

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Sony Interactive Entertainment LLC
Petitioner

v.

Intellectual Pixels Limited
Patent Owner

Case IPR2021-00237
U.S. Patent No. 10,681,109

**DECLARATION OF HENRY FUCHS IN SUPPORT OF
PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE**

SONY 1033
Sony v. IPL
IPR2021-00237

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I. INTRODUCTION

1. I have been retained as an expert in this proceeding by counsel for Sony Interactive Entertainment LLC (“Petitioner”). I previously submitted a declaration (Ex. 1002 (First Fuchs Declaration)), which includes my expert opinions regarding the unpatentability of claims 1-18 of U.S. Patent No. 10,681,109 (“’109 patent”) (Ex. 1001). I understand that Patent Owner has since disclaimed claims 13-18 of the ’109 patent. Ex. 2001 (Patent Owner’s Disclaimer). Thus, I understand that the only claims remaining at issue are claims 1-12 (hereinafter, the “challenged claims”).

2. I submit this Reply Declaration to address and respond to arguments made by Patent Owner in Patent Owner’s Response and Dr. Hart’s accompanying declaration (Ex. 2009).

II. QUALIFICATIONS

3. My background and qualifications are summarized in my first declaration (Section II of Exhibit 1002), and in my C.V. (Attachment A to Exhibit 1002).

III. MATERIALS CONSIDERED

4. In my first declaration (Ex. 1002 (First Fuchs Declaration)), I identified the materials I considered in forming my opinions set forth in my first declaration. In forming my opinions set forth in this Reply Declaration, I have reviewed the following additional materials:

- Petition for *Inter Partes Review* (Paper No. 3) and the exhibits cited therein;
- Patent Owner’s Preliminary Response (“POPR”) (Paper No. 11) and the exhibits cited therein;
- Decision Granting Institution of Inter Partes Review (Paper No. 13);
- Patent Owner’s Response (“POR”) (Paper No. 17) and the exhibits cited therein;
- Declaration of Dr. Hart (Ex. 2009) and the exhibits cited therein;
- Picture of devices shown at Dr. Hart’s deposition (Ex. 1024)
- November 6, 2021 Deposition Transcript of Dr. Hart (Ex. 1025);
- Wang and Garlan, Task-Driven Computing, May 2000 (Ex. 1026);
- In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With respect to Commercial Mobile Services, FCC Report, August 18, 2000 (Ex. 1027);
- Encyclopedia of Computer Science, Fourth Edition, 2000 (Ex. 1028);
- Ahamed et al., Digital Subscriber Line (HDSL and ADSL)

Capacity of the Outside Loop Plant, IEEE Journal on Selected Areas in Communications, Vol. 13, No. 9, December 1995 (Ex. 1029);

- Kompatsiaris et al., Using Asymmetric Digital Subscriber Line (ADSL) for Fast Internet and Multimedia Services (Ex. 1030);
- Complaint, Intellectual Pixel Ltd. v. Sony Interactive Entm't LLC, Case No. 8:20-cv-01422 (C.D. Cal.), D.I. 1 (Ex. 1031);
- Amended Complaint, Intellectual Pixel Ltd. v. Sony Interactive Entm't LLC, 8:20-cv-01422 (C.D. Cal.), D.I. 33 (Ex. 1032);
- U.S. Patent No. 8,131,826 ('826 patent) (Ex. 1034)
- PC Magazine Encyclopedia (Ex. 1037); and
- Any documents or exhibits cited herein.

IV. RELEVANT LEGAL STANDARDS

5. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of the law is summarized in Section V “Relevant Legal Standards” in my first declaration (Ex. 1002 (First Fuchs Declaration) ¶¶ 15-25), as well as in the paragraphs below, which I have applied in forming my rebuttal opinions to Patent Owner’s proposed constructions.

A. Claim Construction

6. I have been informed and understand that the terms of a patent are generally given their ordinary and customary meaning, which is the meaning that the term would have to a hypothetical person of ordinary skill in the art at the time of the claimed invention, which is when the application for the patent was filed. For purposes of my declarations, I have assumed that the priority date for the '109 patent is January 24, 2001.

7. I have been informed and understand that a claim term should be construed in the context of the claim as a whole. I also understand that the specification of the patent is relevant to a claim term's meaning and that a claim term must be read in light of the specification.

8. I have been informed and understand that a patent specification may provide a special definition for a claim term by the patentee that is not the same as the meaning it would otherwise have. When that is the case, the inventor's own lexicography controls the claim term's meaning. The specification may also contain an intentional disclaimer or disavowal of claim scope by the inventor. I understand that such a disclaimer or disavowal must be clear and unmistakable. When that is the case, the inventor's special definition of the meaning of the claim term, as reflected in the specification, controls the meaning of the claim term.

9. I have been informed and understand that a patent's file history (also

referred to as its prosecution history) is also relevant to the meaning of a patent's claims. In particular, an applicant's statements to the Patent Office characterizing its invention may give rise to prosecution disclaimer. Prosecution disclaimer can arise from both claim amendments and arguments made to the Patent Office.

