure. It's paragraph 223, and you can let me know when you have got it there. 18:09:07 18:09:11

A I'm there now. 18:09:17

Q And in that paragraph you state that "Lemoff's optical signal emitter emulates a WDM multiplexer." Do you see that? 18:09:18 18:09:20 18:09:25

A I do see that. 18:09:27

Q And when you say emulates a WDM multiplexer, you mean that Lemoff's optical signal emitter functions as a WDM multiplexer, correct? 18:09:28 18:09:30 18:09:35

A I don't see that at all. What I do see in Lemoff is the Lemoff doesn't want to use a WDM multiplexer because it's costly and it's difficult to align. The Lemoff has a design where it doesn't need a WDM multiplexer. What Lemoff does is, is geometrically aligns and positions lasers so that they go into the fiber, and each laser has a different wavelength and it enters the fiber at a different entry point. 18:09:43 18:09:45 18:09:52 18:09:54 18:09:58 18:10:02 18:10:05 18:10:08 18:10:12

And so Lemoff has come up with let's call it an interesting way to not use a WDM multiplexer, although the signals, when they're in the fiber, are multiplexed in the fiber. But it doesn't use a multiplexer to put the signals into the fiber, as -- sorry -- as compared to the '416 that actually uses an optical combiner to do the optical multiplexing. 18:10:13 18:10:17 18:10:22 18:10:26 18:10:30 18:10:35 18:10:39

Q What do you mean by the word "emulate" in this paragraph? 18:10:44 18:10:50

A Well, so if you look at the Lemoff solution, when you look at the perspective of the fiber, the fiber has more than one wavelength of light, so it has different wavelengths of light. 18:10:51 18:10:54 18:10:58 18:11:03

And so in the industry that fiber would have a wavelengths multiplexed signal because it's got more than one wavelength of light going through the same fiber. 18:11:07 18:11:11 18:11:16 18:11:19

But when I say emulate, it's because Lemoff is looking to teach away, he's not looking to use a multiplexer. He sees multiplexers as being costly expensive, different to align, adds complexity, adds a lot of cost to the product, and wants to actually get rid of it. And the way he gets rid of it is actually geometrically positioning the lasers, individual laser chips, and so that those lasers go into the fiber at different entry points where you can multiplex a signal through the fiber, but it doesn't use a multiplexer. And my term "emulate" means it doesn't need it. 18:11:19 18:11:22 18:11:27 18:11:31 18:11:35 18:11:39 18:11:42 18:11:46 18:11:50 18:11:54 18:11:57 18:12:00

Q All right. Now, in terms of the device disclosed in Lemoff, and I understand that there's a number of embodiments, so the questions I'm going to ask you are going to focus on the embodiment shown in Figure 2. 18:12:07 18:12:10 18:12:14 18:12:17 18:12:20

Does the embodiment of Figure 2 in Lemoff 18:12:21

multiplex light of different wavelengths? 18:12:24

A So Lemoff Figure 2 is much -- very 18:12:32

different than what's being construed in the '416 18:12:35

patent. The '416 patent, and I'll go back to 18:12:39

paragraph 59 again, I mean, we have an integrated 18:12:42

optical subassembly of optical components as part of 18:12:46

an optical combiner that multiplexes light in 18:12:52

different wavelengths, and it does that through an 18:12:53

integrated, pre-aligned connector with a stop to 18:12:58

hold a fiber optic cable, which fiber optic cable 18:13:00

receives those multiplexed wavelengths. 18:13:04

In Lemoff there isn't a WDM multiplexer. 18:13:06

It uses individual lasers that are imaged through 18:13:11

lens 220 onto different sections or endpoints of 18:13:15

that fiber and sends different wavelengths through 18:13:20

the fiber, but doesn't use a multiplexer. And 18:13:24

certainly is vastly different than what is the '416 18:13:29

teaches is an optical combiner, and certainly 18:13:34

doesn't have a stop to hold a single fiber optic 18:13:37

cable. 18:13:41

Q Okay. But you agree that Lemoff, the 18:13:41

embodiment of Figure 2 multiplexes light of 18:13:43

different wavelengths, correct? 18:13:46

A So I agree when you look at Lemoff, even 18:13:48

though it's not prior art, qualified prior art to 18:13:52

even be close to the '416 patent, certainly is an 18:13:56

innovative way to send different wavelengths down 18:14:00

the fiber, and so that would be a multiplexed fiber 18:14:04

solution. But doesn't use what is taught in the 18:14:07

'416, which is an integrated subassembly of optical 18:14:12

components that multiplex the light. 18:14:15

What he actually does is he doesn't use a 18:14:17

multiplexer at all. He just arranges in Figure 2 18:14:20

the laser chips geometrically placed so that each 18:14:23

laser can be imaged on the end of the fiber, and he 18:14:27

does it that way so he can save costs, and he 18:14:30

doesn't need to align or purchase a multiplexer to 18:14:33

do the wavelength MUXing. 18:14:39

Q Is it your opinion that the emitter 200 in 18:14:41

Figure 2 of Lemoff does not multiplex light? 18:14:46

MS. RICHEY: Objection. Form. 18:14:50

Q Let me re-ask that. 18:14:58

So is it your opinion that emitter 200 in 18:14:59

Figure 2 of Lemoff does not multiplex light of 18:15:03

different wavelengths? 18:15:07

A So we can see from the front page of 18:15:08

Lemoff in the title, it's an array of discretely 18:15:12

formed optical signal emitters, in other words, 18:15:16

laser chips, for multichannel communication. So 18:15:18

Lemoff does actually design something to multiplex 18:15:21

wavelengths, but he doesn't use a multiplier -- a 18:15:25

multiplexer, sorry. 18:15:29

And Lemoff actually designs away from 18:15:32

what's being taught in the '416, because the '416 in 18:15:36

the optical component -- in the optical combiner 18:15:41

does use an integrated subassembly of optical 18:15:45

components that multiplex light. 18:15:46

So yes, I would agree with you that Lemoff 18:15:48

does have different wavelengths of light that enter 18:15:52

the fiber, but it has a very different technique to 18:15:55

do that. And Lemoff's technique is not using a 18:15:57

multiplexer, but is actually geometrically locating 18:16:01

and aligning individual lasers so that they can 18:16:05

enter the fiber at different endpoints. So it's a 18:16:10

very different design. 18:16:13

In fact, in Figure 1B doesn't even use an 18:16:14

imaging lens at all. It just brings a fiber right up to the lasers that are geometrically positioned to enter light directly but coupled into the fiber. That means the fiber is actually touching the laser output. 18:16:18 18:16:21 18:16:24 18:16:27 18:16:30

Q Does Lemoff's optical signal emitter 200 of Figure 2 combine light from multiple lasers of different wavelengths? 18:16:38 18:16:42 18:16:48

MS. RICHEY: Objection. Form. 18:16:49

A There's nothing in Lemoff's optical components that you would call a multiplexer. A multiplexer is a component that would combine light, and Lemoff's design eliminates the need for that. So the way Lemoff actually launches different wavelengths of light into the fiber is by geometrically placing laser chips in a certain way in a certain layout, and so it takes a lot of time to position all those laser chips. 18:16:50 18:16:54 18:16:57 18:17:02 18:17:06 18:17:09 18:17:12 18:17:15 18:17:21

Figure 1B of Lemoff just directly couples the laser directly into the fiber. And Figure 2 has the laser chips imaged through lens 220 to the fiber at different end spots on the fiber. This is not 18:17:24 18:17:27 18:17:30 18:17:35

the optical combiner that is being taught in the '416, and is certainly not even close to being construed of an optical combiner that I've indicated in paragraph 59 of my declaration. It's certainly not an integrated subassembly of optical components that multiplexes light of different wavelengths that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 18:17:38 18:17:42 18:17:44 18:17:48 18:17:51 18:17:54 18:17:57 18:17:58

I will agree there is a cable, there is a fiber optic cable, and there's an imaging lens, but there's no multiplexer. And what actually ends up into the fiber are multiplexed wavelengths because there's different wavelengths into the fiber. 18:18:01 18:18:04 18:18:07 18:18:10 18:18:15

But Lemoff is smart in designing a solution here in his '195 patent that doesn't use a multiplexer, and so I don't see it as being prior art to the '416 teaching. 18:18:18 18:18:22 18:18:27 18:18:33

Q So Lemoff you agree has a connector, correct? 18:18:36 18:18:39

MS. RICHEY: Objection. Form. 18:18:43

A I don't know if what Lemoff has designed in Figure 2 is a connector or not. But certainly it 18:18:49 18:18:52

is not an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. What it is is a fiber optic cable with a ferrule glued to it. That ferrule does not have a stop, and the fiber probably has to be polished once the ferrule is actually glued to it. Just like I've indicated in -- in page 29 on my initial declaration, there is a ferrule without a stop and the fiber goes through and it's polished at the end. That's probably the way that Lemoff does his solution. So it's very much different than the '416 patent. 18:18:56 18:18:59 18:19:02 18:19:05 18:19:09 18:19:13 18:19:29 18:19:33 18:19:37 18:19:40 18:19:44

Q If we turn to column 1 of Lemoff, and that's Exhibit 1006, at lines 52 to 56, it's the first paragraph of the Summary of the Invention, it says that "The invention provides a multichannel optical signal emitter for a wavelength division multiplexed (WDM) communication system that combines multiple signal components into a multichannel optical signal without using an optical multiplexer or other device external to the emitter." 18:19:46 18:19:49 18:19:59 18:20:03 18:20:06 18:20:09 18:20:12 18:20:15 18:20:19

Do you see that statement, Dr. Lebby? 18:20:23

A Yes, I do. 18:20:25

Q And so based on this statement from the Summary of the Invention, Lemoff says that its optical signal emitter, quote, "combines" multiple signal components into a multichannel optical signal. Is that correct? 18:20:26 18:20:28 18:20:32 18:20:37 18:20:41

A And so I've already indicated on record Lemoff through the title of the '195 patent is, quote, "Array of Discretely Formed Optical Signal Emitters," i.e., laser chips, "for Multichannel Communication." Lemoff actually teaches that it's a wavelength multiplex system. 18:20:42 18:20:44 18:20:49 18:20:55 18:20:58 18:21:01

However, if you look at line 56 -- lines 55 and 56 of column 1, he says "without using an optical multiplexer or other device external to the emitter." And you can see, as a person of ordinary skill in the art, Figure 1 doesn't use anything other than the geometrically aligned lasers that are butt-coupled to or directly connected, physically connected to a fiber, or in Figure 2, each of the geometrically aligned lasers via an imaging lens to image them on different endpoints of the fiber. There's no multiplexer at all, because Lemoff 18:21:04 18:21:09 18:21:13 18:21:16 18:21:19 18:21:21 18:21:26 18:21:31 18:21:34 18:21:39 18:21:42

teaches away, he doesn't want to use a multiplexer because they're expensive and difficult to align. 18:21:45 18:21:48

Q And so the emitter that Lemoff is referring to, for example, in Figure 2 embodiment would be the optical signal emitter 200. Is that correct? 18:21:50 18:21:54 18:21:57 18:22:33

A I believe Lemoff when he uses the word "emitter" is talking about the laser diodes. And so the laser diodes when they emit light, that light path doesn't pass through any optical component that will act as a multiplexer to multiplex different wavelengths of light. And so Lemoff is clearly teaching away from the '416 patent that has -- the '416 patent has an optical combiner. 18:22:33 18:22:36 18:22:39 18:22:44 18:22:50 18:22:55 18:22:58 18:23:00

And as we already know, the optical combiner actually has an integrated subassembly of optical components for multiplexing light on different wavelengths. Lemoff teaches away from this. He doesn't want to use a multiplexer. He just wants to add different wavelengths into the fiber from the lasers geometrically positioned. It was very different than what the '416 teaches in 18:23:02 18:23:05 18:23:08 18:23:11 18:23:14 18:23:18 18:23:22 18:23:26

terms of an optical combiner. And, actually, it doesn't even have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 18:23:31 18:23:34 18:23:38 18:23:38

So, again, both from the fiber standpoint, as well as the fact that it doesn't have a multiplexer standpoint, it's -- I don't consider this parallel. 18:23:40 18:23:43 18:23:45 18:23:47

Q Let's turn to column 5 of Lemoff starting at line 50, which is where it begins to describe Figure 2, and it says that "Figure 2 is a cross-sectional view of optical signal emitter 200, according to an embodiment of the invention." And then it explains that optical signal emitter 200 includes die 110, emission apertures 120, pads 130, and substrate 140. 18:23:48 18:23:53 18:23:57 18:24:00 18:24:04 18:24:07 18:24:11 18:24:15

And then in the next paragraph at line 55, it goes on to say that "The optical signal emitter 200, also includes receptacle 260, optical fiber 258, and ferrule 255, which together function in a manner similar to that of optical conduit 150, as shown in Figure 1." 18:24:17 18:24:20 18:24:24 18:24:29 18:24:34 18:24:38

So are these other components -- and then -- sorry. If we look further at figure -- column 6, line 8, it says "Optical signal emitter 200 also includes optical imaging element 220." 18:24:39 18:24:43 18:24:47 18:24:51

