Neikirk

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS, CO. LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

CELLECT, LLC,
Patent Owner

_____

Case IPR2020-00476
U.S. Patent No. 9,198,565

Case IPR2020-00477
U.S. Patent No. 9,667,896

DEAN PAUL NEIKIRK, Ph.D.

New York, New York

Tuesday, March 2, 2021

Reported by: Steven Neil Cohen, RPR

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Neikirk

March 2, 2021

11:05 a.m.

Videotaped Videoteleconference

Deposition of DEAN PAUL NEIKIRK, Ph.D., taken pursuant to notice, at Dripping Springs, Texas, before Steven Neil Cohen, a Registered Professional Reporter and Notary Public of the State of New York.

APPEARANCES

KRAMER LEVIN NAFTALIS & FRANKEL LLP
1177 Avenue of the Americas
New York, New York 10036
Attorneys for Patent Owner
BY: JONATHAN S. CAPLAN, ESQ.
MARCUS COLUCCI, ESQ.
212-715-9488
jcaplan@kramerlevin.com
mcolucci@kramerlevin.com

ROPES & GRAY LLP
1900 University Avenue
Sixth Floor
East Palo Alto, California 94303-2287
Attorneys for Petitioner
BY: JAMES L. DAVIS, JR., ESQ.
CAROLYN REDDING, ESQ.
650-617-4794
james.l.davis@ropesgray.com
carolyn.redding@ropesgray.com

ALSO PRESENT:
Tim Jezek, Esq.

THE COURT REPORTER: I will make a brief statement before we begin.

My name is Steven Neil Cohen. I am a New York State notary and a Registered Professional Reporter.

This deposition is being held via videoconferencing equipment. The witness and reporter are not in the same room. The witness will be sworn in remotely pursuant to agreement of all parties. The parties stipulate that the testimony is being given as if the witness was sworn in person.

Let me remind everyone that only one person can speak at a time. If two people are speaking at the same time the audio will disable and I will not hear anything anyone is saying.

Thank you.

DEAN PAUL NEIKIRK, Ph.D., called as a witness by the Patent Owner, having been duly sworn, testified as follows:

BY MR. CAPLAN:

Q. Good morning, Dr. Neikirk.

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A. Good morning, Mr. Caplan.

Q. Good to see you again.

I am Jonathan Caplan representing patent owner Cellect in these two IPR proceedings for the purpose of the depositions today.

Just for the record that is IPR 2020-00476 and 477. Do you understand that?

A. I do.

Q. Any reason that you cannot give full and complete testimony today?

A. No. There is not.

Q. Today I will be referring to -- I want to start with the 476 IPR and in particular your declaration which for the record is Samsung Exhibit 1086.

These are existing exhibits already in the proceeding.

Just, Dr. Neikirk, so you know we are going to be making reference to Exhibit 2088 so you probably want to have both of those available. That is Dr. Lebby's declaration?

A. Okay. One second. I did have Dr.

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Lebby's declaration.

I just wanted -- 2088, yes. I have that right at hand.

Q. Okay. To the extent we have other exhibits that we refer to I plan on using exhibits that are in the IPR.

They should be numbered so we will use the exhibit numbers from the IPR proceeding. Okay?

I have one question for the court reporter. Off the record.

(Discussion off the record)

BY MR. CAPLAN:

Q. Good morning, once again, Dr. Neikirk.

Just to get caught up, we are going to start off with Exhibit 1086 which is your declaration in support of the reply brief by the petitioner.

Also we are going to be making reference to Exhibit 2088.

I think you testified earlier I think we are on record that you were able to fully testify today, there is no

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restrictions on your ability to answer questions; is that correct?

A. That is correct.

Q. Okay. If you need to take a break at any point just let me know. Certainly at least once an hour we will break for a few minutes.

A. That will be fine. Thank you.

Q. Okay. So if you could turn to page 4 of Exhibit 1086, your declaration, let me ask you this briefly for the record.

Did you recognize Exhibit 1086?

A. Yes, I do. This is one of my declarations in response to -- I have been referring to the rebuttal declaration but in response to the patent owners.

Q. On page 39 of that exhibit is your signature.

When I make reference to the page numbers I am going to go by the Bates stamped page number on the bottom right corner which is a little different than the pagination of the original document.

A. Okay. I understand, and, yes, on

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the Bates page number 39 that is my signature, yes.

Q. Okay. Now, in this exhibit if you go to your paragraph 10 on page 7.

A. I have it.

Q. Here you are talking about the motivation to combine Wakabayshi and Ackland; do you see that?

MR. CAPLAN: So Wakabayshi is a term that you are going to hear, Steven, so I don't know if you have that but W-A-K-A-B-A-Y-S-H-I, and then Ackland, A-C-K-L-A-N-D.

THE WITNESS: That is correct.

BY MR. CAPLAN:

Q. Dr. Neikirk, in paragraph 10 it looks like five -- the sentence starting five lines down, paragraph 10, it says, "Dr. Lebby similarly wrongly contends."

Do you see that?

A. Give me one moment to find that. Oh, yes, I have it, yes.

Q. Okay. Just for the record it says, "Dr. Lebby similarly wrongly contends

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that Wakabayshi merely disposes the use of solid state imager and shows an architecture that would have been understood to use CCD, MOS or CID in its sensors;" correct?

A. Yes, that is correct.

Q. And then you cite to Dr. Lebby's declaration, page 100.

Do you see that?

A. I do.

Q. So if we could turn -- we are going to be back and forth a little bit, Dr. Neikirk, but if you can go in Exhibit 2088 to paragraph 100 of Dr. Lebby's declaration?

A. I am there.

Q. Okay. You see in paragraph 100 it starts on what is labeled as page 56 and extends onto page 57 and -- actually all the way to page 59 -- actually -- I am sorry, I stand corrected.

So paragraph 100 starts on page 56 and extends onto page 57.

A. Excuse me. I may be in the wrong exhibit. Which exhibit?

Q. 2088.

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A. Okay. In my Exhibit 2088 paragraph 100 is on page 57 and it is not actually -- clearly there is something wrong with the citation or something I am looking at because it just has to do with constructions.

MR. DAVIS: I can double-check this but check -- Dr. Neikirk check the first page. Which case is that in?

THE WITNESS: Okay. This is the -- yes. Okay. This is the 475. It says Exhibit 2088 on it so I didn't look at the rest.

MR. DAVIS: All the numbers here are going to be reused. We need to call out the case number and the exhibit number given the combination.

MR. CAPLAN: My apologies about that, yes.

THE WITNESS: So this should be for the --

BY MR. CAPLAN:

Q. This is IPR 00476.

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A. Give me one moment.

Q. Sure.

A. Give me one moment. I think I may have the correct 2088.

No, I don't think I do. So this is for the 476 IPR, correct?

Q. Correct.

A. Okay. Sorry. I finally -- okay. I have Exhibit 2088, the declaration of Dr. Lebby in the 476 IPR.

Q. If you can turn to paragraph 100 in that exhibit, start there.

A. Okay. I am at paragraph 100.

Q. We have an interlude there.

This paragraph 100 is what you are referring to where we started in the -- in your declaration in paragraph 10 we were just talking about where you are talking about Dr. Lebby at least disagreeing with him about Wakabayshi insight into his declaration at paragraph 100. That is what we are now looking at, correct?

A. That is correct.

Q. That paragraph 100 extends over

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two pages, at least it is on my copy should be pages 56 and 57 of that declaration.

A. Yes, I see that.

Q. Okay. Now in this paragraph of Dr. Lebby's declaration he cites the number of exhibits in the latter part of that. Do you see there is an Exhibit 1054 cited?

A. Yes, I see that.

Q. Okay. There is also Exhibit 2036 that is cited?

A. I see that.

Q. Then in that same exhibit is cited further down in that paragraph.

Do you see that?

A. I do.

Q. Now when you were evaluating Dr. Lebby's declaration and commenting on it in your reply declaration did you consider Exhibit 2054?

A. I believe I did. Let me put that is one of Fossum's -- it is an IEEE 1995.

Now the quotation that Dr. Lebby included from that exhibit is, "The camcorder market has driven through

impressive improvements in charge coupled devices, the ubiquitous electronic camera sensor technology."

That sentence certainly is not stating that all -- the only type of solid state imaging device that Wakabayshi calls out for must be a CCD.

Q. My question is did you consider Exhibit 2054 in preparing your response in your rebuttal declaration?

A. I would have to take a quick look at 2054. I certainly considered several Fossum's articles so I would have to look that up.

Q. That is fine. I just want to make sure because that was my question that that exhibit is one that you considered in responding as you did in paragraph 10 of your declaration.

A. Give me just a moment.

So in my declaration there is a list of materials considered. So I am just going to go there first.

The one in particular from

Dr. Fossum 2054, actually I didn't put that in the list so I assume that is not one of the ones that I specifically went through.

I did note the sentence that Dr. Lebby included in his own declaration from that reference.

Q. But in connection with your declaration that you submitted in January of this year you did not specifically address Exhibit 2054, is that right?

MR. DAVIS: Objection. Form.

THE WITNESS: So 2054 is not in my list of materials considered.

I did consider the quotation that Dr. Lebby placed in his declaration from that reference which I read into the record just a moment ago concerning the camcorder market.

I certainly considered the quotation that Dr. Lebby included.

BY MR. CAPLAN:

Q. With regard to Exhibit 2054 do you have any reason as you sit here today to disagree with the accuracy what is described

in Exhibit 2054?

A. Well, what Dr. Lebby quoted was, "The camcorder market has driven impressive improvements in charge coupled devices, technology."

I have no particular reason to disagree with that in 1995, the date of this article. It is followed by "The ubiquitous electric camera sensor technology," which given the way the sentence is constructed that refers back to CCD technology. In 1995 the CCD technology was very common. I have no reason to dispute that.

"Ubiquitous" is different from saying it is the only possibility.

Q. You testified earlier that Exhibit 2054 is not listed as materials considered in connection with this declaration, correct?

MR. DAVIS: Objection. Form.

THE WITNESS: In my list of materials considered contained in my declaration I did not list Exhibit 2054.

BY MR. CAPLAN:

Q. Now, in that same paragraph, paragraph 100 of Dr. Lebby's declaration that we are looking at Exhibit 2036 is identified which you mentioned earlier.

Did you consider Exhibit 2036 in preparing your declaration that is in Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So, again -- excuse me. In my Appendix A of my declaration I did include Exhibit 2036.

BY MR. CAPLAN:

Q. Did you address specifically anything about Exhibit 2036 in your declaration?

A. Again, in Dr. Lebby's declaration the quotation he used from 2036 was, "CCDs have historically been the dominant image sensor and have been very successful in high speed applications such as digital cameras, digital copies -- copiers and flat bed standards. CCDs are also appropriate for

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surveillance, manufacturing applications, et cetera, et cetera."

I certainly considered explicitly all of that quotation where again me simply -- that this article is stating that CCDs have historically been dominant unit sensors. So I agree with that statement.

Q. Do you have any basis to disagree with that statement from Exhibit 2036?

MR. DAVIS: Objection. Form.

THE WITNESS: So 2036, the date, excuse me, I believe is October 2007 and as of October 2007 I don't know that I would necessarily agree with that statement.

It does say "have historically been dominant."

I don't know if we went to 2036 perhaps the author would clarify what historical period they were referring to.

As of 2007, I am not sure I would agree with that statement.

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BY MR. CAPLAN:

Q. You did not address the accuracy or not of Exhibit 2036 in your declaration, did you?

MR. DAVIS: Objection. Form.

THE WITNESS: So, as we were just discussing, I did in paragraph 10 of my declaration discuss Dr. Lebby's characterization that "Wakabayshi merely discloses the use of a solid state imager and shows an architecture that would have been understood to use CCD, CMOS or CID image sensors, and, as I stated, I disagree with that opinion.

I did not have a separate discussion of Exhibit 2036.

BY MR. CAPLAN:

Q. Okay. Now, going back to paragraph 106 your declaration, Exhibit 1086, kind of the next -- after you cited Dr. Lebby's declaration paragraph 100, you then -- you had a "see also cite" for Dr. Lebby's declaration a number of paragraphs.

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Do you see that?

A. I do.

Q. So the first couple are 8 to 10. So if you could turn to Exhibit 2088 to paragraph 8.

A. I am there.

Q. Okay. Sorry. In Exhibit 2088 go to paragraph 10 which is one of the paragraphs in Dr. Lebby's declarations of which you cited.

Do you see paragraph 10 in Exhibit 2088?

A. I do.

Q. Great.

And there are a number of exhibits cited by Dr. Lebby in his paragraph 10. The first being Exhibit 2064.

Do you see that?

A. I do.

Q. Is Exhibit 2064 a reference that you considered in preparing your declaration?

MR. DAVIS: Objection. Form.

THE WITNESS: So, again,

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Dr. Lebby cited a specific sentence from Exhibit 2064. I certainly considered the sentence that he quoted, "while offering" -- that sentence was, "While offering high performance CCD array areas are difficult to integrate with a CMOS due to their high capacitances complicating the integration of on chip drive and signal processing electronics."

That is what he quoted.

In my declaration, in my list of the materials considered I did not include Exhibit 2064.

I certainly considered what Dr. Lebby cited and included in his declaration.

BY MR. CAPLAN:

Q. Do you have -- do you have any reason to disagree with what Dr. Lebby quoted from Exhibit 2064?

A. So I don't know what the date is without looking at Exhibit 2064 and the date

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is relevant but the statement that "CCD area arrays are difficult to integrate with CMOS.

I have no reason to disagree with that in say the 1997 time frame, that statement that is difficult, that is different from saying it is impossible.

The other thing that Dr. Lebby emphasized in his quotation was the statement, "complicating the integration of on chip drive and signal processing electronics."

I have no particular reason in the time frame of 1997 to disagree with that since there are complications of integrating any electronics with any other electronics and in particular in the 1997 time frame combining CMOS with CCD I believe was considered to be challenging, not impossible but challenging.

I believe the patent of the -- the '565 patent itself cites an example of such an integration. Let me find my copy of the '565 patent.

If you were to look at column 2 in

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the '535 patent starting at line 35 through line 56 there is a discussion in the background of the invention section of integration of CMOS and CCD. That it was challenging, I have no reason to disagree with.

That it was impossible, I certainly do not agree with.

Q. You testified a few minutes ago that Exhibit 2064 is not a reference that you considered in preparing your declaration that is in Exhibit 1086, correct?

MR. DAVIS: Objection. Form.

THE WITNESS: No. I don't believe that is what I testified.

What I testified was that I certainly considered the direct quotation that Dr. Lebby used from Exhibit 2064.

I also stated that in my list of materials considered in my declaration I did not include 2064.

BY MR. CAPLAN:

Q. The next exhibit in this paragraph

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10 of Dr. Lebby's declaration that we have been talking about is Exhibit 2036 but we already spoke about that a few minutes ago. I am going to go to Exhibit 2054.

