1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3 APPLE INC. AND GOOGLE LLC,
4 Petitioners,
5 vs. Case Nos.
6 IPR2023-00343
7 IPR2023-00344
8 SPACETIME3D, INC.,
9 Patent Owner.
10 _____
11
12
13 The Virtual Deposition of SCOTT SCHAEFER, Ph.D.
14 Taken Via Remote Zoom Videoconference
15 Commencing at 10:39 a.m.
16 Tuesday, January 9, 2024
17 Stenographically reported by:
18 Joanne Marie Bugg, CSR-2592, RPR, RMR, CRR
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22
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25 Job No. 6405535

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Zoom Videoconference
Tuesday, January 9, 2024
10:39 a.m.

SCOTT SCHAEFER, Ph.D.,
was thereupon called as a witness herein, and after having first been duly sworn to testify to the truth, the whole truth and nothing but the truth by the stenographer, was examined and testified as follows:

EXAMINATION

BY MR. KHAN:

Q. Thank you. Good morning, Dr. Schaefer. My name is Usman Khan. I am here on behalf of the petitioner, and will be asking you questions related to your declarations. Before we just get started, I wanted to check the transcript. It's not updating realtime. Can we just check that quickly, please.

(Off the record at 10:39 a.m.)

(Back on the record at 10:40 a.m.)

BY MR. KHAN:

Q. Okay. Great. Good morning again, Dr. Schaefer. Thanks for your patience. I'll start off today with some questions, general questions before getting into specifics. I'll provide some breaks periodically, and should you need to take a break, please let me know.

I'll just request that when you do ask for a break, maybe give me a few minutes advance notice so that I can wrap up my line of questioning upon the pause. Does that work for you?

A. Yeah, that should be fine. Thank you.

Q. Great. During the breaks, you understand that you're not allowed to discuss the substance of your testimony today until your cross-examination has concluded.

A. That's right.

Q. And we agree to let me know if at any point anyone does communicate with you in any manner during the course of our deposition today regarding your testimony?

A. Sure.

Q. And do you agree that we'll be discussing your declaration submitted in the IPR proceedings IPR2023-00343, which relates to U.S. patent number 9,304,654, and IPR proceeding IPR2023-00344 which relates to U.S. patent number 9,696,868?

A. Yes.

Q. For purposes of brevity, I'll refer to the patents in question as the '654 and '868 patents, and the proceedings as the '654 and '868 proceedings. Is that okay?

A. Yeah, should be fine.

Q. Okay. And do you agree that your declarations in these

proceedings correspond to Exhibit 2015 in the '654 proceedings, and Exhibit 2016 in the '868 proceedings?

A. I'm not sure. I don't remember the exhibit numbers. It doesn't sound incorrect, but I don't know for sure what the exhibit numbers are.

Q. Okay. And because this is a consolidated deposition, my questions will generally apply to both the declarations unless I specify that a particular question is directed to one of the declarations.

A. Okay.

Q. And for the purposes of convenience or ease, I'll refer to the paragraph numbers that are used in your '868 declaration if that's okay. Please let me know.

A. Yes, that should be fine.

Q. Great. Do you understand that your testimony today is sworn testimony taken under oath?

A. Yes.

Q. And do you understand that your oath, that the oath you've taken in this deposition is as solemn as the oath you would take as if you were testifying at trial?

A. That's my understanding.

Q. Do you understand that the deposition today, the testimony from the deposition today can be used at trial and in subsequent briefs in these proceedings?

A. Yeah, I believe that's true.

Q. Are you taking any medications that would prevent you from answering the questions completely and truthfully to the best of your ability today?

A. No.

Q. Is there anything else that would prevent you from answering the questions completely and truthfully to the best of your ability today?

A. No.

MR. CORDREY: Can I ask one quick question? I just want to confirm this is being transcribed, and we're not recording this by video means.

MR. KHAN: That's correct. We're not doing any video recording today.

MR. CORDREY: Thank you.

BY MR. KHAN:

Q. Dr. Schaefer, did you write the '868 and '654 declarations yourself?

A. I met with counsel. We discussed things. I wrote an initial draft there. Actually, originally parts of the text are from the '048 declaration, which we can see if you compared them, for example. So that was sort of the starting point.

Q. And how long, approximately, did it take for you to write these declarations?

A. Oh, I don't remember exactly. This is months ago. It

was probably over a period of a few weeks is my recollection, but I don't know for sure.

Q. And was there anyone else other than counsel for patent owner who was involved in the preparation of your declaration?

A. No.

Q. Did you have any assistance from any other person, for example, a student or somebody else in reviewing any of the documents for preparing your declarations?

A. No.

Q. Have you been deposed before?

A. Yes.

Q. Approximately, how many times would you say you have been deposed?

A. Oh, I don't know numbers exactly. I'd say probably on the order of maybe 20 times or something is a guess. I don't know. I'd have to check my records to be sure.

Q. Okay. And do you have an idea or sense of how many of these depositions were in IPR proceedings?

A. I do.

Q. Could you give me an approximate of the number of depositions you're involved with for IPR proceedings?

A. You want me to include this deposition or not?

Q. Sure.

A. Then two.

Q. So before the '048 and this deposition today, were you involved in any other depositions for IPR proceedings?
A. Not to my recollection.
Q. Did you review the '654 and '868 declarations that you wrote prior to our deposition here today?
A. Yes.
Q. Did you review the board's institution decisions in these cases?
A. I have reviewed those documents, but it's been a while since I looked at them.
Q. So I wanted to ask you a few questions about your background, if that's all right, beginning with your professional background. Is it correct that you received a BS in computer science and mathematics from Trinity University in the year 2000?
A. That's correct.
Q. And after that, you received a Master's in computer science from Rice University in 2003?
A. Yes.
Q. And after that, a Ph.D. in computer science from Rice University in 2006?
A. Yes.
Q. Can you tell me a little bit about your Master's thesis?
MR. CORDREY: Objection. Form.

A. One second. I'm trying to remember what the title of my Master's thesis was actually. Interpolatory subdivision for surfaces of revolution. Sure. Subdivision is a process that uses some geometry as input. In this case, I was focusing on surfaces, and uses a set of refinement rules to create more refined geometry as output. It's a recursive process, so you repeat this process repeatedly.

This has been used to generate various types of curves or surfaces that we call splines that are usually polynomial or piecewise polynomial in nature.

Surfaces of revolution are surfaces whose cross-section's a circle. And so a circle is not made out of polynomials. It's made out of a set of perhaps rational polynomials, but then they don't have what we would call arc length parameterization. Basically the dots that you would generate that are part of the surface are not evenly spaced is what would happen.

You can use trigonometric functions for surfaces of revolution like cosine and sine, but these are not polynomial, and not rational in that case either. And so what I did is I developed a set of refinement rules that would place vertices in locations such that you could actually generate surfaces of revolution.

They're called interpolatory surfaces because we call them control points. The points that control the shape of the surface actually lie on what we would call the limit surface, which is the limit if you repeat this recursive process an infinite number of times, it generates a surface in we call it the limit. The end result where the points actually lie on the surface, and this is opposed to shapes like B splines where they are approximating the control points, and actually do not lie on the surface. They just approximate the shape. And we can make that what approximate the shape means like mathematically precise if you'd like.