Prosecution disclaimer arises if the disclaimer is clear and unmistakable to a person of ordinary skill in the art. For example, if a patentee makes a clear and unmistakable statement during prosecution to overcome a prior art reference, prosecution disclaimer applies, even if the patentee's disclaimer may not have been necessary. If, on the other hand, statements made during prosecution are ambiguous or amenable to multiple reasonable interpretations, prosecution disclaimer does not apply.

10. I have been informed and understand that the claim language, specification, and prosecution history are referred to as “**intrinsic evidence.**”

11. I have been informed and understand that evidence external to the patent and prosecution history (such as dictionary definitions) are referred to as “**extrinsic evidence.**” I have been informed and understand that extrinsic evidence is less significant than the intrinsic evidence in determining the legally operative meaning of claim language.

V. REBUTTAL TO ARGUMENTS MADE BY PATENT OWNER AND DR. HART

A. Patent Owner's Proposed Claim Constructions

1. "frame"

12. I understand that Patent Owner proposes a construction of "frame" to mean a "single instance of the display." POR at 11-18, 32-39; Ex. 2009 (Hart Decl.) ¶¶ 44-51.

13. As set forth in my first declaration, a POSITA would understand that "frames represent the still images that are ordered in a sequence to produce a video or animated sequence" (Ex. 1002 (First Fuchs Declaration) ¶ 31) and that, consistent with Saha, "[a] POSITA would understand that a video stream is a sequence of frames (or pictures), where each frame is an image of a video sequence." Ex. 1002 (First Fuchs Declaration) ¶ 89 (citing Ex. 1005 (Saha) at 9:47-50 ("The compressed video bitstream stored in the video buffer consists of 'slices' each representing a horizontal section of an image frame."); 2:24-26 ("The I (intra) frames contain the video data for the entire frame of video"). Dr. Hart appears to agree at least in part, as he has also opined that a "frame" refer to the image "at *any given instance in time*...."¹ Ex. 2009 (Hart Decl.) ¶ 48.

14. However, Patent Owner's construction of the term "frame" to mean a

¹ All emphasis is mine unless otherwise noted.

“single instance of the display” goes further than what a POSITA would understand, and adds requirements about a “display.” Specifically, Patent Owner contends that the frame must fill the entire screen of a “client display.” POR at 33 (arguing that the “relevant display is the client display” and that a “single instance of the display” means a single instance of the “*client* display”), POR at 34 (“Wiltshire was completely silent on what part of any display, much less the client display, the image comprised.”); POR at 37 (arguing that a frame means “an instance of the *client display*”), POR at 36 (arguing that an MPEG frame that “only occupies a *fraction* of the [client] display” is not a “frame”). Dr. Hart also testified that a frame must fill the entire screen. Ex. 1025 (Hart Depo. Tr.), 61:5-62:2 (testifying that “[frames] are still images that fill the entire display, *the entire screen*”).

15. However, Dr. Hart also appears to take an opposite view of the meaning of “display” in Patent Owner’s construction. Dr. Hart opines that a “frame” is a “full image *generated by the application* at any given instance in time,” regardless of whether the image is displayed in a window that takes up the entire client display. Ex. 2009 (Hart Decl.) ¶ 48; Ex. 1025 (Hart Depo. Tr.), 68:15-69:10. Dr. Hart also contradicted Patent Owner’s construction when he testified that “the term frame being used in Claim 1 *isn’t referring to what the client is doing.*” Ex. 1025 (Hart Depo. Tr.), 85:4-10; *compare with* POR at 33 (Patent

Owner arguing that “[b]ecause the frame is transmitted to the client to be displayed on the client, the relevant display is the *client* display”), POR 37 (Patent Owner arguing that “Claims 1 and 8 require ... an instance of the *client* display”).

16. As I explain in my analysis below, a POSITA would not understand “frame” to have either display requirement, but should have its plain and ordinary meaning, which is that frames represent the still images that are ordered in a sequence to produce a video or animated sequence.

a. Claim language

17. Claim 1 recites “a compressed frame” and claim 8 recites “a frame.” There is no additional limitation that a frame must fill the entire “client display” or be the full image generated by the application. Ex. 1001 (’109 patent), claims 1, 8. Given that there is no reference to “display, “client display,” or a full image generated by the application, a POSITA would not understand, from reading the claim language, that “frame” requires anything more than its plain and ordinary meaning, which I have set forth above.

b. Specification

18. There is also no support in the specification for Patent Owner’s requirement that a frame must fill the entire client display or be the full image generated by the application as Dr. Hart has opined. None of the specification sections cited in the Patent Owner Response characterize a frame (1) in relation to

the size of the client display, as Patent Owner argues; or (2) the full image generated by the server application, as Dr. Hart argues. Patent Owner first cites the Abstract (POR at 12), but the Abstract merely describes a “sequential display of modified frames,” without reference to the client display, the size of the image relative to the size of the client display, or whether it must be a full image generated by the server application. To the contrary, the Abstract is consistent with the plain meaning that I set forth in my first declaration—that “frames represent the still images that are ordered in a sequence to produce a video or animated sequence.” Ex. 1002 (First Fuchs Declaration) ¶¶ 31, 89.