Do you see that Exhibit 2054?

A. I do.

Q. Did you consider Dr. Lebby's citation of Exhibit 2054 in preparing your declaration that is in Exhibit 1086?

A. So, in paragraph 10 of Dr. Lebby --

MR. DAVIS: Dr. Neikirk, if you can just pause?

Objection to form.

Thank you.

THE WITNESS: Sorry for interrupting.

In paragraph 10 of Dr. Lebby's report he quoted from Exhibit 2054 that "CMOS based image sensors offered the potential opportunity to integrate a significant amount of BOSI electronics, introduced component and packaging costs."

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CCD technology on the other hand has become quite specialized and in general is not well-suited to CMOS integration due to voltage capacity and processing strengths.

I certainly considered the quotation that Dr. Lebby cited to from the Fossum 1995 article Exhibit 2054.

However, in my list of materials considered I did not include Exhibit 2054.

BY MR. CAPLAN:

Q. Do you have any basis to disagree with the statement from Exhibit 2054 that Dr. Lebby cites in his paragraph 10?

MR. DAVIS: Objection. Form.

THE WITNESS: The statement includes the wording "CMOS based image sensors offered the potential opportunity to integrate a significant amount of the old style electronics."

That in this article was apparently in 1995, that in 1995 the idea that CMOS based image sensors

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offered potential opportunity for integration I have no reason to disagree with that. In 1995 I think that is a fair characterization.

It then goes on to say that "CCD technology, on the other hand, has become quite specialized and in general is not well suited to CMOS integration in a voltage capacitance and processing strengths.

Again, in 1995 that CCD is in general not well-suited to CMOS integration. I believe that is probably an accurate characterization although as I just pointed out in the '565 patent itself in the background section it gives a specific example of such integration so that in general it is not well-suited, that general statement seems fair. That it is impossible, that is certainly not true.

BY MR. CAPLAN:

Q. Staying in paragraph 10 of Dr.

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Lebby's declaration that we are talking about right now following the citation of Exhibit 2054 you just talked about there is a citation to Exhibit 2004.

Do you see that?

A. I do.

Q. Is Exhibit 2004 the document that you considered in preparing your declaration that is in Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So, once again, Dr. Lebby has a specific quotation from the Fossum Exhibit 2004 and states that -- the quotation is, "CCD fabrication process is quite different from compliment -- complimentary metal oxide semiconductor CMOS process.

"The preferred technology for implemate -- for implementation of on chip signal processing creating a further impediment to miniaturization.

"Although some integrated CMOS CC processes have been demonstrated undesirable compromises in performance

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of CMOS or CCD technology must be made."

The first part of that quotation that "CC fabrication process is quite different from CMOS" in broad terms, I believe that is a fair characterization.

That the preferred technology for implementation of on chip signal processing is CMOS, as a broad statement I would agree with that.

That the integration of CMOS and CC processes required undesirable compromises in performance of CMOS or CC technology, I don't know whether those who did the combinations would necessarily agree with that. In some cases I am sure I would imagine that there were compromises made. Whether they were undesirable or not, the people who did such combinations such as the ones cited in the '565 patent apparently found some reason to do it.

So I don't know whether I would

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agree or disagree with the statement that "undesirable compromises" had to be made.

BY MR. CAPLAN:

Q. Did you address the substance of Exhibit 2004, that article, in your declaration Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: In my list of material I did not include Exhibit 2004.

I certainly am taking into account what Dr. Lebby's quoted from the article in terms of his characterizations.

Now, my paragraph 10 concerned its characterization of Wakabayshi in my report. Dr. Lebby's statement was that Wakabayshi merely discloses the use of solid state imager and shows an architecture that would have been understood to use CC, MOS or CID image sensors. That is the statement that I disagree with. I don't believe that

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that -- fundamentally I think that opinion is wrong.

BY MR. CAPLAN:

Q. You didn't challenge the underlying references that Dr. Lebby cites in your declaration, did you?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: No. I wouldn't say it that way at all.

Dr. Lebby cited specific sentences from these references and in fact none of those sentences say that Wakabayshi would have been understood to use only CCD, MOS or CID image sensors. Each of those sentences address things related generally to CCDs and CMOS but nothing is specific so, yes, I believe I did address those citations in that they do not support Dr. Lebby's opinion.

BY MR. CAPLAN:

Q. But in your declaration you just say that you disagree with Dr. Lebby; isn't

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that right?

MR. DAVIS: Objection. Form.

THE WITNESS: In my declaration in paragraph 10, "Dr. Lebby's statement that Wakabayshi merely discloses the use of solid state imager and shows an architecture that would have been understood to use CCD, MOS or CID image sensors."

I disagree with that statement.

I continue to quote from Dr. Lebby. That positive would use a CCD image sensor with this architecture because it would have been the simplest, best and most logical approach at the time.

I believe as I stated in my declaration that is a conclusory opinion and these sentences from these references I don't believe support that opinion.

BY MR. CAPLAN:

Q. Well, you also going back to your declaration, your paragraph 10 that we have

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been looking at in terms of the citations to Dr. Lebby's report that you are taking issue with, you also cited paragraphs 101 to 103.

Do you see that?

A. I do.

Q. So if you could turn to paragraph 101 of Dr. Lebby's declaration.

A. I am there.

Q. Okay. In that paragraph 101 once again Dr. Lebby has cited a few exhibits. The first one being Exhibit 2069.

Do you see that?

A. I do.

Q. Did you evaluate Exhibit 2069 in connection with preparing this declaration?

MR. DAVIS: Objection. Form.

THE WITNESS: So, 2069, Dr. Lebby has a quotation that says, "While Hatachi and Matsushita have developed MOS imagers until recently CCDs have been widely manufactured and used due to the fact that they have offered superior image quality than MOS imagers," and I believe that is

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the citation or the quotation from Exhibit 2069.

Now, Exhibit 2069 is in my list of material considered in my declaration. I have certainly considered the quotation that Dr. Lebby used and I have looked at the rest of that article as well.

BY MR. CAPLAN:

Q. Do you have basis to disagree with the quotation that Dr. Lebby provides from Exhibit 2069 in his paragraph 101?

MR. DAVIS: Objection. Form.

THE WITNESS: So, the statement that what he quoted has two pieces.

One is that Hitachi and Matsushita have developed MOS imagers.

I have no reason to dispute that statement. I believe it was true.

And then it says, "Until recently," so let's get the time frame. This is 2069 which is listed as an article from the 2008 CRS press article. When it says, "Until

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recently CCDs have been widely manufactured and used due to the fact that they offer superior image quality than MOS imagers."

That statement unqualified as of 2008, I am not sure whether I would agree or disagree.

Certainly CCDs were widely manufactured and were widely used.

The time frame is relevant as to when this author meant this to be true and the image quality depends on the situations as to whether an MOS sensor has sufficient image quality, whether a CCD is required.

So that statement is rather broad and without any further qualification I don't know whether I would agree or disagree.

We could go to Exhibit 2069 and look for additional context.

BY MR. CAPLAN:

Q. Your declaration didn't further address Exhibit 2069, whether it was

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accurate or not, did it?

A. No.

MR. DAVIS: Objection.

Objection. Form.

THE WITNESS: It is important to note that paragraph 101 which is what I referred to in my declaration, starts with the sentence from Dr. Lebby, "Due to the state of the art in 1997 and the intended purpose of the Wakabayshi, a high-end consumer device where video and still images were the primary function, the quality of the image would have been important."

That statement I certainly have addressed further.

That "Wakabayshi is a high-end consumer device," there is no evidence of that at all.

His next sentence was a positive reading, "Wakabayshi would have used a CCD image sensor due to its better performance."

And then he cites these exhibits

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to support that.

I have certainly addressed his opinion, Dr. Lebby's opinion, that Wakabayshi would have used a CCD image sensor and in summary what I said in my declaration is that there is no such evidence.

BY MR. CAPLAN:

Q. Your declaration doesn't address anywhere the accuracy of Exhibit 2069, does it, and if it does I would like you to identify where.

MR. DAVIS: Objection. Form.

THE WITNESS: I was addressing Dr. Lebby's opinions. Not the opinions of his references in general terms.

So, no, I don't think I have any separate paragraph discussing Exhibit 2069.

Again, he, Dr. Lebby, quoted a sentence from that article in support of his opinion and his opinion was a positive reading, "Wakabayshi would

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have used a CCD image sensor due to its better performance, e.g., S/N," so Signal to Noise is what Dr. Lebby meant. He used the abbreviation "S/N."

I have addressed Dr. Lebby's opinion that Wakabayshi would use only a CCD image sensor and I disagree. There is no such evidence.

The evidence he cited concerning CCDs and their better performance, some of these statements in broad and general terms under certain circumstances might be true but they are not the issue of Wakabayshi being required to use CCD which is Dr. Lebby's opinion which I disagree with.

BY MR. CAPLAN:

Q. In that same paragraph 101 there, the next reference that is cited is Exhibit 2068.

Do you see that?

A. I do.

Q. Did you consider Exhibit 2068 in

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forming your declaration that is now Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So once again Dr. Lebby cited a specific sentence from Exhibit 2068 and that sentence is, "CCDs have been widely manufactured and used due to the fact that they have offered superior image quality than MOS imagers."

That broad statement, again it certainly does not support the idea that Wakabayshi would be required to use a CCD since Wakabayshi nowhere says that an objective is superior image quality just as a reference -- just as a note, but that that sentence in isolation that "CCDs have been widely manufactured," that was certainly true, that they have been "used due to the fact that they offered superior image quality than MOS imagers," depending on the time frame that may or may not have been at

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the time of -- certainly in the '70s and early '80s that was absolutely true.

As we moved into the mid to late '90s that became less true.

BY MR. CAPLAN:

Q. In Exhibit 2068 is not identified as -- in your Appendix A list of materials considered which is attached to your declaration, is it?

MR. DAVIS: Objection. Form.

THE WITNESS: That's correct. Exhibit 2068 is not listed in my materials considered.

I have certainly considered the quotation that Dr. Lebby included from the reference in support of his opinions concerning CCDs being required by Wakabayshi.

BY MR. CAPLAN:

Q. Then in paragraph 101 of Dr. Lebby's declaration, the next exhibit that Dr. Lebby cites in support of his declaration in paragraph 101 is Exhibit

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2063.

Do you see that?

A. I do.

Q. Did you consider Exhibit 2063 in forming your opinions for the declaration you submitted as Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So, once again Dr. Lebby included a direct citation, a quotation, Exhibit 2063, apparently to support his opinion that Wakabayshi had to use CC image sensors and this citation from Exhibit 2063 was "CMOS can't compete with CCDs in the number of pixels, quantum efficiency and noise ... CMOS has more inconsistency ... and thus you see a lot of graininess because the address lines are affecting sensitivity."

That sentence in and of itself I -- depending on the time frame I may or may not agree with.

The statement that it can't -- that "CMOS can't compete with CCDs in

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the number of pixels." That I don't believe is generally true.

The "quantum efficiency and noise is not as good as CMOS compared to CCD."

Actually I am not sure I would always agree with that. Noise in some circumstances.

The statement "You see a lot of graininess because the address lines are affecting sensitivity," that statement out of context, I don't understand what the support for that would be. I don't think I would agree with that.

But again the relevant issue is does that sentence -- that citation from Exhibit 2063 support Dr. Lebby's contention Wakabayshi would be required to use a CCD image sensor.

I do not believe it does.

Exhibit 2063 is not in my list of materials considered.

I considered the quotation here

in the context of Dr. Lebby's opinion considering Wakabayshi and the use of CCDs.

BY MR. CAPLAN:

Q. Your declaration does not provide an analysis of Exhibit 2063 or at least the quote of Exhibit -- from Exhibit 2063 in this paragraph 101, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: My declaration addressed Dr. Lebby's opinions. It did not necessarily go through and address separate statements from every reference and for 2063 I do not believe I have a separate paragraph discussing just that reference.

BY MR. CAPLAN:

Q. So in the context of Exhibit 2063 as understood by a person skilled in the art your declaration does not provide any opinion on that exhibit, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: My declaration certainly provides an opinion as to

Dr. Lebby's opinions concerning the idea that Wakabayshi would be required to use a CCD image sensor.

Inasmuch as this quotation in Exhibit 2063 says no such thing, in that sense I have addressed it but I have not separately gone through to consider that sentence in isolation from Dr. Lebby's opinion.

I have not considered the quotation from Exhibit 2063 that Dr. Lebby cited to, I have not considered that sentence in isolation from Dr. Lebby's opinions concerning Wakabayshi and the use of a CCD imager.

BY MR. CAPLAN:

Q. Still in paragraph 101 of Dr. Lebby's declaration the next exhibit that is cited by Dr. Lebby is Exhibit 2007. Do you see that?

A. I do.

Q. Did you consider Exhibit 2007 in preparing your declaration as your now

Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So, Exhibit 2007, once again Dr. Lebby has a specific quotation from Exhibit 2007. That quotation being, "Although more radiation tolerant than CCDs CMOS imagers will never be as robust as the P channel MOS CID which will continue to control the market sector."

Let me re-read the quotation that Dr. Lebby included in his declaration from Exhibit 2007.

And that quotation was, "Although more radiation tolerant than CCDs CMOS imagers will never be as robust as the P channel MOS CID which will continue to control that market sector."

That statement I have considered in the context of Dr. Lebby's opinion earlier in paragraph 101 that he believed Wakabayshi would have used a CCD image sensor.

This quotation from Exhibit 2007 once again I don't believe supports his opinion in any way, shape or form.

The sentence itself I have not considered separately in isolation from Dr. Lebby's opinions.

And Exhibit 2007 is not listed in my materials considered so I have considered what Dr. Lebby quoted from but I have not done a separate analysis of Exhibit 2007 independent of Dr. Lebby's opinions.

BY MR. CAPLAN:

Q. The next exhibit cited by Dr. Lebby in paragraph 101 is Exhibit 2036 which we talked about already so I am not going to revisit that.

But the next exhibit is 2062 which I don't believe we have talked about yet.

Do you see Exhibit 2062 cited at the end of paragraph 101?

A. I do.

Q. Okay. Did you consider Exhibit 2062 in preparing your declaration that is

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now Exhibit 1086?
MR. DAVIS: Objection. Form.
THE WITNESS: So, again, Dr. Lebby in his paragraph 101 cited to a specific quotation from Exhibit 2062.
That quotation was, "Most of today's digital cameras use charge coupled devices, CCD, sensors, rather than the far less expensive complimentary metal oxide semiconductor CMOS chips used in most computing technologies."
Again, in the context of this paragraph Dr. Lebby appears to be citing them to support his opinion that Wakabayshi would have used only a CCD image sensor for its solid state image sensor and would not have used -- could not have used CMOS image sensor.
I don't believe that is a -- statement from Exhibit 2062 supports that opinion.