Q. And was your Ph.D. dissertation a continuation of this research, or was it a separate project altogether?

A. It was mostly a separate project, although there were sort of three aspects of my dissertation. One was related to subdivision, but it was in this case it was a volumetric subdivision scheme that was based off of tetrahedra and octahedra, and made up a portion of my dissertation, so it was related in that there was some subdivision aspect.

Q. According to your CV, your Ph.D. dissertation title was Intuitive Methods for 3D Shape Deformation. Can you tell me a little more about the intuitive methods that

were the subject of your dissertation?

A. Sure. There were multiple things covered by my dissertation, as I said. There was a tetrahedra octahedra subdivision scheme, or actually octahedral subdivision scheme.

Tetrahedra, they're just pyramids basically in 3D. Octahedra have sort of a square pyramid, so four triangles touching a point, and then reflect that over it, and it generates the same type of thing on the bottom basically. So it's one shape. And you can tile space using alternating tetrahedra and octahedra, and so I built a subdivision scheme. Actually, the first volumetric subdivision scheme for dealing with these sort of mixed types of shapes. And you could use it to deform surfaces.

So the way this works is you create a whole bunch of tetrahedra around a shape that you want to deform, and put the shape inside of it. And then the points on the shape actually can be represented as a weighted combination of the vertices of the tetrahedra. So more laymen's terms, if you take those tetrahedra and now move them, the shape and side moves as well.

Okay. And so it's a type of deformation that we call a preform deformation that are used to manipulate shapes, so this was a new form of preform

deformation. That was one part of my dissertation.

Another part of my dissertation was to develop a 3D form of what's called new value coordinates which are a type of barycentric coordinate. And so these points -- barycentric coordinates go back to Mobius, which is -- what was he, in the 17 or 1800s, or something like that. But we generated a generalized form. And so the way this works is in this case you have a high resolution surface, and you build a polygon approximation, so not tetrahedral approximation, which requires volumes, but a surface that approximates the shape. And then you can represent the vertices of the surfaces of the combination of what then has been called a cage since then. And so if I manipulate the vertices of the shape, it produces a deformation of the underlying surface.

So this is actually a technique that's been implemented by Pixar as part of their movies. They used it as part of production since the movie Ratatouille, I believe. And so you can take -- like the example that they did for testing is Dash from the movie The Incredibles, and you put sort of a polygonal low resolution cage around Dash. And then if you move that low resolution cage, it causes Dash to perform different animations basically.

And so Pixar ended up liking this because it divorced the geometry from the animation. A lot of their tools, the animation is embedded in the geometry. And so if the director, for example, says later I want to change the look of Dash's face, or something like that, you have to throw away those animations and redo them. So if you divorce them from the geometry, you can change the geometry and leave the animations in the end.

And then the last aspect was about a technique for moving these squares to perform -- this one was an image deformation technique. And it used both points and lines for deforming images. It was a mathematical technique that I developed for creating such deformations.

The example that I did it was taking a picture of the Leaning Tower of Pisa, and like straightening it basically so that it was vertical, you know, fixing an architectural problem. And it's through the perception in the image of doing that, yeah.

Q. Thank you. Now, you finished your Ph.D. in 2006, and MS in 2003, on Bachelor's in 2000; is that correct?

A. Yes.

Q. So were you at this point basically continuously

working on your research, and Master's, and Ph.D. from the year 2000 and 2006?

A. Yes and no. I was also employed by some companies during that time period. Sometimes that was related to my research that I was working on. Well, almost all it related to my research, but usually it was related to computer graphics, or computer science in some way.

Q. What were your employments at this time?

A. What do you mean by at this time?

Q. So between 2000 and 2006, you just told me that you were employed by some companies. My question is what were the companies, and what was your employment?

A. Sure. So in -- I think it was around 2003 time period, I was employed by a company in Boston called SensAble Technologies. They make a -- or at least at the time, I don't know if they still do, they made a 3D haptic feedback device called the Phantom. It's a pan on the robotic arm that you can move in space, and you can actually feel objects basically with it, even though there's nothing there. They hired me to implement some of my research on a topic called dual contouring as part of their 3D modeling software that I think that they were building.

I think they had a customer in the automotive industry, and so they were interested in

utilizing my research as sort of the core part of their modeling algorithm. So they employed me during that time period.

Around, it's probably around 2004, I'm not 100 percent sure on the date just sitting here, I was employed by a company called MAC3. It was a startup company that was spun out of MIT. Again, I was in Boston, this time right outside of MIT. And it was a computer vision company. So they hired me to implement the core computer vision algorithms as part of their product.

The basic idea was you took photos of different objects. Maybe they were buildings, or statues, or something like this from different perspectives. Those photos would have to be aligned pairwise from one another in sort of the three dimensional space to get the camera parameter's position, location, orientation that the camera took the picture of. And then there was a process of bringing them all into alignment together through something called bundle adjustment. That was the algorithm.

And they were having trouble finding MIT students and graduates that could understand the algorithms, and so forth, to actually implement these

things, so they hired me to implement them as sort of the core part of their computer vision modeling system.

I spent some time at Microsoft Research in 2005. And I worked for them working on some algorithms for it was the next generation of graphics hardware that was being produced. The research that I did there ended up making a change to the direct X11 standard which they were working on at the time to include something called a test later unit.

And so that was -- the idea there was we were trying to bring -- this is the way we told management, it was to bring movie quality graphics to realtime applications. And so that created a change to every GPU produced since I think it was 2009 is the first time DirextX 11 GPU started being produced. And I also worked there a little bit after I got my Ph.D. in 2006 as well.

Q. Just to be clear, when you said you worked there after you got your Ph.D., did you mean you worked with Microsoft?

A. Yeah, Microsoft Research.

Q. How long was your employment with SensAble Technologies?

A. I don't remember. I think I was there maybe three months, maybe it was four. I don't really remember.

Q. Was it full time or part time?
A. During the time that I was there, I was full time, but it was just going to be for a short time period, because I was still working on my Ph.D.
Q. How long was your employment with MAC3?
A. MAC3 I think was two or three months. I remember it snowed in Boston at the time, and I thought it was one of the coldest places on earth.
Q. I can certainly empathize. I was there at the same time.
A. Were you?
Q. Okay. And was that full time or part time?
A. I mean, while I was there, it was part time, but there that was -- I was going sort of back and forth, because I was still doing -- that was when I was at SensAble. It was mostly over the summer. And so it was sort of a break in the whole academic schedule. Whereas, when I was at MAC3, it was not. It was over the regular semester. So they were flying me back and forth to spend, you know, a week working full time there, and then I'd fly back for a time period, and then come back.
Q. And your work at Microsoft Research in 2005, how long did that last?
A. That was about three months.

Q. And was that full time or part time?
A. Full time.
Q. Do you recall when in 2005 you started your work with Microsoft Research?
A. It was either probably May or June. Not exactly sure what month.
Q. In your CV you mention that you were a visiting researcher with Microsoft Research starting as of August 2006; is that correct?
A. Yes.
Q. At the same time were you also assistant professor at Texas A&M?
A. I started in the same month.
Q. Were you teaching any classes in 3D graphics when you were appointed as assistant professor in the fall of 2006, or after your appointment? Sorry.
A. Once I started that first semester in the fall of 2006, I did have a class on -- I think it was a special topics class on deformation methods in computer graphics, or something to that effect. I don't remember the exact title.
Q. Did that involve 3D graphics?
A. It involved graphics in different dimensions, but 3D was part of it.
Q. What parts of 3D did you cover in that special topics

class?