So is it fair to say that optical signal emitter 200 of Lemoff includes more than just the die; it includes the imaging lens 220, the ferrule, the optical, the receptacle 260, and the other components that it described in columns 5 and 6? 18:24:54 18:24:57 18:25:01 18:25:06 18:25:12

A I have no reason to disagree with what's been written in the Lemoff patent '195. The Lemoff patent teaches that it is -- the title of the patent is an "Array of Discretely Formed Optical Signal Emitters for Multichannel Communication," end quote. And what Lemoff actually teaches that he's arranged laser chips in a way that different wavelengths -- different wavelengths can end up through different entry points into the fiber to create a multiplexed or multichannel system, and certainly there's no reason to believe otherwise. 18:25:23 18:25:26 18:25:30 18:25:32 18:25:37 18:25:40 18:25:44 18:25:48 18:25:51 18:25:55 18:26:00

But Lemoff teaches a way of using a multiplexer. Lemoff doesn't even use collimated 18:26:02 18:26:06

lenses. Lemoff doesn't even have a fiber stop and a pre-aligned connector with a stop to hold a fiber optic cable. 18:26:10 18:26:16 18:26:16

So while I understand what you said in terms of optical signal emitter 200, it certainly is not prior art to the '416 patent, and it certainly is not an optical combiner because it doesn't even have a multiplexer. And I don't even see an integrated subassembly of optical components for multiplexing because the lasers -- multiplexer there, just different lasers go into the fiber at different entry points, and there's no fiber stop in the pre-aligned connector. 18:26:19 18:26:21 18:26:26 18:26:30 18:26:34 18:26:38 18:26:42 18:26:48 18:26:50 18:26:54

So yes, I think you can -- you can look at the optical signal emitter and describe it your way, but I don't see it as being prior art for the '416 at all. 18:26:55 18:26:59 18:27:03 18:27:07

Q So when Lemoff describes at column 1, lines 52 to 56, that the invention provides an emitter for a WDM communication system, quote, "without using an optical multiplexer or other device external to the emitter," that means that it 18:27:07 18:27:11 18:27:14 18:27:18 18:27:21

doesn't need anything external to optical emitter 200 of Figure 2 in order to be a WDM communication system, correct? 18:27:26 18:27:29 18:27:34

A What column 1 of Lemoff actually teaches me as a person of ordinary skill in the art is that he's designed a unit, let's call it 200 in Figure 2 or 100 in Figure 1B, that can send different wavelengths of light down a fiber without using a optical multiplexer or any other device external to 100 or 200 that would multiplex light. 18:27:38 18:27:41 18:27:45 18:27:52 18:27:57 18:28:01 18:28:04

And so he's figured a way to the '195 patent for not using a multiplexer. And it certainly is very different than what's been taught in the '416 patent, which is an integrated subassembly of optical components that are designed to multiplex light of different wavelengths, and includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. Lemoff doesn't even have that. Lemoff doesn't even have collimated lenses. In fact, I don't think you could even have them fit into the Lemoff design. And so it is very different. 18:28:07 18:28:11 18:28:14 18:28:18 18:28:21 18:28:24 18:28:28 18:28:30 18:28:33 18:28:36 18:28:39 18:28:42

But, as you say, it is a solution to send different wavelengths -- different wavelengths of light down a fiber, and that qualifies it to be a WDM, but it doesn't qualify it to be prior art of the '416 patent. 18:28:43 18:28:48 18:28:51 18:28:54 18:28:59

Q So you agree, though, that the optical signal emitter 200 of Figure 2 of Lemoff is a multichannel signal emitter for a WDM communication? 18:28:59 18:29:03 18:29:06

MS. RICHEY: Objection. Form. 18:29:11

A So I've already indicated on record, and Lemoff actually teaches that different wavelengths of light can be launched into a fiber at different endpoints on the end of the fiber. 18:29:16 18:29:19 18:29:23 18:29:26

But in doing that, Lemoff doesn't use an optical multiplexer, and has a completely different design than what's being taught in the '416 patent. And the '416 patent is an integrated subassembly of optical components that multiplex light in different wavelengths. 18:29:27 18:29:31 18:29:35 18:29:38 18:29:42 18:29:45

So yes, the final solution is to send different wavelengths of light down the fiber. But Lemoff is very different and it has -- does not have 18:29:46 18:29:48 18:29:51

an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. So it's very different, it's a very different design. 18:29:54 18:29:57 18:30:00

And if you read the specification in the '416, as I indicate in paragraphs 59 to 70, you see that I've defined integration and subassembly and the fact that the '416 is a very novel solution. 18:30:02 18:30:08 18:30:13 18:30:18

But, in general, Lemoff teaches away, but I agree with you does end up with different wavelengths of light going down the fiber, but it does it in a very different technique and a very different solution. 18:30:22 18:30:24 18:30:28 18:30:33 18:30:36

Q Okay. And I just want to clarify, so you agree, then, that optical signal emitter 200 of Lemoff provides, and here I'm quoting from column 1, lines 52 to 55, of Lemoff, the signal emitter 200 provides, quote, "a multichannel optical signal emitter for a wavelength division multiplexed (WDM) communication system that combines multiple signal components into a multichannel optical signal." Is that correct? 18:30:37 18:30:40 18:30:43 18:30:49 18:30:53 18:30:58 18:30:59 18:31:02 18:31:08

A No, that's not correct. While Lemoff does 18:31:08

actually teach to send different wavelengths of light going through the same fiber, he approaches it in a very different technique and a very different way than what's been taught in the '416 patent. And you can see in lines 55 and 56 in column 1, Lemoff actually teaches away, he doesn't even use an optical multiplexer. He's figured out an innovative way to get different wavelengths of light going to different entry points of the fiber by geometrically aligning different lasers, and does not use an optical multiplexer, so doesn't have an optical combiner. And certainly doesn't use an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. So I disagree with the way you phrased that question. 18:31:12 18:31:15 18:31:20 18:31:23 18:31:26 18:31:30 18:31:32 18:31:37 18:31:42 18:31:45 18:31:47 18:31:51 18:31:54 18:31:57 18:32:00

Q All right. I want to turn to paragraph 228 of your original, your first declaration, Exhibit 2003, and you state there that "Lemoff uses an unusually large fiber - larger than fibers used in nearly all WDM systems - to allow for the light to enter into the fiber at different locations." 18:32:04 18:32:08 18:32:14 18:32:18 18:32:22 18:32:26

Do you see that? 18:32:29

A Not yet. Is this paragraph 228? 18:32:30
Q Yes. 18:32:35
A I do see that. 18:32:46
Q Yeah, I believe it's the last sentence. 18:32:47
A Yes. 18:32:50
Q And you base your statement -- well, let me ask you this. What do you base your statement that Lemoff uses unusually large fiber on? 18:32:50 18:32:56 18:32:57
A So if we look at column 3 of Lemoff, especially lines 34 to 43, Lemoff does knowledge that optical fiber could be narrower than 100 microns. Typically, the optical fiber that is used in these types of systems in industry is the core especially can be down to 10 microns or 8 microns and can be up to 50 or 62. These are the commercial core diameters of fiber that's used in the network today. 18:33:27 18:33:31 18:33:42 18:33:47 18:33:50 18:33:58 18:34:02 18:34:07 18:34:10
What Lemoff is anticipating here is somewhere between 100 microns and 1000 microns. And in fact, in lines 41 to 43, actually teaches, column 3, quote, "In some embodiments, the optical fiber has a core diameter that is equal to the diameter of 18:34:11 18:34:13 18:34:17 18:34:22 18:34:25

the signal emitting area." 18:34:30

The whole goal of Lemoff is to find a 18:34:31

receiving area for the geometric alignment of all 18:34:36

these little laser chips so that it doesn't need to 18:34:39

use an optical multiplexer, that is, or an optical 18:34:42

combiner as construed in the '416 patent. 18:34:46

So he's desperately trying to avoid that. 18:34:49

And one of the best ways to do that is to use a 18:34:52

larger fiber, which makes it a little easier to 18:34:56

image all the different geometrically located laser 18:35:00

diodes on different endpoints of the fiber. 18:35:04

In fact, if Lemoff decided to use single 18:35:07

mode fiber, which has a core diameter of typically 8 18:35:09

microns, I don't think this thing would ever work at 18:35:12

all; it would be too difficult to align. 18:35:17

And so it is very different in terms of 18:35:20

its optical design compared to the '416 patent that 18:35:22

does have an optical -- an integrated optical 18:35:25

subassembly of optical components to multiplex 18:35:29

light. And Lemoff doesn't have a multiplexer, as 18:35:32

we've already established on record. 18:35:36

Q Would Lemoff work if you used a core a lot 18:35:38

less than 1000 micrometers in diameter in the embodiment of Figure 2? 18:35:42 18:35:46

MS. RICHEY: Objection. Form. 18:35:47

A Certainly Lemoff doesn't teach the use of small core fibers. But Lemoff is already concerned that the alignment and the cost of optical multiplexes is really impeding his design, so he's teaching away and designing them out. 18:35:51 18:35:55 18:35:59 18:36:02 18:36:07

So I believe there's a good reason why he doesn't want to use an optical multiplexer, because it is quite difficult to implement, and doesn't want to go through all the tricky alignment. 18:36:08 18:36:10 18:36:14 18:36:16

But I'm not here to say whether it would work or not work. I'm just indicating that the motivation for Lemoff is teaching away from what's being taught in the '416 patent, because in Lemoff's eyes it's incredibly difficult. 18:36:18 18:36:21 18:36:23 18:36:27 18:36:31

Q All right. Now we're looking at column 3, lines 35 to 37 of Lemoff, Exhibit 1006, that says, "The optical fiber used in some embodiments has a core diameter that is a lot less than 100 micrometers." Do you see that? 18:36:33 18:36:37 18:36:39 18:36:43 18:36:47

A I do see that. 18:36:49

Q So, in other words, the core diameter could be a lot less than 100 micrometers in Lemoff's embodiments, correct? 18:36:49 18:36:51 18:36:57

A So, yes, Lemoff does teach that core diameters could be smaller than 100 microns. Lemoff doesn't give any teaching whether that is easier to implement or not. But certainly the smaller the core of the diameter, the harder it is to align, the harder it is to align all those individual laser chips so they are geometrically correctly aligned to emit light through the imaging lens and to different end spots of the fiber. And so the smaller the core of the fiber, the harder it is to align the optics. 18:36:58 18:37:01 18:37:06 18:37:09 18:37:11 18:37:15 18:37:19 18:37:23 18:37:26 18:37:30

And clearly, Lemoff is trying to figure out a way to take the alignment out of the equation, not use an optical multiplexer, and try and design something that alleviates these alignment issues. 18:37:34 18:37:37 18:37:40 18:37:45

So I agree with you that Lemoff does talk about smaller core diameters, but doesn't give any indication whether he would be successful in that. 18:37:48 18:37:50 18:37:54

And again, this is very different than the 18:37:56

'416 patent and what that teaches. That has an optical combiner which is an integrated subassembly of optical components that multiplexes light of different wavelengths, and it also includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. And Lemoff is a different design and certainly teaches away from what is being taught in the '416. 18:37:59 18:38:02 18:38:05 18:38:09 18:38:12 18:38:13 18:38:17 18:38:20

Q If the core diameter in Lemoff is a lot less than 100 micrometers as it teaches, would it be unusually large in that case? 18:38:23 18:38:27 18:38:32

A All I could say is from my experience base, the smaller the core diameter, the harder it is to align. That will impact yield and manufacturing. It will impact cost. And so Lemoff already realizes this, and that's why he's teaching that the core diameters of the fiber can be up to 1000 microns, which is exceedingly large, and that works for his design. It may or may not work for smaller core diameters. But he certainly doesn't teach the use of standard fiber cores that are found in industry. 18:38:51 18:38:54 18:38:58 18:39:00 18:39:03 18:39:06 18:39:11 18:39:14 18:39:17 18:39:20 18:39:23

What Lemoff teaches is that his design alleviates the use of an optical multiplexer because he doesn't want to deal with the cost of a multiplexer and the difficulty of alignment, that his design is better suited for larger core diameters. 18:39:23 18:39:27 18:39:30 18:39:33 18:39:36 18:39:41

But having said that, I have no reason to disbelieve it may not work for smaller core. But it's certainly not the direction of the design where Lemoff is actually going, and it certainly is not prior art to the '416 teaching that has an optical combiner, that has an optical multiplexer, and certainly has an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. Lemoff doesn't have that at all, and so it's a very different design. And certainly I don't believe it is prior art to the '416 and what that teaches. 18:39:41 18:39:43 18:39:46 18:39:49 18:39:52 18:39:56 18:39:59 18:40:02 18:40:05 18:40:08 18:40:11

MS. RICHEY: Mark, before you ask your next question, are you in a good place to take a break almost? 18:40:16 18:40:17 18:40:20

MR. RAWLS: Yeah. I'll ask one more question and then I think we can take a break. 18:40:21 18:40:23