19. Patent Owner next cites to column 4, lines 10-12 of the ’109 specification, which states that “the typical data processing segment is a frame.” POR at 12. This quote also does not refer to the display or a full image generated by the server application. Patent Owner’s other citations (listed below) each lack any description that the “frame” must fill the entire client display or that the frame must be the full image generated by the server application:

- 4:48-55 (describing “transmitting the modified image ... as a compressed data comprising a frame”);
- 4:12-16 (“the image-modifying data can be generated and transmitted from the client, and the modified image data sent from the visual server to the client after predetermined duration has elapsed”); and

- 4:66-5:2 (“interactively generate complex graphical images to a user without the need for significant client resources”).

POR at 12-14.

20. Thus, the specification is consistent with the plain and ordinary meaning of “frame” as I have described above.

c. Prosecution History

21. The Patent Owner also relies on the prosecution history to support its construction. In particular, Patent Owner relies on the applicant’s arguments over the Yamada reference. POR at 16-18; Ex. 2009 (Hart Decl.) ¶ 50. Patent Owner relies on the following statements from the prosecution history:

Sections 102, 103 Rejections

On page 6 of the Office Action the Examiner has indicated that Yamada teaches all of the limitations of claim 21, and by extension uses the same analysis in rejecting claims 28-36. Applicant respectfully submits that Yamada does not teach or suggest all of the limitations of independent claims. For example, with respect to claim 21 Yamada does not teach or suggest “compressing the at least one updated image and transmitting the compressed updated image to the client device “ much less transmitting the “updated image as a compressed frame”. First, there is absolutely no mention of a “frame” in Yamada. Second, there is nothing to suggest that Yamada first generates a frame of image data and then compresses that frame prior to transmitting it to a remote client device.

Ex. 2004 (’109 File History) at 273.

22. Nowhere in the above statement does the applicant refer to Yamada lacking disclosure of “a single instance of a client display”, that the image did not

fill the entire client display, or that it was not the full image generated by the application. Ex. 2004 ('109 File History) at 273. Applicant merely stated “there is absolutely no mention of a ‘frame’ in Yamada.” Ex. 2004 ('109 File History) at 273. But this simply means that Yamada does not use the word “frame”—not that a “frame” is a “single instance of the display.”

23. Rather, the applicant goes on to distinguish Yamada as follows:

Yamada (US 6,929,549) generally describes a gaming system that uses a hard drive located on a STB, the hard drive used for storage of the game software received from an external source by the STB, but delegates to the game machine (such as controller 1 in FIG. 1) responsibilities for execution of the game.

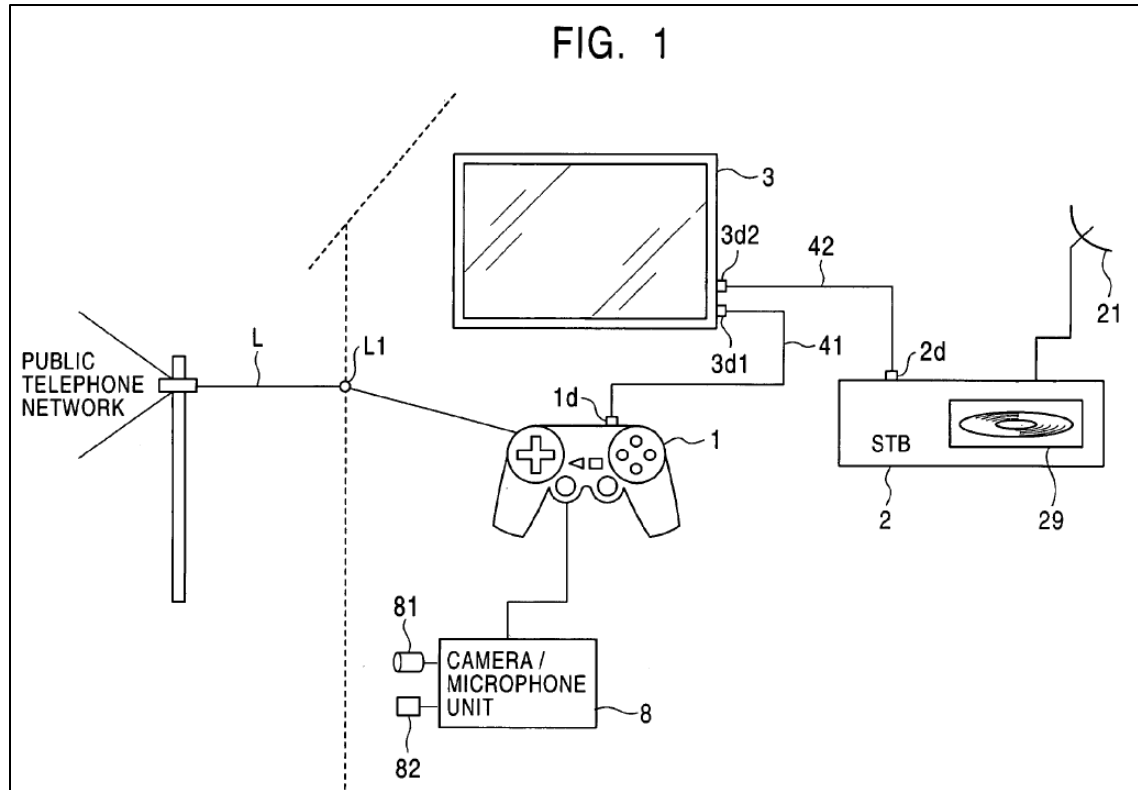
“The game software information stored in the information storage unit of the server device is supplied to the game executing device via the digital communication line in response to the request issued by the game executing device. **In the game executing device, a game image is generated** in accordance with the supplied information and the resultant image is output over the digital communication line to supply it to the display device.” (Col. 3, lines 20-27) (emphasis added).

