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

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TESLA, INC., :
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Petitioner, :
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v. : Case No.
: IPR2025-00339
INTELLECTUAL VENTURES II, :
LLC, :
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Patent Owner. :
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Deposition of ELI SABER, Ph.D., held via remote videoconference and taken stenographically by Misty Klapper, Registered Merit Reporter, Certified Shorthand Reporter, Registered Professional Reporter, Realtime Systems Administrator and Notary Public.

APPEARANCES:
ALL APPEARANCES BY REMOTE VIDEOCONFERENCE
ON BEHALF OF PETITIONER:

HONG SHI, ESQUIRE
DAVID W. O'BRIEN, ESQUIRE
HAYNES AND BOONE, LLP
98 San Jacinto Boulevard, Suite 1500
Austin, Texas 78701
(512) 867-8400
E-mail: hong.shi@haynesboone.com
david.obrien@haynesboon.com

JONATHAN R. BOWSER, ESQUIRE
HAYNES AND BOONE, LLP
888 16th Street, N.W., Suite 300
Washington, D.C. 20006
(202) 654-4500
E-mail: jonathan.bowser@haynesboone.com

ON BEHALF OF PATENT OWNER:

BRANDON R. THEISS, ESQUIRE
VOLPE KOENIG
30 South 17th Street, Suite 1800
Philadelphia, Pennsylvania 19103
(215) 568-6400
E-mail: btheiss@vklaw.com

P R O C E E D I N G S

ELI SABER, Ph.D.,

The witness herein, called for examination by the Petitioner, having been duly sworn, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR PETITIONER

BY MS. SHI:

Q. Dr. Saber, so just a couple of questions for housekeeping. Let's see.

Do you have the Box link we sent you that include the exhibits that we will use today?

A. Yes, I have a Box link and at this time it includes three exhibits.

Q. Can you read the exhibit numbers?

A. Exhibit 1001, Exhibit 2020 and Exhibit 1047.

Q. Do you have with you any documents?

A. Counsel has sent a binder with all the exhibits. And I have with me -- I have not pulled them up, but I have with me a binder of my declaration and obviously the patent and all the

exhibits that are in question in this case.

Q. Are they clean copies?

A. Yes, they're clean copies. They were sent by counsel. I think they arrived on Saturday.

Q. And do you understand that the oath you just took requires you to answer truthfully and completely?

A. Yes, I do.

Q. And you will answer truthfully and completely today, right?

A. Of course.

Q. Is there any reason that you cannot provide truthful, complete and accurate testimony today?

A. No, there is not.

Q. Is there any other reason why your deposition should not go forward today?

A. Not that I know of. I'm looking forward to it.

Q. Okay. So could you please open your declaration, which is Exhibit 2020.

(Thereupon, Exhibit 2020, previously marked, was referred to.)

THE WITNESS: So I have downloaded the exhibits and I will open them both online -- or in front of me and obviously in hard copy format as needed.

What page would you like me to go to?

BY MS. SHI:

Q. So I will refer to Exhibit 2020 as your declaration for the '180 IPR.

Will that work?

A. That works very well, thank you.

Q. Is there any error in your declaration that you would like to correct?

A. I noticed a couple of minor typos, but nothing major, a couple of -- I think a minor typo in a footnote --

Q. So --

A. -- on page -- one second.

On page 18 of my declaration there is a minor typo in the footnote. It should say

Exhibit 2008, footnote 2. Page 18, footnote 2 should say Exhibit 2008. And page 44, just below the figure -- the figure says Figure 4, but the citation says Figure 3. It should say Figure 4. Those are the only two typos that I noticed.

Q. Let's go to paragraph 60. Let me know when you're there.

A. I am there.

Q. Could you read the second statement of paragraph 60.

A. Well, paragraph 60 reads, I understand that claim language is not read in isolation; rather, the claim language, when read in light of the specification and the prosecution history, elucidates the meaning of the claim language.

Q. Did you consider the specification of '180 patent when reading the claim language?

A. Of course I did.

Q. Did you consider the prosecution history?

A. Yes, I did.

Q. What prosecution history documents that you considered when you considering the claims?

A. The ones that are cited in my declaration. And so if you go to page 1 and 2 of my declaration, the documents are -- the exhibits are cited there as what I considered. And I think there is a list exactly of them in the POR.

Q. Did you consider those files in prosecution history in their entirety when considering the claim language?

A. Yes, I've -- I've looked at the prosecution history when -- when I'm looking at the claim language.

Q. So in this claim construction section of your declaration, what claims are you construing?

A. Well, I'm responding to the petition for the claims that were challenged in the petition.

Q. What are the specific claim languages that you're construing?

A. You mean on -- I guess I don't understand your question.

Q. Okay. So --

A. I mean, on -- on paragraph 60 I'm responding to the claims that were challenged in the petition.

Q. So for Section VII.A, you are construing the term "simultaneous data acquisition" with each of the plurality of channels; is that right?

A. That is correct, yes.

Q. And for Section VII.B of your declaration, you're construing the term "during a frame" of claim 22; is that correct?

A. That is correct.

Q. And in Section VII.C, you're construing the term "independently controlling simultaneous data acquisition ... during a frame" of claim 22; is that right?

A. That is correct.

Q. In addition to these terms, do you construe any other terms?

A. Not to my knowledge, off the top of my head. Those are the ones that are listed in that section.

Q. Is it correct that it's your opinion that all other claim languages do not need construction?

A. Yes. I've applied plain and ordinary meaning to the claim language in light of the specification. And the ones that you have listed here is the ones I've articulated more in detail, given -- you know, as responding to the petition.

Q. Can we go to paragraph 63.

A. Yes.

Q. Can you read the first sentence of paragraph 63.

A. A person of ordinary skill would also have understood that the subject claim language is not met when the image -- where image capture with a plurality of channels is nearly simultaneous, i.e., close in time, but not actually simultaneous, i.e., at the same time.

Q. When you referred to nearly

simultaneous, what specific amount of time are you referring to?

A. I don't understand your question.

Q. How do you define nearly?

A. Nearly simultaneous, close to simultaneous, close in time.

Q. How close is nearly?

A. Well, I mean, close in time, like, you know, maybe -- I mean, kind of like -- I think in the previous proceeding that we were talking about, you had a -- a reference that was Miyazaki. It had images that are, essentially, close in time by delta T.

So that would be nearly simultaneous. They're close in time. There's some time instance between them. They're not at the same time.

Q. Do you agree that "nearly" is a term of degree?

A. I don't understand what you mean by term of degree.

Q. Could you point me to the

specification of one zero where it has description that informs the boundary of nearly?

A. I don't know what you mean by one zero.

Q. Oh, '180 patent. Sorry.

A. Yes, what about it?

Q. Could you point me to the description in the specification of '180 that informs the boundary of nearly?

A. I mean, there are disclosures in the '180 about -- for instance, if you look at column 3, line 28, you see where it says includes simultaneous or nearly simultaneous use. So it clearly delineates simultaneous different from nearly simultaneous.

It says the same thing on column 8, line 64. So nearly simultaneous is not the same as simultaneous.

Q. Other than the description that informs that nearly simultaneous is different from simultaneous, any other description in the '180 that helped to understand the boundary of

nearly?

A. Well, obviously, I mean, you're reading the entire specification, so you have an understanding of what the inventors are talking about in the specification. It's not just one line somewhere.

Q. So what measurement unit would be related to nearly simultaneous?

A. Well, in this case it would be, you know, a time. Time would be the unit, generally speaking.

Q. So when you mention nearly, are you referring to a difference of several minutes of the time?

A. Well, I mean, the difference could be several minutes, could be several seconds, could be milliseconds. It depends on the context. The point is nearly simultaneous is close in time. It's not the same as simultaneous, which is at the same time.

Q. So if the difference is several nanoseconds, it is also nearly; is that right?

A. Well, the point is it's -- simultaneous is at the same time. If I said to you I'm moving my right hand and my left hand simultaneously, that means I'm moving them both at the same time, versus nearly simultaneous, where I may move my right hand and a few milliseconds or later I move my left hand. I don't think I can move in a nanosecond world, but -- so it's -- the point is simultaneous is at the same time of whatever something is happening.

Q. You said you don't think you can move in the nanosecond world; is that right?

A. I mean my hands. I can't move my hands in a nanosecond world.

Q. So is that right, that in the context of the example of you moving your hands nearly simultaneously, it excludes moving two hands within a difference of several nanoseconds?

A. Simultaneously means you're moving them at the same time. Anything outside of that -- if I'm moving one, then the other, but very close in time, not one today and tomorrow

I'm moving the other one, so I'm moving one very closely in time, delta T, I'm moving the other, that would be near simultaneous, versus simultaneous, I'm moving them at the same time.

Q. Is it correct that simultaneous means delta equals zero?

A. They're -- they're moving at the same time, within the same time interval that you're talking about for whatever that you are doing.