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In isolation the statement from 2062 that most of today's digital cameras use charge couple device sensors, that depends on the year we are talking about.
In any case, it uses the qualifier "most," not "all," and that it asserts that the CMOS chips are far less expensive.
I would say that that is -- again this is a general statement generally true; not necessarily always true but generally true.
Again, that statement from Exhibit 2062 I don't believe supports Dr. Lebby's opinion that Wakabayshi would be required to use a CCD imager.
The Exhibit 2062 is not in my list of materials considered and I do not believe I have a separate discussion of Exhibit 2062 in isolation from Dr. Lebby's opinions.
BY MR. CAPLAN:
Q. Are you aware that Exhibit 2062 is

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a Stanford University publication from April of 2001?
MR. DAVIS: Objection. Form.
THE WITNESS: Without going back and looking, I don't have that recollection. I wouldn't necessarily disagree with that. I don't know.
I would have to look at the exhibit to determine where it was published and by whom.
BY MR. CAPLAN:
Q. So that is paragraph 101. Your declaration of paragraph 10 cite the paragraph 101 to 103 so I want to move on briefly to paragraph 102.
MR. DAVIS: We have been going for over an hour. Do you want to take a break?
MR. CAPLAN: We can take a break. I guess we got a little bit of a slow start but why don't we take a break here?
THE WITNESS: If -- do you want to finish -- you wanted to do

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paragraphs 102 and 103?
MR. CAPLAN: Yes. We can take -- it is okay. As far as my flow goes it is fine. So 15 minutes.
THE WITNESS: That is fine.
(Recess)
BY MR. CAPLAN:
Q. Dr. Neikirk, we were up to -- we are still in your paragraph 10 of your declaration, Exhibit 1086.
We were about to move on to paragraph 102 of Dr. Lebby's declaration, Exhibit 2088.
Here again, just to kind of get us back where we were, you are taking issue or you took issue with Dr. Lebby's position in your paragraph 10 and you cited Dr. Lebby's positions including in paragraph 102.
So turning to paragraph 102 talking about the exhibits I assume you see that in paragraph 102 there is Exhibit 2067 which Dr. Lebby cites to?
A. I see that.
Q. Is Exhibit 2067 an exhibit that

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you reviewed and considered when you were preparing your declaration that is now Exhibit 1086?

A. So, again, in paragraph 102 of Dr. Lebby's report or declaration he is contending that a positive would understand the Wakabayshi architecture would be intended to use CCD, MOS or CID image devices.

Dr. Lebby also contends that off chip design features were hallmarks of a CCD, MOS and CID device and he cites to Exhibit 2067 and specifically quotes the sentence, "It is difficult to integrate control and signal processing functions into CCDs."

Now, exhibit -- I have certainly considered that specific citation from Exhibit 2067 in the context of whether that supports Dr. Lebby's opinion that Wakabayshi is required to use CCDs.

Certainly this statement from Exhibit 2067 does not say that. It says there is -- "It is difficult to integrate

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control and signal processing functions in CCDs." It does not say it is impossible.

Exhibit 2067 is one that is in my list of materials to consider. I actually recall this one fairly specifically and I have discussed a number of these references in some greater extent in different places in my declaration, whether Exhibit 2067 is one of those, I couldn't recall unless I flipped through every page of the declaration but at the very least I have certainly considered the quotation that Dr. Lebby used in the context of whether it supports his contentions or not, his opinion that Wakabayshi is required to use a CCD.

It is my opinion that Wakabayshi is not required to use a CCD and this statement from Exhibit 2067 does not support an opinion that Wakabayshi would be required to use a CCD.

Q. Do you have -- well, do you agree with the quoted language from Exhibit 2067 which is in paragraph 102?

MR. DAVIS: Objection. Form.

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THE WITNESS: So I have considered that language in the context of Dr. Lebby's opinion.

I don't believe that this quotation supports Dr. Lebby's opinion. "Wakabayshi would be required to use a CCD."

As to the statement itself, it is a quote. "It is difficult to integrate control and signal processing functions into CCDs."

It is a fairly broad statement. I haven't really formed an opinion as to whether it is correct or incorrect.

I certainly have formed an opinion as to whether it supports Dr. Lebby's opinion and my conclusion is, my opinion is that it does not support the contention that Wakabayshi is required to use a CCD.

BY MR. CAPLAN:

Q. Does your declaration, Exhibit 1086, challenge the accuracy of what is set forth in Exhibit 2067?

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MR. DAVIS: Objection. Form.

THE WITNESS: I need to flip through the rest of my declaration to see whether Exhibit 2067 is one that I discussed in its -- as it stands on its own so give me a moment while I flip through to see if I see that one.

We are talking about Exhibit 2067. So, let's see, in paragraph 16 of my declaration, again, I am -- actually I am addressing Dr. Lebby's reliance on Exhibit 2067 and, in fact, I cited this same quotation we have been discussing, the one that Dr. Lebby included in paragraph 102.

I discussed that it doesn't suggest that Wakabayshi's architectural features cannot be used with a CMOS image sensor.

I go on to discuss other things that the article discloses, the article itself, that would be Exhibit 2067.

I cited a quotation from that

article. It said, "Single chip complimentary metal oxide semiconductor integrated circuit comprises an active pixel image sensor with timing control and read-out circuits."

But it also discloses the reference 2067 several off chips circuitries and I cite examples of them including externally generated clock signal to produce video output.

In addition -- furthermore, the article states, "In addition to clocking power required input C chip for single plus high volt, power strength, start command and parallel data load commands for defining integration time and windowing parameters."

So as an example in that paragraph 16 I do discuss other citations from Exhibit 2067.

Once again I don't believe support Dr. Lebby's opinion that

Wakabayshi would have to use CCD and that CMOS integrates all circuitry on chip.

I don't think that is what Exhibit 2067 says as set forth in my paragraph 16. I didn't challenge the accuracy of the statements in Exhibit 2067.

What I challenged is Dr. Lebby's interpretation of those statements in support of his opinion that Wakabayshi is required to use CCD and that CMOS would always have all circuitry on the same chip as pixels.

BY MR. CAPLAN:

Q. Your declaration does not challenge the accuracy of Exhibit 2067 for what it sets forth in that exhibit?

MR. DAVIS: Objection to form.

BY MR. CAPLAN:

Q. Isn't that correct?

MR. DAVIS: Objection.

THE WITNESS: In paragraph -- in my paragraph 16 I cite quotations from

Exhibit 2067 that I believe contradict Dr. Lebby's opinions.

I am not asserting that the statements made by Exhibit 2067 are wrong.

I am using them to demonstrate that Dr. Lebby's own exhibit does not support his opinions.

BY MR. CAPLAN:

Q. Okay. Now, I am going to move on to paragraph 103 of Dr. Lebby's declaration, Exhibit 2088 which also is a paragraph that you identified in your paragraph 10 of your declaration when you disagreed with Dr. Lebby's position.

So in paragraph 103 here we have a citation to the Fossum reissue, that is Exhibit 2056.

Do you see that?

A. I do.

Q. Is Exhibit 2056 the reference that you considered in forming your opinions in your declaration that is now Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So in Dr. Lebby's paragraph 103 he cited -- he quoted from Exhibit 2056 and his quotation was, "An inordinate percentage of the power in such imaging devices."

That is the quotation.

He placed it in his own sentence, Dr. Lebby's own sentence, where he stated -- where he is contending that those CCD arrays themselves displayed very little power, and this is a quotation directly from Dr. Lebby, "Those CCD arrays themselves displayed very little power, CCD control circuitry dissipate," and then he shifts to a quotation from Fossum, "An inordinate percentage of the power in such imaging devices." Fossum.

In the form of -- the context of this sentence is a paragraph that Dr. Lebby starts with his contention that Wakabayshi was a CCD device because it required a mounting plate

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I don't believe that this statement from Fossum, Exhibit 2056, in way, shape or form states that Wakabayshi's mounting plate shows that the sensor must have been a CCD imager.

There is no such suggestion. As I discussed in my report elsewhere -- let me see if I can find this.

So my paragraph 17 is a discussion of Dr. Lebby's paragraph 103 where Dr. Lebby is contending that Wakabayshi was a design to use a CCD because it needed a mounting plate 28.

Again, as I discuss in that paragraph I see no support for that. There is no reference in Wakabayshi to CCDs.

There is no reference to heat in Wakabayshi or the need for heat sync as Dr. Lebby seems to be suggesting in paragraph 103 and in that context Exhibit 2056 the citation doesn't

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provide any support for that either, the opinion that Wakabayshi must use CCDs because there is a mounting plate.

Now, Exhibit 2056 is not in my separate list of materials considered and I believe in my declaration, my discussion is about Dr. Lebby's opinions considering heat syncs, not a discussion of Fossum's reference 2096.

BY MR. CAPLAN:

Q. This Exhibit 2056 is a reissue patent and it names one of the inventors is Eric Fossum that we have talked about in the past.

You are familiar with Dr. Fossum, correct?

A. I am.

Q. Do you have any basis to disagree with the description of the technology described in Exhibit 2056?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: So Dr. Lebby's

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report only cites to a statement about CCD control circuitry dissipating an inordinate percentage of power in such imaging device.

I don't have any particular reason to agree or disagree with that statement.

It actually doesn't state that the power is large to start with or requires heat sync.

It just says that what is used is used by, according to Fossum, some of the control circuitry.

The opinion that I have formed relates to Dr. Fossum's contention that Wakabayshi requires the CCD because it has a mounting plate.

It isn't about Fossum's statements concerning where power is dissipated in a CCD.

BY MR. CAPLAN:

Q. Is it your testimony that with regard to Exhibit 2056 you don't have an opinion whether it is accurate or not even

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in connection with the portion that is cited in Dr. Lebby's paragraph 103?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: So the particular statement from Exhibit 2056, the quotation, "An inordinate percentage of the power in such imaging devices," I haven't formed an opinion concerning that statement at all.

The relevant inquiry for me was Dr. Lebby's opinion that Wakabayshi requires a CCD because it has a mounting plate. I don't believe this statement from Exhibit 2056 supports Dr. Lebby's opinion.

I don't believe that there is anything in Wakabayshi and its use of a mounting plate that would show that Wakabayshi's solid state image sensor is a CCD device. That is the extent of my opinion.

BY MR. CAPLAN:

Q. Staying in paragraph 103 of

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Dr. Lebby's declaration which you refer to you -- there is an Exhibit 2051 that is cited next.
Do you see that?
A. I do.
Q. Is Exhibit 2051 a document that you considered in preparing your declaration that is now Exhibit 1086?
MR. DAVIS: Objection. Form.
THE WITNESS: So in Dr. Lebby's paragraph 103 when he cites to Exhibit 2051 he provides a specific cite, column 1, lines 58 through 65. In this case he doesn't actually give the quotation.
He contends that this Exhibit 2051 supports his statement, Dr. Lebby's statement, that CCD imagers in 1977 used cooling elements advantageously cool down the CCD sensor to help achieve extended exposure images in low light conditions with less noise as well as to dissipate heat."

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Then he references Exhibit 2051.
Exhibit 2051 is not in my list of materials considered. I do of my own knowledge know that in the astronomy fields in the 1980s and '90s CCD sensors were widely used and frequently were cooled to very low temperatures because in the astronomical applications extraordinarily low noise was required and that was achieved by simply making the semiconductor devices very cold.
Inasmuch as that is what Dr. Lebby seems to be referring to I don't disagree with that statement in isolation but it doesn't support the idea that Wakabayshi is required to use CCD simply because it has a mounting plate.
Wakabayshi nowhere discusses cooling and nowhere discusses heat dissipation.
It nowhere suggests that the mounting plate is a heat sync for the

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solid state imaging device.
BY MR. CAPLAN:
Q. Your declaration, Exhibit 1086 does not provide any analysis challenging the accuracy or veracity of Exhibit 2051, does it?
MR. DAVIS: Objection. Form.
THE WITNESS: So I don't believe that I have a separate discussion of Exhibit 2051.
My analysis concerns Dr. Lebby's opinion that somehow Wakabayshi's mounting plate is used for cooling which again is not supported by any reference and certainly is not contained in Wakabayshi.
I did not challenge the assertion that Exhibit 2051 apparently supports the idea that operating at low temperatures allows for extended exposure images in low light conditions because of low noise.
Part of the reason I didn't challenge that is because of my own

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knowledge, working with astronomers in the 1980s I know this to be true, that they frequently cooled their CCDs to very low temperatures and that was because they needed to use very long exposure times to detect very faint astronomical objects and noise was about the -- that was the dominant question for them was reducing noise.
But that has nothing to do with what Wakabayshi shows.
BY MR. CAPLAN:
Q. The last paragraph that you identify from Dr. Lebby in this part of your paragraph 10 where you take an issue with his position is paragraph 107 of his declaration. If you can just turn to that?
In paragraph 107 again Dr. Lebby cites several documents and exhibits supporting his position.
The first one being Exhibit 2036 which I believe we talked about already in the context of a different part of Dr. Lebby's declaration but here my question

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is did you consider the particular quote and the accuracy of that quote that is provided from Exhibit 2036 in this paragraph 107?

MR. DAVIS: Objection. Form.

THE WITNESS: So you are asking about Exhibit 2036, correct?

So first of all, Exhibit 2036, that is one that is in my materials considered.

I believe in my report I refer to that reference itself -- I am trying to find it -- I refer to Exhibit 2036 in my paragraph 29 to point out that Dr. Lebby's contention that CCDs were not -- I am sorry -- CMOS imagers were not in use in 1977 is contradicted by Figure 7.5 of Exhibit 2036, the figure that Dr. Lebby himself cites.

In terms of his paragraph 107 his contention -- that he cites Exhibit 2036 to support his contention was "Wakabayshi camera has an off chip architecture that was commonly used

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with all CCD image sensors and would not have been combined with Ackland's CMOS image sensor."

The quotation he cites for 2036 was "CCDs also require additional supporting components ... lastly current CCDs require additional components in order to support both still images as well as video."

I don't believe that there is anything about that statement that supports his contention that Wakabayshi's off chip architecture use consisting of those additional components nor that it has anything to do with Ackland's CMOS image sensors.

I would also point out once again that even the '565 patent itself in Column 2, lines 35 to 56, discusses an example of combining circuitry with CCD so the contention that CCDs require off chip components, well, this statement from Exhibit 2036 simply refers to additional components

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that certain components would be required to support both still images as well as video, I have no particular reason to disagree with that, but it doesn't support Dr. Lebby's opinion that Wakabayshi off chip architecture means that it was a CCD.

BY MR. CAPLAN:

Q. Exhibit 2036 is a global Electronics Industry Market Report and Forecast from October of 2007.

Do you recall that?

MR. DAVIS: Object to form.

THE WITNESS: I do. That is how I have it listed in my materials considered in my declaration, yes.

BY MR. CAPLAN:

Q. Were you familiar with this reference before -- I will rephrase that.

Were you familiar with this reference from your work in the field?