Q I just want to clarify the last question and answer, Dr. Lebby. So if the core diameter is a lot less than 100 micrometers, it would not be unusually large. Is that correct? 18:40:27 18:40:30 18:40:34 18:40:38

MS. RICHEY: Objection. Form. 18:40:40

A The core diameters I've given that you see in commercial fiber optic systems are 8 microns, 50 microns, and 62.5 microns. These three measurements are all below 100 microns. 18:40:50 18:40:53 18:40:58 18:41:03

So when Lemoff teaches that it could be lower than 100, it could be 90, it could be 80, I don't know if what he has in mind aligns with commercial systems. 18:41:05 18:41:08 18:41:11 18:41:14

But what I've already indicated on record with the answer to my last question, Lemoff is actually looking to have this design with logical fiber diameters as it's easier to align and it's easier to launch different wavelength light from different laser chips that go into different endpoints of the fiber, so to generate different wavelengths going down the fiber without the use of an optical multiplexer. And so this is a very 18:41:15 18:41:17 18:41:20 18:41:23 18:41:27 18:41:30 18:41:35 18:41:39 18:41:42

different design than the '416 teaches. Lemoff is looking to reduce costs and reduce alignment issues. 18:41:47 18:41:52

And so your hypothetical question of could this system of Lemoff actually work with smaller cores, perhaps, but it's not designed for that. It's actually designed for larger core diameters. And it's very different than the '416 that teaches an optical combiner that is particularly set up for commercial fiber diameters. 18:41:56 18:42:00 18:42:04 18:42:07 18:42:10 18:42:13 18:42:18

Q Okay. Now, as an example of less than 100 micrometers you gave 90 and then 80 micrometers as two examples, so I'll ask both of those in turn. 18:42:20 18:42:25 18:42:30

The first one, is 90 micrometers a lot less than 100 micrometers? 18:42:33 18:42:36

MS. RICHEY: Objection. Form. 18:42:38

A So the question was, hypothetically, is 90 less than 100. Well, clearly 90 is less than 100. Is it a lot less? I don't know the answer to that. 18:42:46 18:42:50 18:42:54

All I do know is in Lemoff's design small core diameters make it more exceedingly difficult for Lemoff's device to work well and to work with high yield, and it's going to add extra cost to 18:42:57 18:43:01 18:43:04 18:43:07

Lemoff's design. Lemoff's design alleviates the use and the need of an optical multiplexer. And so Lemoff's design actually is worried about the cost in the optical alignment of the use of optical multiplexers, and certainly doesn't utilize things like collimating lenses. 18:43:12 18:43:15 18:43:19 18:43:22 18:43:25 18:43:29

So Lemoff's design is trying to simplify how you get different wavelengths into the same fiber. And Lemoff's design actually is better suited to larger core diameters. 18:43:31 18:43:36 18:43:39 18:43:43

So your question of whether it's 80 microns or 90 microns or whether that's -- let's see, what did you say? -- is a lot less than 100, I don't know the answer to that question. 18:43:46 18:43:48 18:43:52 18:43:56

All I do know is, is that the degree of difficulty of having Lemoff's design work well is much higher, and Lemoff probably would go to larger core diameter fibers, as he teaches in column 3, lines 34 to 44. 18:43:57 18:44:00 18:44:04 18:44:09 18:44:14

MR. RAWLS: All right. We can take a break now. We can go off the record. 18:44:18 18:44:19

THE VIDEOGRAPHER: We are going off the 18:44:21

record at 6:44. 18:44:22

(Recess 6:44 p.m. - 6:56 p.m.) 18:44:25

THE VIDEOGRAPHER: We are back on the record at 6:56. 18:56:45 18:56:49

BY MR. RAWLS: 18:56:52

Q Welcome back, Dr. Lebby. I'll ask you a couple more questions about Lemoff that we've been looking at, which is Exhibit 1006. 18:56:53 18:56:57 18:57:00

So do you agree that Lemoff teaches a connector? 18:57:04 18:57:09

MS. RICHEY: Objection. Form. 18:57:09

A If there's part of Lemoff that talks about a connector, could you direct me to it? Because I'm going to have to go through it. 18:57:34 18:57:37 18:57:40

Q Sure. If we can look at column 5, line 65 -- sorry, I think I wrote it down wrong. There's a paragraph at line 55 through column 6, line 2. Specifically the sentence beginning on line 65 refers to "Receptacle 260 and ferrule 255 constitute a connector." But I'll let you take a moment to look more closely. 18:57:42 18:57:46 18:57:48 18:57:55 18:57:57 18:58:02 18:58:06

A Thank you for that. 18:58:14

So as I look in Lemoff in column 5, lines 55 to 67, Lemoff does call out, expressly call out that receptacle 260 and ferrule 255 constitute a connector. However, that is a different type of connector that is taught -- that is being taught in the '416 patent. 18:58:29 18:58:35 18:58:46 18:58:52 18:58:54 18:58:57

And the '416 patent, as I indicate in my first declaration, from paragraphs 59 to 70 that actually describe an optical combiner, actually has an integrated pre-aligned connector with a structural feature of a stop to stop the fiber in the zed direction, or the Z direction, as the fiber is placed into the ferrule. 18:58:58 18:59:00 18:59:05 18:59:12 18:59:17 18:59:21 18:59:25

So while Lemoff does expressly call out a connector, it's very much different than what's being taught in the '416 patent that has a stop, a stop single optical fiber with an integrated, pre-aligned connector, and so it is different than what is being taught in the '416 patent. 18:59:28 18:59:33 18:59:36 18:59:42 18:59:52 18:59:54

Q If we look at the next column, column 6, lines 12 to 15, that says, "Optical signal emitter 200 also includes housing 230, which secures 18:59:57 19:00:03 19:00:09

receptacle 260, optical imaging element 220, and substrate 140, and which holds them in alignment with each other." 19:00:13 19:00:16 19:00:20

So is the connector in Lemoff integrated with its housing? 19:00:21 19:00:24

A Lemoff in column 6, lines 12 to 15, doesn't use the term "integrated" at all, just describes optical signal to optical signal emitter 200. It does also expressly call out a connector in column 5, line 66, but that's very much different than what's being taught in the '416 patent. 19:00:50 19:00:54 19:00:58 19:01:02 19:01:11 19:01:15

In the '416 patent what we have is, as I've indicated in paragraph 59, is an optical combiner, and an optical combiner is an integrated subassembly of optical components that multiplexing light at different wavelengths, and that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 19:01:17 19:01:21 19:01:25 19:01:29 19:01:33 19:01:36 19:01:40

What is just described in Lemoff is different; it doesn't have a stop, and it doesn't have what I think is a stop in a pre-aligned connector. Certainly the connector in Lemoff is a 19:01:42 19:01:46 19:01:49 19:01:52

ferrule without a stop, and it's actually glued to a fiber, so that's completely different. 19:01:57 19:02:01

And the other thing that Lemoff doesn't have is an optical multiplexer. So it actually sends different wavelengths of light into the fiber, but avoids the use of a multiplexer. And so when you start looking at what I've defined as an optical combiner for the '416, Lemoff is completely different. 19:02:03 19:02:05 19:02:10 19:02:13 19:02:17 19:02:20 19:02:23

Q Is receptacle 260 integrated in the housing 230? And you can also, in addition to what we looked at here in column 6, refer to Figure 2 that illustrates these components together. 19:02:23 19:02:27 19:02:29 19:02:32

A Well, if I look at column 6 of what you've indicated, at lines 12 to 15, and I look at Figure 2, what I see in Figure 2 is a very different connector setup that is actually being taught in the '416 patent. 19:02:40 19:02:46 19:02:48 19:02:52 19:02:55

Lemoff actually shows a fiber that does not -- that is connected to a ferrule, actually glued to a ferrule. The ferrule does not have a stop. The fiber is probably polished at the end, 19:02:56 19:03:00 19:03:04 19:03:09

probably is stuck through to begin with, like I've shown in my first declaration report. And it looks like that fiber, according to Lemoff, is pluggable, it can be removed. And so when I look at that and compare that to the '416 patent, I do not believe it's the same, and I do not believe that it actually achieves what I've defined as the optical combiner, which is an integrated subassembly of optical components for multiplexing light of different wavelengths that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 19:03:12 19:03:15 19:03:19 19:03:23 19:03:26 19:03:30 19:03:34 19:03:37 19:03:40 19:03:43 19:03:46 19:03:46

And furthermore, Lemoff is designing away from what is being taught in the '416, as he does not use an optical multiplexer because he's worried that is extra costs and more difficult to align, there's a very different solution. And somewhere in the Lemoff patent he talks about that the fiber connector with the stuck-on ferrule that doesn't have an endstop is pluggable, and you can see that from Figure 2 because it's not joined; it just can be pulled away. 19:03:50 19:03:52 19:03:57 19:04:01 19:04:04 19:04:09 19:04:15 19:04:17 19:04:21 19:04:25

Q All right. Well, that's not really what I asked. I want to be specific in the question I'm asking you, Dr. Lebby. 19:04:27 19:04:30 19:04:33

Referring specifically to the embodiment of Figure 2 into element 260, which is referred to as receptacle 260, is that element integrated with element 230, which is referred to as housing 230? 19:04:35 19:04:36 19:04:41 19:04:46

A I'm looking at column 6, lines 12 to 15, which indicates that "Optical signal emitter 200 also includes housing 230, which secures receptacle 260." I'm not clear what the meaning of securing actually means for 260. 19:05:22 19:05:29 19:05:34 19:05:38 19:05:44

It looks like 260 from Figure 2 is connected to housing 230. I don't know if that means that it's integrated or not. But certainly the pluggable fiber ferrule that Lemoff has designed, that doesn't have an endstop, is different than what is being taught in the '416. The fact that it's pluggable and it can be removed is very different, and as well as the fact that Lemoff doesn't have an optical multiplexer of which the '416 does have. So it's a very different design. 19:05:46 19:05:50 19:05:55 19:05:58 19:06:02 19:06:05 19:06:09 19:06:13 19:06:16 19:06:20

But I don't know if the Lemoff patent actually defines what securing actually means. But certainly it looks like it could be connected to the housing 230, or 260 connected to the housing 230. But it's very much different than what Lemoff -- sorry. It's very much different than what the '416 teaches in terms of an optical combiner. 19:06:23 19:06:30 19:06:33 19:06:36 19:06:40 19:06:43 19:06:45

Q What would it take for the receptacle 260 to be integrated into the housing? 19:06:48 19:06:53

MS. RICHEY: Objection. Form. 19:06:56

A Well, first of all, Lemoff is not an optical combiner as taught in the '416. And so the optical combiner, as I've construed, is an integrated subassembly of optical components for multiplexing light of different wavelengths that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 19:07:01 19:07:04 19:07:09 19:07:13 19:07:14 19:07:17 19:07:20

The Lemoff doesn't have a stop to hold a single fiber optic cable and doesn't have an optical multiplexer. It's not clear how Lemoff's housing is constructed. He certainly doesn't even have collimating lenses either. So there are a lot of 19:07:22 19:07:25 19:07:29 19:07:33 19:07:38

things different in the Lemoff design. 19:07:41

In fact, the Lemoff design designs away 19:07:43

from what's being taught in the '416. It doesn't 19:07:45

have an optical multiplexer, and it uses the 19:07:48

location of lasers to actually get light imaged on 19:07:49

the end of different parts of the fiber. Whether 19:07:52

that is -- could be construed as an integrated 19:07:56

housing or not, I don't know. 19:07:59

But I certainly don't see it as being 19:08:01

prior art to the '416, or at least what's been 19:08:04

taught in the '416, as I've indicated in my first 19:08:07

declaration and supplemental declaration. 19:08:11

Q And in terms of the receptacle 260 that 19:08:13

was described in columns 5 and 6 and shown in Figure 19:08:23

2, does that stop the movement of the fiber 250 in 19:08:26

the Z direction? 19:08:30

MS. RICHEY: Objection. Form. 19:08:36

A So what we're looking at here in the 19:08:40

Lemoff Figure 2 is a fiber that has a ferrule 19:08:42

adhered to it, and the fiber is probably placed in 19:08:46

the ferrule and then polished at the end. What is 19:08:49

very clear is that ferrule doesn't have a fiber 19:08:53

stop, and so it's not designed like what is being taught in the '416 patent. 19:08:57 19:09:00

However, the question is, is that pluggable fiber, and the fiber in the '416 patent is not pluggable, so it's a very different design, does that have -- does the 260 it plugs into have a stop to stop the ferrule, then, clearly, from Figure 2 there is a stop that stops the ferrule, and so there is a Z direction. But it's not an endstop in a fiber, as I've written in my first declaration. 19:09:02 19:09:04 19:09:09 19:09:13 19:09:17 19:09:20 19:09:23 19:09:28

And also, Lemoff doesn't have the components that would make up an optical combiner, especially the optical multiplexer or even collimated lenses. 19:09:33 19:09:42 19:09:46 19:09:49

But I would agree with you that the fiber is stopped on 260, but it's not a stop within the ferrule, so it's a completely different design. 19:09:51 19:09:53 19:09:57