Q. So are you saying moving within the same time interval for whatever that you are doing, then it's simultaneous?

A. At the same time. As long as you're moving them at the same time, you're moving them simultaneously in the context of what we are talking about here in this particular application.

Q. Do you remember you used delta T to explain nearly?

A. Well, I used it as an example, yes.

Q. Is there any restriction on the value of T, of delta T, for it to be nearly

simultaneously or simultaneously?

A. Simultaneous is at the same time. So as long as you're moving whatever items that you are moving at the same -- in the same time interval, at the same time, they're simultaneous.

I mean, I don't know. I keep giving you the same answer and you keep asking me the same question. And I believe I've answered that question multiple times now.

Simultaneous, at the same time.

Q. If delta T is zero, is that simultaneous?

A. I would -- we would have to look at the application to see what you're talking about. You know, delta Ts of zeros are philosophical. But if you're moving something simultaneously, you're moving it at the same time.

Q. So you cannot give a range of delta T for defining what nearly is; is that right?

A. I believe I've defined nearly for you very well as close in time versus simultaneous being at the same time. So as long as I'm moving

element A and element B at the same time, that would be simultaneous.

If I move element A and X time later I move element B, that would be nearly simultaneous. They're close in time, not at the same time.

Q. How do you define close?

A. Close in time with the application that you're talking about here.

Q. How do you define close in time?

A. Just what I said, close in time. They're close in time. They're not at the same time.

Q. When you refer to simultaneous, what is the minimum time difference that you would still consider simultaneous?

A. I don't understand what you mean.

Q. If the time difference of two events is several nanoseconds, would you consider that simultaneous?

A. Simultaneous means at the same time. So as long as event A and event B are happening

at the same time within practical engineering applications as we are discussing here in this '180, then it's simultaneous, at the same time, just like the claims here call for.

Q. What do you mean by at the same time within practical engineering applications?

A. Well, I mean, within -- within practical, you know -- you know, nothing can move, for instance, in one, you know, nanosecond or picosecond. You know, things -- depending on the application that you're at, things have different time intervals that they're moving. Some things don't move as quickly as others. Cars don't move in nanoseconds.

So simultaneous would be two events are happening at the same time, as close in time as engineeringly possible, in a sense, as practical and as we're talking about in this application for the -- for the camera systems that we're talking about.

Q. So what is the practical time difference to be considered at the same time

within practical engineering applications in the context of '180 patent?

A. At the same time. They're simultaneously moving. I'm capturing image alpha and I'm capturing image beta at the same time.

Q. What components of the digital camera, according to '180 patent, are required to perform simultaneous data acquisition?

A. Well, that's discussed in the claims, for instance, claim 1 and claim 22, which I'm sure we'll be talking about quite a bit today. But those are discussed in the claims.

Q. Which component of the claim are you referring to?

A. Well, if you look at, for instance -- if you look, for instance, at claim 1, you see the word -- let me call it 1B. So 1A would be a plurality of channels. 1B would be a processing component.

So if you look at 1B, you see -- I'm looking at column 24, line, roughly, 14, you see -- or let's say 12 through 15.

Do you see where it says, a processing component coupled to the plurality of channels? That processing component that you just called a processing component -- that the antecedent basis is there -- configured to independently control simultaneous data acquisition with each of the plurality of channels. So the simultaneous data acquisition is happening with the plurality of channels.

Q. What techniques are described in '180 patent to perform simultaneous data acquisition?

A. I don't understand. I mean, the whole patent is about doing what we're talking about. I don't understand your question. The whole patent is describing what we are -- what -- what it's trying to do, obviously. Even the title, you see it says the title, Simultaneous Multiple Field of View Digital Cameras, so it's -- that's essentially what it's trying to do.

Q. Let's go to paragraph 61 of your declaration.

A. Okay.

Q. You said that the simultaneous aspect of data acquisition is heavily emphasized in the specification of the '180 patent.

Do you see that?

A. Yes.

Q. What's the plain and ordinary meaning of "data acquisition"?

A. Data. You're acquiring data. I don't know what you mean by -- data is, like, data. And you're -- data acquisition, you're acquiring data.

Q. Does the data include analog data?

A. Data. Could be analog. Could be digital. Could be something written in a notebook, in a lab where I'm doing an experiment and I'm writing down numbers. Data acquisition.

Q. In the context of the claims of '180 patent, does data acquisition include acquisition of data written in a notebook?

A. No. In the context of the '180, as you -- if you look at the claim 1, for instance,

you see where it says, data acquisition with each of the plurality of channels. So essentially it requires that -- at least some data acquisition with each of the plurality of the channels to be done. And obviously it said simultaneous before, so at the same time.

So you're not acquiring data manually in a notebook. You're acquiring data, obviously electronically, with the -- with these channels in the cameras that you have -- the camera that you have and the channels that we're talking about.

Q. So the data of claim 1 includes analog data; is that right?

A. Yes. I mean, it includes -- the proper data that you're capturing with the channels that we're -- you know, the claim says a plurality of channels. 1A, for instance, says a plurality of channels on column 24, line 3. And it describes each channel.

So where -- each channel includes an optic component, like a lens, and an array of

photo detectors, like CCD arrays. So it defines -- it gives you some understanding of the channels. And obviously it talks more about it, but that is the channels that you're talking about in this case.

Q. And the data of claim 1 captured with the channels includes digital data as well; is that right?

A. Well, it captures the data, obviously, and it -- you know, the data is being converted, you know, as being -- it's captured -- in the CCD arrays you're capturing data and then you're converting that data and processing it.

Q. So is it correct that the data of claim 1 includes both analog data and digital data?

A. Well, you're acquiring -- it's -- you have a process of acquiring the data. Right? Light is falling on the CCD arrays. The CCDs are developing. You're acquiring that data and then you're basically processing it.

So it gets collected -- you know,

you're getting -- the CCD arrays are passing on to -- you know, electronic boards are processing that data and eventually converting it to digital. So ...

Q. You just mentioned that the channels are required to perform simultaneous data acquisition; is that right?

A. Well, that's what the claim claims. The claim claims that the processing component configured to independently control simultaneous data acquisition with each of the plurality of channels.

Q. So in addition to the plurality of channels, what components is required for performing simultaneous data acquisition?

A. I don't understand your question.

Q. Does the claim require, in addition to the channels, a processing component for performing data acquisition?

A. I don't understand what you're asking. The claim -- if you look at claim 1, it claims in 1A a plurality of channels and it has a

series of whereins. And it claims in claim 1B a processing component that's coupled to the plurality of channels and does certain activities.

So it has channels and it has a processing component. Obviously, you know, you have a camera that's going to run and produce an image at the end.

Q. Does simultaneous data acquisition require any additional components not recited in claim 1?

A. I don't understand what you mean. I mean, the camera obviously has a frame -- has a physical frame. So the camera has electronic boards. The camera has power supply. So there are components that are there to operate the device. But the main invention is what's being claimed.

Q. Does claim 1 require any configuration of the channels not recited in the claim language of claim 1?

A. I don't understand what you're

asking. Your questions don't make any sense.

Q. Does claim 1 require any specific configuration of the processing component for performing simultaneous data acquisition?

A. Well, if you read -- if I understand your question -- and I'm not claiming that I understand it correctly, but if I understand your question, if you read 1B, it says you have a processing component -- example, a CPU -- that's coupled to the plurality of channels. So that CPU, as an example, would be connected -- there will be connectivity between that CPU and the channels because it's coupled to the plurality of channels. So it has to be able to control all of them.

The processing component configured -- so it's configured, it's designed and configured, to independently control. So it's got to control each -- each one of those channels independently from the other. It has to have the ability to do so, change one without changing the other, just like if I would move my

left hand without moving my right hand or move my right hand without moving my left hand.

And it's got to do that simultaneously, at the same time, you know, as close in time as engineeringly possible, you know, practical, for -- you know, for a product, et cetera.

So it's coupled and configured and has independent and simultaneous. And it's -- eventually it's -- that processing component, if you continue reading that 1B, is configured to combine data of a frame from at least the plurality of the channels that it's able to control to provide you with an image. So it has multiple functions.

Q. Does claim 1 have any additional requirements, other than that the processing component is configured to perform independent control of simultaneous data acquisition?

A. I don't understand your question. I mean, the claim -- claim 1 claims the inventive part of what's being, you know, discussed here.

So it doesn't, for instance, say well, the CPU has a power supply. Well, obviously a POSITA would know that every CPU has to have some power supply. It's got to have some heat sinks. It's got to have embedded code. I mean, that's understood. But the claim is claiming what's inventive here, what's innovative.