A. I don't necessarily remember off the top of my head. That class is a -- it's sort of a one time type of class, you know, that was taught. I think, what is that now, over 17 years ago at this point. They were techniques, I think, related to different types of deformations. Sometimes those are specific to 3D. Other times they work in other dimensions, or sometimes they're specific to 2D in that case. It just depends on the technique.

Q. Did you hold any post-doc positions, or did you transition straight into an assistant professorship role after your Ph.D.?

A. I mean, technically I think my advisor employed me as a post-doc for a few months after my Ph.D. Maybe it was even part time. I don't really remember, but it was a very short time period. It wasn't something that I applied for, and I don't even typically list it on my CV. It was more just a continuation of our Ph.D. relationship after I graduated for a short time.

Q. Do you recall what the nature of the research was during your post-doc?

A. Yes. We were working on medical data from the medical center in Houston. And specifically it was looking at volumetric data that came from -- I think they were CT

scans typically of patient's lungs. And the idea was to perform CT scans sort of continuously while a person was breathing. You know, the lungs don't stay constant. You can tell someone to stay still, but you've got to keep breathing, basically, so your lungs keep moving.

And so the idea was to track the movement of the lungs, basically, through this volumetric data while someone is breathing to sort of register. It's called registration, the data together. And so I worked on both image and sort of surface techniques for doing the registration and tracking of lung tissue as somebody was breathing.

Q. Up to the year 2006, were you familiar with any SpaceTime3D products?

A. No.

Q. In searching for literature during your research up to 2006, did you come across any publications that discuss SpaceTime3D products?

A. No.

Q. Are you a named inventor in any patents?

A. There's been a few patent applications that I think I've been listed on, but I don't think any of them were issued as patents.

Q. Do you recall why those applications did not issue as

patents?

A. I wasn't really involved with much of those. One I think was submitted by Microsoft. I had a meeting with an attorney, and that was the last I think that I dealt with that. There was another Microsoft employee on that. Maybe he dealt with it more after that, but I don't know. That was something Microsoft was pursuing.

Another one was one that a faculty member at Georgia Tech wanted to pursue. I was not very interested in pursuing. But, you know, as these things happen to go, when Georgia Tech said that they were going to pursue it and cut the university out, Texas A&M got pretty upset about the whole thing. All of a sudden wanted to be a part of it. So Georgia Tech handled that. I was just, you know, one of the people that worked on the project, so I don't really know what happened.

Q. Have you ever been involved in the prosecution of any patent?

A. What do you mean by involved in the prosecution of the patent?

Q. Thanks for letting me clarify that question. Have you reviewed any communication from an examiner during the course of prosecution of one of your patent applications?

A. I do not recall seeing anything from an examiner for any of the patent applications that I had.

Q. Were you involved in providing any kind of feedback to the patent office with respect to any rejection an examiner may have provided for one of your patent applications?

A. No. Like I said, in those applications, I was only involved in the very initial aspect. I don't really know what happened after that.

Q. Prior to the year 2006, were you involved in research -- scratch that.

Prior to the year 2006, were you involved in any research that involved transitioning from 2D displays to 3D displays? I'm sorry. Let me paraphrase that. Let me rephrase that.

By 2006, were you involved in any research that involved display systems that were capable of transitioning from 2D displays to 3D displays and vice versa?

MR. CORDREY: Objection. Form.

A. Can you clarify what you mean by 3D display?

BY MR. KHAN:

Q. So I'll rephrase that question. Prior to 2006, working you involved in any research that involved display systems that were capable of displaying 3D data and 2D

data, and transitioning between the display of 2D data and 3D data?

MR. CORDREY: Objection. Form.

A. I mean, I think you'd need to -- it depends on how you interpret some of the terms that you just provided here. So we talked about like my computer vision work at MAC3, for example. Computer vision is often thought of as an inverse rendering problem. You're given a two dimensional image, and the goal is to sort of recreate the geometry that produced the image.

And so computer vision could be thought of as taking an image that's, you know, just at a standard two dimensional shape, and trying to recreate sort of three dimensional geometry.

Rendering, on the other hand, is often considered the opposite problem where you're given some geometry. The dimension of the geometry could vary, I suppose, but the goal's to produce an image of that geometry. So, I mean, in that sense, I guess I have been involved, but it depends on how you interpret the terms that you just mentioned.

BY MR. KHAN:

Q. In preparing your opinions provided in the '868 and '645 declarations, what materials did you review?

A. Well, I reviewed a lot of the materials, I suppose.

1 Anything that's cited in those declarations is
2 something that I reviewed. I may have reviewed other
3 documents. I don't really remember.
4 Q. In your declaration, you mention a priority date. What
5 is the priority date that you use for purposes of the
6 '868 proceedings?
7 A. Can you tell me where in my declaration you're
8 referring to?
9 Q. Sure. Paragraphs 18 and 19 in the '868 declaration.
10 CONCIERGE: Do you want me to move that to
11 the public folder, counsel?
12 BY MR. KHAN:
13 Q. Dr. Schaefer, do you have a copy of the declaration, or
14 would you like us to provide you one?
15 A. If you could provide me an electronic copy, that would
16 be useful. I have a paper copy here, but multiple forms
17 is good.
18 MR. KHAN: Okay. So, Jarame, for purposes
19 of the record, this is Exhibit 2016 in the '868
20 proceedings that is Dr. Schaefer's declaration.
21 DEPOSITION EXHIBIT 2016
22 Scott Schaefer's Declaration
23 11:26 a.m.
24 A. So the section you referred to in my declaration is
25 under the legal principles of validity, and has not

specified a date associated with it. I may have a date somewhere in here. But on paragraph 30 I state that it has further been explained to me by counsel for patent owner that the relevant timeframe is in or around September 13th, 2005. So without looking further, I would probably estimate that that's the priority date, but I may have it listed somewhere in here.

Q. And what is the priority date that you used for purposes of the '654 proceedings?

A. I believe it would be the same date. Again, paragraph 30 of my '654 declaration also indicates it has been further been explained to me by counsel for patent owner that the relevant timeframe is in or around September 13th, 2005.

Q. In your declaration you mention secondary considerations of nonobviousness. I can refer you to paragraph 24 of the '868 declaration.

A. Yes.

Q. What is your understanding of secondary considerations?

A. My understanding is as stated here. It has further been explained to me by counsel for patent owner that the following factors are used to make an obviousness determination. One, the scope and content of the private art. Two, the level of ordinary skill in the art. Three, the differences between the claimed

invention and the prior art. And, four, objective or secondary considerations of nonobviousness. Any relevant objective factors or secondary considerations of nonobviousness, which may include commercial success of a product using the invention, if that commercial success is due to the invention, long felt need for the invention, evidence of copying of the claimed invention, industry acceptance, the taking of licensees under the patent by others, initial skepticism, failure of others, and praise of the the invention.

I understand that when a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention. I also understand that courts may find the commercial success of the infringer and other members of the industry persuasive, even though the patentee was not successful with a product governed by the patent.

MR. CORDREY: We've been going about an hour. When he gets to a point, can we take a quick break, maybe 10 minutes?

MR. KHAN: That sounds good. Thanks. I'll just wrap up this line of questioning, and then we can

take a break.