Q Now, speaking of the '416 patent, is the purpose of a ferrule in the '416 patent to allow an optical fiber to be placed into the ferrule? 19:10:01 19:10:06 19:10:09

A Well, that's certainly one of the reasons why you have a ferrule is so an optical fiber can be 19:10:18 19:10:20

placed in it. But the inventive and the interesting part of the '416 design is the ferrule has a fiber stop, so it actually deals with the X and Y alignment, as well as the Z alignment, and that is integrated in an optical combiner, as the '416 teaches, with an integrated subassembly of optical components that multiplex light in different wavelengths, and also includes an integrated, pre-aligned connector with a stop to hold the fiber optic cable that is passively aligned. 19:10:24 19:10:27 19:10:31 19:10:36 19:10:40 19:10:45 19:10:49 19:10:52 19:10:57 19:10:59

And so the tolerances designed in the '416 allows passive alignment. The tolerances in the Lemoff is not clear if that's passively aligned or not. Certainly from Figure 2, there seems to be a large space between the ferrule and 260. So I don't know if there's enough tolerance there for passive alignment that Lemoff teaches. But it's a very different design, and it certainly is a different optical combiner that doesn't have an optical multiplexer. 19:11:01 19:11:04 19:11:08 19:11:13 19:11:16 19:11:19 19:11:23 19:11:26 19:11:30 19:11:33

Q So in your view, the stop within the ferrule is a novel aspect of the '416 patent? 19:11:34 19:11:37

A The stop within the ferrule is certainly one of the novel aspects of the '416 patent. Clearly, there are a bunch of others, including the integrated subassembly of optical components that multiplex light at different wavelengths that includes the integrated, pre-aligned connector with the stop to hold the single fiber optic cable to allow passive alignment. 19:11:42 19:11:46 19:11:49 19:11:52 19:11:54 19:11:57 19:11:59 19:12:02

But there's also other things that I've indicated in paragraph 59 to paragraph 70 in my initial declaration that adds to the clear benefits of the '416 design, including collimating lenses, including optical MUX, including stops within ferrules that actually allows the '416 to be inventive and novel, of which the Lemoff patent does not, and doesn't, in my eyes, qualify as prior art. 19:12:04 19:12:06 19:12:10 19:12:14 19:12:22 19:12:25 19:12:29 19:12:33

Q Were the types of connectors that we see in the '416 patent known in the art? 19:12:44 19:12:46

MS. RICHEY: Objection. Form. 19:12:53

A I don't understand the question. 19:12:57

Q So connector 80, for example, in Figure 1 is a type of connector or ferrule that the '416 19:12:59 19:13:03

patent teaches, right? 19:13:07

A So as I understand it -- I mean, I've got a 40-year experience in the field of optoelectronics. I've certainly seen fiber connectors and so fiber connectors that contain ferrules. But certainly I haven't seen anything that is integrated, as I define in my first declaration in paragraph 59 when I call out the -- construe the optical combiner. 19:13:13 19:13:15 19:13:19 19:13:21 19:13:24 19:13:27 19:13:30 19:13:36

What I'm looking at here is an integrated subassembly of optical components that the '416 teaches. I'm also looking at a way where the '416 teaches the multiplexing of different wavelengths of light for WDM, plus the integration of a pre-aligned connector with a stop. 19:13:38 19:13:41 19:13:44 19:13:48 19:13:51 19:13:55

So your question is, is were they available before 2003. A connective with a ferrule that wasn't integrated, that wasn't part of an optical combiner, probably was available. But certainly as an integrated unit as construed, at least in paragraph 59 and paragraphs 59 to 70, and as taught by the '416 patent, doesn't mean that's 19:13:58 19:14:00 19:14:06 19:14:08 19:14:11 19:14:15 19:14:18

inventive. And I believe that's why I support the patent owner in terms of this is a novel idea and I believe that Lemoff is not prior art. 19:14:22 19:14:25 19:14:32

Q Now, we said earlier, and I think you agreed with me, that one of the purposes of the ferrule in the '416 patent, and there are others, but one of the purposes is to allow an optical fiber to be placed into the ferrule. Would a POSITA have known about that prior to the '416 patent? 19:14:37 19:14:38 19:14:40 19:14:43 19:14:47 19:14:51

A Well, most of the ferrules I came across when I was working in the field that predate the priority date of this patent, which is the 17th of July 2003, were ferrules that I show on page 29 of my expert report where a ferrule does actually provide X and Y alignment for a fiber, but generally the fiber is pushed out to the end and then polished. That's typically what's done in the industry. And so I certainly was not aware that an endstop in the ferrule could be used for a Z alignment axis together with X and Y. 19:14:55 19:14:58 19:15:02 19:15:05 19:15:10 19:15:13 19:15:18 19:15:20 19:15:23 19:15:26 19:15:30

So when I look at the '416 and what it teaches in terms of an optical combiner that has an 19:15:33 19:15:37

integrated subassembly of optical components that multiplex light using a multiplexer and collimating lenses, et cetera, and also includes an integrated, pre-aligned connector with a stop that holds a fiber optic cable, I certainly viewed that as being novel as a person of ordinary skill in the art at the time of the priority date of the '416. 19:15:41 19:15:47 19:15:47 19:15:53 19:15:55 19:15:57 19:16:00

Q Okay. Well, I'm not asking about the stop right now. 19:16:04 19:16:06

I'm just asking would a POSITA as of the priority date have known that one of the benefits of a ferrule or a connector is that it enables one to place an output fiber optic cable into it? 19:16:07 19:16:10 19:16:13 19:16:16

A Well, as a POSITA looking at the '416 patent at the time of the priority date, it's very clear to me that what's being designed is not an X and Y alignment, which is the position of the fiber within the ferrule, but also the ferrule containing an endstop would actually allow the fiber to be positioned in the Z dimension accurately in an integrated unit called an optical combiner that also has integrated subassembly of optical components 19:16:25 19:16:29 19:16:33 19:16:38 19:16:41 19:16:43 19:16:48 19:16:53 19:16:56

that multiplex light, that, to me, was novel in the 17th of July 2003 time frame. 19:16:59 19:17:05

I certainly understood what the inventors were designing, and it certainly looks like a compact, efficient design that makes a lot of logical sense, and certainly I do see that. But I don't recall there being fibers with endstops and different types of fiber connector scenarios before the priority date of this patent. 19:17:07 19:17:10 19:17:12 19:17:15 19:17:21 19:17:24 19:17:29

Q Okay. So do you have an opinion about whether a POSITA would have known that a benefit of a ferrule as of the priority date is that it enables one to place an output fiber optic cable into it? 19:17:31 19:17:34 19:17:37 19:17:41

A Can you define ferrule? 19:17:46

Q I believe you have a definition in your expert report. We can use that. 19:17:51 19:17:54

A So if you're talking about a ferrule I have on page 29, it doesn't have an endstop, so the fiber is actually pushed all the way through and then polished at the end. I've already indicated on record that's typically what the industry utilized, and utilizes. 19:18:00 19:18:02 19:18:05 19:18:08 19:18:11 19:18:14

The '416 patent actually designs a ferrule with an endstop, so the fiber can go all the way in, aligned passively X and Y, and stop on a Z dimension. And when that's integrated with other optical components as part of an integrated optical subassembly that allows the wavelength multiplexing of light, that integrated, pre-aligned connector for passive alignment with the stop for the fiber optic cable is novel, and that's what's being taught in the '416. 19:18:15 19:18:18 19:18:22 19:18:25 19:18:28 19:18:32 19:18:36 19:18:40 19:18:43 19:18:48

Q So the '416 -- the '416 patent's ferrule allows for passive alignment or pre-alignment, correct? 19:18:49 19:18:53 19:18:55

A So what I've indicated in paragraphs 59 to 70 in my first declaration is certainly the design of the optical combiner certainly allows passive alignment of a fiber that gets inserted into the ferrule, that comes upon the endstop, and so the fiber gets pushed in until it meets the endstop and then it's automatically aligned, and we call that passive alignment, so I would agree with you. 19:18:58 19:19:02 19:19:07 19:19:11 19:19:14 19:19:18 19:19:22 19:19:25

Q And a POSITA would have known as of the 19:19:27

priority date that one of the benefits of the ferrule or a connector is that it can allow for passive alignment or pre-alignment, correct? 19:19:30 19:19:33 19:19:36

A Well, certainly when a POSITA looking at the '416 on the 17th of July 2003 would have readily seen that this was a system that certainly allowed for passive alignment. And as we've already established on record, if you've got passive alignment, you don't have to turn the optics on to do the alignment; the alignment is already made, it's pre-aligned. 19:19:42 19:19:45 19:19:49 19:19:52 19:19:55 19:19:59 19:20:02 19:20:04

And this is a novel design because it's not only that it's integrated with an optical subassembly, an integrated subassembly of optical components that allow the multiplexing of light at different wavelengths down into the fiber. So, yes, this is a novel design, and a POSITA would immediately have seen this. 19:20:05 19:20:07 19:20:11 19:20:16 19:20:20 19:20:24 19:20:26

Q So the question is a little different. 19:20:27

Prior to the '416 patent, would a POSITA have known that a benefit of a ferrule or connector is that it allows for passive alignment or 19:20:30 19:20:33 19:20:35

pre-alignment? 19:20:39

A Well, it depends how you define 19:20:41

pre-alignment or passive alignment. The ferrule, as 19:20:43

I've indicated on page 29, certainly holds a fiber 19:20:46

in place in the X dimension and the Y dimension. 19:20:51

Certainly it does not hold a fiber in place in the 19:20:55

zed direction, or the Z direction. So whether 19:21:00

that's good enough for passive alignment or not I 19:21:01

don't know. 19:21:01

But certainly what's been designed in the 19:21:04

'416 is much more elegant. It has an endstop, so 19:21:06

you push the fiber in, it stops, it's automatically 19:21:10

aligned with the integrated connector and the 19:21:14

integrated optical subassembly of components. This, 19:21:17

I think from the '416 standpoint, is a neat and 19:21:20

inventive design. 19:21:25

Now, as we've seen on page 29, ferrules 19:21:26

didn't have a fiber stop. And I've shown a typical 19:21:29

one that was used in the industry then and it's 19:21:31

still used in the industry today, where the fiber 19:21:35

gets placed in the ferrule, or XY dimension, but not 19:21:37

on the Z dimension. 19:21:42

Q And we just saw Lemoff was an example that discloses a connector that is held in alignment with other optical components with a housing, correct? 19:21:44 19:21:47 19:21:50

A Well, Lemoff has got a different design of the ferrule entirely. Lemoff's design has a ferrule that is adhered to the end of the fiber and the fiber is polished, and so it is actually in line with the end of the ferrule. And Lemoff's design is designed for pluggability, so you can plug in the fiber ferrule and plug it out again. That's what Lemoff really wants to do there. 19:21:54 19:21:57 19:22:01 19:22:03 19:22:07 19:22:10 19:22:14 19:22:17

Lemoff's fiber ferrule design does not have an endstop and is a very different design than what's being taught in the '416. And Lemoff's design, as we've already indicated on record, is a very different design. It doesn't have an optical multiplexer, it doesn't have collimating lenses, and certainly is a very different ferrule design; it doesn't have an endstop in the ferrule. 19:22:20 19:22:23 19:22:27 19:22:31 19:22:34 19:22:37 19:22:38 19:22:41

Q Are there ways to allow an optical fiber to be placed into the ferrule in a support passive alignment or pre-alignment other than using a 19:22:44 19:22:49 19:22:53

connector that abuts against a fiber stop or seat? 19:22:56

MS. RICHEY: Objection. Form. 19:23:00

A So I've certainly aligned fibers into 19:23:03

ferrules in a number of different scenarios. But I 19:23:08

certainly didn't come to this deposition prepared to 19:23:10

answer that question. 19:23:13

What I can say is, is that the design of 19:23:14

the '416 that has the integrated connector with the 19:23:17

ferrule and the endstop is an innovative design, as 19:23:21

part of the optical combiner with the integrated 19:23:25

subassembly of optical components that do WDM, and 19:23:28

that is novel. 19:23:32

Certainly there are other ways to hold 19:23:34

fibers. For example, we just look at my 19:23:36

supplemental report in paragraph 12 and we can see 19:23:40

an image of the opposing expert's optical lab, that 19:23:43

we can see fibers held by different optical 19:23:46

components that are bolted down to an optical bench. 19:23:51

So, yes, there are other ways to do it, 19:23:54

but that's not what the '416 patent teaches at all. 19:23:56

Q And in your opinion, for example, Lemoff 19:24:01

is another way to do it, correct? 19:24:04

A Lemoff certainly holds a fiber, but it's not integrated, and it's certainly not got an endstop as designed in the '416. So I would say Lemoff's design is different than what's been taught in the '416. And certainly from how I've described an optical combiner in paragraphs 59 to 70 of my first declaration that has integrated subassembly of optical components that does WDM, Lemoff does not have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable. 19:24:08 19:24:12 19:24:16 19:24:19 19:24:23 19:24:29 19:24:32 19:24:35 19:24:41 19:24:44