A. So there are many, many market reports published all the time. I can't say that I ever saw this one or did not see this

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one.

Q. Do you have -- does your declaration, Exhibit 1086, challenge the accuracy or veracity of what is set forth in Exhibit 2036?

MR. DAVIS: Objection to form and compound.

THE WITNESS: Sorry. It fell off my desk.

BY MR. CAPLAN:

Q. That is fine.

A. So I have discussed Dr. Lebby's opinions, I have just explained to you how it is my opinion that this statement that he quotes doesn't support Lebby's opinion that CCDs are required by Wakabayshi.

I have cited elsewhere in my declaration and again I gave you the paragraph, I believe it was paragraph 29 of my declaration. I have cited to a figure contained in this report. I did not suggest that that figure is incorrect.

In fact, I believe other evidence that I pointed to shows that that figure is

consistent with there being CMOS sensors used in cameras in 1997 as I stated in that paragraph.

Q. Do you have any basis to challenge the accuracy of what is set forth in Exhibit 2036?

MR. DAVIS: Objection. Form.

THE WITNESS: I don't believe I testified that I had challenged the accuracy.

What I challenged is that the statement that Dr. Lebby quoted from Exhibit 2036 supported his opinion.

I also in my declaration at paragraph 29 pointed out that a figure in that reference also demonstrates that Dr. Lebby's contention that there were no CMOS sensors in cameras in 1997 is simply untrue.

BY MR. CAPLAN:

Q. Still in paragraph 107 of Dr. Lebby's report that we were referring to that you were faced with an issue in your paragraph 10 there is also a citation by

Dr. Lebby to Exhibit 2062 by Lebby, I believe we described that earlier, but my question here is do you have -- do you agree with the quote -- the quoted language that Dr. Lebby cites from Exhibit 2062 in this paragraph 107?

MR. DAVIS: Objection. Form.

THE WITNESS: So Dr. Lebby quoted from Exhibit 2062, "Designers cannot integrate the CCD sensor with other devices on the same chip."

As I pointed on the '565 patent itself in its background section provides an extensive discussion of a CCD that includes integration of other components so this very broad statement that "CCD sensors cannot be integrated with other devices on the same chip," I actually don't believe that that is true and as the '565 patent points out there is an example of a situation where that was not true.

I believe we have other

references that state that integrating CCD and other components is potentially difficult but that is not the same as impossible.

BY MR. CAPLAN:

Q. In your declaration, Exhibit 1086, you challenged the accuracy of this Exhibit 2062 that Dr. Lebby cited?

MR. DAVIS: Objection. Form.

THE WITNESS: I certainly challenged the accuracy of Dr. Lebby's opinion that CCDs sensors are required in Wakabayshi and that is demonstrated by the use of off chip circuitry in Wakabayshi.

As with respect to the specific statement in Exhibit 2062 I don't think I addressed that specific statement.

BY MR. CAPLAN:

Q. In the next exhibit cited by Dr. Lebby in this paragraph 107 is Exhibit 2064 which we also, I believe, addressed earlier so my question here is just to -- to

ask you if you agree with the quoted language from Exhibit 2064 that is cited in paragraph 107?

MR. DAVIS: Objection. Form.

THE WITNESS: So, here the quotation from Exhibit 2064 is, "While offering high performance CCD area arrays are difficult to integrate with CMOS due to their high capacitance complicating the integration of on chip drive and signal processing electronics."

I would point out that statement from Exhibit 2064 directly contradicts the statement in 2062 which says -- simply said you cannot integrate. Clearly Exhibit 2064 says you can, that it states that it is difficult to integrate, I have no particular reason to agree or disagree, depends on your definition of "difficulty."

We have the example from the '565 patent of doing such an integration from a company called --

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what did they call it -- SUNY Microsystems.

In terms of the Exhibit 2064 again I have addressed this quotation and as to whether it supports Dr. Lebby's opinions. Wakabayshi requires CCDs.

As I stated repeatedly I do not believe Dr. Lebby's opinion is correct nor do I believe this statement supports Dr. Lebby's opinion. Otherwise I don't think I have a separate analysis of Exhibit 2064 in my declaration.

BY MR. CAPLAN:

Q. Okay. Going back to your paragraph 10 in Exhibit 1086, it is on the page that is Bates labeled 7 but in paragraph 10 you state that -- I will just read the sentence.

It says, "Wakabayshi teaches its image sensor is a solid state imager, a broad class of known sensors that patent owner and Dr. Lebby both admits include CMOS

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image sensors."

Do you see that?

A. I do.

Q. Then you cite to I believe it is paragraph 50 and 51?

A. I do see that, yes.

Q. In particular you make reference to footnote 2 which is along the bottom of page 22 of Dr. Lebby's exhibit or his declaration, right?

A. Yes. That's correct, I do.

Q. So we are clear on this, we may have talked about this before but what is your understanding of the term "solid state imager"?

A. Well, I believe it is a broad class of devices for converting light into an electronic signal. It makes use of solid state materials in that conversion.

As Dr. Lebby said in his footnote he said it refers to devices using solid state semiconductors in contrast to vacuum tubes and then he mentions different technologies, he was CCD, PMOS, NMOS, CMOS

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and in broad terms I would agree with that.

That solid state imagers must use a semiconductor, I would say that is the most common situation but the key is that it makes use of solid state materials in an integrated form, well, this is solid state imagers, it does integrate it in some sense, it is a full point array, and that would include CMOS and CCDs is certainly true.

Q. Those different types of solid state imagers that have been developed over time; isn't that right?

A. I would say all electronic devices have been developed over time and since solid state imagers are electronic devices, yes, they have developed over time.

Q. So a CCD device would be -- is different than a CMOS device in its design, isn't that correct?

MR. DAVIS: Objection. Form.

THE WITNESS: If we are discussing the pixels themselves and the way they are organized and operate to read out the signals then, yes, CCD

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pixel is different from a CMOS pixel.

BY MR. CAPLAN:

Q. So even though both in this example, a CCD and a CMOS, can be considered or are considered a type of solid state imager each are different, they are not the same; is that correct?

A. No. They are not identical. That is why they have different names.

Q. They have different structures; isn't that right?

A. They use -- actually both use a semiconductor to convert light to charge so there are some common features but then there are other portions of it that are quite distinct.

Q. A person familiar would understand that a CCD image sensor is different from a CMOS image sensor?

A. A person of ordinary skill in the art in 1997, the time of this invention, the relevant time period would certainly understand that a CCD is different from a CMOS pixel, yes.

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Q. Okay. I want to move on to paragraph 12 of your declaration in Exhibit 1086.

A. I have paragraph 12 in front of me.

Q. Okay. Now paragraph 12 and it is on, it spans pages 8 to 9 of your declaration as it has been Bates numbered, it talks about -- you are discussing Dr. Lebby's position about how a POSITA would understand Wakabayshi and then you say "I disagree" on the top of page 9.

Do you see that part?

A. I do.

Q. Okay. You in the course of that part of your declaration you cite to Dr. Lebby's paragraph 102, do you see that?

A. I do.

Q. So Dr. Neikirk, here you identify Dr. Lebby's paragraph 102 and you say "I disagree."

Do you see that part?

A. I do.

Q. In paragraph 102 we went over not

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that long ago and we spoke about it and I just want to confirm that I believe it is your testimony that you disagree with Dr. Lebby's construction but you did not have a particular analysis or disagreement with the underlying Exhibit 2067 that Dr. Lebby cites in that paragraph 102; is that right?

MR. DAVIS: Objection to form.

THE WITNESS: Paragraph 102 in Dr. Lebby's declaration cites to Exhibit 2067 and uses the following quotation, and this is on Dr. Lebby's declaration, page 59, at the end of paragraph 102. He quoted from Exhibit 2067. "It is difficult to integrate control and signal processing functions into CCDs."

That reference says "it is difficult." It does not say it is impossible.

Dr. Lebby's contention at the beginning of paragraph 102 is that because Wakabayshi discusses some

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circuitry not on the chip, that that somehow means it must have been CCD, MOS or CID.

The statement he quotes from Exhibit 2067, I do not believe supports that conclusion at all. It says what it says. "It is difficult to integrate control and signal processing functions into CCDs." It does not say anything about MOS or CID. It does not say it is impossible.

And as I mentioned several times we have a specific example from the '565 patent itself showing that it is possible.

Let me conclude my answer. Exhibit 2067 is one of those ones that is in my list of materials considered and I would have to look through the rest of my declaration to see if I have a further discussion of that reference standing on its own.

I do recall reading this article

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more than once but I don't recall whether I then separately discussed it.

So in a first review I am not seeing a separate discussion but again we talked about this reference and this specific citation from it that Dr. Lebby alleges supports his opinions. I disagree.

BY MR. CAPLAN:

Q. I want to move along to paragraph 30 of your declaration.

A. I have paragraph 30 open.

Q. Okay. Here Dr.-- you are addressing Dr. Lebby's declaration. You are relating to the Ackland and once again you state on page 23 but still in paragraph 30 of your declaration that you -- it says, "I disagree with these assertions."

Do you see that?

A. I do.

Q. 23. Okay. Right prior to that there is a number of citations to Dr. Lebby's declaration so I want to take a

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look at those. So we can go to paragraph 109 of Dr. Lebby's declaration.
A. I have paragraph 109 open.
Q. Okay. In paragraph 109 Dr. Lebby cites to a few exhibits. So I want to go to the first one and that would be Exhibit 2004.
Do you see that?
A. I do.
Q. So my question is, did you consider Exhibit 2004 in preparing your declaration that is now Exhibit 1086?
MR. DAVIS: Objection.
THE WITNESS: When -- in my declaration when I referred to paragraph 109 I am referring to Dr. Lebby's contentions that and I will quote his paragraph 109, his opening sentence, "Petitioner's proposed combination of the Wakabayshi camera architecture with Ackland's CMOS image sensors requires significant redesign on both the Wakabayshi camera architecture and

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redesign of the Ackland CMOS image sensor with no technical benefits, a significant loss of quality image, little to no costs -- to be accurate what Dr. Lebby said was Ackland CMOS image sensor with no technical benefits, a significant loss in image quality, a little to no cost savings."
That is -- I want to be careful and not quote Dr. Lebby.
He then goes on to cite things that he appears to believe demonstrates that.
He claims, Dr. Lebby, that there would be a proposed redesign which would result in the worst aspects of CCD and CMOS image sensors.
As a base observation I disagree that there is any redesign necessary to start with, but Dr. Lebby purports to claim that that is supported by Exhibit 2004's quoted statement, "Although some integrated CMOS, CCDs sensor processes have been

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demonstrated undesirable compromises to the performance of CMOS or CCD technology must be made."
That is what that reference says.
It admits that CMOS and CCD combinations have been done which contradicts Dr. Lebby's opinions elsewhere by the way. That this requires undesirable compromises, the reference that Dr. Lebby didn't cite to what undesirable consequences those might be, that that would result in Dr. Lebby's contention that you would end up with the worst aspects of CCDs and CMOS image sensors.
I don't believe that sentence says you may end up with the worst aspects of each. It just says that there are compromises.
The design of any circuit involves compromises and depending on the objectives some may be undesirable in some circumstances and in other

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circumstances they might be fine.
That is all that Exhibit 2004 says is that some of these demonstrations resulted in undesirable compromises.
It didn't say that all demonstrations did. It doesn't say that that would always be the case or that you end up with in Dr. Lebby's words the worst aspects of CCDs and CMOS imagers. I don't believe that reference says that at all.
BY MR. CAPLAN:
Q. Your declaration doesn't challenge the accuracy or veracity of Exhibit 2004, this article by Dr. Fossum, does it, though?
MR. DAVIS: Objection. Form.
THE WITNESS: Exhibit 2004 is not in my list of materials considered. I don't believe I have a separate discussion.
What I challenge is that this reference, the quoted section of this reference supports Dr. Lebby's

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opinions. I do not believe it does.

BY MR. CAPLAN:

Q. But as you sit here today you don't have a basis to challenge the accuracy or veracity of what is set forth in Exhibit 2004, do you?

MR. DAVIS: Objection. Form.

THE WITNESS: I haven't formed an opinion one way or the other on that issue.

The question for me to address is does this citation, the quote that Dr. Lebby used, support Dr. Lebby's opinions and in my opinion it does not.

BY MR. CAPLAN:

Q. Dr. Lebby also cites Exhibit 2054 in this paragraph 109.

Do you see that?

A. I do.

Q. Do you consider Exhibit 2054 in forming your opinion that is set forth in the declaration Exhibit 1086?

MR. DAVIS: Objection. Form.

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THE WITNESS: Dr. Lebby in paragraph 109 quotes from Exhibit 2054 the following, "CMOS based image sensors offer the potential opportunity to integrate a significant amount of BOSI electronics and reduce component and packaging costs. CCD technology, on the other hand, has become quite specialized and in general is not well suited to CMOS integration in voltage capacitance and process constraints."

That citation says nothing about his -- Dr. Lebby's contention that combining the two would result in the worst aspects of CCDs and CMOS.

That statement from Exhibit 2054 simply addresses potential opportunities for CMOS, not that it is required.

It mentions CCD technologies having become more specialized, quite specialized, and, in general.

He doesn't say that it is not

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possible to integrate with CMOS integration and in fact in Exhibit 2004 the same author stated that it was possible.

So I don't see that this statement from Exhibit 2054 supports Dr. Lebby's opinion that the combination of Wakabayshi and Ackland would result in a redesign, which I disagree, there is no redesign to start with, but his contention that there would be a redesign resulting in the worst aspects of both, I don't see that at all in this reference.

BY MR. CAPLAN:

Q. But like Exhibit 2004 your declaration doesn't provide any critique of the accuracy or veracity of Exhibit 2054, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: Exhibit 2054 is not in my list of materials considered.

I do not believe I have a

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separate discussion of it.

I have addressed it in the context of Dr. Lebby's opinion as we began this discussion when we were talking about my paragraph -- I believe my paragraph 30, where I pointed out that I disagree with Dr. Lebby's contention, first, that there is a redesign. I disagree with that, but, secondly, that you would end up with the worst aspects of CCDs and CMOS.

BY MR. CAPLAN:

Q. So just so that the record is clear the answer is, no, your declaration doesn't specifically address either Exhibit 2004 or 2054 with regard to their accuracy, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: It does address Exhibit 2004 and 2054.

As to whether they support Dr. Lebby's opinion in that sense I am taking those statements at face value

and I am pointing out that they don't support Dr. Lebby's opinions. Taking those statements at face value.

I have not formed any separate opinion as to the accuracy of those two statements. I took them at face value and they do not support Dr. Lebby's opinions.

BY MR. CAPLAN:

Q. What is your view on the pros and cons of using CCD versus CMOS in 1997?

MR. DAVIS: Objection to form.

THE WITNESS: I have not sat down and tried to make any such list. It wasn't relevant to my inquiry.