BY MR. KHAN:

Q. Dr. Schaefer, why did you include a paragraph on secondary considerations in your declaration?

A. There's paragraphs about a lot of legal principles regarding validity. It's one of the legal principles regarding validity, I think.

MR. CORDREY: And I'll object to the extent it calls for attorney-client and privileged communications, and attorney work product. So I would caution the witness not to reveal any conversation with counsel as to why certain things were included in the declaration, and why things were not.

BY MR. KHAN:

Q. Okay. We can take a break now. Would 10 minutes work?

A. That'd be fine.

Q. Okay. Great.

A. What time do you want to come back? Let's be specific.

MR. KHAN: 11:42 a.m. Eastern time.

A. All right. Sounds good.

(Break at 11:32 a.m.)

(Back on the record at 11:43 a.m.)

BY MR. KHAN:

Q. Dr. Schaefer, prior to the break, we were talking about secondary considerations. In your answer you had

mentioned that this was part of the legal section of your declaration; is that correct?

A. Yes.

Q. You do not offer any additional evidence of secondary considerations in your declaration; is that correct?

A. That's correct.

Q. Were you aware of any other secondary considerations?

A. It's not something I looked into.

Q. If secondary considerations were not something you had looked into, why did you mention it in your declaration?

A. So I should be clear. It wasn't something I looked into as part of this declaration. It's just part of the legal principles. I think that section, it may have actually been copied from the '048 declaration.

Q. So why include the secondary consideration as part of the legal principles in your declaration?

A. You know, typically with these declarations there's usually a section on legal principles, and it's fairly boilerplate text.

MR. CORDREY: Also objection as to form and, again, I'll caution Dr. Schaefer not to reveal any conversations with counsel about the reasons for including or not including sections in this declaration.

BY MR. KHAN:

Q. So you noted in one of your earlier answers that secondary considerations were only mentioned in the legal principle section of your declaration. Is it your opinion that this particular legal principle did not apply to the '654 or '868 patents?

A. I haven't rendered an opinion on that at all.

Q. In section four of the '868 declaration entitled person of ordinary skill in the art, you provide an opinion of who that POSITA may be. How did you arrive at that description of a POSITA?

A. It's a fairly standard description of a POSITA, and I don't think it necessarily differs significantly from any of the other experts in this case. Usually you look for someone that's, as I said here, I defined the POSITA as a Bachelor's degree in computer science or related field, and two years of experience working in the field of computer graphics or graphical user interfaces for GUIs. An individual with less technical education, but more experience or vice versa could also qualify as a person of ordinary skill in the art.

Q. Are you also serving as an expert in the co-pending district court litigation involving these patents?

MR. CORDREY: Objection. Relevance.

A. If you're asking whether I'm serving as an expert in

the -- well, I'm serving as a validity expert in the patent trials.

BY MR. KHAN:

Q. Are you aware of the claim construction standards in the IPR proceedings?

A. Well, as I say in the claim construction section, I am informed that claim terms are construed under the standard provided by the U.S. Court of Appeals for the federal circuit in Phillips versus AWH Corp., and informed that under this standard claim terms are presumed to have their ordinary and customary meaning in light of the patent's specification as understood by a person of ordinary skill in the art at the time of the invention unless, one, the patentee acts as its own lexicographer by setting out the definition in the specification. Or, two, the patentee disavows the full scope of a claim term in either the specification or during the prosecution of the patent.

Q. So what does the term ordinary and customary mean?

A. I think exactly what it says, what ordinary and customary mean.

Q. So how would you determine what the ordinary and customary meaning is?

A. How would I determine? Just the ordinary meaning in terms of the words that are provided.

Q. So how would you determine the ordinary meaning?

MR. CORDREY: Objection. Form.

A. Maybe I'm not understanding the question. I interpret them in terms of just the way that we would use terms in everyday speech, the English version.

BY MR. KHAN:

Q. In the claim construction section of your declaration, you also mention a Markman order, for example, in paragraph 61 of your '868 declaration. Do you see that?

A. Yes.

Q. Did you review the Markman order?

A. Yes.

Q. You listed the constructions of 3D space and 2D space in paragraph 61 of your '868 declaration. Do you agree with those constructions?

A. Those are the constructions that I've applied.

Q. My question was do you agree with those constructions?

A. I don't -- I don't see necessarily anything wrong with these constructions, but these are the constructions that I've applied to the patents.

Q. I understand that these are the constructions you applied. But my question was whether you agree with the constructions?

MR. CORDREY: Objection. Form.

A. Again, what I just said was I don't see anything necessarily wrong with the constructions, and these are the constructions that I've applied.

BY MR. KHAN:

Q. Now, Dr. Schaefer, can you explain to me how a computer system typically displays data on a screen?

MR. CORDREY: Objection. Form.

A. Well, how a computer system would display data on a screen, a screen is made up of a set of pixels. These are just dots on the screen. Typically they're too small. We started using computers, when I did, the dots were visible on the screen, but today they're very small, and basically invisible. But the goal is to determine what color every pixel is on the screen to produce an image. Depending on how you're rendering things, then that determines algorithms that you might use to determine what the color of those pixels are.

BY MR. KHAN:

Q. So how did the colors -- sorry. How did the pixels know what color to output?

A. Depends on the rendering algorithm that you're utilizing. There's a lot of different rendering algorithms.

Q. Where does the rendering algorithm -- sorry. Scratch that.

Is the rendering algorithm something that is stored in the computer?

MR. CORDREY: Objection. Relevance.

A. Stored? I mean, in the end, an algorithm is usually thought of as a set of instructions. And those instructions are going to exist at some point if it's executing on the computer in the memory of the computer. And so, I mean, if you consider that to be stored, it just depends on what you mean by stored. It's going to be a set of instructions basically.

BY MR. KHAN:

Q. So how does the computer access the set of instructions?

MR. CORDREY: Objection. Relevance.

A. Well, in general in terms of how a program executes is you have a compiled version of the program. Typically it's a binary file that is loaded into memory through the operating system. The operating system they only load part, depending on how the application's develop. There's a program counter that tells the CPU where it is executing, or what instruction it is currently executing, and that's advanced and manipulated through various sets of instructions to the processor that cause it to perform various actions.

BY MR. KHAN:

Q. So if a device were to display a web page on a computer screen, what's the computer's process for rendering that web page onto the screen?

MR. CORDREY: Objection. Relevance.

A. So, I mean, in general it's going to depend upon the web browser and how the web browser implements its techniques. But you can talk about sort of generalities that a web browser will utilize various protocols, usually HTTP to download a web page from a website. It will then parse the text of that web page. Again, it depends on the web browser and how it operates. But usually it creates some form of sort of usually called document object models. That's sort of a programmatic or data structure representation of the web page.

These things are then parsed, and potentially more files are downloaded, depending on what's referred to in the web page to attempt to create an image on the screen. But the specifics of how that happens, it's going to be dependent on web browser.

BY MR. KHAN:

Q. If an application such as Microsoft Word were to be displayed, is this process of displaying a Microsoft Word window similar to that of displaying a web browser?

A. I mean, there's similarities, but there's also

differences, right. These are different types of applications displaying different types of application specific data.

Q. Can you explain what some of the differences may be if you were to display a Microsoft Word window and a web browser?

MR. CORDREY: Objection. Form. Objection. Relevance.

A. For example, one is displaying a web page versus a Word document, and those are different types of documents at different capabilities to render different things as part of the document.