What Lemoff has is a pluggable ferrule without a stop that's actually glued to a fiber, where the fiber is polished back. And so it doesn't have any Z dimensional stop within the ferrule. There's no stop within Lemoff's ferrule. It's completely different. And, therefore, I don't believe that it's prior art to the '416 design. 19:24:47 19:24:51 19:24:54 19:24:57 19:25:03 19:25:06 19:25:08

Q There's a stop, to be clear, in receptacle 260 of Lemoff, correct? 19:25:11 19:25:15

A So receptacle 260 in Lemoff's Figure 2 certainly has a stop. It certainly allows for that pluggable ferrule to be pushed against that stop. 19:25:28 19:25:33 19:25:36

But has a very different design than what is being taught in the '416 patent. 19:25:40 19:25:45

As we've already indicated on record, that ferrule design doesn't have a stop, it's the receptacle that has a stop, and that ferrule is actually glued to the fiber and that receptacle -- sorry -- and that ferrule doesn't control the Z dimension of that fiber; it only controls the X and Y dimension. In fact, it's not even clear that that's controlled very well because there seems to be a large gap between ferrule 255 and receptacle 260 because of its pluggability, which means he has to plug in and out all the time, and when that happens, there has to be some tolerance to allow for the pluggability. 19:25:47 19:25:49 19:25:52 19:25:54 19:25:58 19:26:01 19:26:04 19:26:08 19:26:11 19:26:16 19:26:19 19:26:22 19:26:25

So it's not even clear to me it has a good optical accuracy for optical alignment that is passively. It could go out of alignment for whatever I know. But I certainly haven't done any analysis of this. But it's a completely different design compared to what's being taught in the '416. 19:26:26 19:26:29 19:26:32 19:26:38 19:26:41 19:26:44

Q Now, other than the way the '416 patent 19:26:50

teaches a ferrule and a stop, and other than Lemoff that we just looked at, and the optical bench example you gave, are there other ways where a fiber can be fixed in place? 19:26:54 19:26:59 19:27:02 19:27:05

MS. RICHEY: Objection. Form. 19:27:07

A I just answered that question, but I'll answer it again. 19:27:11 19:27:13

I mean, there are other ways where I have aligned fibers and positioned fibers in different types of scenarios. But certainly I haven't designed a fiber with an endstop in a ferrule that is being taught in the '416. 19:27:14 19:27:18 19:27:21 19:27:24 19:27:28

I think what I just indicated on record in page 29 of my first declaration, a typical ferrule looks like the figure we see on page 29 where the fiber actually is placed through the ferrule, so it has X dimension alignment and Y dimension alignment, but certainly does not have zed directional alignment. And so that fiber is pushed through and typically polished. And so it is very different. And so the techniques for aligning fibers are very different than what's being taught in the '416. 19:27:30 19:27:33 19:27:36 19:27:40 19:27:43 19:27:47 19:27:51 19:27:53 19:27:56 19:28:00

And I'll go back to that image that opposing expert has of his optical lab where he actually has fibers bolted to the optical bench, and the fiber is fixed, but it's not passively aligned. It has to be actively aligned. And certainly that doesn't have an endstop in the ferrule. So it's a completely different scenario than what is being taught in the '416. 19:28:04 19:28:06 19:28:10 19:28:14 19:28:17 19:28:20 19:28:24 19:28:28

Q If an optical fiber is not capable of staying in position when an optoelectronic device is deployed, would that mean that the device would not function effectively? 19:28:29 19:28:32 19:28:37 19:28:40

A So I think the answer is it depends, it depends on the tolerance. And so if the tolerance allows the fiber to move but still stay in optical alignment, then the function will still be successful within that device. 19:28:48 19:28:52 19:28:54 19:28:59 19:29:01

Certainly from what I've seen in the '416 patent, the endstop and the fiber -- the ferrule design certainly allows for that fiber inserted into the ferrule in the X dimension and the Y dimension and stops at the ferrule stop in the Z direction is 19:29:04 19:29:06 19:29:10 19:29:14 19:29:18

going to be aligned. 19:29:22

For example, if we look at the Lemoff 19:29:24

Figure 2 example, it has a different ferrule design. 19:29:25

It doesn't have an endstop where the ferrule is 19:29:30

actually glued to the end of the fiber and the fiber 19:29:33

is clearly polished afterwards. But that's a 19:29:36

pluggable ferrule, and you can see there's a large 19:29:39

space between the ferrule and the receptacle 260. 19:29:42

That may be enough to take the whole thing out of 19:29:46

alignment for all I know. It certainly looks like a 19:29:49

large space. 19:29:52

And so we don't know right now if the 19:29:53

Lemoff design really can accept misalignment through 19:29:56

its tolerance and if it's a pluggable ferrule or 19:30:02

not. But certainly I would consider that a 19:30:06

disadvantage on the design of the Lemoff invention 19:30:08

that doesn't use optical multiplexers. And 19:30:11

certainly I don't see Lemoff as prior art to the 19:30:15

design that I've clearly discussed in my 19:30:19

declarations for the '416 patent. 19:30:24

Q If we turn to paragraph 131 of your first 19:30:29

declaration, Exhibit 2003, I'll give you a minute to 19:30:33

get there. You state -- and looks like it's the third sentence from the end -- "To be used in a data communication system, the fiber needs to be capable of staying in position when the system is deployed." 19:30:37 19:30:52 19:30:55 19:30:57

Do you see that? 19:31:01

A I do see that. 19:31:54

Q Now, would a POSITA have been aware as of the priority date of the '416 patent, that to be used in a data communication system, the fiber needs to be capable of staying in position when the system is deployed? 19:31:57 19:32:01 19:32:03 19:32:06 19:32:09

A So if we think about what Kurita is all about, it's all about optical computing, and has to do with arrays of lasers and lenses, and to send light with different wavelengths down a fiber. 19:32:12 19:32:15 19:32:19 19:32:25

Kurita doesn't teach -- doesn't disclose that the fiber stays in alignment. You can see from Kurita it's a lab bench experiment. You can see you're going to have to manually align the laser array with the lens array, which is actually quite difficult. 19:32:29 19:32:34 19:32:38 19:32:42 19:32:46 19:32:49

And you can see from my supplemental 19:32:49

report paragraph 12, the image of opposing expert's optical test bench, you can see this is the way you would have to set up Kurita. Kurita doesn't teach anything about the fiber, doesn't teach that the fiber has to stay in alignment, doesn't teach that it's pre-aligned, doesn't teach that it's passively aligned. 19:32:51 19:32:56 19:32:58 19:33:01 19:33:03 19:33:06 19:33:11

But I would agree with you if you want to use Kurita either in any type of communication system, but namely, an optical computing system, which is what it's designed to do, you're going to have to align the fiber correctly with all those beams of light, which is actually pretty difficult. 19:33:12 19:33:15 19:33:17 19:33:22 19:33:25 19:33:30

And but Kurita doesn't even teach that the system needs to be pre-aligned or passively aligned. In fact, Kurita doesn't care. As far as Kurita is concerned, you can set it up on an optical bench and you can actively align the laser chip with the lens array chip, and as long as you get a signal through the system, Kurita is happy. 19:33:32 19:33:35 19:33:39 19:33:42 19:33:45 19:33:49 19:33:51

And so I can fully see that fixing the fiber for Kurita would be just like shown on 19:33:52 19:33:56

paragraph 12 of my supplemental report of opposing expert's optical bench, you just bolt it down to the optical bench and fix the fiber in position. That's not integrated. That's not pre-aligned. That's not passively aligned. It's a free space system that is not even applicable to what is being taught in the '416 patent. 19:34:00 19:34:04 19:34:06 19:34:09 19:34:13 19:34:16 19:34:20

Q Okay. Now, the question being specifically about what a POSITA would have known, would a POSITA have known to be used in a data communication system the fiber needs to be capable of staying in position when the system is deployed? Is that correct? 19:34:27 19:34:28 19:34:31 19:34:33 19:34:35 19:34:39

A So one of the general things that a POSITA would know is, is that if you want to get an optical signal out, then you're going to have to have alignment, whether it's a data communication system or otherwise. And so you've got to be able to align the fiber, at least the optical path from the lasers to the fiber. 19:34:40 19:34:43 19:34:46 19:34:51 19:34:53 19:34:57 19:35:00

And what we're talking about here is Kurita doesn't really teach that anything is 19:35:01 19:35:03

passively aligned or pre-aligned. What Kurita teaches is things have to be manually aligned because it's free space components that are not integrated as taught in the '416 patent. 19:35:06 19:35:09 19:35:12 19:35:16

And we all know in the '416 patent the optical combiner is an integrated subassembly of optical components with an integrated connector that is pre-aligned and passively there, has a fiber stop for a fiber optic cable. Kurita doesn't even teach any of this. All Kurita is interested in is reducing the component count and putting individual lasers on to a laser chip. There's no teaching here. 19:35:19 19:35:21 19:35:25 19:35:28 19:35:31 19:35:36 19:35:39 19:35:42 19:35:45

And so a person of ordinary skill in the art could actually apply active alignment as well as passive alignment to Kurita. And active alignment is what you would do on an optical bench. And so that's what a POSITA would most likely do. And that's what I would do if I saw Kurita, because it's an optical computing application from an optical bench, as shown by the opposing expert's optical bench on his website with fiber that's actually 19:35:45 19:35:49 19:35:54 19:35:56 19:36:00 19:36:03 19:36:07 19:36:10 19:36:13

fixed to columns that are bolted to an optical bench. 19:36:17 19:36:21

Q All right. And I want to return to the size of Kurita's device that I think we touched on a little bit before. 19:36:25 19:36:30 19:36:33

If we look at Figure 3 of Kurita, I just want to understand a little bit more about -- I'll ask this first. Can you remind me what the size of the Kurita device would be, in your opinion? 19:36:36 19:36:40 19:36:45 19:36:49

I think paragraph 231 might be one place where you discuss that in your first declaration. 19:37:54 19:37:57

A Yeah, I'm nearly there. 19:38:00

So I indicated in my initial declaration in paragraph 231, that given the discrete components in Kurita, and the fact that the optical part is a free space, and the fact that to implement Kurita from an optical computing standpoint, because Kurita is really trying to reduce the component count, it's going to be quite large. And I do indicate from an optical bench a meter by a meter by a half a meter would not surprise me. 19:38:13 19:38:17 19:38:24 19:38:30 19:38:33 19:38:41 19:38:44 19:38:46 19:38:50

But certainly I haven't done any optical 19:38:51

measurements and I certainly haven't done any calculations. But typically those are the sizes of experiments that will go on to an optical bench. 19:38:54 19:38:56 19:38:59

Q And I also want to turn briefly to paragraph 1 of Kurita Exhibit 1004, where it says, "The present invention relates to light connection elements and light connection devices for inputting laser lights into and outputting them out of optical fibers that are used with multistage switching networks inside optical computers and switchboards, and with optical communications, laser processing, et cetera." Do you see that? 19:39:03 19:39:06 19:39:11 19:39:14 19:39:17 19:39:20 19:39:24 19:39:27 19:39:30

A I do see that. 19:39:32

Q And so as I read this, optical computers -- or, rather, multistage switching networks inside optical computers is one element of a list of different potential uses, that also include switchboards, optical communications, laser processing, and an expansive term et cetera." 19:39:33 19:39:38 19:39:42 19:39:44 19:39:49 19:39:52

Do you see that? 19:39:57

A I see paragraph 1 of Kurita. 19:39:58

Q And is it your opinion that Kurita is 19:40:01

limited to an optical computer? 19:40:04

MS. RICHEY: Objection. Form. 19:40:11

Sorry, did you hear me? Objection. Form. 19:40:13

A The design of Kurita is clearly for 19:40:16

optical computing. It may have other applications. 19:40:18

But optical computers are not commercially available 19:40:22

today because of their size, they're huge. And in 19:40:25

terms of you look at the optical computer, optical 19:40:29

computing processing power and compare that to what 19:40:35

you get in a microprocessor chip and a computational 19:40:38

power of electronic chip that is one inch by one 19:40:43

inch by about a millimeter thick, the electronic 19:40:46

computing seems to be the order of the day, whereas 19:40:49

optical computing is still being researched. 19:40:53

But I'm aware -- I'm not aware of any 19:40:56

commercial optical computers on the market today 19:40:59

because of their size. And Kurita is an optical 19:41:02

system, at least the design for an optical computer 19:41:09

that goes on to an optical bench. And so the size 19:41:12

that I've indicated may not be perfectly accurate, 19:41:16

but on an optical bench in an optical lab one meter 19:41:20

by one meter by half a meter is not unreasonable. 19:41:23

Q Why do you say that the design of Kurita is clearly for an optical computer? 19:41:28 19:41:30

A Because Kurita uses free space, it actually uses discrete components and aligns them actively using free space, which is the way optical computers have been designed in the past. 19:41:33 19:41:39 19:41:43 19:41:46

And it clearly says in Kurita one of the motivations in the field of industrial application is optical computing. It says that in black and white. This is a design that is not integrated as per what is being taught in the '416 patent, and not even close to what I've indicated in, for example, for the optical combiner in paragraphs 59 to 70 of my first declaration. 19:41:48 19:41:50 19:41:52 19:41:55 19:41:59 19:42:04 19:42:06 19:42:11