Yamada clearly teaches that the game software information stored on the hard disk of the STB is used by the game machine 1 to execute a game. This local execution of the game fails to meet the limitations of claim 21 which further includes the limitation that the server runs the interactive software application.

Ex. 2004 ('109 File History) at 273.

24. As shown above, the applicant argued that Yamada did not transmit a frame to “a remote client device” because Yamada discloses “local execution of the game” on the client, not on a server. Ex. 2004 ('109 File History) at 273. This is consistent with the disclosure of Yamada, which discloses in Figure 1 (below) a gaming system with a set top box (STB) 2 with a hard drive 29. Just as applicant

argued in the section copied above, Yamada teaches that the game software stored on the hard disk of the STB is used to execute the game. Ex. 2005 (Yamada), 7:55-60, Fig. 1. Accordingly, applicant distinguished Yamada by arguing that this “local execution of the game fails to meet the limitations of claim 21 which further includes the limitation that the server runs the interactive software,” and that Yamada does not teach “generat[ing] a frame of data” at the server and “transmitting it to a remote client device.” Ex. 2004 (’109 File History) at 273.



Ex. 2005 (Yamada), Fig. 1.

25. Further, I disagree with Patent Owner’s contention that the examiner “relied on Yamada’s use of the MPEG protocol” and found it did not disclose a

“frame.” POR at 17; Ex. 2009 (Hart Decl.) ¶ 50. As shown above, the applicant made no remarks at all about MPEG when distinguishing Yamada.

26. I have been informed and understand that there must be clear and unmistakable statements in the file history to modify the claim scope. As shown above, none of applicant’s statements would convey to a POSITA that the applicant clearly and unmistakably disclaimed any “frame” that was not a single instance of a client display or is not the full image generated by the application.

d. Extrinsic Evidence

27. I also reviewed the extrinsic evidence Patent Owner cited for its construction, and they also do not support Patent Owner and Dr. Hart’s proposed construction.

28. The IEEE Dictionary cited by Patent Owner (POR at 12) (Ex. 2009 (Hart Decl.) ¶ 47) defines “display frame” as a “single display image analogous to a frame in a motion picture.” Ex. 2002 (IEEE Dictionary) at 3. This definition does not require a “client display” or that the image fill the entire “client display” as required by Patent Owner’s construction; to the contrary, this definition is consistent with the plain and ordinary meaning that a frame is a single still image in a video sequence as set forth in my first declaration. Ex. 1002 (First Fuchs Declaration) ¶¶ 31, 89. Further, the IEEE Dictionary’s definition of “frame” in the context of “television” (Ex. 2002 (IEEE Dictionary) at 4) is not relevant to the ’109

patent, since the '109 patent is an “image display system with one or more *client computers*” and “generally relates to “*computer* systems” and “*computer* graphics.” Ex. 1001 ('109 patent), Abstract, 1:28-33 (“Field of the Invention”), and a POSITA would have understood that client computers would often display applications in windows that did not take up the full client display. For example, common operating systems at the time (such as Windows) had user interfaces where applications are displayed in resizable windows that could still contain and display a series of “frames” but not take up the entire screen.

29. The Microsoft Computer Dictionary (Ex. 2003) also is not pertinent to a POSITA’s understanding of “frame” in the context of the '109 patent. Patent Owner relies on the definition that a frame is a “single screen-sized image” (POR at 12; Ex. 2009 (Hart Decl.) ¶ 47), but even Dr. Hart admitted that the Microsoft Computer Dictionary is a “general book” and its definition does not match what is being described in the '109 patent. Ex. 1025 (Hart Depo. Tr.), 75:22-76:10. I agree with Dr. Hart that this general dictionary definition referencing a “single screen-sized image” would not reflect the understanding of a POSITA in the context of the '109 patent; as explained above, applications that generated frames in 2001 were often run in windows that did not take up the full screen.

30. Patent Owner also references an article I co-authored in 1994 entitled “Frameless Rendering: Double Buffering Considered Harmful.” POR at 15; Ex.

2008 (Frameless Rendering paper). In that article, we explained a different rendering strategy that could serve as an alternative to double frame buffered displays that provides better refresh rates. Ex. 2008 (Frameless Rendering paper), Abstract. A frame buffer generally refers to a particular area of memory that stores an image ready to be displayed. There is nothing in that article that limits “frames,” as used in the ’109 patent, to have to be displayed on a full screen on a client after being transmitted to the client from a server. To the contrary, the examples of frames shown in the article can be displayed in windows on a client, and still be considered frames as used in the ’109 patent.