BY MR. KHAN:

Q. I should probably rephrase that question. What I would like to ask you is can you explain what some of the procedural differences may be if in a computer if you were to display a Microsoft Word window versus a web browser?

MR. CORDREY: I'm going to object to this line of questioning. This is outside the scope of Dr. Schaefer's declaration in these two proceedings. Unless you can tie this to his opinions in those declarations, we're going to shut down this line of questioning, and I'll seek a conference with the board today about whether these are relevant.

MR. KHAN: Counsel, you're more than welcome to approach the board. I think these questions are relevant because the applications are -- sorry. The times in question are all about rendering applications on display, and I'm trying to understand how that process works, and what Dr. Schaefer's understanding is of those process. That's directly related to the claims.

MR. CORDREY: You're not directing any of your questions to his opinions in his declarations.

MR. KHAN: Well, I'm not going to run by my phrasing of the questions with you, but the relevance is there. And if you'd like to pick up and call the board, I'm happy to discuss it with them. But this is my questions, and I'd appreciate it if I could be given the opportunity to speak to your expert about his understanding of how this technology works.

MR. CORDREY: Well, with that limited explanation, we'll indulge this line of questioning a little further.

MR. KHAN: I appreciate that. Thanks.

A. Can you repeat the question, because I'll be honest I've forgotten it at this point.

BY MR. KHAN:

Q. The question was can you explain what some of the

procedural differences may be in a computer that were to display Microsoft Word window versus a web browser window?

MR. CORDREY: Objection. Form.

A. I'm not sure I completely understand what you mean by procedural differences. There are different rendering algorithms that exist, and they may implement different rendering algorithms.

BY MR. KHAN:

Q. Okay. And is the rendering algorithm different because the application is different?

A. Typically, different rendering algorithms may focus on different types of objects, or different considerations, for example. It just depends on what the developers were interested in when they implemented the application.

Q. You mentioned that there's some similarities as well in the process of displaying a Microsoft Word window versus a web browser. Can you explain what some of those similarities are?

A. Well, as I mentioned, these rendering algorithms are all trying to determine what the color of dots are on the screen. That's the output of these algorithms. They both do that.

Q. And so if you have a data that -- sorry. Scratch that.

When you have data to be output on a screen from say a Microsoft Word file, how is that data communicated to the pixel?

MR. CORDREY: Objection. Form.

A. Typically there's going to be a rendering algorithm. It's going to take data, and it's going to determine what the pixels are on the screen. Again, as to how that happens, it depends on the algorithm.

BY MR. KHAN:

Q. Is the rendering algorithm for when outputting the data in 3D the same as the rendering algorithm for outputting data in 2D?

MR. CORDREY: Objection. Form.

A. Not always. There can be differences.

BY MR. KHAN:

Q. Can you explain what the differences are?

A. Well, it does depend on your rendering algorithm, for example, and what your data is. Often we discuss sort of a pipeline that happens in 3D of different operations, but they may not all actually be necessary. Depends on what your data is, and how it's being processed, so it really depends.

Q. Is the execution of these rendering algorithms, is that part of a generation process for an image that is to be displayed on a screen of a computer device?

MR. CORDREY: Objection. Form.

A. Usually. It's usually part of the output of an image, whether it's being displayed or not.

BY MR. KHAN:

Q. And when you're working on a Microsoft window, how does the computer display like a character that you have just input on your keyboard?

MR. CORDREY: Objection to form.

A. What do you mean by Microsoft window?

BY MR. KHAN:

Q. I'm sorry. Microsoft Word.

A. Oh, okay. Well, a character in Word is actually defined by something called a TrueType font typically. It could potentially be a bitmap font, but those are very rare these days. A TrueType font is a shape that is bounded by a sequence of what are called Bezier curves. These are polynomial curves. Typically these are represented as quadratic Bezier curves which have three control points per point. These TrueType fonts, the way that they're often specified is with on curve and off curve points. But then those are actually converted into quadratic Bezier curves. And then the process is basically determining which pixels fall within the sequence of curves that defines the outline of the shape. And I should caveat that a little bit, TrueType

fonts were originally defined as quadratic Bezier curves, but there's been some push to use cubic Bezier curves also. And so I actually don't know right now if TrueType fonts utilize cubic Bezier curves, but various vector graphics programs like Inkscape, and so forth, actually do.

Q. So I understand from your answer that TrueType font may be used. But my question was perhaps more related to the process, right. And so what I wanted to understand was when a user selects a key on the keyboard, then how does the computer know that a key has been selected, and where a corresponding point should be activated in the display?

MR. CORDREY: Objection.

A. Some of the stuff is going to be -- I'm sorry, okay. Some of the stuff is going to be dependent on an operating system. When the user selects a key, it generates an interrupt typically in an operating system that is caught. Now, that is delivered then to -- and how it does this depends on the operating system, I guess, but delivered typically to a running application. In your example, I think you were utilizing Microsoft Word in this case.

There is a -- in Windows there's typically a function that catches the keyboard input. And so an

ascii character would be delivered to the program. How Word goes about processing from that point it depends on the execution of Word. But it's going to utilize that character.

You asked where it's going be spaced. That's actually a fairly complicated process about where you place characters, and there's a whole host of work about like spacing characters and so forth, because they're all variables spaced between one another.

If you look all the distance between characters in Word, it varies, actually, for example, in what's placed on the screen. And so it's going to try to determine using various algorithms as to where that character goes. And then it's going to utilize those curves, as I mentioned previously, to determine which pixels are going to be placed. But this is -- placement of characters in Word is not something I'm addressing in my declaration here.

BY MR. KHAN:

Q. I understand, and thank you for the background. Have you used Microsoft Word in the past?

A. Yes.

Q. Have you used it in a 2D display?

A. Yes.

Q. Have you used it in a 3D display?

A. I don't have a 3D display.
Q. Are you aware of Microsoft Word being used in a 3D display?
A. What do you mean by 3D display? Maybe I should ask that question.
Q. Yeah, that's the question. So are you aware of a system that renders Microsoft Word for -- scratch that.
That renders web pages in a 3D space?
A. In a 3D space? For example, the asserted patents?
Q. Sure. I believe the asserted patents use the term 3D space, yes. I'm sorry. Are you waiting for me to ask a question, or are you thinking?
A. I am waiting for you to ask a question.
Q. I'm sorry. Okay. So let me ask the question again. Are you aware of a system that can render a web page in a 3D space?
A. Yes.
Q. And are you aware of a system that can render Microsoft Word application in 3D space?
A. Yes.
MR. CORDREY: Object to relevance.
BY MR. KHAN:
Q. In the systems that can render a web page in 3D space, can the user browse the web?
A. Can the user --

MR. CORDREY: Objection. Form.

A. I mean, I suppose it depends on what you mean by browse the web. Web browsers display web pages. So, I mean, in that sense, yes.

BY MR. KHAN:

Q. How about to do a search like a Google search?

MR. CORDREY: Same objection.

A. When you do a Google search, it's rendering a web page, so we just decided -- I just specified that you can render a web page. So in that sense it would be yes.

MR. KHAN: Okay. We can take a five minute break now. We can go off the record and take a five minute break.

MR. CORDREY: Okay.

MR. KHAN: Thank you.

(Break at 12:23 p.m.)

(Back on the record at 1:05 p.m.)

BY MR. KHAN:

Q. Dr. Schaefer, can I ask you to turn to paragraph 34 of your declaration, please. If you could let me know when you're there. This is the '868 declaration.