Q. How does the '180 patent explain the inventive step for this limitation?

A. I don't know what you're talking about. I don't know what you're asking.

Q. You just said the claim is claiming what's inventive here; is that right?

A. The claims obviously claim the innovation, the inventive part of what's being disclosed in this -- in the specification. So the claims are essentially the invention. This is what's being invented.

And that's described in the specification. So you read the claim in light of the specification to -- to shed some light on what's being claimed and how it's being

practiced.

Q. Let's go back to paragraph 61.

A. Yes.

Q. You cited Exhibit 1001 title.

Do you see that?

A. Yes.

(Thereupon, Exhibit 1001, previously marked, was referred to.)

BY MS. SHI:

Q. Is it correct that the title Simultaneous Multiple Field of View Digital Camera is within the scope of claim 1?

A. Well, obviously it says Simultaneous Multiple Field of View Digital Camera. So the point here -- the point of paragraph 61 is to illustrate to you the multiple citations to simultaneous -- and there's more. This is just a few of them -- that are disclosed in the specification, including, obviously, in the title.

Q. In the next line you cited to abstract, which says that digital cameras

configured to simultaneously acquire image data via multiple channels.

Do you see that?

A. Yes, I do.

Q. Is simultaneously acquire image data view multiple channels within the scope of claim 1?

A. I mean, that's what's being discussed in claim 1. Claim 1 claims you have a processing component coupled -- so it claims a processing component that is coupled to the plurality of channels that were discussed in 1A; and that the processing component is configured to independently control simultaneous data acquisition with each of the plurality of channels. So it's capable of doing independently and simultaneously that acquisition with each of the plurality of channels that are cited or discussed in 1A with a plurality of channels. So that's the antecedent basis to that plurality of channels.

Q. So the -- next you cited to column 2,

line 42 through 43.

Do you see that?

A. I do.

Q. Can you read that sentence, please.

A. Yes. Figure 3 shows a digital camera configured for simultaneous acquisition of multiple fields of view.

Q. So is it correct that Figure 3 shows an example of a digital camera that -- for performing simultaneous data acquisition?

A. Well, if you look at -- for instance -- if you look at the patent on column 2, line 42 to 43, that's where that quotation comes from. And if you look at Figure 3, that's what you see.

Q. Can you walk me through how the digital camera of Figure 3 performs simultaneous data acquisition?

A. Well, if you look at Figure 3, so you have Figure 3 in front of you, and then we can --

Q. I have Figure 3 in front of me.

A. Okay. And if you go to the

specification starting on column 5, line 45/46 -- so let's say at line 44 it starts a description of Figure 3. And that goes on until column 6, line 13.

Q. So what components of Figure 3 of the '180 patent is used for achieving simultaneous data acquisition?

A. Well, there's a description there of all the components that are listed in the figure, in those lines I just cited to you.

Q. So how is the electronic image storage media 220 of Figure 3 configured to achieve simultaneous data acquisition?

A. What was that component again?

Q. The electronic image storage media 220, which is described at column 5 --

A. Yes.

Q. -- line 49.

A. Yeah. What -- what's your question? I mean, the description is there. I don't understand what you're asking.

Q. How is the electronic image storage

media 220 of Figure 3 configured to achieve simultaneous data acquisition?

A. Well, that's disclosed in column 5, line 44 to column 6, line 13. We can walk through those sentences.

Is that what you're asking, you want to walk through the sentences?

Q. I'm asking the specific component, the electronic image storage media 220.

A. Yes, but the point is there is a description there of all the components of how this is happening. So you see, for instance, starting on line -- column 5, line 46, it -- it says Figure 3 shows a digital camera 200 and then lists all the components of that.

So you can see, you know, starting on line 48, all the different components, the housing portions, the -- you know, the electronic storage media, the digital camera subsystem 210, et cetera.

You see on lines 56 it says the digital camera subsystem 210 -- which you

obviously see in the figure -- includes one or more camera channels -- which you see in the figures -- and it shows you -- it gives you an e.g. with the four channels that you see in the figures 260A through D. So you have the four channels there.

And it talks about the lens assembly 110, the color filters and the image sensor of the digital camera 100 described above, which were described earlier.

Then if you look at column 5, line 61, you see it says the four camera channels 260A through D are configured through pixel array size and/or optical focal length to provide a desired field of view for each channel. So each channel can have a desired field of view.

Then, if you look at the next one, it says the four camera channels -- I'm on line 5 -- column 5, line 63 -- you see those four camera channels can be operated simultaneously with independent electrical control of the features, such that -- such as integration time control and

1 frame rate to obviously acquire the data.
2 And then it goes on in column 6 to
3 talk about the peripheral user interface 232 and
4 continues on from there to mention, obviously,
5 the electronic storage media, the power supply,
6 et cetera.
7 Q. Is it correct that no additional
8 configuration for electronic image storage media
9 220, other than the description here you just
10 mentioned, is required for simultaneous data
11 acquisition?
12 A. I don't understand what you mean. I
13 mean, it's understood what an electronic storage
14 media is. I don't know what you mean by
15 description. I mean, electronic storage media,
16 like memory, RAM -- not RAM -- ROM, or -- not
17 read only but it would be like RAM or some other
18 memory that you have in the system.
19 There is -- if you go to column 23,
20 you see -- well, column -- starting on column 22,
21 line 60, you see it says, It should be noted that
22 components of the various systems ...

And if you continue to column 23, you see it says, are not limited to, non-volatile storage media in various forms, e.g., optical, magnetic or semiconductor storage media.

So you have electronic storage media, memory that you can store electronically information.

Q. Please look at column 5, line 50 of the '180 patent.

A. Yes.

Q. It describes that the digital camera 200 of Figure 3 includes a power supply 224.

Do you see that?

A. Yes.

Q. Does claim 1 require any specific configuration for power supply 224?

A. I don't understand what you -- I mean, claim 1 is claiming the invention that the inventors are claiming. Obviously, it's understood that power supply would be part of a camera, just like an electronic board will be part of this particular digital camera.

So it's claiming the invention that's being claimed here, not -- it's not going to say every part of the camera. But when you read, obviously, the specifications, it's clear that the camera has a power supply.

Q. Other than the existence of a functional power supply 224, does claim 1 require any specific configuration of the power supply 224?

A. Well, claim 1 doesn't -- doesn't say anything -- the words "power supply" do not appear, obviously, in claim 1. So claim 1 is not claiming -- it's not -- doesn't say anything about power supply. It's obviously understood that a power supply is part of the digital camera that's being claimed.

Do you think this is a good time for a quick break?

Q. Yeah, we can take five minutes -- do you need five minutes or ten minutes?

A. I'm good for five minutes, but I'll let Misty be the boss.

(Thereupon, a brief recess was taken.)

BY MS. SHI:

Q. So, Dr. Saber, we were talking about Figure 3 of the '180 patent --

A. Yes.

Q. -- before the break.

A. Yes, we were.

Q. So what is element 242?

A. Well, if you look at column 5, you see it says housing 240, including housing portions 241, 242, 243, 244, et cetera, 245 and 246. They're housing portions.

Q. How element 242 is involved in the data acquisition?

A. They're housing portions. I mean, the entire -- the entire camera, you know, has -- has not just electronics. It has also housing and has an aperture, you know, has a frame. So it has multiple components.

Q. Does claim 1 require housing?

A. I think we've been over that before,

1 but I'm more than happy to answer it again.
2 So as I mentioned to you earlier,
3 claim 1 claims the inventive -- the innovation,
4 the inventive parts of this particular patent.
5 It's understood by a POSITA that, you know, a
6 camera has these other elements, but what's being
7 claimed in the claims, the inventive part of
8 the -- of this patent.
9 Q. What is element 232?
10 A. The patent -- the specification
11 refers to it as the peripheral user interface
12 232, which includes the shutter button, can
13 include one or more additional input devices.
14 Q. How is element 232 involved in
15 simultaneous data acquisition?
16 A. Well, it's -- it's part of the
17 camera.
18 Q. Other than being a part of the
19 camera, how is element 232 involved in
20 simultaneous data acquisition?
21 A. Well, as you can see, it says a
22 peripheral user interface 232, which includes the

shutter button. So it could also -- I mean, you have -- obviously when you push the button to -- to try to acquire the imagery. So it's a user interface. You may be able to set some controls there. So the camera doesn't just automatically work by itself without some type of interface from the user.

Q. What is element 236?

A. I don't see element 236 on the figure. Circuit board.

So on column 5, line 51, obviously it states there a circuit board 236 that supports and/or electrically couples or interconnects the components. That's what element 236 -- okay. I see it now on -- on the diagram. So it's on the diagram showing right next to element 220.

Q. Is circuit board 236 recited by claim 1?

A. Again, as -- I've already answered this question multiple times, but I'm more than happy to answer it again for you.

Claim 1 claims the innovative parts

of this patent. So it's claiming what's being -- what's being -- what's innovative here, what's the invention.