My inquiry concerned the prior art and what it disclosed or did not disclose. And the relative -- one versus the other, CMOS versus CCD, I believe the references in some cases mention things.

Certainly not in the Wakabayshi. He is completely silent. He is agnostic as to what kind of solid

state device is used so I have not tried to make any such list.

I do believe I discussed in the context of Ackland certain advantages that Ackland itself points out; lower reduced per chip cost, for instance, for a single polysilicon device.

BY MR. CAPLAN:

Q. I heard your testimony, you compared CCD and CMOS as part of your analysis but what is your view on -- let's talk about CCD.

What were the best and worst features of the CCD devices in that time period, 1997?

A. I have not sat down -- I have not done that. The best and worst features.

CCDs existed for sure. As we just discussed in some of these references. There were general characteristics that were well known. That is not a best and worst list and I have not made such a list.

Q. How about for CMOS, did you consider the best and worst features for

CMOS devices in that relevant time period of 1997?

MR. DAVIS: Objection to form.

THE WITNESS: Again, as numerous references have pointed out, there are characteristics of CMOS in the sensors.

Ackland itself certainly points out a number.

In the '565 patent, in the background of the invention it identifies a number of CMOS features but again that is not a best and worst list and I have made no such list.

BY MR. CAPLAN:

Q. In your paragraph 30 you -- we were just talking about you referenced paragraph 109 but you actually cited paragraphs 109 to 116 of Dr. Lebby's declaration so I want to turn to paragraph 110.

And here again you made a reference to that you disagree in general with Dr. Lebby and in paragraph 110

Dr. Lebby cites to Exhibit 2058 in support of his position set forth in paragraph 110.

My question is did you consider Exhibit 2058 in reaching your position that -- or your view that led you to disagree with Dr. Lebby?

MR. DAVIS: Objection. Form.

THE WITNESS: So in paragraph 110 Dr. Lebby alleges that a POSITA, Person of Ordinary Skill in the Art, would not redesign Ackland using the architecture of Wakabayshi.

So as a starting point I do not agree there was ever any redesign involved in the combinations.

This is not a redesign. So I want to point that out.

This whole paragraph seems to refer to redesign which I do not agree with to start.

He talks about, Dr. Lebby, talks about redesigning Ackland with timing and control circuitry on a chip as described in Wakabayshi.

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I would point out that in Wakabayshi timing and control circuitry is not described as being off chip specifically.

It is -- we have to go back and look at the -- the read but the reference you ask about, 2058, Lebby does not-- he cites pages 91 and 92 but he does not quote.

Now this exhibit I have looked at. It is in my list of materials considered, Exhibit 2058.

Let me look through my report and see if I then discussed it on its own.

So for instance, on page -- Bates page 28 of my declaration which is a continuation of paragraph 34 I have stated, "And even if the proposed combination included signaling from off chip and timing control circuitry any additional conduction or capacitance would not significantly affect synchronization and timing of

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the image sensor."

Then I mention Exhibit 2058 and point out that that exhibit at page 92 simply states that "With the APS approach highly integrated image sensors are possible."

Not required, "possible."

So again in paragraph 110 -- I believe it was paragraph 110 of Dr. Lebby's report we were discussing --

BY MR. CAPLAN:

Q. Yes.

A. He suggests that moving timing and control circuitry would be -- he didn't say "insurmountable problem" but he suggests that it simply would not be done and I disagree.

And I do not believe the reference he cites, Exhibit 2058, supports his conclusion.

The reference as I have stated in my own declaration on page 28 at the end of paragraph 34 states that high integration is

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possible but not that it is required.

Q. Your declaration, Exhibit 1086, does not challenge again the accuracy or veracity of what is set forth in Exhibit 2058, does it?

MR. DAVIS: Objection to form.

THE WITNESS: So the quotation that I cited from Exhibit 2058 that with the APS approach highly integrated image sensors are possible.

I don't have any reason to disagree with that statement. I took it at face value as well.

I would generally agree that using CMOS allows integration but of course using CCD also allows some integration.

MR. CAPLAN: We have been going about an hour so we like to take a break here. We are going to take a short lunch break now so I can go 30 minutes, is that all right?

THE WITNESS: 30 minutes. I can make 30 minutes work.

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MR. CAPLAN: We can go off the record.

(Luncheon recess: 1:31 p.m.)

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AFTERNOON SESSION
2:13 p.m.
BY MR. CAPLAN:
Q. Dr. Neikirk, welcome back.
A. Thank you.
Q. So we left off, we were in paragraph 30 of your declaration and in particular the part of it where you were addressing your disagreement with Dr. Lebby's testimony or his declaration and we were going through a number of the paragraphs that you identified as supporting Dr. Lebby's position and that you disagreed with and so I want to keep going there.
So we were in section 109 to 116 or paragraphs 109 to 116. I wanted to turn to paragraph 111 of Dr. Lebby's declaration which is referred to in your paragraph 30.
So do you have that, Dr. Lebby's declaration?
A. I do.
Q. In paragraph 111 Dr. Lebby cites to Exhibit 2050 which I believe is a reference that you considered in connection

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with your declaration; is that right?
A. Yes. He refers to an IEEE article of which Ackland was one of the authors.
Q. Now, the Ackland reference that you opined on in this proceeding was a patent that has been identified as Exhibit 1006 but Exhibit 2050 is a different document, is that right?
A. Yes. That's correct. Exhibit 2050 is an IEEE publication. I believe I discussed that in paragraph -- at least in paragraph 32 in my declaration.
Q. Okay. So in paragraph 111 of Dr. Lebby's declaration he quotes from Exhibit 2050.
Do you see that? There is a block quote.
A. I do see that.
Q. Okay. Do you agree with the text of that block quote from Exhibit 2050?
MR. DAVIS: Objection. Form.
THE WITNESS: So that block quote starts with the sentence, "Arguably, the most important

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advantage of the CMOS APS approach, however, is the ability to integrate much of the camera timing, control and signal processing circuitry on the same silicon die."
So given the qualifications in that sentence, first, that it is arguable, Ackland states it is; that, secondly, that the -- it is the ability, not the requirement, to integrate; and furthermore to integrate "much" rather than "all" of the camera circuitry.
So given the, what is it, if you will, three qualifications that is arguable, that it is an ability and that it requires -- that it is an ability to integrate "much" as opposed to "all," I don't see any particular reason to take issue with that sentence.
BY MR. CAPLAN:
Q. How about the next sentence?
MR. DAVIS: Same objection.

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THE WITNESS: Presumably that is a simple statement.
It specifies the sensor array, golden half micron CMOS and quotes an active area.
I haven't bothered to try to run the numbers.
You would have to determine what the actual pixel size was even if you know that it is half micron CMOS, that doesn't tell you the pixel size. I don't know one way or the other.
It is not a-- again, Dr. Lebby's report is citing this section with respect to his paragraph 111 in support of its contention that the main advantage of an Ackland CMOS image sensor is achieved when chips are fully integrated.
I would point out that the reference, the patent Ackland, is about the single level polysilicon pixel structure.
It is not necessarily the same

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CMOS APS approach that Ackland is discussing in the IC -- this is an ICCS article, I think, or an ISSC article.

BY MR. CAPLAN:

Q. So this exhibit, Exhibit 2050, it is an ISSCC 96 article which I believe stands for the IEEE International Solid State Circuits Conference.

Are you familiar with that conference?

A. Yes.

Q. Have you attended that conference?

A. I don't recall that I have attended that specific conference, I have read the conference proceedings. I may or may not have a conference paper.

I asked to see -- I forgot now whether -- I have papers from Design Automation Conference. That is DAG. I don't know whether I have one from ISSCC or not.

Q. According to the exhibit itself, Exhibit 2050, it says it is the 1996 IEEE,

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International Solid State Circuits Conference.

1996 is the same year that the Ackland patent asserted in this case was filed; is that correct?

That is Exhibit 1006 if you are looking for that.

A. So Ackland was filed January 3, 1996. It is a continuation in part from a 1994 patent. It issued November 10, 1998.

Q. It is the same Brian Ackland who is an inventor on the Ackland patent, Exhibit 1006, who is also one of the two authors on Exhibit 2050; is that right?

A. I assume it is.

Q. And your declaration doesn't challenge the accuracy or veracity of what is set forth in Exhibit 2050, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: In my declaration in paragraph 32 I discuss this paper. I point out there that the paper and Ackland's patent don't reference one another so Ackland's patent apparently

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did not consider this paper of sufficient relevance to list it in his references I would assume.

The paper doesn't talk about the single polysilicon CMOS active pixel sensor which is the subject of the patent.

The general block quote that Dr. Lebby referred to that points out that CMOS APS approach provides the ability to integrate.

I believe that is -- I don't have any reason to disagree with that. It provides the ability. It doesn't state that it is a requirement in all processing circuitry be placed on one chip.

BY MR. CAPLAN:

Q. But, again, just so I am clear, your declaration doesn't challenge the accuracy of what is set forth in Exhibit 2050, the article by Dr. Ackland?

MR. DAVIS: Same objection.

THE WITNESS: As I am actually

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looking at my declaration I had a rather extensive discussion of Exhibit 2050, this Ackland paper.

In paragraph 33 in fact I quoted a paragraph from it myself referencing a variety of advantages of APS sensors that are not related to integration that involve circuitry on one chip.

So, no, actually I think that by and large the paper published by Ackland is one that I would agree with in general terms.

Certainly the paragraph I have quoted on Bates page 26 of my declaration I believe that that is an accurate list of advantages.

BY MR. CAPLAN:

Q. Okay. So moving on because we are talking about this range of paragraphs 109 to 116 which you cited in your paragraph 30 so I will keep going to paragraph 113 of Dr. Lebby's declaration and here Dr. Lebby cites a number of exhibits in support of his position which you didn't disagree with but

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the first exhibit that he cites is Exhibit 2004.
Do you see that in paragraph 113?
A. I do.
Q. I think we have talked about Exhibit 2004 so I won't revisit that piece of it.
But my question here is, there is a quote from Exhibit 2004 and my question is, do you agree with the quoted language from Exhibit 2004 in this paragraph 113?
A. So --
MR. DAVIS: Objection. Form.
THE WITNESS: So paragraph 113, Dr. Lebby's opening sentence seems to suggest he is attacking the idea that separating on chip functionality would be something one would do.
The statement that he gives from Exhibit 2004 is, "To get high transfer efficiency CCDs are often driven with relatively large voltages by micro electronic standards. And also represent high enough capacitive loads

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to driving electronics to make on-chip integration clocks and drivers nearly impractical. Yet on-chip integration is the key to achieving future camera miniaturization."
So there is a variety of things in there that and I will go to the last sentence first, "on-chip integration is the key to achieving future camera miniaturization."
I don't know if that is the key, the only key, that it would be something that future camera miniaturization might find desirable. It seems reasonable to me.
The statement before that about "CCDs are often driven with relatively large voltages by microelectronic standards," again it is qualified.
It says "often." It didn't say "always."
Just for reference, the '565 patent in its discussion of a CCD with integrated CMOS electronics stated

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that it could operate with five volts which wouldn't be a large voltage by micro electronic standards.
So Fossum's Exhibit 2004 did qualify. I don't know that I disagree with that. That it -- the capacitance loads to driving electronics makes on-chip integration of clocks and drivers nearly impractical.
I haven't really considered whether I would fully agree with that or not.
Again, it is qualified. It didn't say it is impossible.
So it is question of one's view as to what -- how hard is "nearly impractical."
I don't believe any of that supports Dr. Lebby's opinion that Ackland must be -- must have all electronics integrated on a single chip.
BY MR. CAPLAN:
Q. The next exhibit that is cited in

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paragraph 113 is Exhibit 2039.
Do you see that?
A. I do.
Q. I don't know that we talked about in one yet.
Did you consider Exhibit 2039 in preparing your declaration that is now Exhibit 1086?
MR. DAVIS: Objection. Form.
THE WITNESS: Again in examining Dr. Lebby's opinions and in particular in paragraph 113 somehow his opinion that the Ackland patent requires all circuitry on a single chip, here he cites Exhibit 2039 and gives a quotation, "One chip can incorporate all manner of electronic controls that are usually on multiple chips from timing circuits to Zoom and anti-jitter -- jitter controls by consolidating many functions and reading images in a more efficient way, requires 100 the power of CCD-based systems and the chip does it

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own conversion from analog to digital for output on computer monitors for disk storage."

So there is many things in that statement. I have considered them in the context of Dr. Lebby's assertion that the patent requires everything to be on the same chip.

I would point out that Exhibit 2039 simply makes general statements about incorporating all manner. It doesn't say everything is placed on a single chip. There is a capability to put some or many things on a single chip. That is true.

The specific statement that it is because of this it requires 100th of the power of CCD-based systems, I don't know that that is really necessarily accurate.

CMOS chips themselves do tend to consume less power whether the circuitry is -- some of the support circuitry is on chip or off. That is

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still true.

And then finally the comment about "analog to digital conversion," that is not a requirement and certainly is not part of Ackland's patent.

There is no analog to digital conversion in Ackland's patent.

So in terms of Exhibit 2039 and supporting Dr. Lebby's contention Ackland requires everything to be integrated on a single chip, I don't believe this statement does that.

BY MR. CAPLAN:

Q. Do you disagree with the statement itself that is contained in Exhibit 2039?

MR. DAVIS: Objection. Form.

THE WITNESS: I really haven't tried to -- I haven't formed an opinion one way or the other.

I looked at the statement taking it at face value to try to evaluate whether I believed it supported Dr. Lebby's contentions. I do not

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believe it does.

As to whether every statement in that is absolutely always true, I haven't really tried to form an opinion one way or the other.

BY MR. CAPLAN:

Q. You are aware that Exhibit 2039 is an article about Dr. Fossum's work at JPL, aren't you?

MR. DAVIS: Objection. Form.

THE WITNESS: I honestly don't recall the title.

Exhibit 2039 is not in my list of materials considered. I can certainly look at the reference to refresh my memory but here I was addressing the specific quotation that Dr. Lebby chose in alleged support of his opinions.

BY MR. CAPLAN:

Q. Your declaration doesn't set forth any attack or analysis that undermines the accuracy of what is set forth in Exhibit 2039, does it?

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MR. DAVIS: Objection. Form.

THE WITNESS: What I address --

MR. DAVIS: I think compound.

Go ahead.

THE WITNESS: What I did address in my declaration is my opinion that Dr. Lebby's evidence supporting his opinion does not support it. I did not otherwise provide a discussion of Exhibit 2039.

BY MR. CAPLAN:

Q. Still in paragraph 113 of Dr. Lebby's declaration Dr. Lebby also cited Exhibit 2054.

Do you see that on page 67 of his declaration but still in paragraph 113?

A. I see that.

Q. Okay. Did you consider -- let me ask you -- do you agree with the citation to Exhibit 2054 in terms of what it sets forth and I will read it for the record so the question is clear.