A. Yes, I'm there.

Q. In paragraph 34 the first sentence reads, However, there are times when it is difficult to operate in 3D space, and you provide an example. I'll quote what you

said here, In certain cases it may be difficult to interact with a file, document, application, desktop or other input within a 3D virtual space. Are there times where it is difficult to operate in 2D space?

A. Well, I don't think that's something I address in my declaration. You're asking me for a hypothetical that I haven't really considered here. But I can't necessarily think of something right now, but that doesn't mean that there's not times. I don't know.

Q. So you didn't consider times when it would be difficult to operate in 2D space?

MR. CORDREY: Objection. Form.

A. Oh, as I said, I can't think of a case right now sitting here. But, you know, it's not something that I spend a lot of time trying to consider.

BY MR. KHAN:

Q. Are there any other examples when it might be difficult to operate in 3D space?

A. I'm not sure. I mean, the quote that I have here is directly.

Q. I understand, but in the first sentence you said that there are times when it is difficult to operate in 3D space, so I'm trying to understand what examples are there of those times that you mention in the first sentence?

A. Sure. I give examples right here. I say, for example, in certain cases it may be difficult to interact with a file, document, application, desktop or other output within a 3D space. This can be the case if the end user is occupying an unfavorable viewpoint in the virtual space.

Q. Yes. And are there any other times that it is difficult to operate in 3D space?

A. Well, the patent gives another example where it says objects are drawn in skew within the virtual space.

Q. Can you explain what you mean by objects are drawn in skew within the virtual space?

A. Well, that's a quote directly from the patent. But if objects are drawn in skew, then they may be at an angle such that it might be difficult to discern individual pieces of the application.

Q. In the next paragraph, paragraph 35, under item 2B you note displaying the objects including application specific data in 2D space. Do you see that?

A. I see that text.

Q. What do you mean by objects?

A. I mean the objects that are specified in the claims.

Q. What does it mean to be an object?

A. Well, for example, in paragraph 35 I talk about objects, for example, a window.

Q. How would you define an object?
A. Just the plain ordinary meaning. It's not a term that was construed here. But in the context of the patent, an example was window.
Q. So I understand that you are saying a window is an example of an object. But the question is what your definition of an object is.
A. My definition is plain and ordinary meaning.
Q. And what is that?
A. An object.
Q. And I'm asking you what an object means, and you're telling me that it means an object.
A. I mean I'm giving it its plain and ordinary meaning, and I gave you an example as a window.
Q. Is the example a definition?
MR. CORDREY: Object to form.
A. Something that I'd need to think about as to how broad that necessarily could be, but I gave you an example, which is a window.
BY MR. KHAN:
Q. Did you not think about this when writing your declaration?
A. I thought about a lot of things. But in the context of the patents, I looked at what I was supplied, and I gave an example here as a window how it applied.

Q. You mentioned you thought about a lot of things. Among these things that you thought about, did you think about what the plain and ordinary meaning of an object is?

A. I mean, in general, I gave all the terms that were construed as to plain and ordinary meaning.

Q. Sorry. If I could ask you to answer the question, that wasn't my question. The question was among these things that you thought about, did you think about what the plain and ordinary meaning of an object is?

MR. CORDREY: Objection. Form.

A. I mean in general for all of the terms, I am interpreting them in terms of plain and ordinary meaning, and how they're used in the patent themselves. For an object I gave you its plain and ordinary meaning, and I gave you an example of an object.

BY MR. KHAN:

Q. Dr. Schaefer, I understand you gave an example, but I'm asking you what the plain and ordinary meaning of an object is, which you said you used in writing your declaration.

A. In general, I didn't come up with my own definition of an object. I'm just giving you its plain and ordinary meaning. But as the claims say, an object is displayed in said 2D space on the fixed resolution display. I

gave you an example of an object, for example, a window.

Q. So I'm not asking generally. I'm asking specifically regarding an object what was the plain and ordinary meaning of an object that you used when you used this term in your declaration?

MR. CORDREY: Objection to form.

A. I didn't ascribe it any particular special meaning. It's not a term that is construed. I simply gave it its plain and ordinary meaning interpreted it in the context of the patent.

BY MR. KHAN:

Q. You haven't told me what that meaning is, and I'm asking you what that meaning is?

A. As I said --

MR. CORDREY: Objection. Asked and answered.

A. I didn't ascribe any particular definition or special meaning to the term. It's not a term that was construed.

BY MR. KHAN:

Q. Thank you. In the same paragraph, paragraph 35 of the '868 declaration, in the last sentence you state, The claims require that active applications, including objects and application specific data, are first opened and displayed in 2D space. Do you see that sentence?

A. Yes, I do.
Q. What makes an application active?
A. Well, in general, you can interact with the application. Applications often are responding to some form of input, whether it be buttons, or whatever, and that makes an application active.
Q. So if a user cannot interact with an application, then does that mean that that application is no longer active?
A. I'm not sure. You might have to give me a more specific scenario than that.
Q. Well, I'm trying to understand what makes an application active, and you gave me an example of interacting with an application. I am asking you whether that is the limits of what an active application is, or if an active application can be -- sorry. Or whether an application can be active even when there's no interaction?
MR. CORDREY: Object to form.
A. Well, in general, the patent makes a distinction between applications, objects having application specific data, and images thereof. Images are images. Applications, well, you can interact with them by press a button, and it has some action associated with it. The application responds to it. It's different on an

image in that case, because it's just an image. And so there is a distinction made in the claims between those two things, and I'm drawing that distinction.

BY MR. KHAN:

Q. You mentioned that applications you can interact with them by pressing a button. Does that make the application an active application?

MR. CORDREY: Objection. Form.

A. Can you explain what you mean by that?

BY MR. KHAN:

Q. I should rephrase. Sorry about that.

Is an application an active application if you can interact with the application by pressing a button?

MR. CORDREY: Objection. Form.

A. Well, that was an example, right? Again, drawing a distinction between images versus applications, or these objects, Windows in this case. An image is just that, an image. Whereas, an application different components will behave differently depending on how you interact with it. An example was pressing the button.

BY MR. KHAN:

Q. So my question was not regarding images. My question was regarding active applications, which is a phrase that you use in your declaration. And I'd request that

you can answer the question specifically, and I'll repeat that again. It's is an application an active application if you can interact with the application by pressing a button?

MR. CORDREY: Objection. Form.

A. Well, again, I'm drawing a distinction with images. Because the patent is drawing the distinction here, or patents, I should say, are drawing the distinction. When you press a button, it has an action, for example, that's specified by that button. If it does what the application would do, I would say you're interacting with an application and not an image in that case.

BY MR. KHAN:

Q. What's your understanding of the word interacting?

MR. CORDREY: Objection. Form.

A. I'm not ascribing any particular special meaning to the word interacting. It just means interact.

BY MR. KHAN:

Q. What does interact mean?

A. Well, as I said, I'm not ascribing a special meaning to it. As an example, interacting could be pressing a button.

Q. If an application is storing data in memory, is that application an active application?

MR. CORDREY: Objection. Form.

A. I don't know if that's the distinguishing feature that I would necessarily use. I mean, possibly I might need a specific example to give a better answer.

BY MR. KHAN:

Q. And maybe I'll give an example that if Microsoft Word is storing data on the memory, is Microsoft Word an active application?