So the invention is -- is claimed in the claims. Circuit board 236 is obviously part of the camera to process -- to acquire and process the data.

Q. Is circuit board 236 involved in the simultaneous data acquisition?

A. I don't understand what you mean. I mean, the circuit board is part of the electronic components of the camera that acquire and facilitate the processing of the data from the acquiring process to where the image is formed.

So there are circuit boards that will facilitate that functionality, either directly or indirectly, dependent on what the circuit board is doing.

Q. Is that a yes?

A. Yes. I mean, circuit boards are part of -- you know, the integral part of the camera. So they facilitate the processing, the

acquisition and processing of the information.

Q. How is circuit board 236 involved in simultaneous data acquisition?

A. I don't know what you mean by how it's involved.

Q. What functions does the circuit board 236 need to perform to achieve simultaneous data acquisition?

A. It supports -- see it says there, circuit board 236 supports and/or electrically couples or interconnects the components. So it -- it provides the proper support to interconnect the components so you can acquire and process the data.

Q. Any other functions?

A. I don't understand what you mean. I mean, the circuit board that you see there is connected -- is part -- is an integral part of the camera. So it's going to provide, you know, proper power as needed to the channels, acquire the data, process the data, convert from analog to digital.

And so it's going to be involved directly and indirectly in the processing of the data, you know, combining the frames into an image until the end result is formed and potentially display the image on -- you know, on the LCD display.

So it's -- it's like, you know, part of the camera.

Q. What is element 250?

A. That would be the aperture. Aperture.

Q. Is aperture 250 recited by claim 1?

A. I think I've already answered this question several times for you, but I'm again happy to answer it again.

So claim 1 claims the innovative parts of what's being disclosed here in the specification. Aperture 250 is part of the camera that facilitates how this invention, you know, takes place.

Q. Is that no?

A. I think I've answered this question,

1 but every component of this camera is part of
2 this camera. Right? A power supply is part of
3 this camera. An aperture is part of this camera.
4 So claim 1 claims the innovative
5 components of the camera. It's understood that
6 the other components -- a POSITA reading claim 1
7 in light of the specification would understand
8 that these components are part of the
9 functionality of the camera to enable the -- the
10 innovation that's being claimed.
11 Q. Is that a yes?
12 A. Yes to what question are you asking?
13 Q. The question is, is aperture 250
14 recited by claim 1?
15 A. So the word "aperture" isn't in
16 claim 1. It's not printed there in the claim.
17 But it's understood, when you read claim 1 in
18 light of the specification, that a camera would
19 require an aperture to function according to
20 what's being claimed.
21 So it's understood as part of the --
22 you know, what's being claimed.

Q. So you're saying that an aperture is required by claim 1; is that right?

A. Well, claim 1 claims the innovative parts of what's being -- what's being disclosed here in the specification. But when you read -- a POSITA reading the specification would understand for you to be able to practice claim 1 in this particular digital camera, the camera has these other components that are understood to enable this particular invention.

Q. Is it correct that every component of Figure 3 is understood to enable the invention claimed by claim 1?

A. Well, Figure 3 is an illustration of how the inventive claim part -- you know, the invention that's claimed in claim 1 is essentially practiced. So it's an illustration. You know, we have a digital camera and those other components are just part of a normal digital camera.

But what's being claimed is what's in claim 1. That's -- if you're practicing what's

in claim 1, you're practicing the invention.

Q. So looking at the example of Figure 3, how do you determine whether it's practicing the invention of claim 1?

A. Well, you read the invention that's claimed in light of the specification that describes -- you know, sheds light on how the claimed invention is practiced with embodiments and illustrations to tell you how this invention is practiced.

Q. So the example of Figure 3 practices the invention of claim 1; is that right?

A. Well, yes. I mean, the invention -- what's being illustrated in Figure 3 is an embodiment, essentially, is how claim 1 is being practiced. So when you read claim 1 in light of the specification from the eyes of a POSITA, you understand how this invention is being practiced. This is essentially an illustration of it.

Q. What is -- I think we discussed this element 220 before the break.

Do you recall?

A. I don't recall off the top of my head, but we can talk about it.

Q. Okay. So what is element 220?

A. An electronic storage media. An electronic image storage media 220. So, yes, we have discussed it.

Q. Is element 220 -- scratch that.

Is an electronic image storage media recited by claim 1?

A. I think we've been over that a few times now. So the claim claims the innovation, the innovative parts of what's being claimed.

Figure 3 is an illustration of how that -- those -- that claim is practiced. And the components there are obviously supporting how this innovation would be practiced. But as long as you're practicing what's in claim 1, you're practicing the innovation.

Q. So is it your opinion that an electronic image storage media is not required by claim 1?

A. Well, what's required by claim 1 is

in claim 1. So claim 1 claims a plurality of channels, claims, you know, an array of photo detectors, claims what each channel has in terms of field of view. What's being -- what's in claim 1 is described in claim 1. So as long as you have what's in claim 1, you're practicing the invention.

Q. Is electronic storage media 220 involved in simultaneous data acquisition reciting claim 1?

A. Well, again, I think we've been over this a few times.

So what's in claim 1 is claimed. So you have a processing component that's coupled to the channels that can independently control, has simultaneous data acquisition and has the ability to configure and combine data into a frame.

Now, when you read the specification, obviously there is memory there. There's a storage media where data is -- is being stored and/or transformed from, perhaps, one type to another to be able to practice that invention.

But what -- as long as you're practicing what's in the claims, you're practicing the invention.

Q. Let's go back to paragraph 61 of Exhibit 2020.

A. Yes.

Q. Do you see that you cited to Figure 5?

A. Yes.

Q. Can you read that sentence.

A. Yes. So quote -- open quote, Figure 5 is a flow diagram for simultaneous acquisition of multiple fields of view, close quote.

Q. Do you agree that Figure 5 is a flowchart for simultaneous data acquisition, as recited in claim 1?

A. Well, Figure 5, as described in the specification, is exactly what I just read to you. And that's a quote directly from the specification. It's a flow diagram for simultaneous acquisition of multiple fields of

view. So it provides you with a -- with a flowchart of how one might practice the invention.

Q. So you agree that Figure 5 is an example for the simultaneous data acquisition of claim 1?

A. Yeah. Figure 5 illustrates a flowchart of -- you know, engineers, I guess, like flowcharts. So Figure 5 illustrates a flowchart of how you would practice, you know, the invention as claimed.

Q. When you say the invention as claimed, does it include the invention as claimed in claim 1?

A. Well, claim 1 claims a plurality of channels. I could have two. I could have four. I could have six. Right? It claims a plurality of channels, where each channel includes an optic component and the plurality of channels including the first and the second. So it claims a plurality of channels.

Q. So is it correct that Figure 5

illustrates an example of invention, as claimed in claim 1?

A. Figure 5 provides a flowchart of how a POSITA would practice the invention that's claimed in claim 1.

Q. Is it correct that Figure 5 also illustrates an example of invention as claimed in claim 22?

A. Well, claim 22 brings in the additional limitation of during a frame, which is, obviously, very important to the claim. So it's -- it's claimed slightly differently or it's written differently, obviously, from claim 1. It's a method claim and it discusses the during a frame, which is discussed in my declaration on Section B. On page 26 of my declaration there is a discussion of during a frame. And that's an important element of claim 22 that has to be considered.

Q. Is it correct that Figure 5 illustrates an example of simultaneous data acquisition, as claimed in claim 22?

A. Well, Figure 5 doesn't show -- wouldn't illustrate that during a frame that we're talking about. I mean, claim 22 has the during a frame -- like if you go to my declaration on page 26, you see I have a discussion there on -- starting on paragraph 64 of claim 22 and during a frame. And that's an important component of the claim -- of claim 22 that's distinctively different from claim 1.

Q. Is it correct that Figure 5 illustrates an example of simultaneous data acquisition without during a frame?

A. Well, Figure 5, I mean, is -- is a flowchart, but you -- obviously, when you look at Figure 5 and you -- I mean, it's an illustration. But when you look at the figure, you see it says and is captured approximately simultaneously in block 508.

So the claim -- I mean, this just kind of gives you a flowchart. But the claim claims simultaneous. So it's not approximately simultaneous. It's not nearly simultaneous.

It's simultaneous.

So as long as you're practicing simultaneous, you would be practicing the claim. If you're practicing nearly simultaneous, then you're not practicing the claim.

So the figure just gives you a flowchart to kind of like illustrate some ideas. But what's claimed is simultaneous, and that's what you need to do to practice the claim.

And same thing with claim 22. What's claimed is simultaneous, at the same time, and during a frame for claim 22. So you've got to do it simultaneously and you've got to do it during the capturing of a frame of video from each of the channels.