31. Finally, Patent Owner ignores the Saha reference (Ex. 1005) as extrinsic evidence. Saha explains “frame” in the context of MPEG compression, which is a preferred embodiment of the ’109 patent. Ex. 1001 (’109 patent), 8:10-12 (“the visual server 12 compresses the image data in a predetermined format, *such as MPEG*”); 6:55-62 (“The modified image data can be compressed at the visual server 12 in any compression standard, *such as MPEG*, JPEG, H.261, or other industry standard codecs, and streaming formats such as Windows Media .ASF standard, Real .RM standard, Apple .MOY standard. The client 16,18, 20 includes the requisite hardware and software to decompress the modified image.”); 9:26-38 (“When the drawing is complete the resulting image is compressed and transmitted to the client using a protocol *such as MPEG4*. The

transmission of the compressed image usually occurs on completion of a frame; in the event that there is no distinct end to a frame the transmission occurs after a specified elapsed time. [¶] The use of an industry standard image compression protocol ***such as MPEG*** allows us to make use of facilities that are already present in most clients. Set-top boxes already need to ***decode MPEG*** data in order to display digital television; mobile telephones will soon need to ***support MPEG*** protocols for video conferencing or television display.”); Ex. 1025 (Hart Depo. Tr.), 114:7-22 (agreeing that MPEG frames are within the scope of the ’109 patent).

2. “mobile device”

32. Patent Owner construes “mobile device” as a “handheld computing device.” POR at 18-23, 44-45; Ex. 2009 (Hart Decl.) ¶¶ 52-56. Patent Owner then argues that a “handheld computing device” excludes laptops, such as the Apple iBook laptop disclosed in PC Magazine. Ex. 1007 (PC Magazine) at 9. I disagree. A POSITA would understand that a mobile device has its plain and ordinary meaning, and can include laptops such as the Apple iBook described in PC Magazine (Ex. 1007 at 9).

33. As an initial matter, Patent Owner previously argued in the related district court case that a “mobile device” specifically includes laptops. *Intellectual Pixels Limited v. Sony Interactive Entertainment LLC*, Case No. 8:20-cv-01422-

JVS-KES (C.D. Cal.) (the “-01422 Action”). In the -01422 Action, Patent Owner alleged in its complaints that the claimed “mobile device” includes a “laptop.” Ex. 1031 (Original Complaint) at 20:26-21:1 (“Claim 6 requires ‘the client device is a mobile device.’ ... The PC client devices that are supported *include laptop computers, which are mobile devices.*”), at 30:19-24 (“Claim 6 requires ‘the client device is a mobile device.’ Remote Play satisfies this claim because Remote Play supports a variety of mobile client devices, including ... PC and Mac *laptop computers, which are mobile devices.*”); Ex. 1032 (Amended Complaint) at 20:26-21:1, 30:19-24 (same). Patent Owner’s own arguments for infringement contradict its narrow definition it now proposes for trying to preserve validity.

a. Claim language

34. The claim language recites a “mobile device”—not a handheld computing device. Ex. 1001 (’109 patent), claims 6, 11, 12. If Patent Owner wanted to limit “mobile device” to handhelds like PDAs or mobile phones, it could have done so, just as it did in an earlier patent in the same patent family. *See* Ex. 1034 (U.S. Patent No. 8,131,826), claim 5 (reciting “the client device is a PDA”), claim 6 (“the client device is a mobile phone”), 1:6-12 (claiming priority as a continuation to U.S. Patent No. 7,587,520, just like the ’109 patent); Ex. 1001 (’109 patent), 1:6-23 (claiming priority as a continuation to U.S. Patent No. 7,587,520). Here, in contrast, the ’109 claims recite “mobile device” without

limitation. Thus, the claim language supports the plain and ordinary meaning and not the narrower definition proposed by Patent Owner.

b. Specification

35. The specification does not use the term “handheld” or even “mobile device.” Rather, the specification uses the general term “client device” throughout, and specifically refers to “common consumer client devices.” Ex. 1001 (’109 patent) at 3:26-33 (“Therefore, for reasons of cost, size, and power consumption, sophisticated three dimensional graphics are not available on ***common consumer client devices*** such as personal digital assistants (PDAs) mobile telephones and set-top boxes used to decode cable and satellite television signals. Consequently, it would be advantageous to display complex three dimensional graphics, such as those used by games, on these ***consumer client devices***.”); 5:49 (“any client device”); 9:13; 9:42. Both Dr. Hart and I agree that in 2001, laptops were common consumer devices. Ex. 1025 (Hart Depo. Tr.) at 23:8-25:11.

36. I note that the specification discloses PDAs and mobile phones as “examples” of client devices, but this exemplary embodiment should not be used to limit the claims. POR at 19; Ex. 2009 (Hart Decl.) ¶ 53. The specification makes clear that PDAs and cellular telephones as “***exemplary clients***.” Ex. 1001 (’109 patent) at 5:51-59 (“Another ***exemplary clients*** are PDA 18, such as a Palm Pilot or a Handspring Visor, which has a display screen 26, and cellular telephone 20,

which includes a display screen 28....”). I have been informed and understand that it is improper to use examples from the specification to limit the claims. By making clear these are “exemplary,” a POSITA would understand that the claims are not limited to these examples and can include other mobile devices, such as laptops.

c. Extrinsic evidence

37. Patent Owner relies on a textbook published in 2008—seven years after the priority date of the ’109 patent (January 24, 2001). Ex. 2007 (Discovering Computers) at 3 (showing copyright date of 2008). Thus, Patent Owner’s cited textbook is not probative of a POSITA’s understanding of “mobile device” at the time of the claimed ’109 invention in January 2001.