"On-chip analog to digital converters and on-chip timing and control

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circuits permit utilization of an electronic camera on the chip."

Do you agree with that statement from Exhibit 2054?

MR. DAVIS: Objection to form.

THE WITNESS: So I considered that statement in the context of Dr. Lebby's allegation that supports his opinion.

Again, this statement simply says it "permits." It doesn't say that you must do those things all on the same chip and in particular it does reference permitting utilization of an electronic camera on a chip.

Ackland's patent doesn't refer to a camera on a chip.

So this statement in isolation I haven't really tried to form an opinion as to whether I agree or disagree with it.

This statement in the context of Dr. Lebby's allegations that this supports his opinions, I don't agree

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that it does.

I disagree fundamentally with Dr. Lebby's opinions as I stated repeatedly.

I haven't looked at that statement. It is a fairly general statement. Again, only talking about permission -- permitting utilization.

I would probably take -- I took it as face value in trying to determine whether it supported Dr. Lebby's allegations. I do not believe it does.

BY MR. CAPLAN:

Q. Exhibit 2054 is an article by Dr. Fossum, correct?

A. It is, yes.

Q. That is the same Dr. Fossum who does a lot of work on the camera on a chip, CMOS, camera on a chip technology that is described in the '565 patent; is that right?

MR. DAVIS: Objection. Form.

THE WITNESS: Dr. Fossum and many others did work on such chips.

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For instance, Ackland's patent is about pixels for use in a CMOS array.

BY MR. CAPLAN:

Q. The next exhibit that Dr. Lebby cited in his paragraph 113 is 2007 which I believe we talked about before but maybe a different aspect of it.

Do you see the citation to Exhibit 2007?

A. I do see that.

Q. My question is did you consider in that part of Exhibit 2007 in reaching your opinion that is set forth in your declaration that is now Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: Again, the context and what Exhibit 2007 was quoted as saying is "The piece cost versus performance winner on every instance be the CMOS imager, combination of standard CMOS fabrication and on-chip electronics to lower external system costs yields the most economical

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solution."

Again, Dr. Lebby seems to suggest that this statement supports his opinion that the Ackland patent is for a chip that contains all electronics on a single chip.

Even this statement doesn't say "all" on-chip electronics. I would say that it was widely held that increasing pouring circuits on chip sometimes provided a cost advantage.

This says that it would be the winner in every instance. I don't know that I would necessarily agree that it would be the winner in every instance.

But the real issue here is does this support Dr. Lebby's assertion that the Ackland patent is for a chip with all electronics integrated on it and I don't see that this offers that at all.

BY MR. CAPLAN:

Q. Did you do any investigation as to

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the state of what is described in Exhibit 2007 that Dr. Lebby cites to here?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: Again, in looking at this I took it at face value to see whether it supported Dr. Lebby's own arguments. In my opinion it does not. Even taken at face value.

BY MR. CAPLAN:

Q. Do you have a basis to disagree with the accuracy of what is set forth in Exhibit 2007 that Dr. Lebby cited to?

MR. DAVIS: Same objection.

THE WITNESS: I already said I took it at face value. In reading the sentence I did say, just a moment ago I testified, that whether or not it will win in every instance I don't know but I haven't done an analysis about this.

I took it at face value and it simply does not support Dr. Lebby's arguments even taken at face value.

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BY MR. CAPLAN:

Q. Okay. Another exhibit that Dr. Lebby cited in this paragraph 113 is Exhibit 2060.

Do you see that?

A. I do.

Q. My question here is: Is this Exhibit 2060 an exhibit that you considered in reaching your opinion that is set forth in Exhibit 1086?

MR. DAVIS: Objection. Form.

THE WITNESS: So in this case he does -- well, he specifies Exhibit 2060 at 1 and 2.

I did not include Exhibit 2060 in my list of materials considered and I must admit sitting here right now I don't recall what figures -- what the references here he is specifying are to so I would have to look at that reference to refresh my memory.

BY MR. CAPLAN:

Q. Well, as you sit here now your paragraph 30 says that you disagree with

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Dr. Lebby including that this part of it.

So my question is as you sit here today do you have a recollection about what it is in connection with this Exhibit 2060 that you disagree with?

MR. DAVIS: Objection. Form.

THE WITNESS: Sitting here right this moment looking at Exhibit 2060 I don't recall what Dr. Lebby is trying to refer to.

His broad assertion that the Ackland patent must have everything on chip, this Exhibit 2060 we could look but I doubt it references the Ackland patent and I don't know that that the Ackland patent references this article.

That is easily determined. This is an article by Nixon. I don't see a reference to the Ackland patent to this article.

BY MR. CAPLAN:

Q. Again, your declaration doesn't take issue with the accuracy or veracity of

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what is set forth in Exhibit 2060, does it?

MR. DAVIS: Objection. Form.

THE WITNESS: I have no specific discussion of this reference in my declaration.

When I was reading paragraph 113 I was considering references cited in the context of Dr. Lebby's opinions and in general was taking the citations he used at face value.

As I pointed out in the other cases, they didn't support his conclusions that the Ackland patent requires all electronics to be integrated on the same chip.

BY MR. CAPLAN:

Q. If we move on from this grouping to paragraph 115, Dr. Lebby's declaration.

A. I have paragraph 115 in front of me.

Q. So here again Dr. Lebby cites Exhibit 2060 but he does have a quote from the exhibit.

My question here is of the quoted

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language that Dr. Lebby cites from Exhibit 2060 is something that you disagree with the actual quote of that language and what that language is saying?

MR. DAVIS: Objection to form.

THE WITNESS: You are asking about Exhibit 2060 or 2039?

BY MR. CAPLAN:

Q. 2060.

A. So in paragraph 115 of Dr. Lebby's declaration he quotes from Exhibit 2060.

The quotation states that "CMOS sensors cost an average of less than $14, about 15 to 20 cents cheaper than CCDs."

That particular statement, I haven't conducted a separate investigation about those costs.

If -- it then continues to state, "If additional image processing functions are cramped out of the chip savings can reach 50 percent."

Again, I don't know one way or the other where this Exhibit 2060 found that information.

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It then references the chip Nintendo used, "Mitsubishi Electric Corp.'s new artificial retina incorporates both light sensing and image processing functions. It costs only $10 or half of what traditional CCD technology would have cost."

In this statement it suggests that using a CMOS sensor whether you integrate or not has a cost advantage with respect to CCDs. It doesn't specify all electronics must be incorporated. It doesn't discuss Ackland's patent.

Taking this at face value again I don't believe this supports Dr. Lebby's contention that the Ackland patent requires all electronics to be integrated on a single chip. In fact, Dr. Lebby's paragraph states that there would be little to no cost savings. This suggests that there would be a 15 to 20 percent cheaper for the CMOS sensor than the CCD even without electronics incorporation.

Q. It was your testimony you did not

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investigate this particular statement from Exhibit 2060, correct?

MR. DAVIS: Objection to form.

THE WITNESS: What I testified was taking this at face value in evaluating whether it supports Dr. Lebby's conclusion that the Ackland patent requires all electronics to be integrated on a single chip, it does not support that.

BY MR. CAPLAN:

Q. Still in paragraph 115 the next part of the paragraph following that quote from Exhibit 2060, there is a highlighted excerpt from Exhibit 2039 which we talked about before quoting Dr. Ackland from a Business Week article.

Do you see that?

A. I do.

Q. Dr. Lebby provides that excerpt in connection with the statement by Dr. Ackland about how the cost savings benefit from using the pixel -- CMOS pixels was achieved with full integration.

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That is what he says in paragraph 115.

Do you agree with what is set forth in that excerpt of Exhibit 2039?

MR. DAVIS: Objection. Form.

THE WITNESS: So, this is the same as the others. Reading what is stated there and looking to whether the -- taken at face value whether it supports Dr. Lebby's contention that the Ackland patent must integrate all electronics, the things that I note is that the quotation from Dr. Ackland suggests that CCD costs a modest $20.

He does further say that additional components -- he doesn't specify which components.

He then says that putting everything on one chip what we are trying to do is build the entire camera subsystem for $20. He doesn't say they have done it. He doesn't say it is the only way to do it. He says that is what they are trying to do.

Neikirk

I couldn't imagine disagreeing with what Dr. Ackland was saying about what he was trying to do but taking this at face value it does not require that the Ackland patent place all circuitry on a single chip.

BY MR. CAPLAN:

Q. So this excerpt from Exhibit 2039 is providing statements by Dr. Ackland who is the same Dr. Ackland who is an inventor on the Ackland patent, right?

A. So far as I know it is. I don't know if there might be more than one Brian Ackland. I assumed it was not.

Q. It is also the same Dr. Ackland who was the author on the Ackland article that you were talking about earlier, Exhibit 2050?

A. To the best of my knowledge, yes. And I would point out that the Ackland patent did not reference the Ackland article, did not reference this Business Week article. There are other things that

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Dr. Ackland said but certainly he is entitled to say lots of things.

Q. Okay. Going back into your paragraph 30 as we march through part of your declaration here you -- in connection with your disagreement with Dr. Lebby's declaration we just went through paragraphs 109 to 116 of Dr. Lebby's declaration but you also identified paragraphs 122 to 124 of Dr. Lebby's declaration which you said you disagree with the assertions there as well.

So I want to turn to paragraph 122 of Dr. Lebby's declaration if you could.

A. I have paragraph 122.

Q. Here again Dr. Lebby cites a number of exhibits supporting his position, a number we have been through so I won't go through that aspect of it but just ask you the question starting with Exhibit 2004, do you agree with the quoted statement from Exhibit 2004 that Dr. Lebby relies on in his paragraph 122?

MR. DAVIS: Objection. Form.

THE WITNESS: In paragraph 122

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Dr. Lebby asserts that the redesign, presumably the redesign of Wakabayshi, would require redesign of the voltage supply levels.

I would first point out that there is no redesign to start with.

I would also point out that Wakabayshi doesn't require CCD and doesn't specify any power supply voltage levels so the assertion that there wouldn't be some voltage supply that needs to be changed is on its face false.

Then he supports -- then he cites Exhibit 2004 in support of this alleged redesign. The statement from 2 -- Exhibit 2004 is that "CCDs are often driven with a relatively large voltage by microelectronics standard."

We already went over this and I point out that the statement that they are "often driven" might indeed be true. That is different from saying they always are.

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I even gave you an example from the '565 patent of a five volt level for a CCD which is not relatively large.

But taking this statement at face value it still does not support Dr. Lebby's assertion that a redesign would be required of a voltage supply of Wakabayshi. There is no redesign.

Wakabayshi doesn't require a CCD. Dr. Wakabayshi says use any solid state device and he doesn't specify what voltage levels to use. He leaves it to the designer.

So the statement from Exhibit 2004 taken at face value does not support Dr. Lebby's assertion.

I haven't gone through and separately done any analysis to determine whether anything within that quotation from 2004 I might agree or disagree with. I took it at face value.

BY MR. CAPLAN:

Q. Let me ask you the same question then in connection with the next exhibit that Dr. Lebby cited, Exhibit 2063, which I think we talked about.

Did you do any separate investigation of the citation to Exhibit 2063 beyond your disagreement with Dr. Lebby's position set forth in his declaration?

MR. DAVIS: Objection. Form.

THE WITNESS: So, Dr. Lebby cited Exhibit 2063 and a statement from that specifying that CMOS operate at very low voltage, five volts or less, whereas CCD in modern camcorders require 10 to 30 volts.

Taken at face value it does not support any assertion that there was redesign of Wakabayshi required because Wakabayshi doesn't require CCD and there is no redesign.

In terms of the statement itself taken at face value, it just doesn't

support Dr. Lebby's arguments.

We know, for example, from the '565 patent itself there is an example of the CCD that uses five volts. So this statement says that -- it says "CCDs in modern camcorders."

Well, I don't know but taken at face value it simply does not support Dr. Lebby's contention that Wakabayshi requires a redesign.

BY MR. CAPLAN:

Q. A couple times you mentioned this, you made reference to the '565 patent in the background to this five volt CCD device.

Are you referring to -- let me ask this. What part of the '565 patent are you referring to?

A. So in the background of the invention section at column 2 starting at line 35 through 56, it discusses a -- let's look down at line 40. "Development of the CCD CMOS hybrid which combines high quality image processing of CCD with standard CMOS circuitry construction."

I am quoting from the '565 background of the invention.

If you read down to line 48, "Additionally, this hybrid is able to run on a low power source, five volts, which is not normally possible on standard CCD imagers which require 10 to 30 volts plus."

So simply pointing out that the contention that a CCD requires in all cases 10 to 30 volts is not true but regardless Wakabayshi is not limited to CCDs so the idea that any statements about these voltages are relevant to determining whether a redesign is required is just fundamentally wrong.

Q. Had you ever heard, aside from what you just read in the '565 patent, are you familiar with this SUNY Microsystems product?

A. There are many companies have worked on various chips and I don't recall that one specifically.

Q. Have you ever seen the product that is described -- that is supposedly

described in that part of the '565 patent?

A. Again, I haven't. It stated it in the patent and I just took their statements at face value.

Q. Would you agree that that product that is described there if it ever existed involved a CCD image sensor, it did not involve a CMOS image sensor, correct?

MR. DAVIS: Object. Form.

THE WITNESS: This sentence specifically says that it used -- it combined high quality image processing CCD with standard CMOS circuitry construction.

BY MR. CAPLAN:

Q. Right. It doesn't describe the CMOS image sensor, does it?

A. No. It says a CCD. I am pointing out that where the references suggest that CCDs must operate in a certain way and Dr. Lebby or at least Dr. Lebby suggested that and then somehow concludes that using Ackland with Wakabayshi would require a redesign, first, it is fundamentally flawed,

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wrong, because Wakabayshi doesn't require CCD but even assuming you selected a CCD not that it is required to be used but if you did it is still not true that you would always have to have these higher voltages. You might but this is an example of the case where you did not.

Q. Just in this paragraph 122 that we started with you, Exhibit 2036 is an exhibit we talked about before, and my question to you though is aside from your disagreement with Dr. Lebby do you disagree with the quote from Exhibit 2036 that is set forth in this paragraph 122?

A. So Exhibit 2036 is one that is in my list of materials considered so let me point out that I discussed in Exhibit 2036 on page -- Bates page 21 of my declaration a figure that I believe Dr. Lebby used concerning the availability of CMOS image sensors, so that is a different citation than what he is referring to in Dr. Lebby's paragraph 122.

The quotation he cites there is

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"CCDs also require additional supporting components, increasing the footprint of the total solution. Power consumption is significantly higher with CCDs compared to CMOS imagers. Voltage requirements also run higher typically over 10 volts. In some instances two different voltages are required. Lastly, current CCDs require additional components in order to support still images as well as video."

Again, taken at face value none of that supports Dr. Lebby's contention that any redesign of Wakabayshi would be required.