Q. Could you go to '180 patent, column 9, line 13.

A. Column 9, lines?

Q. 13 to 14.

A. 13 to 14, Figure 5.

Q. Can you read the -- that sentence.

A. Yes. So column 9, line 13 says,

Figure 5 is a flow diagram for simultaneous acquisition of multiple fields of view 500 under an embodiment.

Q. And you agree that Figure 5 is a flowchart for simultaneous data acquisition, as recited in claim 1?

A. Well, again, as I mentioned to you, it's got to be simultaneous. So what it says there in the patent is simultaneous. But when you look at the block 508, it says approximately simultaneous. But the claimed invention is simultaneous. So as long as you do it simultaneously, you're following the flowchart and doing it simultaneously, then you're practicing the invention.

If you're doing it nearly simultaneously, then you're not practicing the invention. So it has to be simultaneous for you to practice the invention.

Q. Which block of Figure 5 illustrates simultaneous data acquisition?

A. Well, block 508 says, and is captured

approximately simultaneous, and that's essentially what I'm responding to.

So as long as you capture it simultaneously, you're practicing the invention. But I don't want to get into -- so the claims claim simultaneous, at the same time, as we've been discussing. So Figure 5 is just an illustration. But what's in the claims is simultaneous. It's got to be at the same time to be in -- to be practiced in the claims.

Q. Is approximately simultaneous the same as simultaneous?

A. I think we've been over that a few times now. Simultaneous means at the same time. So anything outside of that is not simultaneous. It's got to be at the same time. Nearly simultaneous is not simultaneous. Approximately simultaneous is not simultaneous. May be simultaneous is not simultaneous.

At the same time is what simultaneous means.

Q. So why are you relying on the

1 approximately simultaneous step in Figure 5?
2 A. I'm not relying on it. I'm just
3 explaining to you that Figure 5 is just an
4 illustration. But what is claimed is in the
5 claim. So the claim language is what's claimed.
6 That's what claims the innovation.
7 The specification sheds light. You
8 know, you read that in light of the specification
9 from the eyes of a POSITA. The claim doesn't say
10 approximately simultaneous. It doesn't say
11 nearly simultaneous, even though that language is
12 found in the specification, as I argue in my
13 declaration.
14 The claim talks strictly about
15 simultaneous. Both claim 1 and 22 only talk
16 about simultaneous, don't mention anything about
17 nearly or anything else.
18 Q. So is it correct that step 508 of
19 Figure 5 is not required by the claims?
20 A. The claim claims simultaneous. So as
21 long as you practice step 508 simultaneously,
22 you're practicing the claim.

Q. Is it correct that 58 [sic] does not recite simultaneously without having approximately simultaneously?

A. Well, 508 says, and is captured approximately simultaneously. So the claims don't have such language. The claims claim simultaneously. There's no approximately. There's no nearly. It claims simultaneously.

So as long as you're acquiring simultaneously at the same time, you're practicing the claim.

Q. How do you distinguish approximately simultaneously and simultaneously?

A. Same way you distinguish nearly simultaneously and simultaneously. We've been, I think, over this before.

Q. So is it your opinion that approximately has the same boundary as nearly?

A. It's not simultaneous. So simultaneous means at the same time, as we have been discussing for probably an hour earlier. So it's got to be at the same time, you know,

within, obviously, practical engineering design standards.

Q. So as a POSITA, are you familiar with techniques for simultaneous data acquisition with multiple imaging channels?

A. Yes.

Q. Can you give some examples of those techniques?

A. I don't know what you mean. This is, obviously, an example of that, the specification here.

Q. Other than the examples in the specification, can you give some examples of techniques for simultaneous data acquisition?

A. For example, if I had a camera that has a red, green and blue channel and I want to acquire via all three channels simultaneously, I would basically activate all three channels within a time -- you know, an appropriate engineering design standard time interval and I would acquire the data simultaneously, versus -- like Miyazaki is doing it sequentially.

1 Miyazaki is a reference from the
2 previous IPR that we talked about last week. And
3 if you look at Miyazaki, for instance, it's doing
4 them sequentially. It would acquire an image.
5 And some delta T time later, it would acquire
6 another image. And some delta T time later,
7 maybe a 1/30 of a second, it would acquire
8 another image. So that's sequentially.
9 Simultaneously would be you would
10 acquire all three channels -- you would acquire
11 data from the RGB channels at the same time
12 within acceptable, you know, engineering
13 practical standards.
14 Q. Does '180 patent specification
15 describe any specific technique for the technique
16 for simultaneous data acquisition?
17 A. I don't understand your question. I
18 mean, the '180 specification describes the
19 innovation.
20 Q. What techniques are used to activate
21 all channels within an appropriate engineering
22 design standard time interval?

A. I don't understand your question.

Q. So you gave an example stating that one example for simultaneous data acquisition is to activate all three channels within a time, you know, an appropriate engineering design standard interval.

Do you recall?

A. Yes. I mean, the specification that you have in front of you -- obviously, the claims claim the innovation. Claim 1 claims the simultaneous acquisition. Claim 22 claims the simultaneous acquisition during a frame.

So there's -- there's a distinction between them. With claim 1, it's a simultaneous acquisition and the specification describes -- you know, describes -- you know, if you read the claim in light of the specification, you understand what's being described.

Q. Does '180 patent describe an appropriate engineering design standard time interval?

A. Well, it describes simultaneous.

So -- and, you know, I mean, you understand when reading the specification that the capturing has to be done simultaneously. And a POSITA would understand that that is within acceptable engineering standards.

Obviously, I can't capture something in 1 times 10 to the negative 100 of a second. So there are certain engineering standards that we, you know, are able to operate on at the time of the invention. So a POSITA would understand that.

Q. Can we go to paragraph 62 of Exhibit 2020.

A. 62, yes.

Q. In the last sentence of paragraph 62 you mentioned data acquisition windows.

Do you see that?

A. Yes, I do see that, the last sentence of 62.

Q. What time interval does data acquisition windows include?

A. Well, you see in this sentence that

you have just mentioned, you see it says a POSITA would have -- would have understood that the recitation of simultaneous in this phrase that we're talking about in the previous sentence requires at least some overlap in the data acquisition windows in each of the plurality of channels. So you have a window in -- in -- where the data acquisition is happening in channel 1. And I have a window with the data acquisition happening in channel 2.

And to be simultaneous, there has to be an overlap between those two windows. So you -- you wouldn't do channel 1 and then some millisecond later do channel 2. There has to be an overlap between those two data acquisition windows for the two channels that I just provided in the example.

Q. How does a POSITA determine the data acquisition window?

A. Well, the window would be determined by the hardware that you have, the -- the design that you have and the hardware that you have, how

you design the device.

Q. Can you give an example of the hardware?

A. Well, you design this device. You have, let's say, two channels. You have lenses. You have optics. You have CCD arrays. You have circuit boards that are going to take data off the CCD arrays. So you have certain windows, whether that's done in hardware or embedded software, to acquire -- basically to acquire the data.

So as I'm acquiring the data on channel 1, I'm also acquiring the data in channel 2 with an overlap between them.

Q. Does a data acquisition window include the integration time of the channels?

A. Well, it's -- it's -- you're acquiring the data. So it would -- it would include the time that you're acquiring the data.

So as I'm acquiring the data off of CCD A, I'm also acquiring the data with an overlap off of CCD B, which is, more or less --

let's say CCD A goes with the red channel and CCD B goes with the green channel. So the acquisition of data from CCD A and CCD B has -- to be simultaneous has to have an overlap, you know, of that acquisition.

Q. So do you agree that a data acquisition window include the period of time for integration of a channel?

A. So if you look at column 5 -- I think we've looked at this passage before, but I'm looking at column 5, lines 63 to 67. So you see there where it says the four camera channels. And this is referring to Figure 3, which we talked about earlier. And the channels are mentioned 2060A [sic] to 2060D [sic] as in delta. So can be operated simultaneously with independent electrical control of features, such as integration time control and frame rate.

So for you to acquire the data of the channels, you -- part of the, you know, control is to control the integration time of, you know, that particular channel.

So the data acquisition is -- is, you know, the integration time plus, obviously, the pushing of the data to the backplane or wherever, you know, to do the data acquisition.

Q. What does pushing of the data to the backplane mean?

A. Well, I mean, it's a figure of speech. But essentially you're -- you're integrating on the CCDs. So you're collecting 4,000 CCD and you have an integration time. And then you clock that CCD and get the data into, let's say, the backplane, where you can -- you know, as part of the data acquisition process.

Q. Any other steps are part of the data acquisition process?

A. I mean, obviously you may have some amplifications or filtering techniques are embedded into the design. You know, conversion, let's say, from analog to digital. I mean, there are some, you know, steps in the process there.

Q. Are you familiar with the readout period for data acquisition?

A. Yeah. I mean, I don't understand what you mean, but, yes, I'm familiar with -- generally speaking, I'm familiar with -- I mean, you have to be more specific on what exactly do you mean, but -- but, yeah.