38. An examination of articles closer in time to the ’109 patent reveals that POSITAs did consider “mobile devices” to include laptops:

- Ex. 1026 at 4 (Wang et al., Task-Driven Computing, May 2000):
“The services available in an environment change in the presence of *mobile devices, such as laptops* and I/O devices.... Typically people own some stationary devices such as desktop workstations and a *couple of mobile devices (laptops, PDAs)*, and they do their computing primarily on those devices.”
- Ex. 1027 at 36 (FCC Report, August 2000): “*Mobile data devices*

include telephone handsets, pagers, handheld computers, personal digital assistants ('PDAs'), *and laptop computers* equipped with wireless modems.”

- Ex. 1028 at 27 (Encyclopedia of Computer Science, 2000): “Mobile computing is computing using a device that can communicate through a wireless channel.... *Mobile devices* which provide interaction with people require some sort of display device for feedback. In *laptop* computers, the design goal is usually to have displays which can provide the same resolution, refresh rate, and color capabilities as the desktop version in a screen which is less than an inch thick.... *Other mobile devices, ...*”.

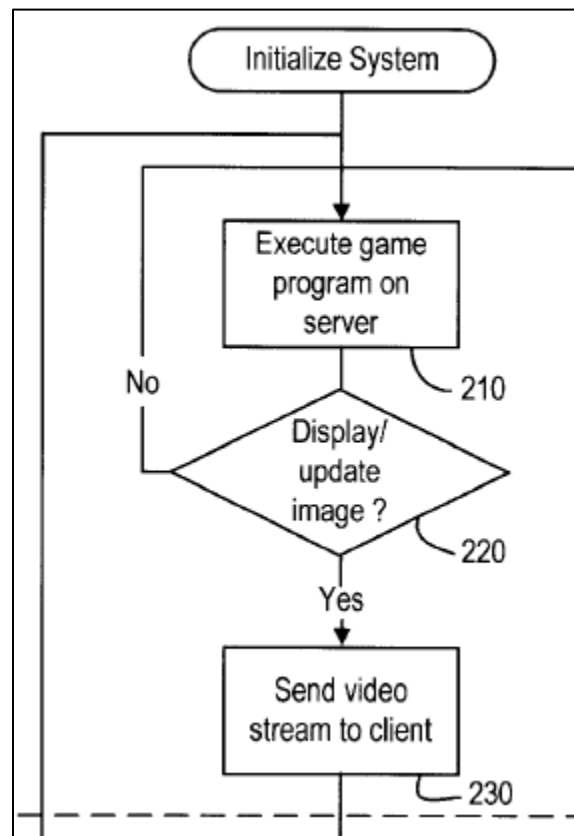
39. In conclusion, based on the claims, specification, file history, and extrinsic evidence, I disagree with Patent Owner’s narrow construction of “mobile devices” to exclude laptop computers. Rather, the term should have its plain and ordinary meaning, which can include laptops such as the Apple iBook.

B. Wiltshire And Saha Disclose “Compressing At Least One Updated Image And Transmitting The Compressed Updated Image To The Client Device, Wherein The Server Transmits The Updated Image As A Compressed Frame.”

40. As set forth in my first declaration, the combination of Wiltshire and Saha discloses “compressing at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the

updated image as a compressed frame” (claim 1) and “and compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a frame” (claim 8). Ex. 1002 (First Fuchs Declaration) ¶¶ 80-99 (claim 1); ¶¶ 135-138 (claim 8). I disagree with Patent Owner and Dr. Hart’s arguments to the contrary, as set forth below. POR at 24-32; Ex. 2009 (Hart Decl.) ¶¶ 60-82.

41. First, Patent Owner incorrectly argues that Wiltshire does not disclose an “updated” image (POR at 27-30; Ex. 2009 (Hart Decl.) ¶ 61), despite the fact that Wiltshire expressly discloses the “*update* image” step 220 in Figure 2, as shown below in the excerpt below:



Ex. 1004 (Wiltshire), Figure 2 (stage 220 “Display/*update* image?”). Wiltshire also describes “modifying” an image based on the game state on the server. Ex. 1004 (Wiltshire), 8:61-63 (“Game program 112, then responds to input command 112 by updating the state of the game and possibly *modifying the image* displayed on screen 140.”). As I explained in my first declaration, Wiltshire discloses that the decision to “update” or “modify” an image at the server is in response to the updated game state running on the server, meaning that the server will, at times, update or modify the image in response to the updated game state. Ex. 1002 (First Fuchs Declaration) ¶¶ 71-79 (citing, for example, Ex. 1004 (Wiltshire), 8:61-63, Fig. 2). For example, if the decision at step 220 of Figure 2 is to “update [the] image,” Wiltshire’s server will do so, as Wiltshire explicitly describes, including at column 8, lines 61-63 (quoted above).

