EXHIBIT 4

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION

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MAXELL, LTD., :

Plaintiff, : Case No.

v. : 5:19-cv-00036-RWS

APPLE INC., :

Defendant. :

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Videotaped deposition of VIJAY MADISETTI Ph.D.

Tuesday, October 22, 2019

Atlanta, GA

8:57 a.m.

Job No.: 170439

Pages: 1 - 186

Reported by: Giselle Mitchell-Margerum, RPR, CRI, CCR

different aspects of image and video processing. Do you consider any of those topics more relevant to the technology at issue in this case?

A. I would generally say that they are all generally relevant. The whole area was in the area of image and video processing.

Q. Got it. So, around the same section of your expert report -- around paragraphs 28 through 31, you provide an opinion on the level of ordinary skill in the art. Do you see that?

A. I do.

Q. And it's your opinion that a person of ordinary skill in the art would be a person with a bachelor's of science degree in electrical or computer engineering, computer science, or an equivalent degree; and at least two years of experience working in the field of image/video processing.

Is that correct?

A. That's right.

Q. And what do you mean by "working in the field of image/video processing?"

A. They would be dealing with both the hardware and the software aspects of image and

video processing.

Q. So you would consider someone of ordinary skill in the art, as a bare minimum requirement, to have some experience in both the hardware and the software aspects of video image -- I'm sorry -- video/image processing.

Is that right?

MR. NESE: Object to the form.

A. No. The way I've said that in paragraph 30 -- I mean, I think that two years of experience in the field of image/video processing is what I consider as the definition of a "POSITA" here.

THE COURT REPORTER: Of a what?

THE WITNESS: Of a person of ordinary skill in the art. P-O-S-I-T-A.

BY MR. ZHOU:

Q. So, during this deposition, if I use the phrase, "POSITA" -- P-O-S-I-T-A -- to refer to a person of ordinary skill in the art, around the time of the 493 Patent's filing, would you understand that?

A. Yes, I would. It would refer to what I describe in paragraphs 28 through 31 of my declaration.

Q. So, as part of working in the field of image/video processing, what knowledge must a person know to qualify as a POSITA?

A. Generally, familiarity with the types of processing that occurs with image and video acquisition; with post-processing with the different types of -- with the different types of -- improvement of the quality of the image; better storage; ability to convert it to different forms.

Q. So if you were to, say, you know, interview a person to determine whether that person qualifies as a POSITA, or not, would you expect that person to know about the different types of image sensors that were, you know, available on the market?

A. At some level, yes, they would be knowledgeable about some types of sensors.

Q. So around -- I want to keep -- ask you to keep in mind that this patent was filed in early 2000. Do you recall that?

A. Yes.

Q. So, around that time, would you expect a POSITA to know about different types of image

sensors, like CCD sensors, and CMOS image sensors, and so forth?

A. Yes.

Q. Would you expect that person to know the differences between how a CCD sensor would work versus how a CMOS sensor would work?

A. Yes.

Q. Would you expect a person skilled in the art to know about how the pixels are arranged on the sensor?

A. Yes.

Q. In horizontal row, and vertical columns, and so forth?

A. Yes.

Q. And those would be common knowledge that you would expect a person skilled in the art to know, heading into -- you know, even before reading the 493 Patent. Right?

A. Yes. They would be -- they would be knowledgeable as to those formats.

Q. As part of working in image/video processing, would you expect a person skilled in the art to know about image signal processors and image signal processing algorithms?

A. Yes.
Q. What would you expect a person skilled in the art to know in those aspects?
A. Things like -- topics like interpolation, decimation. Topics like noise removal; pixel collection; various types of compression; storage types of techniques.
Q. Right. So, I think the first thing you mentioned was "interpolation." Right?
A. Yes. Interpolation, decimation and others.
Q. So, interpolation refers to taking an image and trying to kind of increase the resolution -- pixel resolution of the image by interpolating between pixels. Is that, generally, correct?
A. Now, as I said, I mean, one of -- it could be one of the uses. That's not a definition. "Interpolation" can be used in many, many ways.
Q. So one example of a use for "interpolation" would be to take a low resolution image and try to increase the resolution by interpolating between pixels. Is that right?
A. That's one example, yes.

Q. And "decimation;" one example of a use for "decimation" would be to take a higher resolution image and reduce the resolution of that image. Is that right?
A. That's -- one again -- one example of "decimation."
Q. In your CV -- earlier in your CV, around paragraph 13, you had mentioned that you worked on image processing chipsets, like the Intel and MXP5800 family of image processing chipsets.
Do you see that?
A. Yes.
Q. So, would you expect a person of ordinary skill in the art, as relevant to the 493 Patent, to know about different types of image signal processors available on the market, around the time of the patent's filing?
A. At a high level, yes.
Q. The product that you worked on -- the Intel MXP chipset -- was it capable of performing the general types of image/video processing you discussed earlier? Like interpolation, and decimation, and noise removal, and so forth?
A. Yes. It was used in photocopiers.