And so I see this as a lab solution that is impractical, that is a test bench setup, that is not integrated, that uses discrete components that are actively aligned using free space, and that takes a lot of volume to do. And it certainly doesn't teach anything about passive alignment or pre-alignment. This is all active alignment. 19:42:12 19:42:18 19:42:22 19:42:26 19:42:29 19:42:32 19:42:34

As indicated earlier today on my 19:42:37

supplemental report, you would expect to see Kurita implemented in the same type of optical bench and the same type of lab as your expert has shown on his website, which is difficult to align, takes a long time to set up, and clearly, is not commercially practical. 19:42:40 19:42:43 19:42:46 19:42:52 19:42:55 19:43:00

Q Could the embodiments of Figures 1 to 3 in Kurita be used for optical communications? 19:43:00 19:43:05

MS. RICHEY: Objection. Form. 19:43:13

A So optical communications is a term when you're communicating light from a source to a destination, and so from that standpoint, an optical computer will include optical computing or optical communications. 19:43:16 19:43:20 19:43:25 19:43:29 19:43:36

But in this -- in this case the optical communications are free space using discrete components, they are not integrated at all, and so it's not even close to being prior art to what is being taught in the '416 patent, and what I've explained, for example, how to multiplex different wavelengths of lights in an integrated optical subassembly that includes an integrated, pre-aligned 19:43:38 19:43:39 19:43:42 19:43:45 19:43:48 19:43:52 19:43:56 19:43:58

connector with a stop to hold a single fiber optic cable that is passively aligned. 19:44:04 19:44:09

Kurita may provide free space optical communications, but it's a completely different design, and is not applicable to what's being taught in the '416 whatsoever. 19:44:10 19:44:13 19:44:18 19:44:21

Q Could the embodiments of Figures 1 to 3 in Kurita be used in applications outside of optical computing? 19:44:23 19:44:27 19:44:30

MS. RICHEY: Object -- 19:44:33

A As I've just indicated -- 19:44:34

MS. RICHEY: I'm going to object to form. 19:44:36

A As I've just indicated in my previous answer, motivation for Kurita is optical computing. 19:44:38 19:44:41

Your question says what happens if you use Kurita in a different type of optical communication scenario, and the answer is there's no reason why it wouldn't work. I mean, obviously, it's the size of an optical lab bench, which is totally impractical. But if you had an impractical application that needed the size of what Kurita is, then I would presume as being a person of ordinary skill in the 19:44:45 19:44:47 19:44:51 19:44:54 19:44:57 19:45:01 19:45:04 19:45:07

art, you could get the optics to go. 19:45:10

But we have to bear in mind this is a free space system with discrete components. It's not integrated. It's not even close to what the '416 is -- teaches. And it's not even close to, for example, the optical combiner which is being taught in the '416, which I explained from paragraphs 59 to 70, for example, in my first declaration. 19:45:12 19:45:16 19:45:18 19:45:23 19:45:25 19:45:30 19:45:34

There's no integrated subassembly of optical components in Kurita. There's no integrated, pre-aligned connector with a stop to hold a single fiber optic cable in Kurita. 19:45:36 19:45:38 19:45:42 19:45:44

Yeah, it could be used in a different application, if the application was happy to use a one meter by one meter by half a meter size of free space communications, perhaps. But it's an impractical invention. 19:45:48 19:45:49 19:45:53 19:45:57 19:46:01

Q Now, if a POSITA were going to use the embodiments of Figure 1 to 3 of Kurita in an application outside of optical computing, could they make the device smaller? 19:46:05 19:46:07 19:46:10 19:46:13

MS. RICHEY: Objection. Form. 19:46:15

A So I haven't designed Kurita and I haven't looked into the details of Kurita. 19:46:20 19:46:23

But Kurita is a free space system. I'm sure there could be ways to design it and still operate it, it could be smaller as a person of ordinary skill in the art. But, certainly, why would anybody do that? Because Kurita teaches, the whole goal of Kurita's patent application is not to try and miniaturize it; it's that you reduce the optical component count. And Kurita clearly shows and teaches that over Figures 4 and 5 that have individual lasers. 19:46:25 19:46:30 19:46:33 19:46:37 19:46:37 19:46:42 19:46:45 19:46:49 19:46:53 19:46:56

So as far as Kurita is concerned, the fact that Kurita has put individual lasers on the laser chip element 10, in the case of Kurita, a linear array of three-by-three of nine lasers, that's what Kurita teaches a person of ordinary skill in the art. There would be no reason to try and think about reducing the size, because the application is optical computing. 19:46:57 19:47:00 19:47:03 19:47:07 19:47:12 19:47:15 19:47:17 19:47:20

So, yeah, Kurita has actually achieved its goal by reducing the component count, not by 19:47:22 19:47:25

miniaturizing the system that doesn't have passive alignment, doesn't have any stops, doesn't have an optical combiner. 19:47:28 19:47:31 19:47:33

So, no, I don't think a person of ordinary skill in the art would even think about it that way. 19:47:35 19:47:39

Q So if a person of ordinary skill in the art were trying to use it for optical communications outside of the context of optical computing, could they integrate the components in housing to make the device of Kurita in the embodiment of Figure 3 smaller than a meter by a meter by half a meter? 19:47:40 19:47:43 19:47:46 19:47:49 19:47:53 19:47:57

MS. RICHEY: Objection. Form. 19:48:01

A Personally, as a person of ordinary skill in the art, Kurita, as it stands with the free space separation of all the discrete components, really makes it difficult to miniaturize, assuming the person of skill in the art would want to miniaturize it. 19:48:06 19:48:09 19:48:12 19:48:14 19:48:18 19:48:22

Kurita is designed for optical computing because of its free space alignment with its components. But Kurita is only really looking to reduce optical component count from individual 19:48:24 19:48:26 19:48:28 19:48:31

lasers that are given in Kurita's Figure 4 and Figure 5. And so Kurita's Figures 1, 2 and 3 show a laser chip that either has four lasers on it or nine lasers on it. 19:48:34 19:48:36 19:48:42 19:48:45

And so even if a person of ordinary skill in the art would look at Kurita and say, well, I sort of like this, but I want to reduce it in size, they wouldn't, because Kurita has already achieved its goal of reducing the component count. 19:48:46 19:48:49 19:48:52 19:48:55 19:48:58

And if they really wanted to have something that was smaller, that can multiplex light, then certainly I believe a person of ordinary skill in the art would look to the '416, because the '416 teaches a really innovative and inventive solution for an optical combiner, which is an integrated subassembly of optical components for multiplexing lights of different wavelengths and actually includes something also novel, which is an integrated, pre-aligned connector with a stop to hold a single fiber optic cable that is passively aligned. 19:49:00 19:49:03 19:49:06 19:49:08 19:49:11 19:49:16 19:49:20 19:49:23 19:49:26 19:49:29 19:49:32 19:49:38

I would say a POSITA wouldn't even think 19:49:38

this way with Kurita. 19:49:41

Q All right. Now, in the system of Kurita in Figure 3, about how big do you think the two-by-two array of lasers is? 19:49:43 19:49:46 19:49:50

MS. RICHEY: Objection. Form. 19:49:56

A Certainly I haven't looked at different sizes of laser chips. But that's a piece of semiconductor with four lasers on it. It just depends on the performance of those lasers and how that chip is designed. 19:50:00 19:50:02 19:50:06 19:50:10 19:50:12

And so at this point, all I can tell you is, is that Kurita has achieved its goal for reducing the component count by having more lasers on a chip as opposed to individual lasers, so they're smaller than individual lasers. And until we know exactly how the laser is designed, it's a hard question to answer. 19:50:13 19:50:16 19:50:20 19:50:23 19:50:26 19:50:31 19:50:35

But those lasers are actually free space connected or coupled to the laser array. And so that free space setup in Kurita using discrete components is vastly different than what's being taught in the '416. And the '416 patent also uses 19:50:36 19:50:40 19:50:44 19:50:50 19:50:53

lasers. And so none of the patents actually teach what the chip sizes are. 19:50:59 19:51:03

But it's not about the chip size, it's about the reduction of optical components. And Kurita doesn't have an integrated subassembly of optical components that make up an optical combiner that multiplexes different wavelengths of light, and it certainly doesn't have an integrated, pre-aligned connector with a stop to hold a fiber optic cable that's passively aligned. 19:51:05 19:51:08 19:51:11 19:51:16 19:51:20 19:51:23 19:51:26 19:51:29

Q Do you have any opinion on what the range of possible sizes of the two-by-two laser array could be at the time of the '416 priority date? 19:51:30 19:51:32 19:51:36

MS. RICHEY: I'm going to object to form. 19:51:52

Q It's been several minutes, Dr. Lebby. Let me know if I need to repeat the question. 19:54:08 19:54:11

A I understand the question. 19:54:15

So if we look at Kurita, or at least a person of ordinary skill in the art would look at Kurita, they would say that Kurita is a free space system where the optical components are spaced apart using free space. So these are discrete optical 19:57:05 19:57:09 19:57:11 19:57:17 19:57:22

components that are spaced apart. 19:57:25

Now, Kurita doesn't give any dimensions of 19:57:27

the laser chip and nor does the '416. But 19:57:31

typically, I would expect a laser chip to be in the 19:57:36

region of one to two centimeter on the side. One of 19:57:40

the issues with having a laser chip that size is 19:57:44

that when you're using a free space system with 19:57:49

active alignment, it means it's extremely difficult 19:57:51

to align. 19:57:54

And so when I look at Kurita, I can see 19:57:55

the application is optical computing, and I see what 19:57:58

Kurita is trying to do is trying to eliminate the 19:58:01

use of individual lasers and use laser chips. Those 19:58:04

laser chips put onto an optical bench are going to 19:58:10

be extremely difficult to align, because, depending 19:58:14

on how many lasers are on the chip, they all have to 19:58:17

align not only in the X and Y plane, they have to 19:58:21

align in the Z plane, and they have to align in the 19:58:25

tilt and angular plane, so that the lens array of 19:58:28

element 20 can be correctly aligned with the laser 19:58:33

chip. And that's not easy, and that takes time on 19:58:37

an optical bench. 19:58:40

And so while Kurita does use laser chip arrays, I would expect them to be in dimensions of one to two centimeters on the side. 19:58:41 19:58:45 19:58:50

Q If it's so hard to align on an optical workbench, why wouldn't a POSITA integrate the components into a housing? 19:58:52 19:58:56 19:59:02

A Well, Kurita doesn't teach that, and a POSITA wouldn't even get that from looking at Kurita. 19:59:03 19:59:05 19:59:08

What Kurita teaches is that instead of using individual lasers, what Kurita teaches is a free space optical setup ideal for an optical bench for optical computing that reduces the component count. There's nothing in Kurita that would teach a POSITA to even think about integration. There's no need to do that. 19:59:08 19:59:11 19:59:14 19:59:19 19:59:24 19:59:26 19:59:29

When you look at Kurita, it's an ideal setup for active alignment in an optical bench. It's not designed for commercial applications, and it's not designed for miniaturization. 19:59:30 19:59:33 19:59:35 19:59:39

So a person of ordinary skill in the art would actually see what's being designed in the '416 19:59:41 19:59:43

to be much more efficient, especially with the optical combiner that is an integrated subassembly of optical components that multiplex light at different wavelengths that includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable that is passively aligned. 19:59:47 19:59:49 19:59:53 19:59:56 20:00:00 20:00:03

So a person of ordinary skill in the art wouldn't even think this way when they looked at Kurita. It's not designed to do that, and there's no motivation to do any reduction in size like you're suggesting. 20:00:05 20:00:08 20:00:10 20:00:12 20:00:17

Q How would the size of the two-by-two laser array in Kurita that you just told me about compare to the two-by-two laser array of the '416 patent? 20:00:18 20:00:24 20:00:28

MS. RICHEY: Just pause for a second before you answer. It's 5 o'clock here. I would like to know how much time we have on the record. 20:00:31 20:00:34 20:00:38

And I know, Dr. Lebby, you mentioned something about a phone call. If you needed to make that, I'm not sure. 20:00:40 20:00:42 20:00:45

THE WITNESS: Can we go off the record for a second? 20:00:47 20:00:49

MR. RAWLS: Sure. 20:00:50

THE VIDEOGRAPHER: We are going off the record at 8 o'clock. 20:00:51 20:00:52

(Recess 8:00 p.m. - 8:07 p.m.) 20:00:56

THE VIDEOGRAPHER: We are back on the record at 8:08. 20:07:50 20:07:57

BY MR. RAWLS: 20:08:00

Q So, Dr. Lebby, before we left you had talked about the size of the two-by-two laser array in Kurita or the range of it, and I had just asked you about the comparative size of the two-by-two laser array in the '416 patent. 20:08:01 20:08:03 20:08:07 20:08:10 20:08:15

Can you tell me how the laser size array in the '416 patent would compare to Kurita? 20:08:18 20:08:20