42. Patent Owner also argues that “update” merely means selecting a new image that is already preloaded on the client. POR at 28-30; Ex. 2009 (Hart Decl.) ¶ 61. I disagree. Patent Owner points to an alternative embodiment in Wiltshire about “preloading images onto the client.” Ex. 1004 (Wiltshire), 8:8-11 (“Moreover, *in some embodiments*, images for use by computer gaming system 100 are preloaded into a memory of client/terminal computers 120 to further reduce the amount of communication network bandwidth required.”). But as the quoted language shows, Wiltshire is describing only “some embodiments.” The

main embodiment described in Figure 2 relies on *transmitting* an updated image “from the server/host computer 110 to client/terminal computer 120” (Ex. 1004 (Wiltshire), 7:13-15), or as shown in the flow chart of Figure 2, “*Send*[ing] video stream to client” following the step of “update image.” *Id.*, Fig. 2. Pre-loading images also would not make sense for interactive video games like “Doom,” which generate updated images in response to user inputs in real time. Ex. 1004 (Wiltshire), 1:26-43 (listing “Doom” as one of the games for use in Wiltshire’s system). An example of gameplay from the game Doom can be seen at: <https://www.youtube.com/watch?v=8mEP4cflrd4>.





(Sequence of screen shots from Doom gameplay:

<https://www.youtube.com/watch?v=8mEP4cflrd4>)

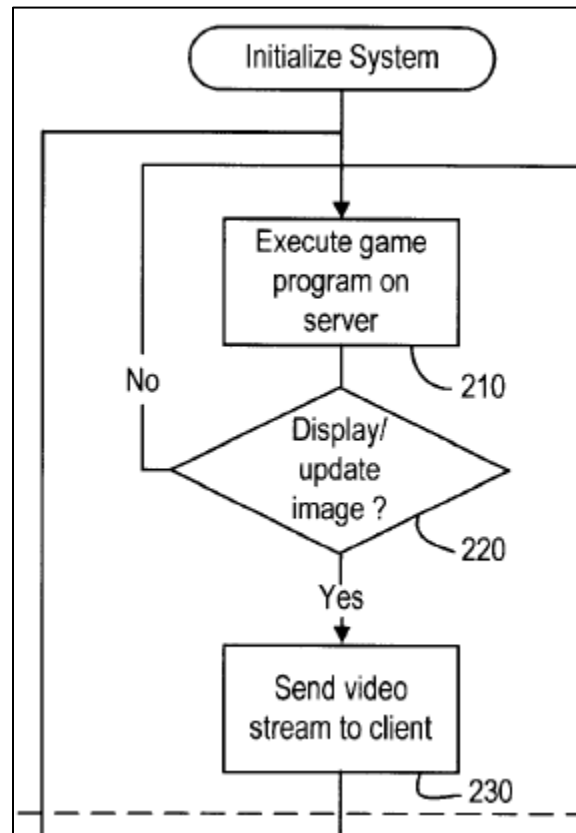
43. In Doom, the player's perspective changes dynamically based on what the user is doing in real time (using inputs from the user), as illustrated in the above screen shots, where the player is running up the stairs. Each image is updated to reflect the current state of the player within the game world. That is why in Wiltshire, the game running on the server generates the image based on the

game state, compresses the image (using MPEG), and transmits the image to the server. Pre-loading an image would not work in this type of game because the client would not know what action the player would take at every instant in time.

44. Second, Patent Owner argues that Wiltshire's updated image is not compressed before being transmitted to the client. POR at 27-32; Ex. 2009 (Hart Decl.) ¶¶ 62-67. Patent Owner argues that Wiltshire "described moving straight from determining whether an image was to be displayed at the client (step 220) to sending the image (step 230)" without compressing the image (as Patent Owner contends). POR at 30. I disagree. Wiltshire expressly discloses using "**data compression**" to reduce bandwidth when sending an updated image from the server to the client, and specifically sending a "**compressed** MPEG video stream." Ex. 1004 (Wiltshire), 7:13-18 ("In stage 230, an **image is sent from server/ host computer 110 to client/terminal computer 120**. The image may include any type of graphical information including a bitmap, a JPEG file, a TIFF file or even **an encoded audio/video stream such as a compressed video MPEG stream.**"), 7:57-64 ("Since only a very limited amount of information needs to be transferred over communications pathways 130 between server/host computer 110 and client/terminal computers 120, the communication network bandwidth required for efficient operation of computer gaming system 100 is in the order of 10 MB/s. This **bandwidth requirement can be further reduced using data compression**

techniques to about 100 KB/sec.”).

45. Wilshire clearly discloses the server updating the image and sending it as “a compressed MPEG video stream” to the client.



Excerpt from Ex. 1004 (Figure 2)

46. As shown in Wiltshire’s Figure 2 above, the updated image from Wiltshire’s step 220 has an arrow that goes into the transmission step 230, which is labeled “Send video stream to client.” A POSITA would understand if the image is displayed or updated, it is then sent to the client in the form of a “video stream.” As explained in my first declaration, a POSITA would understand that a “video stream” includes a sequence of frames, where each frame is an image of a video

sequence. Ex. 1002 (First Fuchs Declaration) ¶ 89. In other words, the diagram above shows that updated images are sent to a client as a video stream.