Q. So are you familiar with the readout process in an image sensor?

A. Yes.

Q. Can you describe that?

A. Well, if you look at the specification on column 20 and you go to line 48 and you see it gives you a decent description there. Column -- column 20, line 48 to 51.

Q. Could you read that.

A. Yes. So I'm on column 20, line 48. The integration time control can be executed, open parentheses, depending on readout configuration, close parentheses, according to a number of techniques, for example, rolling mode and/or snapshot mode, to name a few.

Q. So what is readout configuration?

A. You're reading out the data.

Readout -- you have a configuration of how you're reading the data.

Q. Does Figure 3 have components that perform the readout?

A. Well, I mean, you -- Figure 3 is illustrating, obviously, the -- the major components of the camera. It's not showing you every screw in the camera and what color the camera looks like and whether there's a dial on the lens. So it's showing you the major components of the camera that -- that -- you know, to practice the innovation that's claimed.

It's understood that data is read out from -- you know, as the data is being captured, it's got to be read out from the, you know -- because if you look at claim 1, for instance, it says each channel includes an optic component -- let's say we have a lens -- and an array of photo detectors integrated on a semiconductor substrate.

So obviously you have a series of photo detectors on a semiconductor substrate. So

think of that as a CCD array. So obviously when you collect the data on those CCD arrays, you have to read it out; otherwise, what's the point of collecting it.

Q. So which component illustrated on Figure 3 performs the readout?

A. So you see -- I'm back on column 5, where we were before, earlier. I'm back on column 5, line 51. You see it says there the circuit board 236 that supports and/or electrically couples or interconnects the components.

So that circuit board that couples and interconnect the components, one of its functionality would be, you know, acquiring the data that's being captured.

Q. Let's go to paragraph 64 of your declaration.

A. Okay. Paragraph 64. I wonder if we should take a quick break here before we jump into this section.

Q. Yeah. So --

MS. SHI: Yes, let's go off record.

(Thereupon, a discussion was had off the record.)

(Thereupon, at 12:09 p.m. EST, a lunch recess was taken.)

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AFTERNOON SESSION (12:42 p.m. EST)

BY MS. SHI:

Q. So, Dr. Saber, could you please go to paragraph 64 of your declaration, Exhibit 2020.

A. Yes.

Q. Can you read the first sentence of paragraph 64.

A. Yes. Claim 22 recites, open quote, independently controlling ... data acquisition ... during a frame, underlined, end quote.

Q. Thank you.

So you stated -- do you see on -- starting from line 4 it says, A person of ordinary skill would also have understood that the phrase "during a frame" in this context corresponds to the exposure interval during which an image sensor captures a single image?

A. You read that correctly, yes.

Q. Thank you.

What does exposure interval mean?

A. Just -- well, it's what it says,

exposure interval, the interval that the CCD arrays are exposed. The image sensor captures the single image.

Q. Is it your opinion that the claim language you recited in claim -- in the first sentence, claim -- okay. Let's scratch that. Let's go back.

So for the limitation independently controlling ... data acquisition ... during a frame of claim 22 is it right the petition refers it as limitation 22.3?

A. I believe -- I believe so. I don't have, obviously, the petition in front of me. But if you look at claim 22, there are three elements. So configuring, if that's 22.1 in the petition, then the second configuring is 22.2 and then independently controlling would be 22.3.

Q. Okay. So to make it a little bit easier, when I say limitation 22.3, you will understand it's the limitation start with independently controlling.

Is that okay?

A. That's fine.

Q. So is your opinion that limitation 22.3 requires the exposure interval during which an image sensor captures a single image?

A. It's during a frame, while the frame is being acquired and put together. So this says independently controlling. So this has to have independent control. So it's got to be able to affect one without the other; simultaneous, at the same time that we've been talking about; and you have data acquisition with each of the first and second channels during a frame. So it's during the capturing of a frame of video from each of the channels; so while the frame is being acquired, essentially put together.

Q. Where does the '180 patent describe exposure interval?

A. If you look, for instance, at column 11 of the patent -- I'm on line 34 to 40 -- it talks about exposure control measures the overall volume of light being captured and discusses that.

Then if you look at column 17, lines 32 to, say, 34, you see where it says, After being exposed to light for certain period of time, exposure time, the pixels 15801,1 to n,m are read out, are a sequential line-per-line basis. And there are other citations to exposure control as well.

Q. Okay. Let's go to column 11, line 34 to 40.

A. Okay.

Q. So what are some techniques for implementing the exposure control described here at column 11, line 34 to 40?

A. I don't understand what you mean.

Q. So a POSITA will understand how to implement exposure control as described at column 11, line 34 to 40; is that right?

A. Yes, a POSITA would understand how to apply exposure control in a camera.

Q. What components of Figure 3 are used for exposure control?

A. So if you go back to column 5, which

we have talked about earlier, where Figure 3 is described -- I'm on column 5, starting on lines 44 to column 6, line 13 -- it describes the functionality of Figure 3 that, you know, it has, obviously, circuit board. It has a shutter assembly that's not shown. It discusses digital camera having more -- you know, one or more camera channels, talks about the lens assembly 110, the color filter 112, the image sensor 116.

And then later on in that column 5 towards the bottom -- I'm on line 63 -- it says, you know, the four camera channels can be operated simultaneously with independent electrical control of features, such as integration time control and frame rate.

So clearly, you have basically the elements to be able to control exposure.

Q. What are the elements to control exposure?

A. Well, as I mentioned to you -- I mean, the camera has an aperture, obviously. It has lenses. It's got a lens assembly. So you'd

be able to take light and focus it.

You have color filters to select which part of the light you want. You have an image sensor to integrate -- to collect light and integrate. You have independent electrical controls to -- to independently control each of the channels. You have independent integration time control to control the integration time on each of the CCD arrays. And at some point you're going to, obviously, stop the integration and then process the data.

Q. Does limitation 22.3 requires rolling mode?

A. Well, it's during a frame. Right? So it's got to be while the frame is being collected.

Q. Is that yes?

A. So, yes, you would need to be able to -- you've got to basically make this happen during a frame. While the frame is being acquired, put together, you've got to do this independently controlling simultaneous data

acquisition.

So there is a discussion on that on -- starting on paragraph 64, Section B, and more so on paragraphs -- on Section C, which starts at paragraph 67.

Q. Does limitation 22.3 require a rolling shutter?

A. Well, you have to -- I mean, you would need to be able to perform this during a frame. So you have to have a rolling mode. So you would need to -- to make that happen with a rolling shutter because you have the rolling mode to be able -- to make it happen during a frame.

Q. Does the '180 patent describe a rolling shutter?

A. Yes.

Q. Where is that?

A. So if you go to column 20 -- I mean, obviously the discussion starts on line 19 with the in contrast to exposure control by conventional, et cetera. But the lines that I think that are more specific would be line 48 to

51. You see where it says, The integration time control can be executed, depending on the readout configuration, according to a number of techniques, for example, rolling mode and/or snapshot mode, to name a few.

So you have the rolling mode where, you know, you go down the line, so to speak, or the snapshot mode.

Q. So is rolling mode used for exposure control?

A. Well, it's -- I mean, it's a technique for, essentially, providing exposure on a rolling basis, like is described in page 44 of my declaration. So if you go to page 44 of my declaration, paragraph 101, it kind of shows you a pictorial from Exhibit, I think, 2006 that talks about the rolling mode situation.

Q. Okay. Let's go back to claim 22 of the '180 patent.

A. Yes.

Q. Is it correct that claim 22 recites a first image sensor?

A. Well, if you look at 22.1, it says -- you see it says configuring -- so obviously your physical optics lenses, et cetera, you're configuring -- a first optics component relative to a first image sensor to form a first channel having a first field of view that comprises a first angular width of a scene.

So you're configuring whatever the physical, you know, parts of the channel. The first optic component, like a lens, relative to a first image sensor, like a CCD array, to form a first channel, say a red channel or a gray scale channel, having a first field of view with some angular width, we'll say 90 degrees or something, of a scene, the real-world space that you're capturing.

Q. Is that a yes?

A. I think your question was about a first image sensor; isn't that correct?

Q. Correct.

A. Yeah, so it claims a first image sensor to form a first channel. So, yes.

Q. Is it correct that claim 22 recite a second sensor, image sensor?

A. Yes. With 22.2 you see that limitation talks about a second optic component, second image sensor, second channel, second field of view and a second angular width that's different from the first.

Q. So in paragraph 66 of your declaration you said during a frame in this context corresponds to the exposure interval during which an image sensor captures a single image.

Do you see that?

A. Not yet. Did you say paragraph 66?

Q. Correct.

A. Yes, I see that now.

Q. So the image -- an image sensor here in paragraph 66 refers to the first image sensor recited in claim 22; is that right?