It does state characteristics of CCDs. I would take that at face value. It uses words like "typically" which is a qualifier.

It says "in some instances." It is not saying it is true of every CCD even there.

But fundamentally it does not support Dr. Lebby's assertion that any redesign of a voltage supplier would be

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required in Wakabayshi if Ackland were used with Wakabayshi.

It simply makes broad statements about CCD characteristics. That is not what Wakabayshi requires.

Q. You don't disagree with those broad statements, do you?

MR. DAVIS: Objection to the form.

THE WITNESS: As I believe I just said given the qualifiers in there such as "typically" and "in some instances" I would take this at face value.

BY MR. CAPLAN:

Q. So you would agree then that integration of circuitry onto a CMOS image sensor would be much better for cost savings though based on what we have been talking about, right, and I will rephrase it.

Wouldn't you agree that CMOS integration onto a single device, a camera on a chip design, is better for cost savings compared to let's say a CCD design?

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MR. DAVIS: Objection. Form.

THE WITNESS: You wanted me to compare this to a CCD design but then you are asking me to compare a CCD to a CMOS device with some circuitry integrated? I am not sure I understood what you are asking me to compare.

BY MR. CAPLAN:

Q. I will try and rephrase it.

From a cost savings point of view an on-chip integrated CMOS imager is better for cost savings than having a then conventional CCD multicomponent design, would you agree with that?

MR. DAVIS: Objection. Form. Vague.

THE WITNESS: I haven't done an exhaustive analysis one way or the other.

I believe that I pointed out in my previous depositions that integrating more circuitry into a single chip sometimes doesn't make it

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cheaper and also tends to be dependent on the time scale.

When a particular component is relatively new, which CMOS APS sensors were relatively new in 1995, many of the examples that I believe I discussed did not incorporate other circuitry with that. Well, there was reason.

They were concentrating on fabricating the pixels and adding more circuitry on chip was not necessarily an advantage.

Over time that might change but I am not going to agree to a blanket statement that it is always better. Sometimes it probably is. Sometimes it may not be.

CMOS sensors broad, generally speaking, tend to be lower cost than CCD regardless of whether any circuitry is added to the chip.

BY MR. CAPLAN:

Q. But if somebody could design an

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imaging device to get acceptable performance and one option was less expensive than another you would agree that all things being equal they would take the less expensive option, wouldn't they?

MR. DAVIS: Objection. Form.

THE WITNESS: Well --

MR. DAVIS: Vague.

THE WITNESS: You used the word "design." There is a difference between "design" and "fabricated."

Then you said "all things being equal." I don't know what "all things" you are referring to there so I couldn't answer that question.

BY MR. CAPLAN:

Q. If an engineer was going to fabricate two devices, one was less expensive to fabricate than the other and both gave acceptable performance, as a person skilled in the art which option would the engineer pick?

MR. DAVIS: Objection. Form.

THE WITNESS: So you are asking

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a broad based question about two things. Both, you can fabricate but one is cheaper after you fabricate it.

But the performance requirements of both are presumably adequate for the application. Then I would normally expect you might select the lower cost of the two.

But that is not the same as saying that it would be required to or that in the application you are using some other factor might come into play.

These are assuming that they are plug in replacements for one another presumably although in neither Wakabayshi nor Ackland is anything being plugged in or unplugged.

In Ackland's patent combined with Wakabayshi that is a different discussion entirely.

In your hypothetical I am still not sure whether you have given me enough information to try to answer

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that.

BY MR. CAPLAN:

Q. I think that took us through -- let's take a look here.

I just want to finish off this next section. We did paragraph 122.

Paragraph 123 of Dr. Lebby's declaration, you also disagreed with that, and here Dr. Lebby cited Exhibit 2050 which we just talked about.

Do you see that towards the bottom of paragraph 23?

A. I do.

Q. Now, we have been over this one a couple times. Aside from your disagreement with Dr. Lebby's conclusion do you disagree with the Ackland -- Exhibit 2050, the Ackland articles in teaching you that relates to what is in paragraph 123?

MR. DAVIS: Objection. Form.

THE WITNESS: Well, as an initial matter paragraph 123 of Dr. Lebby's declaration begins with the statement that, "If a POSITA

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wanted to implement an Ackland CMOS sensor, Wakabayshi same cost, they would essentially be starting from scratch in designing the camera and unit die."

So as an initial matter that presumably what he is citing these references to support.

He refers to Exhibit 2050 which is actually the Ackland IEEE article for a broad base, I guess he is trying to support the argument that camera on a chip design was the main benefit of CMOS.

I think we have already discussed that, that it is a potential benefit, I would agree with, all -- I believe all of the references identified these as potential or the ability to, not a requirement to do these things.

And his final sentence in paragraph 123 he talks about this camera on a chip design would include

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CMOS, the CMOS pixel array timing and controls and signal processing on a single board and I don't know what he is talking about there.

Whether he is talking about these references, I honestly don't know.

But his assertion that these references support the idea that a camera on a chip design was the main benefit of for instance Ackland's patent, that is unsupported.

Ackland states in his patent that it is the lower cost because of the single polysilicon design as opposed to any requirement for all circuitry on a single chip.

The exhibits themselves state what they state and, again, I would say taking them at face value they do not support Dr. Lebby's opinions.

BY MR. CAPLAN:

Q. But Exhibit 2050 which is the first exhibit that Dr. Lebby is citing in

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this paragraph, 123, the title of Exhibit 2050 is "Camera on a Chip."

You would agree with that, right?

A. I absolutely agree with that. That is the title.

Q. Okay. In paragraph 124 Dr. Lebby again cites to Exhibit 2050.

My question is do you disagree that there is something in -- there is something wrong with Exhibit 2050 or it is improper to cite Exhibit 2050 in connection with the point Dr. Lebby is making in paragraph 124?

A. So in paragraph 124 Dr. Lebby is arguing that using the Ackland patent -- let's see. You would not re -- you would not move the signal processing from board 29 to 39 because it can and shouldn't be placed on a single die, a pixel array, but that is not what the Ackland patent discloses as an initial matter.

It does not disclose that it is a placed on a single die or anything close to disclose that it should be.

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Ackland's IEEE paper, this is Exhibit 2050, so, actually, let me get Exhibit 2050. I want to see what he specifically says.

So in Dr. Lebby's paragraph 125 he cites to the Ackland IEEE article Exhibit 2050 and he cites to apps 25 which is an entire page, the entire page discusses many things.

It talks about back end manufacturing steps, refers to the concept of single chip camera, not the requirement that everything is, simply indicating an ability to try to make a single chip camera. Discusses color filters, talks about micro lenses.

This has nothing to do with integrating additional electronics.

It does state that you will need more than just a silicon die to form as a complete camera.

Let's see. Talks about the evolution of single chip cameras.

And it talks about the

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concentration of work on single chip cameras.

I think given the time frame all of that is -- I take that at face value as well. That is a very different statement than concluding that Ackland's patent requires all electronics be integrated on a single chip in express contradiction to what Ackland's patent shows.

MR. CAPLAN: Why don't we take a break here? We will come back in 15 minutes.

(Recess)

MR. CAPLAN: Patent owner's counsel would like a copy of the transcript expedited.

MR. DAVIS: For petitioner's counsel we do not need it expedited but we do want a copy.

THE COURT REPORTER: Thank you very much.

BY MR. CAPLAN:

Q. Dr. Neikirk, we will keep moving on.

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I want to move to paragraph 34 of your declaration. This involves the topic you raised a couple times that this has to do, at least in your declaration, it is about whether or not redesign or reconstruction is involved.

So turning to paragraph 34, you take issue with Dr. Lebby's assertion that a person skilled in the art would not redesign an Ackland CMOS imager with timing and control circuitry be off chip as described in Wakabayshi.

Do you see that part --

A. I do.

Q. Dr. Lebby cites to paragraphs 110 and 113 to 114 which you identified and then you say you disagree with these assertions, right?

A. That's correct.

Q. So my first question is, why would there not be a redesign of a Ackland CMOS imager in order to be combined with Wakabayshi?

MR. DAVIS: Objection to form.

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THE WITNESS: Well, in that paragraph on page Bates number page 28 I first point out that Wakabayshi doesn't specify -- this is in -- still in paragraph 34, about a third of the way down the page, Wakabayshi does not specify where its timing and control circuitry is located and leaves the implementation detail to a person of ordinary skilled in the art.

I referenced paragraph 86 and paragraph 114.

Then I go on to point out that Ackland's teaching of the CMOS image sensor with timing control circuitry in implementing Wakabayshi's imager would result in a CMOS pixel array and timing and control circuitry on chip on Wakabayshi's imager device 27 requiring no redesign of Ackland.

So leaving the timing and control circuitry on Ackland's chip is fine. Wakabayshi doesn't require you remove it.

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And in that case there would be no change to any interconnect parameters.

Dr. Lebby seems to be focused on inductive and capacitive delays. If the circuitry in Ackland indicates -- let me go to Ackland. So in particular I am referring to Figure 6 of Ackland. Where the timing controller 20 is inside the dotted box labeled "Active Pixel Imaging System."

Leaving that on chip means that any interconnection parameters such as inductance and capacitance is unchanged. There is no redesign.

I further go on to discuss in my paragraph 34 that even if the off chip timing control circuit -- even if timing control circuitry were off chip there is no reason to believe that that would produce additional inductance or capacitive that would significantly affect the operation of the circuitry.

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All interconnections regardless of whether they are on chip or off require some level of consideration of the interconnect loading properties such as capacitance.

And there is nothing to suggest that these particular chips, this particular device, as used in Wakabayshi based on the disclosures in Ackland would cause those interconnections to make the chip fail.

This is an implementation detail that is left to one of ordinary skill in the art. Ackland doesn't even -- doesn't give a layout even for his on chip disclosure. That impacts capacitance.

This is simply something that every designer has to pay attention to.

Dr. Lebby's assertion in paragraph -- let's see, for instance paragraph 110 -- I will go to

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Dr. Lebby's paragraph 110. That a POSITA would not redesign Ackland.

Well, as I pointed out in my paragraph and in my original declaration, first of all, there is nothing to redesign, and even if you were to take the timing controller off the chip, this is simply part of the normal design process that is left to a POSITA regardless.

BY MR. CAPLAN:

Q. So when a person skilled in the art looks at Wakabayshi what does Wakabayshi teach them about whatever Wakabayshi is describing?

MR. DAVIS: Objection. Form. Vague.

THE WITNESS: That I mean I couldn't begin to answer because there is lots of information in Wakabayshi. I don't know specifically what you are asking about.

BY MR. CAPLAN:

Q. But, your declaration talks about

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the combination of Wakabayshi and Ackland as invalidating grounds for these claims, correct?

A. Yes. That is generally correct.

Q. So you are combining using -- the first sub would combine those two references, correct?

MR. DAVIS: Objection. Form.

THE WITNESS: I provided in my declaration and this would be mostly in my original declaration ample evidence that there would be motivation to combine the two, motivation for one of ordinary skill in the art to combine the two references, yes.

BY MR. CAPLAN:

Q. Here in this section of your declaration, Exhibit 1086, in paragraph 34 you challenge Dr. Lebby's position that there would be redesign involved in combining Wakabayshi and Ackland, correct?

A. Well, this paragraph I am specifically discussing Dr. Lebby's

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assertion that any benefits of Ackland's teaching would be lost due to inductive and capacitive delays in the signaling from -- circuitry so paragraph 34 is specifically addressing.

That quotation is from the POR.

But Dr. Lebby stated that a POSITA would not redesign an Ackland CMOS imager with timing and control circuitry off chip as described in Wakabayshi.

Then the inductive and capacitive delays in signaling will cause synchronization in timing issues to operate image sensor row common matrix.

So the first -- Dr. Lebby first asserts that moving the timing and control circuitry off chip is a redesign of Ackland.

Well, I believe Ackland shows the timing control circuitry, timing controller on chip so it does -- moving it wouldn't be a change in Ackland but as I pointed out on the next page of my declaration I never suggested that Wakabayshi requires you to remove -- to move it.

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It doesn't have to be moved. It can stay on Ackland's chip.

But I further took issue with Dr. Lebby's assertion that if it were moved and I don't agree that it must be moved, if it were to be moved that it would fail, that it would cause synchronization and timing issues.

I don't think there is anything in the teaching of Wakabayshi and Ackland to support that conclusion.

Q. You made reference to this sentence in your paragraph 34 about even if the proposed combination included signaling from off chip timing and circuitry any additional inductance or capacitance would not affect -- would not significantly affect synchronization and timing of the image sensor.

You referred to that sentence a few times now, correct?

A. I did.

Q. Right. Now that is your opinion, correct, because you didn't cite any

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articles for that proposition, right? There is no cites there to any additional exhibits?

A. Yes. That is my opinion based on many years of doing research on inductance and capacitance and resistant effects of interconnects both on chip and off chip.

Q. In paragraph 35 in your declaration you again disagree with Dr. Lebby's declaration about modifying Wakabayshi to use an Ackland image sensor regarding cost savings.

Do you see that?

A. I do.

Q. Now, we spoke about cost savings before the last break. Do you recall that?

A. In the specific context, yes.

Q. I believe you testified in connection with those exhibits that Dr. Lebby cited for the cost savings you didn't do any separate investigation of those exhibits, do you recall that?

MR. DAVIS: Objection to form.

THE WITNESS: I don't know how I

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phrased it but I took the statements in those references at face value in the context that Dr. Lebby used them as to whether they supported the specific assertions he was making in those pages.

BY MR. CAPLAN:

Q. Just before I actually -- I had one question in connection with your declaration, paragraph 34, and I think we started off -- you did make note of Dr. Lebby's declaration paragraphs 110, 113 to 114 and we talked about those paragraphs of Dr. Lebby's declaration already.

Do you recall that?

MR. DAVIS: Objection. Form.

THE WITNESS: We have talked about a lot of paragraphs so I can't honestly remember which ones so far we have been through.

I would believe that -- I believe that we have done 113 and 114, I think.

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BY MR. CAPLAN:

Q. Yes. We specifically spoke about 110, 111, 112, 113.

MR. DAVIS: Objection. Form.

THE WITNESS: Yes. I am looking at the end of paragraph 113, for instance. I remember we talked about those references. I don't know whether we covered paragraph 115.

BY MR. CAPLAN:

Q. In connection with the topic being covered in paragraph 34 which is whether or not redesign would be required in combining Wakabayshi with Ackland, the underlying exhibits that Dr. Lebby cited in paragraphs 110 and 113 to 114, you didn't take issue with those underlying exhibits in connection with your testimony in paragraph 34, did you?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: So, in paragraph 34 I was referencing Dr. Lebby's paragraph 110 and paragraphs 113 and

114. So in paragraph 110 Dr. Lebby did talk about integration, timing and control.

The only citation in that paragraph was Exhibit 2058 and he specifies pages.