A The '416 patent uses and teaches two different types of lasers. It teaches VCSEL laser array, the use of a VCSEL laser array, but it also teaches the use of edge-emitting lasers as indicated in Figure 9 and Figure 10. 20:08:40 20:08:43 20:08:47 20:08:53 20:08:55

The size of a VCSEL laser array would be similar to what I've just given for the size of the laser chip that would be used in Kurita, that would 20:08:57 20:09:02 20:09:05

be similar dimensions. The size of the laser chips in the '416 patent would have been different depending on how the edge-emitting lasers are designed, but certainly it could be in the region of a millimeter or two milliliters squared. It could actually even be bigger depending on the design. 20:09:09 20:09:12 20:09:14 20:09:18 20:09:21 20:09:25

And so that's the type of sizes I would expect to see for the edge-emitting lasers that are used in the '416 patent, and about one to two centimeters on the side for the VCSEL arrays that are used both in the '416 patent and the ones that I believe that Kurita is anticipating to use, although Kurita doesn't really detail the types of lasers that are used. 20:09:28 20:09:31 20:09:35 20:09:38 20:09:43 20:09:46 20:09:50 20:09:53

Q And in terms of the collimating lens array, can you tell me how the size of the collimating lens array in Kurita would compare to the size of the collimating lens array in the '416 patent for the two-by-two embodiments? 20:09:54 20:09:57 20:09:59 20:10:02 20:10:06

A I don't know the answer to that question. It just depends on the optical system and how the optical system and free space with the discrete 20:10:09 20:10:11 20:10:15

components are set up in Kurita. So I don't know the answer to that question. 20:10:18 20:10:20

What I do know is, is it's vastly different than the integrated solution that we find in the optical combiner for the '416 patent. And the '416 patent, which is an integrated subassembly of optical components that multiplex light in different wavelengths with an integrated pre-aligned connector with a stop to hold a fiber optic cable, that is completely different than what Kurita is teaching in terms of using free space. And I don't know on the top of my head the design of I believe it's element 20. Let me double-check. 20:10:22 20:10:25 20:10:28 20:10:34 20:10:37 20:10:40 20:10:43 20:10:47 20:10:49 20:10:54 20:10:58

I don't know the design of element 20 in Kurita what that size would be. Certainly there's a relationship between the quality of the light that comes out of the light source array element 10, how that light diverges, and what the position and the size of the lenses are for element 20. So I don't have an answer for you on that. 20:11:08 20:11:11 20:11:15 20:11:20 20:11:24 20:11:27 20:11:31

And when I look at Figure 1, Figure 2 and Figure 3 from Kurita, it's a discrete unit using a 20:11:32 20:11:36

free space system that is not integrated like what's being taught in the '416. 20:11:41 20:11:44

Q And moving to the next component, the focusing lens, can you tell me anything about the comparative or relative size of the focusing lens in Kurita versus the focusing lens in the '416 patent for the two-by-two embodiments? 20:11:47 20:11:49 20:11:51 20:11:55 20:11:58

A For an optical system that I've indicated that goes onto an optical bench, just like the one that your expert has shown on his website, which has an optical setup very similar to what I would do to put the Kurita design and test that out if I was asked to do that, the element 30 Kurita in Figures 1, 2 and 3, Kurita doesn't give any information about the size of that lens. And it certainly looks like from the Figures 1, 2 and 3, it could be a very large lens. It certainly could be similar. For example, in -- if we look at my supplement report paragraph 12, and we look at the image in paragraph 12, I mean, it could be the size of those lenses that are shown on the optical bench in the top right-hand corner. Those lenses look like they're 20:12:01 20:12:04 20:12:08 20:12:11 20:12:15 20:12:20 20:12:26 20:12:29 20:12:32 20:12:36 20:12:38 20:12:44 20:12:47 20:12:50 20:12:52

at least an inch wide, maybe even bigger, depending on the perspective of the photograph. It could be a very large lens that's placed quite a distance apart from other optical components. 20:12:55 20:12:59 20:13:03 20:13:07

So I don't know the exact answer. But what I do know is it's not a miniaturized solution like the '416 teaches, and it's not an integrated solution like the '416 teaches. It's a discrete free space system that is ideal for optical computing that goes on an optical bench. 20:13:10 20:13:11 20:13:16 20:13:19 20:13:24 20:13:27

Q You keep referring to this optical bench from Dr. Willner's office in paragraph 12 of your report, Dr. Lebby. 20:13:30 20:13:33 20:13:36

Do you have any knowledge of whether Dr. Willner has any relationship to Kurita or the Kurita inventors? 20:13:37 20:13:39 20:13:43

A I have no idea of what Dr. Willner knows or doesn't know. 20:13:46 20:13:51

What I can say is, is if I implemented Kurita as taught in the Kurita patent, which is actually designed to reduce optical components and the motivation is to provide optical communication 20:13:52 20:13:54 20:13:57 20:13:59

for optical computing, then I would set up Kurita just like Dr. Willner's optical bench, as in the image that I've shown on page 4 of my supplemental report. 20:14:03 20:14:07 20:14:11 20:14:15

But whether Dr. Willner has any information about Kurita or knows Kurita or anything like that I'm not privy to. 20:14:15 20:14:18 20:14:21

But what I am privy to is this is what I would use. You can see the fibers are being bolted down from a stand to the optical bench. You can see the X, Y, Z translation stages on the right-hand side. And you can see the typical optical setup that I would use, as well as I would expect Dr. Willner to use if they wanted to actually practically realize what Kurita is teaching. 20:14:24 20:14:28 20:14:31 20:14:34 20:14:38 20:14:40 20:14:44 20:14:47

And that's certainly significantly different than what's being taught in the '416 patent for an integrated optical subassembly of optical components that multiplex light with different wavelengths, and in addition, includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable, and that's vastly 20:14:49 20:14:52 20:14:56 20:14:59 20:15:03 20:15:07 20:15:10

different than what's being taught in Kurita. 20:15:13

Q Are you aware of whether anyone has ever implemented the system of Kurita on an optical workbench? 20:15:16 20:15:19 20:15:22

A So the question is has Kurita ever been reduced to practice. I don't know if it's been reduced to practice or not. I can certainly look at Kurita, which is an English translation of a Japanese patent application, so I don't even know if the patent was that issued. It certainly looks like it's an application, but it might have been issued. I certainly don't know if it's been reduced to practice. 20:15:31 20:15:35 20:15:37 20:15:42 20:15:45 20:15:48 20:15:50 20:15:52 20:15:55

I certainly know it's very difficult to align this type of system, and it's a free space system that's actually large. It's not integrated; it uses discrete components. 20:15:56 20:15:58 20:16:02 20:16:05

But I'm sure if somebody gave me an optical lab with these types of components, I could put the system together and get it to work. But it's going to take hours. This is not a system designed for high volume manufacturing. This is not 20:16:10 20:16:13 20:16:15 20:16:18 20:16:20

a system designed for low cost. This is a free space system designed by Kurita using discrete components that is not integrated, and certainly is not even close to what the '416 teaches as I indicate in my declaration, at least from an optical combiner standpoint in paragraphs 59 to 70. 20:16:22 20:16:27 20:16:30 20:16:33 20:16:39 20:16:44

Q Now, where in Kurita can you show me does it discuss an optical workbench? 20:16:50 20:16:53

A So I read through the translation of Kurita and I don't see an optical lab bench expressly called out. 20:19:44 20:19:46 20:19:50

But as a person of ordinary skill in the art, when I read Kurita, especially at the time of the priority date of the '416, this is a classic optical experiment for optical computing that requires an optical bench. Kurita really is motivated only to do one thing, is to not actually give any designs about how this will be implemented, only to say that here is a design that actually reduces the number of individual lasers, as taught in Figure 4 and Figure 5, in through a laser chip. 20:19:52 20:19:54 20:19:57 20:20:01 20:20:04 20:20:07 20:20:11 20:20:15 20:20:18 20:20:22

And so in order to realize this type of 20:20:27

system that Kurita has opined on or designed, I would need to have an optical bench to do it. There is no teaching in Kurita to say any other technique would be useful, other than the fact that Kurita is using the laser chip, which is smaller, presumably, than the 110 in Figure 4, which is the monochromatic light sources, they certainly look bigger. 20:20:31 20:20:37 20:20:40 20:20:45 20:20:48 20:20:53 20:20:57

And so I would say Kurita doesn't call out expressly an optical bench. But this is how I would implement it, just like the optical bench that is in paragraph 12, which is an image of the opposing expert's optical bench showing how the experiment will be set up in terms of things are bolted to an optical table with lens arrays and lasers and fiber optics and X, Y, Z translation stages. And so that's how I would do it, even though Kurita doesn't expressly do this. 20:20:59 20:21:04 20:21:07 20:21:11 20:21:15 20:21:19 20:21:24 20:21:28 20:21:33 20:21:36

I don't believe Kurita is even close to being prior art for the '416. It doesn't have an integrated subassembly of optical components for multiplexing lights at different wavelengths, and it doesn't include an integrated, pre-aligned connector 20:21:37 20:21:39 20:21:42 20:21:46 20:21:49

with a stop to hold a single fiber optic cable. All these things are missing. And that's the reason why when I look at Kurita, this is the ideal scenario for an optical bench setup. 20:21:53 20:21:55 20:21:58 20:22:01

Q Is it your opinion, Dr. Lebby, that Kurita could only have been implemented on an optical bench as of the '416 patent's priority date? 20:22:03 20:22:06 20:22:11

A The previous answer to a question is, is what I believe as person of ordinary skill in the art of the priority date of the '416, which is the 17th of July 2003, that is the first thing that would come to my mind when I read Kurita in order to realize what Kurita is teaching, which is the reduction of components, in this case reduction of individual lasers to a laser chip that has either four lasers on or nine lasers on. And I would use an optical bench to realize what Kurita is teaching. An optical bench is the ideal scenario. But what people have done over the years for any of these systems apply to optical computing. 20:22:15 20:22:18 20:22:20 20:22:24 20:22:27 20:22:31 20:22:33 20:22:36 20:22:40 20:22:44 20:22:47 20:22:51 20:22:53

Now, the question pertains is could there be other ways to do that? I'm sure there are. 20:22:56 20:22:59

That's not what I would think about as a person of ordinary skill in the art. And certainly it's very much different than what's being taught in the '416. The '416 teaches an optical combiner which is part of an integrated subassembly of optical components that multiplex different wavelengths of light and includes an integrated, pre-aligned connector with a stop to hold a single fiber optic cable that's passively aligned. 20:23:02 20:23:06 20:23:07 20:23:12 20:23:15 20:23:19 20:23:23 20:23:26 20:23:29

And so there could be other ways to implement Kurita. But the obvious one, as a person of ordinary skill in the art, would be to use an optical bench, even though an optical bench is not expressly called out in Kurita. And finally, it is completely different; it uses free space and discrete components. It doesn't have an integrated subassembly of optical components, and it doesn't have an integrated, pre-aligned connector with a stop to hold a single fiber optic cable that's passively aligned. 20:23:30 20:23:33 20:23:37 20:23:39 20:23:43 20:23:46 20:23:48 20:23:52 20:23:55 20:23:58 20:24:01

Q And you refer to other possible ways that it could be implemented. What are those other 20:24:02 20:24:04

possible ways? 20:24:07

A At this point the one that I'm only 20:24:09

comfortable with is an optical bench, because I 20:24:14

think that is the obvious application of an optical 20:24:17

computing test setup that Kurita teaches. 20:24:20

Whether there are other ways, I certainly 20:24:24

didn't come into this deposition to think about the 20:24:26

other ways. But I've only given you the obvious one 20:24:28

that comes to my mind, and it would come to my mind 20:24:31

as a person of ordinary skill in the art at the time 20:24:34

of the priority date of the '416, which is the 17th 20:24:37

of July 2003. 20:24:40

I certainly haven't thought about any 20:24:43

other ways you would set this up. There's nothing 20:24:45

obvious. There's no teaching of using any level of 20:24:48

integration, because Kurita teaches the reduction of 20:24:51

laser, individual lasers to a laser array by using 20:24:56

free space and discrete components. And so that is 20:25:00

an ideal scenario for an optical bench. 20:25:04

Q Could you implement the system of Kurita 20:25:12

using a housing similar to what we saw in Lemoff? 20:25:14

A Well, there's no reason why you wouldn't 20:25:20

put a housing over the free space discrete components of Kurita. 20:25:22 20:25:27

But as I've already indicated in my first declaration, the size of the housing is going to be huge, and it's probably going to be a hundred times bigger than what Lemoff has. And we've already established on record that Lemoff's housing is in the two centimeter by two centimeter by two centimeter range. And Kurita is in the one meter by one meter by half a meter range. They're very different optical designs. And certainly, you couldn't shoehorn Kurita into a Lemoff housing, as far as I'm aware. 20:25:28 20:25:30 20:25:33 20:25:36 20:25:40 20:25:41 20:25:44 20:25:47 20:25:51 20:25:54 20:26:00

Q Aside from the size issue that you mention, is there any reason why you couldn't use the housing of Lemoff in Kurita? 20:26:00 20:26:03 20:26:06