A. You cut out for a second on my end. I didn't understand your question.

Q. Okay. Let me repeat.

So you said an image sensor captures a single image.

Do you see that?

A. Not yet, but -- yes, at the last part of the sentence.

Q. So the -- an image sensor you referred here in paragraph 66, it refers to the first image sensor recited in claim 22; is that right?

A. It refers to an image -- whatever image sensor that's cited in claim 22, whether it's the first or second.

Q. So is it correct that an image sensor you referred here in paragraph 66 of the declaration refers to both the first image sensor and the second image sensor recited in claim 22?

A. Well, this is talking about during a frame. So during a frame, basically while the frame is being acquired, captured, put together, during a frame, at some point between the beginning and the end of the exposure interval during which an image sensor captures a single

image.

So that's what during a frame means. Like, it's got to be within that exposure interval that you are -- the image sensor is capturing the image. Whatever image sensor is capturing the image during a frame, that frame is -- essentially becomes the image at the end. Right?

Q. When you say the image at the end, are you referring to providing an image as recited in the last limitation of claim 22?

A. So you see the last recitation -- we'll call it 22.4 -- it says, combining data received during the frame from one or more of the first and second channels to provide an image. So you're doing -- you're combining them to provide -- so you can see that image, let's say, on the LCD display. You're combining the data received during a frame from, you know, the first and the second channel.

So during the time interval that the frame is being captured, you're doing the

independent controlling, et cetera from 22.3 and then you're combining the data in 22.4 to provide an image at the end that's the combined result of what you captured with -- you know, from channel 1 and channel 2.

Q. When you say during the time interval that the frame is being captured, that includes the time interval that the corresponding image is captured by the first image sensor; is that right?

A. I don't understand your question. I don't understand what you're asking.

Q. Does the frame include data captured by the first image sensor?

A. I think you're mixing apples and oranges in -- in the hope that some sound bite comes out.

So you see, if you look at 22.3, you have independently controlling simultaneous data acquisition. So you have independent control. So you can affect one without the other. I can control channel 1 independently from channel 2,

vice versa.

Simultaneous, it's got to be done at -- the data acquisition is done at the same time with each of the first and second channels during a frame, so during the capture of a frame of video from each of the channels, so not sequential. Like, I'm not getting a frame from channel 1 and delta T later I'm getting a frame from channel 2, like you would do in Miyazaki, for instance.

So it's during the capturing of the frame of video from each of the channels. It's got to be independent, simultaneous and during. All three have to be there.

Q. 22.3 requires separate frames from separate channels?

A. Well, you're acquiring a frame from each channel. So channel alpha or channel red, let's say, has a frame. Channel blue has a frame. You're acquiring the frame from each of the channels. And you're independently controlling the simultaneous data acquisition

during the frame, during, you know, the acquisition of that -- you know, during -- during a frame, during the capturing of the frame of video from each of the channels.

Q. Is that a yes?

A. I think I've answered your question.

Q. So is it correct that limitation 22.3 requires separate frames from separate channels?

A. Yeah. Let's -- let's go over limitation 23 to make sure it's -- 22.3 to make sure it's -- we're on the same page.

So you're independently controlling. You're affecting one without the other. So I have independent control of each of the channels that were talked about in 22.1 and 22.2.

It's simultaneous, so at the same time, within the same time interval that we've been talking about earlier, data acquisition with each of the first and second channels during a frame. So during a capturing of the frame of video from each of the channels. So you're capturing basically the frame of video where --

from each of the channels, you know, in this rolling mode that we're talking about. So you're capturing basically the rolling mode lines that we're talking about, you know, during the capturing of a frame of video from each of the channels. You're not doing it sequentially.

Q. Does during a frame in limitation 22.3 require that the frame is with the first channel?

A. I don't understand your question.

Q. So you see that limitation. Do you agree that limitation 22.3 recites a singular "a frame"?

Do you see that?

A. Yes.

Q. Does the limitation require that a frame is with the first channel?

A. I think you're mixing apples and oranges here. So think about the rolling mode capture that we've been talking about. So you're capturing one line from sensor 1. You're capturing one line from sensor 2.

Then X many microsecond later, you capture the next line. And that's happening simultaneous. So you're capturing these lines that eventually will become the combined image. So that's during a frame, so during that frame time, in a sense, that you are, you know, doing the capture.

But you're capturing, like, this rolling mode. You're not capturing in a full frame like a snapshot. So you're capturing, you know, line from channel 1. You're capturing a line from channel 2. You're next going to the next line and those are -- that's happening simultaneously.

And all of that eventually creates an image at the end when you combine that information.

Q. How many frames does limitation 22.3 require?

A. Well, it says during a frame. So during a frame -- during the capturing of the frame of video that eventually, as you combine

them, you produce the image, you're doing this rolling mode we're talking about.

Q. You just said as you combine them. What does "them" mean?

A. You're capturing with -- with channel 1 data. You're capturing with channel 2 data. That's -- that's being combined in 22.4 during -- that's received during a frame to form the image that you see on the screen, let's say, at the LCD display.

So you're combining them to produce that image that you look at on your screen. So if these were RGB channels, you would combine them to produce a color image.

Q. Do you have any other examples for combining data to produce an image, other than combining RGB channels?

A. Well, you could probably combine a gray scale channel with RGB. I think the RGB is a good example.

Q. Do you have any other examples for combining the images?

A. For -- for this -- for the purpose of this deposition, I think RGB is good enough, a good enough example.

Q. Does the RBG -- sorry.

Does the RGB example fall within the scope of the claim 22?

A. Well, if you look at claim 22, you obviously -- it's talking about the first optic component that has a first channel with a first field of view that comprises a first angular width. So maybe that's channel 1. Maybe that's red or some gray scale channel.

And then you have a second optic component relative to second image sensor that forms a second channel. Maybe that's another gray scale channel or green.

And the angular width of that second one is different from the first one. So you can think of the first one as gray scale one and the second one as gray scale two, if you want. And they have different angular width.

And at the end, you're combining them

in 22.4 to provide you an image on the LCD display.

Q. So does the two field of views have overlap?

A. Well, it's talking about the first angular width of a scene. Right? So that's the 3D world that you're capturing. And then the second one says the second angular width of that scene, so whatever you're looking at out there.

So it's not -- so you'd be looking -- obviously, the angular width is different, so you're looking at different width of the scene, but you're looking -- the idea is you're looking at -- at the -- you know, more or less practically the scene out there that you're looking at.

Q. What's the benefit of having different angular width of the scene?

A. Different -- different, you know, resolutions of -- between the first and the second one. So I'd get, you know, a higher resolution with the second sensor, let's say,

from the first sensor if the second sensor has the smaller angular.

Q. Will that be a part of a scene that is covered by one sensor but not the other?

A. Potentially. If you -- if the second angular width, let's say, is, I don't know, 60 degrees and the first one is 90 degrees, so the first one is going to see more than the second one.

Q. So let's go back to your RGB example.

For the part that is seen in the 90 degrees angle but not in the 60 degrees angle, is it correct that it only contains data from the 90-degree angle channel?

A. So if channel 1 was, for instance, a gray scale channel and you have it at, say, 90 degrees, then you would capture that data. And then channel 2 was another gray scale channel and you're capturing -- at 60 degrees, you would capture that data.

Q. So the output frame is a gray scale image; is that right?

A. Well, I mean, I'm giving this as an example here. So if channel 1 was a gray scale image and being captured at, let's say, 90 degrees and channel 2 was another gray scale image being captured at 60 degrees, which -- which will then result in a higher -- potentially higher resolution, so -- so the combination of the two would result in a gray scale image.

Q. Can both channels capture color images?

A. I'm not sure what -- what you're asking. I mean, if you look at the claims, claim 22 and you go back -- let's say you look at claim 28 and 30, you add, obviously, a third sensor there and a fourth sensor there. So you could add additional sensors as you go down to the other claims.

But claim 22 claims to the first optic channel -- first optic component and a first channel and the second element, 22.2, claims a second optic component and a second channel.

Q. Is it correct that claim 22 does not require separate RGB channels?

A. I don't understand your question. I believe I've answered what I think the claim requires. I don't understand what you're asking.

Q. Does claim 22 require separate channels for separate colors?

A. I think you're mixing up multiple concepts.

Q. Why?

A. Well, I mean, the claim 22.1 provides a first image sensor and to form a first channel. So there's -- 22.1 talks about the first channel and its configuration.

22.2 talks about the second channel and its configuration and how it's different from the first channel. So that's what's claimed.

Q. Let's look at limitation 22.4.

A. Okay. The combining limitation.

Q. Is it correct that the data recited in limitation 22.4 are data having different angle width?

A. Well, it's combining data received during the frame from one or more of the first and second channels, however they're defined. They're configured in 22.1 and 22.2.