I would have to again go look at 2058 to see what those pages said.

2058. And he pointed to pages 91 and 92.

And on page 91 it simply discusses CMOS imagers and that their main advantage is compatible with mainstream silicon chip technology which has nothing to do with the issue of timing and control and any impact, inductive or capacitive delays might have on it.

Page 92, scanning through the page, it actually refers to an on chip capacitance, namely the speed limit which would not be influenced by any of the other circuitry.

It talks about the capacitance

of the line that is part of the APS sensor itself.

It does mention that as you add components to it yield will probably decrease, a potential disadvantage but the only reference to speed in that entire section is a reference to speed, a capacitance that would be unaffected by moving timing and control circuitry.

Taking Dr. Lebby's citation to Exhibit 2058 at face value it does not support his opinion that moving timing and control circuitry would have a deleterious impact.

Again, I don't agree that you even have to move it but taking that as a premise the evidence he supported or he cited does not support it.

I would take -- Exhibit 2058, pages 91 and 92, at face value.

BY MR. CAPLAN:

Q. Okay. In connection with paragraphs 113 and 114 of Dr. Lebby's

declaration which you identify as part of the support for his position that you disagree with, aside from disagreeing with his opinion you did not take up a particular issue with the exhibits underlying that -- that Dr. Lebby cited underlying his opinions; is that correct?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: So there are many citations in paragraph 113 of Dr. Lebby's declaration.

The first references voltages required by CCDs.

I think we already talked about that statement from Exhibit 2004.

Taken at face value I don't believe it supports Dr. Lebby's opinion.

I have not done an analysis to see whether each and every statement in there I agree or disagree with. I took it at face value.

There are many qualifiers such

as "often," "relatively large," things that are broad enough that they cover many circumstances.

The next citation is to 2039. That refers to power. I believe we talked about that one.

Again taken at face value, I don't believe this supports Dr. Lebby's arguments. This explicitly states that 1/100th the power of CCD-based systems would result when many functions are consolidated.

That is such a vague statement I will take it at face value but I don't think I could analyze it one way or the other.

Exhibit 2054 refers to on-chip analog to digital converters and on-chip timing and control circuits permitting utilization of an electronic camera on a chip. Well, that is simply saying that if you put those on that permits -- a camera on a

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chip which is undefined, so I don't know what I would -- could really disagree with on that. That is fine. I took it at face value. It doesn't support Lebby's assertions.

And then the final one that we already talked about was -- well, it wasn't the final, it was Exhibit 2007 where there is a very strong statement saying will in every cost instance, the piece cost versus performance winner.

Again, I took it at face value but I haven't decided or tried to analyze whether I agree or disagree with that.

Then there is a reference to Exhibit 2060, 2050 and 2058. I think we already went over those.

BY MR. CAPLAN:

Q. Just so I am clear it has been your testimony as I have understood it that you disagree with Dr. Lebby's opinions but you haven't taken a particular challenge to

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the accuracy or veracity of the particular exhibits he is citing in support of his positions?

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: I believe what I have testified to is that for each of those citations I took them at face value and determined whether they supported Dr. Lebby's opinions.

I believe in every case I have concluded they do not.

I don't believe that I have done a separate analysis of each of these statements. I took them at face value.

BY MR. CAPLAN:

Q. If you can move to your paragraph 37 in your declaration?

A. Yes. I am at paragraph 37.

Q. So halfway down, on to the second page of it you disagree with the assertions by Dr. Lebby and you cite to Dr. Lebby's paragraphs 123 and 124 supporting the points

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he is making that you disagree with, do you see that?

A. I do.

Q. Okay. Here again we have already spoken about paragraphs 123 and 124 so my question is in connection with the position you have set forth in your paragraph 37, aside from disagreeing with Dr. Lebby's opinions, do you have any particular -- do you have an issue with any of the underlying exhibits that he is citing in support of his opinions?

Let's start with paragraph 123.

MR. DAVIS: Objection. Form. Compound.

THE WITNESS: In paragraph 123 of Dr. Lebby's declaration which was a discussion about an allegation of saving costs and a suggestion that one would be starting from scratch.

That statement I disagree with.

Citations that he uses are ones to general benefits of increasing integration. He references to Exhibit

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2050 and 2053. And those references only propose adding certain circuitries and generally refer to potential advantages of increased integration.

I take those statements at face value as well. They are not terribly specific and again I don't believe they support Dr. Lebby's opinions.

BY MR. CAPLAN:

Q. In the answer you just gave you made a comment, and I am just looking at the real time here, that you disagreed with the statement about "starting from scratch."

Do you recall that?

A. Well, I was quoting Dr. Lebby. He says, "If a POSITA wanted to implement an Ackland CMOS sensor Wakabayshi to save costs they would essentially be starting from scratch in designing the camera and die."

I certainly don't agree with that statement. They are not starting from scratch.

Wakabayshi leaves the choice of

image sensor to the person of ordinary skill, any choice.

Q. I just want to make sure I see where you are reading from. For some reason I am not seeing that.

Are you at paragraph 37?

A. I am sorry. I was reading paragraph 123 of Dr. Lebby's -- sorry.

Q. All right.

A. I was in paragraph 37 because I referenced Dr. Lebby's statement in paragraph 123.

Q. I am sorry. Thank you. I lost track there.

Okay. So I do see in paragraph 123 Dr. Lebby is making a comment about "starting from scratch."

It is your testimony that you disagree that you wouldn't be starting from scratch to implement Ackland's CMOS sensor Wakabayshi, is that right?

MR. DAVIS: Objection.

THE WITNESS: That is correct. Wakabayshi leaves the choice of

the solid state imaging sensor to one of ordinary skill.

Selecting Ackland's CMOS sensor doesn't require a "from scratch" design of Wakabayshi.

BY MR. CAPLAN:

Q. So if you are not starting from scratch when you are combining Wakabayshi and Ackland and you are not redesigning Ackland to combine it with Wakabayshi how do you describe the effort that is required to combine Wakabayshi and Ackland?

MR. DAVIS: Objection. Form.

THE WITNESS: Wakabayshi provides a number of teachings about locations, the sensors and circuit boards and the locations of certain types, classes of circuitry.

Those all fit with the same sorts of things that Ackland contains.

Neither Ackland nor Wakabayshi provides a transistor level circuit diagram to specify how to assemble the system. That is one of ordinary skill

in the arts knowledge.

The teachings of the two references and how they fit with claims of, for instance, the '565 patent, they match, but there is no -- in any of those, no transistor level circuit to redesign. It is not an unplug one component and plug in another. That is not what the combination is.

Q. We will take a short break, ten minutes. Would that be okay?

A. Okay.

MR. CAPLAN: Thanks.

(Recess)

BY MR. CAPLAN:

Q. Dr. Neikirk, if the Wakabayshi reference was understood to be a CCD imaging device how would that change your opinion in this matter?

MR. DAVIS: Objection. Form.

THE WITNESS: I have not considered that because clearly Wakabayshi is not restricted to CCD

and I have not considered anything about Wakabayshi's descriptions that limits it to one type of solid state sensor or not so I couldn't give you an opinion on that.

It is based on a premise that I believe is fundamentally incorrect and not one that I ever assumed.

BY MR. CAPLAN:

Q. We talked a number of times about the Ackland reference and you made the point that the Ackland article that we have talked about which is Exhibit 2050, it doesn't connect to the Ackland patent which I believe is, I don't want to get the wrong number, I think it is 2006, it is -- let me rephrase that.

A few times today we talked about the Ackland article and you have testified that there is no direct linkage between Exhibit 2050 which is the Ackland article and Exhibit 1006 which is the Ackland patent.

Do you recall talking about that

today?
A. I believe we were discussing the section that is in my declaration. Let me find that.
MR. DAVIS: Objection. Form.
THE WITNESS: Just trying to find the right paragraph in my declaration.
I don't have that -- I was looking at my table of contents to see if that would quickly get me to the right section but I think I actually have to flip pages so give me a moment.
BY MR. CAPLAN:
Q. Sure.
A. So I believe that would be paragraph 32 of my declaration where I did point out that the Ackland paper, the ISSC96 paper which is Exhibit 2050, and the Ackland patent, they don't reference each other, there has been nothing else to establish any specific linkage.
The subject of Ackland's patent is

titled "Single Polysilicon CMOS Active Pixel Image Sensor."
It is nowhere referred to in Exhibit 2050 so, yes, I believe I already mentioned all of those things.
Q. If Ackland had an article which talked about the single polysilicon technology in his patent and described that as a camera on a chip technology or implementation would that change or how would that change your opinion in this matter?
MR. DAVIS: Objection. Form.
THE WITNESS: It wouldn't change my opinion as to what Figure 6 clearly and exclusively discloses, figure 6 of the Ackland patent, the '141 patent.
He can write anything he wants in another paper but unless he says that here is -- that the disclosure of Figure 6 in that patent is not what it discloses, not what it shows, then it doesn't change any opinion.
There is a plain and simple

reading of what Figure 6 shows. There is a chip labeled "Active Pixel Imaging System."
It does show timing controller 20 on that and it has a single wire that leaves that chip and exits the chip and goes to two processing circuitries labeled in Figure 6 for the Ackland patent.
Dr. or Mr. or Dr.Ackland may very well have designed other things, may very well have invented other things; that doesn't alter what he discloses in the '141 Ackland patent.
BY MR. CAPLAN:
Q. Your testimony on Figure 6 is based entirely on the arrow which just says "to processing circuitry" in Figure 6, correct?
A. It is based on the dotted box. It is labeled "Active Pixel Imaging System."
If we go to the text of the patent itself there is no statement that indicates that what is not shown inside the dotted box

is inside the box. It does discuss -- let's find wire 19.
Scanning through the specification. It discusses output amplifiers 18 which are inside the box and labeled "Output Amplifiers," I would note.
So if you look in column 7 of the '141 Ackland patent starting at lines 59 and following, it talks about forming a single polysilicon active pixel image system such as Exemplary Imaging System 1 shown in Figure 6.
It then says that that imaging system may be used as a solid state camera. It doesn't say it is a complete camera. It says Imaging System 1.
And then it says what it includes, "an array of pixels, plurality of output amplifiers."
Then moving on to column 8 it talks about any number of rows and columns of the pixels. It says it is connected to a common conductor 55. This is how the pixels operate. That discussion is in column 8.

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And then in column 8 at line 18 it goes on and talks about common conductor 65 to a particular amplifier 18. It is already described, amplifier 18 as an output amplifier.

It nowhere discusses incorporating processing circuitry into the active pixel imaging system.

Q. Doctor, in that Ackland '141 patent that you were just looking at, in column 8, click lines 51 and 52, it does say that "The output signals are routed to suitable processing circuitry not shown."

Do you see that?

A. Yes. It also says at line 49 or 48, "Output signals from amplifiers are provided to the common output line 19 in serial fashion." And those output signals are routed. Yes. On a single wire, off of the active pixel imaging system as shown in Figure 6.

That is what one of ordinary skill in the art looking at Figure 6 would understand.

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Q. That is your understanding of the term "not shown," correct?

A. Correct. Because it is not part of his chip.

Q. Okay.

A. Let me clarify.

You made it sound like the basis of my opinion is only the words "not shown." That is not true.

Look at Figure 6. Figure 6 is unambiguous, it is clear. It shows what the '141 patent considers to be the active pixel imaging system in clear and unambiguous fashion.

It also indicates how it places the data onto a single conductor 19 which leaves the active pixel image system and Ackland didn't show it because the processing circuitry is not part of his invention. It is not part of the chip.

Q. That is your understanding of what is shown in Figure 6, correct?

A. I believe one of ordinary skill in the art would see this as a clear and

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unambiguous disclosure of circuitry that is not on the chip. Yes, that is my opinion.

Q. When you started your analysis of the Wakabayshi and Ackland combination did you start with the assumption that Wakabayshi was the CMOS imaging device?

MR. DAVIS: Objection.

THE WITNESS: No. I read Wakabayshi and Wakabayshi is clear. It is a solid state imaging device, period, any solid state imaging device. Wakabayshi doesn't care.

BY MR. CAPLAN:

Q. But it is your testimony that it is not a CCD device?

MR. DAVIS: Objection to form.

THE WITNESS: It is not -- I testified that it is not required to be a CCD device.

Dr. Lebby seems to be of the opinion that it must be a CCD device. I strongly disagree.

Wakabayshi is silent. It is agnostic. It does not care what kind

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of solid state imaging device is used.

BY MR. CAPLAN:

Q. Wakabayshi was filed in Japan in 1994; is that correct? That is what it says on the base of the original.

A. I have to look at Wakabayshi again but I have no reason to disbelieve that. That sounds about right.

Let me look at my copy.

Yes, it says the foreign filing priority date was August 26, 1993, yes.

Q. Do you have an understanding of what the video camera market was in Japan in 1994 in terms of the type of image sensor device it would use?

MR. DAVIS: Objection. Form.

THE WITNESS: I don't know what every camera that was built in 1994 in Japan, what kind of sensor it used. I have no -- I do not know what every single camera ever built in Japan in 1994 used as its imaging sensor.

BY MR. CAPLAN:

Q. In August of 1995 when Wakabayshi

was filed in the U.S. do you know what the dominant or -- strike that.

Do you know in August 1995 what the U.S. market for video camera image sensors looked like in terms of what was the common type of technology used at that time?

MR. DAVIS: Objection. Form.

THE WITNESS: I don't know what the market was. I believe we have -- I referenced a number of different types of sensor array references. Before 1997. I don't know whether they were 1995 or not.

No, I don't know precisely what the total market distribution list or what kind of sensor was used in every single camera built anywhere in the United States.

(Continued on next page)

MR. CAPLAN: I don't have any further questions, Dr. Neikirk. I appreciate it.

MR. DAVIS: No questions.

(Time noted: 4:27 p.m.)

_____
DEAN PAUL NEIKIRK, Ph.D.

Subscribed and sworn to before me this day of 2021.

_____

CERTIFICATE

STATE OF NEW YORK)
: ss
COUNTY OF NEW YORK)

I, Steven Neil Cohen, a Registered Professional Reporter and Notary Public within and for the State of New York, do hereby certify: That DEAN PAUL NEIKIRK, Ph.D., the witness whose deposition is herein before set forth, was duly sworn by me and that such deposition is a true record of the testimony given by such witness.

I further certify that I am not related to any of the parties to this action by blood or marriage and that I am in no way interested in the outcome of this matter.

I further certify that neither the deponent nor a party requested a review of the transcript pursuant to Federal Rule of Civil Procedure 30(e) before the deposition was completed.

In witness whereof, I have hereunto set my hand this 3rd day of March 2021.

Steve Cohen

STEVEN NEIL COHEN

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DEPOSITION ERRATA SHEET

Case Caption: Samsung Electronics Co. Ltd. vs. Cellect LLC

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I declare under PENALTY OF PERJURY that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

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