A Kurita is a free space discrete optical system that is not integrated, that uses free space to connect discrete components. Those components, as I've already indicated on the record, would not fit into the Lemoff housing, which is about a hundred times smaller. 20:26:10 20:26:15 20:26:19 20:26:23 20:26:27 20:26:30

Kurita is a solution that is ideal for an optical bench, which I've established many times on record today, and certainly it is not even -- Kurita is not even close to what is being taught with -- to the '416 patent, which has an integrated subassembly for an optical combiner that has integrated subassembly of optical components that multiplex different wavelengths of light, that also includes integrated, pre-aligned connector with a stop to hold a single fiber optic cable that's passively aligned. 20:26:31 20:26:34 20:26:37 20:26:40 20:26:44 20:26:48 20:26:51 20:26:55 20:26:59 20:27:02 20:27:05

Kurita, as we've already established on record, is an active alignment solution. All Kurita wants to do is reduce the optical component count of the lasers, and Kurita teaches that, but doesn't teach anything else. And it's huge compared to Lemoff. So nobody would even think about the motivation to combine the two. 20:27:06 20:27:09 20:27:12 20:27:16 20:27:19 20:27:22 20:27:25

And even if somebody was going to think that way, it would take lots of experimental -- experiment, experiments and experimental work to even figure out how you would get a free space 20:27:27 20:27:30 20:27:35 20:27:38

system with discrete components and how you would shoehorn that into a Lemoff design, which is a hundred times smaller. It just wouldn't be done. 20:27:42 20:27:45 20:27:47

Q Now, you've talked about free space several times now, and you just looked over the description of Kurita. Does Kurita use the term "free space" anywhere? 20:27:52 20:27:56 20:27:59 20:28:03

I'll withdraw the question, Dr. Lebby, if you're going to take the time to read Kurita again, and ask something else. 20:29:10 20:29:13 20:29:15

Is Lemoff a free space design? 20:29:17

A If I look at Figure 2 of Lemoff, and I look at the lasers that are indicated by 120, the two lasers that are a cross-section below image lens 220, there's certainly a pre-stage coupling between the lasers and the image lens, and that's a free space coupling from the image lens to different endpoints of the fiber optic. 20:29:52 20:29:55 20:30:02 20:30:07 20:30:12 20:30:14 20:30:17

So yes, Lemoff does utilize free space. It certainly does not use waveguides or doesn't use molded optics. But certainly the light is actually in free space before it hits the next element in the 20:30:20 20:30:23 20:30:27 20:30:31

optical path. 20:30:35

So I would say Lemoff, looking at Figure 2, is a free space system. Lemoff doesn't use collimated lenses. Lemoff is a design that avoids the use of an optical multiplexer. And Lemoff's design avoids the use of an optical multiplexer because Lemoff doesn't want to deal with the cost or the alignment issue of dealing with optical multiplexers and collimated lenses. 20:30:36 20:30:40 20:30:45 20:30:50 20:30:56 20:31:00 20:31:03 20:31:04

So Lemoff is trying to design a simpler design. And you can see in Figure 2 there is free space, there's air between the emission output of the laser 120 to image lens 220, and that optical path is free space from image lens 220 to some point on the end of the fiber 250. 20:31:07 20:31:09 20:31:12 20:31:16 20:31:22 20:31:26

So, yeah, it's a free space system. But it's certainly not even close to what is being designed in the '416 in terms of the '416. Because the '416 has an optical combiner, it's an integrated subassembly of optical components that multiplex light in different wavelengths. It uses an integrated, pre-aligned connector with a stop to 20:31:28 20:31:31 20:31:34 20:31:38 20:31:41 20:31:45 20:31:45

hold a single fiber optic cable, it's passively aligned. It uses molded optics. 20:31:52 20:31:53

So the '416 is very different than what Lemoff is designing, and Lemoff is designing a free space system. 20:31:56 20:32:00 20:32:03

Q Now, is Lemoff a set of discrete components or are the optical components integrated? 20:32:07 20:32:12

MS. RICHEY: Object to form. 20:32:23

A Lemoff is a system that certainly does not have an integrated subassembly of optical components. It certainly doesn't have a collimator and it certainly doesn't have an optical multiplexer, which is taught in the '416 patent. And certainly Lemoff doesn't have an integrated connector with a stop to hold a single fiber optic cable. So Lemoff is very different. 20:32:27 20:32:30 20:32:33 20:32:36 20:32:39 20:32:41 20:32:44 20:32:48

Whether a POSITA would call Lemoff an integrated solution or not, I don't know. I don't see it as an integrated solution. I see it as a very different solution than what's being taught in the '416, and it's not even close to what's being taught in the '416. And certainly without an 20:32:50 20:32:52 20:32:55 20:32:57 20:33:01 20:33:06

optical multiplexer, without collimated lenses, without an integrated, pre-aligned connector with a stop to hold a single fiber optic cable, it certainly doesn't look like it's an integrated solution, at least from the perspective of the '416 patent and what's been defined by the '416 patent, which I detail in both my declarations, the first and the second one. 20:33:08 20:33:11 20:33:15 20:33:18 20:33:20 20:33:24 20:33:27 20:33:30

Q So given your opinion, then, that Lemoff is a free space system and that it has discrete components, I'll ask the question again, that aside from the size issue you mentioned, why couldn't you use the housing in Lemoff in the device of Kurita? 20:33:33 20:33:35 20:33:40 20:33:43 20:33:47

MS. RICHEY: Objection. Form. 20:33:51

A Well, the housing of Lemoff is a hundred times smaller than the housing of Kurita. Kurita is a free space system that is using arrays of lasers that are discrete and spaced apart from arrays of optical lenses, and with a lens element 30, which looks like it's rather large, Kurita is a system that's designed for an optical bench. 20:34:00 20:34:02 20:34:05 20:34:11 20:34:16 20:34:21 20:34:25

The application is optical computing. 20:34:27

Optical computing applications are known to be large, and the size of an optical bench, as indicated in my supplemental report paragraph 12 where I show an image of opposing expert's optical bench showing different types of components that I would use to set up Kurita. That is a lot different in size than what Lemoff teaches. 20:34:29 20:34:32 20:34:35 20:34:39 20:34:42 20:34:45 20:34:48

And Kurita, the motivation for Kurita is not to reduce the size. The motivation for Kurita is actually to reduce the laser component count, which Kurita successfully does by implementing the design of individual lasers as given in Figures 4 and 5 to a laser chip that has four lasers on it or nine lasers on it, as indicated in Figures 1, 2 and 3. 20:34:50 20:34:52 20:34:56 20:34:59 20:35:03 20:35:09 20:35:13 20:35:17

I see the Kurita solution as a large optical bench solution, and I don't believe you could do that with the design that Lemoff has. And Lemoff doesn't even have collimated lenses. Lemoff doesn't even have a multiplexer. And so when you start having those things, the Lemoff size is going to get a lot bigger. 20:35:18 20:35:20 20:35:24 20:35:30 20:35:33 20:35:36 20:35:38

I just don't think you can combine the two. There's no motivation to combine here. One is an application for multiplexing with optical computing and the other one avoids multiplexing, at least the optical multiplexer, and directly couples lasers into a fiber so you can get more wavelengths into a fiber. Very different solutions. 20:35:40 20:35:42 20:35:46 20:35:49 20:35:53 20:35:57 20:36:01

Q So the only issue for why you wouldn't use the housing 230 in Lemoff in the device of Kurita is the size? 20:36:03 20:36:06 20:36:11

MS. RICHEY: Objection. Form. 20:36:11

A So I detail in my first declaration why a person of ordinary skill in the art would not combine Kurita with Lemoff, and I start that on page 71, paragraph 225, and I continue that discussion all the way through paragraphs 236. And so I disagree with you that size is not the only issue. But we can go into all these paragraphs if you wish. 20:37:10 20:37:14 20:37:15 20:37:19 20:37:24 20:37:30 20:37:33

Q I'm going to ask you about the '416 patent. If we look at Figure 1 as an example, is the system shown here in Figure 1 a free space system? 20:37:37 20:37:41 20:37:46 20:37:50

A I think we're out of time. 20:37:51

Q Can you answer the question, please, 20:37:56

Dr. Lebby? 20:37:58

A Not if we're out of time. 20:37:59

MS. RICHEY: Can we check the time? 20:38:02

MR. JONES: Carrie, we're going to finish 20:38:06

up this line of questioning. 20:38:09

MR. RAWLS: We've been pretty generous 20:38:11

about nonresponsive answers and long answers, so I 20:38:13

think we can go a couple minutes extra if we need 20:38:17

to. 20:38:17

MS. RICHEY: Can someone tell me the time 20:38:17

we're at right now? 20:38:20

THE TECHNICIAN: This is Charlie, the 20:38:20

videographer. We're at seven hours and three 20:38:22

minutes. 20:38:24

MS. RICHEY: Okay. So I object to going 20:38:25

past seven hours. 20:38:28

MR. RAWLS: There's a pending question, I 20:38:33

would like an answer to it -- 20:38:35

MS. RICHEY: I don't think you started 20:38:36

that question -- I mean, it was after seven minutes 20:38:37

-- or seven hours -- 20:38:40

MR. RAWLS: I think we have been pretty 20:38:42

reasonable, Carrie, with very long pauses to read 20:38:44

long sections. We've been reasonable for very long 20:38:48

nonresponsive answers that took minutes and minutes 20:38:49

and minutes. So I think one question here is very 20:38:52

reasonable to ask. And we let you go past seven 20:38:55

with Willner, with our expert. 20:38:59

MS. RICHEY: Well, I actually don't recall 20:39:02

going past seven with Dr. Willner. 20:39:04

So I think Dr. Lebby is done, so -- 20:39:10

MR. JONES: We're going to keep -- we're 20:39:15

going to keep the deposition open. 20:39:16

MR. RAWLS: Just for the record, we'll 20:39:18

keep the deposition open and note that the witness 20:39:19

has been nonresponsive and uncooperative. 20:39:21

MR. JONES: And for the record, please 20:39:24

re-ask the question. 20:39:25

MR. RAWLS: And just so the record is 20:39:27

clear, I'll repeat the question that was pending. 20:39:29

Just give me a moment. 20:39:33

So I pointed to the '416 patent and said 20:39:39

if we look at Figure 1 as an example, is the system shown here in Figure 1 a free space system. 20:39:42 20:39:46

MS. RICHEY: Okay. All right. So I'm objecting because we're out of time. 20:39:49 20:39:52

THE WITNESS: I think we're out of time. 20:39:53

MR. RAWLS: Are you instructing your witness not to answer? 20:39:55 20:39:56

MS. RICHEY: I'm leaving -- it's up to him and he's -- we're past the time, so, and he's not going to answer. 20:39:58 20:40:00 20:40:04

MR. RAWLS: Dr. Lebby? 20:40:11

THE WITNESS: We're past the time. I mean, you've actually stretched out and repeated question after question, in fact 10 or 20 times the same question, just to push out today's deposition to seven hours. It's not been efficiently run. And I'm fine. 20:40:13 20:40:15 20:40:19 20:40:22 20:40:24 20:40:28

This is it. We've done seven hours. I don't believe we need to go any further. And you've wasted a lot of time on record. I've actually given you expressly quick answers on probably 90 percent of your questions. And the ones I've looked into my 20:40:29 20:40:33 20:40:34 20:40:38 20:40:42

expert report, I've only spent a maximum a couple of minutes on. And so I think your comments are totally unreasonable. And we're past the time, and I think this deposition is done. 20:40:45 20:40:49 20:40:51 20:40:55

MR. RAWLS: Well, I think the record is clear. We can go off the record now. 20:40:57 20:40:59

THE VIDEOGRAPHER: This marks the end of day 1 of the deposition of Dr. Michael Lebby. We are going off the record at 8:41. 20:41:01 20:41:03 20:41:06

(Time noted: 8:41 p.m.) 20:41:11

*****

CERTIFICATE OF CERTIFIED SHORTHAND REPORTER

NOTARY PUBLIC

I, MONIQUE VOUTHOURIS, Certified Court Reporter and Notary Public within and for the State of New York, do hereby certify:

That MICHAEL LEBBY, PH.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition, and that such deposition was taken before me and is a true record of the testimony given by such witness.

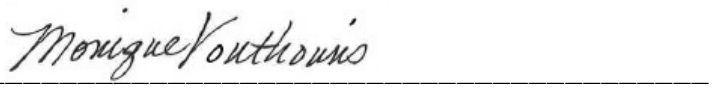
I further certify that the adverse party, INNEOS LLC, was represented by counsel at the deposition.

I further certify that the deposition of MICHAEL LEBBY, PH.D. occurred via Zoom Videoconference, on Monday, July 8, 2024, commencing at 12:00 p.m. to 8:41 p.m. EDT.

I further certify that I am not related to any of the parties to this action by blood or marriage, I am not employed by or an attorney to any of the parties to this action, and that I am in no way

interested, financially or otherwise, in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of July 2024.



Monique Vouthouris, CCR, RPR, CRR
Notary Public of the State of New York
My commission expires: April 8, 2029

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