MR. CORDREY: Objection. Form.

A. I mean, you may be splitting hairs a little bit here. When the application first starts up, the question is is there anything being stored in memory or not. But, you know, I'm going to go with probably here. But, again, whether or not things are stored in memory is -- I don't know if it's particularly relevant or not.

BY MR. KHAN:

Q. If an application sends data to another device, is that application an active application?

MR. CORDREY: Objection. Form.

A. I'm sorry. Sends data to another device? You're talking about like network communication, for example?

BY MR. KHAN:

Q. That could be one example.

A. Usually that would mean that it's an executing application, meaning it's doing something.

Q. And does that make that application active?

MR. CORDREY: Objection.

A. Again, I don't know that that's necessarily a distinguishing feature but, you know, you could say probably.

BY MR. KHAN:

Q. If an application such as Microsoft Word receives input from a user, does that make the application active?

MR. CORDREY: Objection. Form.

A. I mean, I think that's part of it.

BY MR. KHAN:

Q. If the application receives input from a user and displays the input, is the application active?

MR. CORDREY: Same objection.

A. I mean, again, it'd be nice to talk about this in specifics in general, but I don't know that it's necessarily required.

BY MR. KHAN:

Q. So perhaps maybe a more specific example using a web browser, if a web browser receives user input, and displays the user input, is the web browser application, sorry, is the web browser active?

MR. CORDREY: Objection. Form.

A. I would say yes.

BY MR. KHAN:

Q. In paragraph 44 of the '868 declaration, you discuss

figure 13A, and you also mention 13B of the '868; is that correct?

A. Yes.

Q. Can you describe in your words what you see in figure 13A?

MR. CORDREY: Objection. Form.

A. Sure. It says, as I state in figure 13A, the Microsoft Word application 490 is presented in the foreground with a Yahoo search application 492 being present in the background.

BY MR. KHAN:

Q. Earlier you had talked about how you can display Windows in skew in the '868 patent, and if I could ask you to turn to column 22 of the '868 patent.

A. You haven't introduced the '868 patent as evidence, but I do have a printout of it here.

Q. Okay. Sure, the '868 patent is Apple 1001, and the '868 proceedings. And if you could please turn to column 22 of Apple 1001, that'd be great, and if you could let me know when you get there.

A. I'm there.

Q. Great. In column 22 beginning paragraph starting from line seven says, When the viewpoint of the end user within a virtual space. Do you see that line?

A. Yes.

Q. Great. So that paragraph beginning with that line starting from line seven of column 22 briefly mentions, and I'll read the sentence. It says, In such a case, the 3D GUI system utilizes the bind to the HUD feature whereby clicking an icon or bottom analogous to the minimize in windows operating system environment triggers a change to the viewpoint of the end user within the virtual space so that the web page is directly in an end user's visual field, thereby making easier to interact with. Do you see that sentence? Did I read that correctly?

A. Yes. I think so.

Q. What's your understanding of the bind to HUD feature?

A. Just what's presented here in the patent. There's multiple embodiments.

Q. What is the bind to HUD feature?

A. Well, it states the 3D GUI system utilizes the bind to HUD feature whereby clicking an icon or bottom analogous to the minimized windows operating system triggers a change to the viewpoint of the end user within the virtual space so that the web page is directly in an end user's visual field, thereby making it easier to interact with. In one embodiment, this was accomplished by revealing the 2D version of the web page that was initially hidden or drawn off screen and

positioning it in a layer that is in front of the 3D virtual space such that the end user can interact with this layer in 2D. It goes on to discuss the unbind.

Q. So I understand you just read back the paragraph from in columns 22, line seven, to approximately line 20 or so. But my question didn't ask you to read the patent back to me. My question was what is the bind to the HUD feature in this paragraph?

A. Well, exactly what it says. It talks about clicking an icon, triggering a change to the viewpoint so the web page is directly in front of an end user's visual field. It also talks about in an embodiment this is accomplished by revealing the 2D version of the web page that was hidden off screen.

Q. So is that embodiment describing the bind to HUD feature?

A. I think it is.

Q. How does clicking an icon trigger a change to the viewpoint of the end user within the virtual space?

MR. CORDREY: Objection. Form.

A. Well, in general, the viewer's in a virtual space. They're going to have a position and orientation. I suppose it could be accomplished a number of different ways, but one way would be with the viewer in its orientation.

BY MR. KHAN:

Q. Maybe I should be more specific. How does the computer trigger a change to the viewpoint when a user clicks an icon?

MR. CORDREY: Objection. Form.

A. Again, it could be accomplished a number of different ways. You could, for example, move the user. How would you do that? Well, again, there's a lot of different ways you could do that. You could define a spline, for example, that would orient the user or change its location. But this is just one example of how you might do this. There could be many different ways.

BY MR. KHAN:

Q. Can you expound on what you mean by orienting the user as accomplishing the change in viewpoint?

A. Well, the viewpoint is where this sort of virtual user view would be drawn from. So to change that would be to modify it. Again, it's just an example.

Q. And how does a computer modify it?

MR. CORDREY: Objection. Form.

A. I mean, I've already given you examples of how it could be done. There's lots of different ways after, in general, by changing it. But how do you do that, there's many different ways you could do so.

BY MR. KHAN:

Q. Can you provide an example of a few ways one computer would do that?

A. I gave an example of a spline already.

Q. Okay. And can you explain what spline -- sorry. Can you explain how a spline works?

A. Well, in general, splines are thought of as polynomial functions. Usually they are represented in a particular geometric form, for example, Bezier curves, which we already talked about in the context of fonts. Bezier curves can be used for all sorts of different things. But these are typically thought of as splines.

The original motivation for these things was to -- for these curves was to try to reproduce some of the physical process that happens when you bend a piece of wood. Usually you use these pegs on a board, for example, and you put a piece of wood in between them, and it would cause -- and this is called a spline. You would cause a path to be generated if you wanted to model these things mathematically, and so typically we use polynomial functions, because polynomials are things that people are comfortable with, and you manipulate control points to generate paths, for example.

Q. Dr. Schaefer, can you turn to paragraph 65 of your declaration in the '868 proceedings, please.

A. Yes.
Q. About five lines down from the top of paragraph 65 you've included quote "a focal group." Do you see that?
A. Yes.
Q. And just for context, in this section you are describing Anthony, which is Apple 1007, which is one of the prior art references applied by the petitioners; is that correct?
A. I believe so, yes.
Q. And so what is your understanding of what Anthony's focal group is?
A. Well, it's described right here actually. So a focal group is displayed at a primary point of focus in the GUI. The focal group 509 may be placed in the front and center of the GUI view. Remainder of the groups are displayed on either side of the focal group based on their ordering such that they appear to be less prominent to the user in the focal group. On the following page, I include figure four of Anthony showing the picture of that.
Q. Following figure four, what is the focal group?
A. So the -- so in figure four, focal group should be the group in the center, which is the pictures in April.
Q. So I just want to be -- just want to better understand

what you're pointing to. So in figure four, which is included on page 29 of your '868 declaration, which immediately follows paragraph 65 in your declaration, in that figure you noted that the focal group should be the group in the center which is the pictures in April; is that correct?

A. Right. As the patent says on paragraph 69, the focal group 1209 is the month of April.

Q. And what's included in 1209? Is it just the pictures, or is it also the title April?

MR. CORDREY: Objection. Form.