Q. And what years did you work on this Intel chipset?
A. In the early 2000 time frame.
Q. Early 2000, after the filing of the 493 Patent?
A. Around that time frame.
Q. As part of working in image/video processing, would you expect a person skilled in the art to know about different types of display screens and display formats?
A. Yes. Generally, again, at a high level.
Q. For example, would you expect a person skilled in the art to know about the difference between CRT displays, and LCD displays, and active matrix displays, and so forth?
A. At a high level, yes.
Q. What about television display standards, like NTSC, and PAL, and so forth?
A. At a high level, yes.
Q. And what do you mean by a "high level?"
A. Again, because it's signal processing, and image processing, at a very high level. They may not be intimately familiar with all aspects of it.

Q. But you expect them to know, at least, the general concept of, for example, NTSC display. Is that right?
A. I would expect them to know the general aspects of TV broadcast and signal formats. Both progressive, as well as interlaced approaches. Because they have been around since the 1930s and '40s.
So, I would expect them to be familiar that TV -- TV systems -- TV display systems would support both progressive and interlaced approaches.
Q. So, going to paragraph 29, you say here that, as relating to the 493 Patent, the patent involves general principles, including the concepts of digital image and video processing for electric cameras.
Do you see that?
A. Yes.
Q. What do you mean by "electric cameras?"
A. Primarily, digital cameras and devices.
Q. Is there a difference between electric cameras and digital cameras, in your mind?
A. I would say that digital camera is an -- digital camera is what is generally being referred

for interlacing. So where, I think, your expert has errored, or erred, is that he seems to state that vertical blanking period field -- vertical blanking period only applies to master scanning, which only applied to interlacing, and he is wrong.

So you can have vertical blanking period in -- for the sake of progressing scanning and displays as well. And a simple book, for example, by Charles Poynton. The book is called "HD Video," has, in chapter eight, a full description of how vertical blanking period is present in progressive displays and scanning.

Q. Dr. Madisetti, what I asked you to explain is what a vertical blanking period is. Right? And your answer was, "it traces back to the first line." So what I'm asking you is, what is being traced back to the first line?

A. The scan position.

Q. The scan position of what? The electronic gun that's shooting at the CRT? Or what is being --

A. It could be anything. For a digital sensor, or for a digital display. It could be the position. Depending on whether it's a CCD, or

whether it is a CMOS. It can have different types.

Again, the examples are describing certain embodiments, but one of ordinary skill in the art would understand that this applies to CMOS; CCDs. It would have also applied to progressive and interlacing.

Q. So, the horizontal scanning period, is it correct to understand that the horizontal scanning -- strike that.

Is it correct to understand that the horizontal blanking period has a time gap between scanning of individual horizontal lines? Is that correct?

A. Roughly, yes. Again, I'm not exactly sure how -- what additional qualification is needed there, but it's generally right.

Q. And the vertical --

A. And it doesn't matter. It applies to both interlacing and progressive.

Q. And the vertical blanking period is the time gap between the last pixel on one field, or frame, and the first pixel in the next field, or frame. Is that correct?

A. It's the time between successive frame

reads and successive line reads. Successive line reads is the horizontal blanking. Successive frame reads is the vertical blanking.

Q. But in the context of interlace, it would be successful field? Or is it still successive frame?

A. Successive field for interlaced. And for progressive, it's successive frame. But, again, I have to look at the specific way this is used.

Q. And so, we talked about horizontal. We talked about vertical. Are those well understood directions to a person skilled in the art, in the context of image processing?

A. Again, I'm not sure as to your question. I mean, the way the typical digital image sensors are read, are rows and columns. So, in the context of the example shown, they have used some examples to show how you could drive, say, an interlaced or a progressive TV system.

But you don't need to have a TV display as a part -- you don't have -- necessarily have to have a particular type of display.

Q. So, horizontal would be in the direction each line is being either read out, or being

scanned on to the display. And vertical would be the direction perpendicular to that? Is that your understanding?

A. Again, those are, again, very loose terms. Some people say it depends on the type of scanning. So it could be zigzag. It could be angular. It could be moving in -- I'm not sure what you mean, perpendicular. But one refers to rows. The other refers to the entire set of rows.

Q. So if I flip this iPad onto sideways, it doesn't change the direction of its scanning; right?

A. You're talking about the camera?

Q. So, I asked you what vertical -- the scanning period and vertical blanking period are, and you provided an explanation that uses the terms "horizontal" and "vertical."

I'm just trying to understand what you mean by the horizontal and the vertical aspects, in the context of these two terms. Right?

A. Yeah. But those terms are not part of the claims, which is why I was trying to look into the specification.

Q. Sure.

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