22.3 is acquiring the data, independent, simultaneous acquiring during the frame. 22.4 is combining that data that's received during the frame that was talking about in 22.3 to provide the image, let's say, on your LCD display at the end.

So the image is the end result of the combination.

Q. Does limitation 22.4 require any specific algorithms for combination?

A. So, for instance, you can see, like, in column 9, lines 55 to 59, you see it says, The signal processing circuit 710 may combine the output from signal processing 708 into output data usually in the form of a recombined full color image.

So in this case they're combining it into a full color image.

Now, if you look at column 10, lines 43 to 48, you see the individual images are combined to form one full color or black and white image and it talks about the tailoring of the arrays to get a higher quality image.

Q. Let's first go to column 9, line 55 to 59.

A. Column 9?

Q. Correct.

A. Yep.

Q. Does the specification describe that the two channels in Figure 7 have different angle of width?

A. Well, it's describing -- I mean, in this case, Figure 7 being -- obviously if you look at the figure, you have a RGB and an IR channel. And that's an embodiment of what's being discussed here. So you can see it says, Figure 7 is an exploded view of the digital camera subsystem 602, referring to the previous figure, under an embodiment.

Q. So does Figure 7 describe one channel

for a color, for example, red, has a different angle of width than another channel, for example, for color green?

A. Well, it doesn't say -- specifically in Figure 7 doesn't say specifically what the angle -- doesn't describe the angle specifically in Figure 7. But just Figure 7 is talking about a potential embodiment of this -- you know, one of the embodiments that -- how you could practice this invention.

Q. Does '180 patent describe how to combine images of different field of views?

A. So you see there -- like for instance, Figure 9, when you look at figure 9, you see there is in the description on column 10, line 27, so you see it says there Figure 9 is a block diagram of a digital camera subsystem that employs separate arrays, and they show you those in the figure on one image sensor. So you have separate arrays in contrast to the prior art.

So the prior art, obviously, employs Bayer pattern. So it's talking about, obviously,

in this case, for example, typical prior art approaches employ a Bayer pattern --

(Reporter clarification.)

THE WITNESS: So the passage on column 10 says, for example, typical prior art approaches employ a Bayer pattern, or variations thereof, perform operations across the array and integrate each set of four pixels, red, green, blue -- red, green, blue, green or a variation thereof from the array into a single full color image.

BY MS. SHI:

Q. So on Figure 9 it shows four image sensors, right?

A. Well, it shows separate arrays, as it calls them, 904A, B, C and D.

Q. Where does the '180 patent describe that 912A has a different field of view than the other arrays?

A. It states in the claims. That's essentially what it states in the claims.

So if you look at the claim, it tells you that you have a first optic component relative to a first image sensor to form a first channel having a first field of view that comprises a first angular width of a scene.

It's clearly stating that you have a first optic component, let's say a lens, relative to a first image sensor, a CCD array, to form a first channel, let's say gray scale channel 1, having a first field of view with some angular width.

A POSITA reading that would understand exactly what that's saying.

Q. Are you reading Figure 9 in light of the claim language of claim 22?

A. Figure 9 is just an embodiment, right, as it states -- you know, as an example, the block diagram. The -- the invention is in the claims. What's claimed is the invention.

The specification -- a POSITA reads the claims -- that's the invention -- in light of the specification to understand -- you know, to

clearly understand what's being claimed. But the invention is what is claimed.

Q. Is claim 9 an example of the invention of claim 22?

A. Claim 9? I didn't --

Q. Sorry. Scratch that. Figure 9. So scratch that.

Is Figure 9 an example of invention of claim 22?

A. Well, Figure 9 is a block diagram that employs separate arrays on one image sensor. So it's just discussing showing you that here's a way of employing separate arrays on one image sensor.

But the claim itself claims a first image sensor that has a first channel and it claims a second image sensor that forms a second channel. So you have to have -- to practice the claim, you would need to have a first optic component relative to a first image sensor that forms a first channel with a first field of view and a first angular width of a scene to practice

22.1.

Q. So is that a no?

A. Well, Figure 9 is talking about basically multiple arrays on one image sensor. So the claim requires a first image sensor and a second image sensor. So -- so to practice the claim, you have to have a first image sensor and a second image sensor.

Q. So is that a no?

A. The claim claims two separate image sensors. To practice the claim, you have to have a first image sensor and a second image sensor, not one sensor. You have -- the claim claims two -- a first and a second.

Q. Is Figure 7 an example of the invention of claim 22?

A. Well, again, Figure -- Figure 7 is talking about, you know, an image sensor 704. So it's -- it's referring to a single image sensor. And it's potentially an embodiment.

Q. When you say it's potentially an embodiment, do you mean Figure 7 is potentially

an embodiment of the invention of claim 22?

A. Well, there are more than one claims -- one claim in this invention. Right? It's not just one claim. So, like, claim 1, for instance, you have a plurality of channels. And so there are multiple claims in this invention, right, not just one claim.

Q. My question -- sorry.

A. Claim 1, for instance, doesn't say anything about an image sensor. So claim 1 claims -- you have an optic component and an array of photo detectors integrated on a semiconductor substrate and you have a first channel, first field of view, et cetera.

So there's more than one invention that's claimed here. Right? So the specification talks about everything that's being claimed. Not necessarily every paragraph of the specification has to read for every claim.

Q. Is it correct that Figure 7 is not an example of the invention of claim 22?

A. Well, Figure 7 refers to an image

sensor versus claim 22 claims a first image sensor and a second image sensor. So for you to practice claim 22, you would need to have a first image sensor and a second image sensor to practice that claim.

To practice claim 1, you -- doesn't say that. You just have to have an array of photo detectors integrated on a semiconductor substrate.

Q. Does '180 patent describe combining two images of different field of views from two separate image sensors?

A. I think that's what's being described in this patent. Right? Simultaneous multiple field of view digital cameras. So you're capturing simultaneously multiple field of views digital cameras. And if you look at the abstract, the last two sentences or last two lines it says, and to combine data from at least one channel during a frame to provide a high resolution image.

So that's what's proposed in this

1 invention, is you have multiple field of view
2 digital camera that's simultaneously acquiring
3 data and then combining it to form an image.
4 Q. Other than the abstract, do you have
5 description from '180 to describe combining two
6 images of different field of views?
7 A. I think we talked about that earlier.
8 So column 10, for instance, it will say the --
9 column 10, lines 7 through 10, These individual
10 images are then combined with additional signal
11 processing circuitry within the semiconductor
12 chip to form a full image for output.
13 Q. Is that description related to
14 Figure 9?
15 A. I don't know what you mean. I mean,
16 if you look at the description of Figure 9 on
17 column 10, which starts on line 27 to line 52,
18 you can see halfway down that description it's
19 talking about -- I'm on line 40 now -- it's
20 talking about Signal processing circuitry for
21 each of the arrays is also tailored for each of
22 the bands of visible spectrum. It's like 400 to

700 nanometer, approximately.

And you see it says, In effect, individual images are created for each of these arrays. Following this process, the individual images are combined. I don't think -- or -- or to form one color -- in one full color or black and white image. And then, obviously, it's looking for a higher quality image can be generated from the image resulting from traditional image sensors.

So it's talking about single processing circuitry that would basically do this combination.

Q. My question is column 9, lines 27 through line 52 are a description of Figure 9; is that right?

A. Column 9, lines 27? No, it's not right.

Q. Scratch that. My question is column 10 --

A. Correct.

Q. -- lines 27 through line 52 are

descriptions of Figure 9; is that right?

A. Correct.

Q. Okay.

MS. SHI: Let's take a ten-minute break.

(Thereupon, a brief recess was taken.)

MS. SHI: I have no further questions. Pass the witness.

MR. THEISS: Great. Just let me take five minutes -- it's like the end of a basketball game -- and see if I have any redirect. I don't think I do.

MS. SHI: Sure.

(Thereupon, a brief recess was taken.)

MR. THEISS: Patent owner has no redirect at this time.

(Thereupon, signature having been waived, at 2:08 p.m. EST, the deposition concluded.)

1 E X H I B I T S

2 EXHIBITS PREVIOUSLY MARKED AND REFERRED TO:

NO.:	DESCRIPTION:	PAGE:
Exhibit 1001	United States Patent No. 7,916,180	28
Exhibit 2020	Declaration of Dr. Eli Saber in Support of Patent Owner's Response, dated 10/17/25	5

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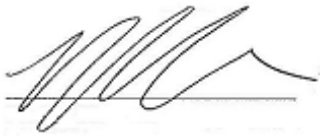
WITNESS:	EXAMINATION BY:	PAGE:
Eli Saber, Ph.D.	Ms. Shi	3

CERTIFICATE OF NOTARY

I, MISTY KLAPPER, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken by me in shorthand and thereafter reduced to typewriting by me; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.



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Misty Klapper, RMR, CSR, RPR,
RSA and Notary Public

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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