A. I need to look through Anthony to see if it defines exactly what a focal group is. You're asking, in particular, about different aspects, and how Anthony has defined a focal group.

BY MR. KHAN:

Q. Okay. Please go ahead and take your time.

A. Do you have a copy of Anthony that you can introduce as an exhibit?

MR. KHAN: Yes, I do. Can we provide a link to Exhibit 1007, please.

DEPOSITION EXHIBIT 1007

Anthony Patent Application Publication

1:57 p.m.

CONCIERGE: Should be in the public folder

if you refresh the page now.

A. Well, a focal group appears 310 times inside of Anthony, and I've not looked through all of them. But Anthony does say in paragraph 44 that items that are within the time range covered by the focal point are collectively called the focal group. Also, identifies figure four as a focal group as well, and figure four does have a date on the top of the displayed grouping that's there similar to the April that from above in figure four. So in that sense, it would appear that it could potentially be part of the focal group. Although, again, I haven't looked through all of the 310 instances of focal group inside of Anthony to determine if there's anything that would contradict that.

MR. KHAN: Okay. We just hit kind of the one hour mark. If you'd like, we can take a 10 minute break, and we can come back. Okay. Great. Off the record.

(Break at 2:01 p.m.)

(Back on the record at 2:13 p.m.)

BY MR. KHAN:

Q. I want to briefly touch upon a few topics that we previously covered, just a few more of them. So one of the items we had discussed earlier was regarding the running and opening of applications. I want to just

get some clarification there. So my question is the following. To open an application, does one have to execute a file that is associated with that application?

MR. CORDREY: Objection. Form.

A. In general, that would be the way that it works, but there may be cases where it doesn't require that. I need to think about it.

BY MR. KHAN:

Q. So maybe if I could be a little more specific it might help. If one -- if a computer were to open an Excel Microsoft application, does the computer have to open an Excel file?

MR. CORDREY: Objection. Form.

A. No, it doesn't have to open an Excel file.

BY MR. KHAN:

Q. So how would it open the Excel application then?

A. Well, the standard way you might do that is by selecting the icon for Excel from maybe a start menu, or double clicking on a shortcut, or something to that effect.

Q. And what does the computer do in response to the selection of say Microsoft Excel icon?

A. Well --

MR. CORDREY: Objection to form.

A. Well, there will probably be a number of different actions that happen. I don't know I can enumerate all of them. In general, it'll cause the application to be loaded in the memory and being executed. There's probably a number of steps in between.

Q. How is the application loaded in the memory?

MR. CORDREY: Objection.

A. I mean, again, it's going to depend, I think, but in general you'll take the executable file, or at least pieces of the executable file, and store them in memory, and set a program counter, set register values, potentially allocate memory depending on what the program's asking it to do, and execute things.

BY MR. KHAN:

Q. And this executable file that the computer takes, this is an executable file that is associated with the Excel application that the user just selected; is that correct?

A. Typically there's usually some executable file, but there may be other executable code.

Q. Going back to column 22 of the '868 patent, can you let me know when you have that in front of you?

A. Just a minute. Yes.

Q. The '868 patent says clicking an icon or bottom (analogous to the minimize in Windows operating system

environment) triggers a change to the viewpoint of the end user within the virtual space so that the web page is directly in an end user's visual field; is that correct?

A. That's the text, yes.

Q. Why is the clicking of an icon analogous to the minimize in Windows operating system environment?

MR. CORDREY: Objection. Form.

A. I'm not sure that it necessarily is.

BY MR. KHAN:

Q. So are you saying that the '868 patent is wrong?

A. No, I'm not.

Q. So in this case, the '868 patent says that it's analogous to the minimize in Windows operating system environment. I'm asking you as an expert hired by the patent owner why the clicking of an icon is analogous to the minimize in Windows operating system environment as stated in the '868 patent?

MR. CORDREY: Objection. Form.

A. So I disagree with your premise.

BY MR. KHAN:

Q. Which part of the premise?

A. The part where you state that the icon is now analogous. I don't know that that's necessarily what it says.

Q. Well, I'm quoting the language there. It says, Whereby clicking an icon or bottom (analogous to the minimize in Windows operating system environment), so I'm just quoting the language there.

A. Well, I don't want to split hairs, but you previously did not quote that language. You changed the language.

Q. Okay. Well, I hope my clarification helps with respect to the specific quoted language that I just said. Can you explain why the clicking an icon is analogous to the minimize in Windows operating system environment?

MR. CORDREY: Objection. Form.

A. So I think what it's saying is clicking an icon or bottom indicating that the bottom may be analogous to the minimize in the Windows operating system environment in that case can trigger a change in viewpoint to the end user in that situation. Why would it be analogous, you know, it depends on the system that's being described in terms of this particular embodiment, but I think it's causing the change to the viewpoint, so that something else is directly in front of the user.

Q. So you have read the '868 patent, correct?

A. Yes.

Q. You have reviewed the embodiments that are disclosed in the '868 patent, correct?

A. There are many embodiments.

Q. And so can you tell me with respect to the disclosure here in the '868 patent that you have reviewed, how the clicking an icon or bottom is analogous to the minimize in Windows operating system environment?

A. Well, again, it says it triggers a change to the viewpoint of the end user within the virtual space, so that the web page is directly in the end user's visual field. Something similar may happen when you click a minimize button in the Windows environment, and that's something different that's in the end user's visual field.

Q. Okay. Returning to the example of Microsoft Excel. When you click -- when a user clicks an Excel icon to open the Microsoft Excel application, does an application window open up to allow a user to interact with the application?

MR. CORDREY: Objection. Form.

A. When you say an Excel icon, what are you referring to? That potentially could refer to multiple things.

BY MR. KHAN:

Q. I guess we don't even have to have the icon. But if a user wants to interact with an application, then they open an application, does it typically open in an application window?

MR. CORDREY: Objection to form.

A. I would say that's typical, but it doesn't have to necessarily. It can depend on the application.

MR. KHAN: Okay. I have no further questions. The witness is yours.

MR. CORDREY: Why don't we take a five minute break. Let me just look over my notes and see if I have any follow-up questions. Why don't we'll say in about -- so it's 2:32 your time right now.

MR. KHAN: Yes.

MR. CORDREY: So let's say 2:40 reconvene.

MR. KHAN: Okay. Sounds good.

(Break at 2:32 p.m.)

(Back on the record at 2:41 p.m.)

MR. CORDREY: We don't have any follow-up questions, so we can conclude the deposition.

MR. KHAN: Great. Thank you, Dr. Schaefer. Thank you very much. Thanks a lot for helping us get this together. And everyone else thank you for jumping on today.

(The Deposition was concluded at 2:41 p.m. Signature of the witness was not requested by counsel for the respective parties hereto.)

CERTIFICATE OF NOTARY

STATE OF MICHIGAN)
) SS
COUNTY OF WAYNE)

I, JOANNE MARIE BUGG, certify that this remote deposition was taken before me on the date hereinbefore set forth; that the foregoing questions and answers were reported by me stenographically and reduced to computer transcription; that this is a true, full and correct transcript of my stenographic notes so taken; and that I am not related to, nor of counsel to, either party nor interested in the event of this cause.

JOANNE MARIE BUGG, CSR-2592
Notary Public
Wayne County, Michigan
My Commission expires: 2-26-2025

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& 2:4,12

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

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

(A) to review the transcript or recording; and

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

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

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

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