Transmitting the updated images as a video stream allows Wiltshire's system to be used with the wide variety of games it contemplates, including arcade games (like Doom) that continually update images on the screen. Ex. 1004 (Wiltshire), 1:26-43 (listing a wide variety of games contemplated by Wiltshire's system, including arcade games and sports games).

47. Wiltshire then discloses that that video stream may be compressed. In describing step 230, Wiltshire explains that the updated image transmitted in step 230 as a "video stream" "may include ... a *compressed video MPEG stream*." Ex. 1004 (Wiltshire), 7:13-18 ("In stage 230, an *image is sent from server/ host computer 110 to client/terminal computer 120*. The image may include any type of graphical information including a bitmap, a JPEG file, a TIFF file or even *an encoded audio/video stream such as a compressed video MPEG stream*.").

Sending a "compressed video MPEG stream" corresponds exactly with step 230 shown in Figure 2, which is labeled, "Send *video stream* to client." *Id.*, Fig. 2 (step 230). A POSITA would thus understand that the term "compressed video MPEG stream" is compressing the "video stream" being sent to the client, of which the updated image is a part. A POSITA would understand Wiltshire's description that "[t]he image may include ... an encoded audio/video stream such

as a compressed video MPEG stream” to mean that the server may send to the client each updated image as part of a compressed video MPEG stream, in accordance with the MPEG protocol (as described in Saha, for example).

Wiltshire then reiterates that the use of compression in this system can reduce the required bandwidth. Ex. 1004 (Wiltshire) at 7:57-64 (bandwidth from server to client transmissions “can be further reduced using data *compression* techniques”).

48. Dr. Hart relies on the word “file” in Wiltshire’s disclosure that “[t]he image may include ... a JPEG file, a TIFF file or even an encoded audio/video stream such as a compressed video MPEG stream.” Ex. 2009 (Hart Decl.) ¶ 62 (citing Ex. 1004 at 7:13-18). Dr. Hart concludes from this sentence that the MPEG stream is also a “file” that is somehow attached to an image. Ex. 2009 (Hart Decl.) ¶ 62. I disagree. The word “file” is only used for JPEG and TIFF, and is specifically *not* used when describing the MPEG stream. Moreover, Dr. Hart incorrectly contends that when Wiltshire discloses that the “image may include ... a *compressed* video MPEG stream,” that actually means to “*decompress* the file on the server/host and combine the *decompressed* image with any other image elements generated by the game program.” Ex. 2009 (Hart Decl.) ¶ 63. In other words, contrary to Wiltshire’s express teaching to transmit a “*compressed* video MPEG stream” from the server to the client, Dr. Hart argues Wiltshire should be read to teach the opposite: transmitting only a *decompressed* image. Not only

does this not follow from Wiltshire's disclosure of compression, but decompressing on the server prior to transmission would conflict with Wiltshire's teaching to reduce bandwidth "using data compression techniques" when transmitting from the server to the client. Ex. 1004 (Wiltshire) at 7:57-64.

49. Patent Owner also argues that Wiltshire's disclosure of transmitting a "compressed video MPEG stream" actually means sending a *pre*-compressed MPEG file, such as a pre-rendered "video clip banner ... to play at the top of the screen showing the word 'Jackpot' surrounded by fireworks." POR at 28. A POSITA would not read Wiltshire's disclosure this way (indeed, Patent Owner admits that "Wiltshire does not disclose this example"). POR at 28. As explained above, Figure 2 and the accompanying descriptions teach dynamically generating updated images based on game states that are in turn affected by user inputs, and sending those images to the client as a compressed video stream. The video stream must be dynamically generated because Wiltshire system must be capable of playing real-time interactive games like Doom. Wiltshire clearly teaches that its system is designed to play real time games like Doom. When describing the operation of Figure 2, Wiltshire explains that "a *game* program 112 is executed on server/host computer 110 in stage 210." Ex. 1004 (Wiltshire) at 7:7-9. Wiltshire further describes Figure 2 as "a flow diagram of the operation of the computer *gaming* system of Fig. 1." Ex. 1004 (Wiltshire) at 3:15-16. Wiltshire states at the

outset of the patent that the “terms ‘*game*’ and ‘*gaming*’ as used herein, include ... *video based games such as Doom*” Ex. 1004 (Wiltshire) at 1:27-44 (“The terms ‘*game*’ and ‘*gaming*,’ as used herein, include all types of electronic, electromechanical or mechanical gambling and casino game facsimiles (as defined in 15 U.S.C. 11719(a) (2) or (3), such as faro, monte, roulette, kono, bingo, fan-tan, twenty-one, blackjack, seven-and-a-half, big injun, klondike, craps, poker, chuck-a-luck, Chinese chuck-a-luck (dai shu), wheel of fortune, chemin de fir, baccarat, pai gow, beat the banker, panguingui, slot machines, video poker machines, etc.; lottery, sports betting and pari-mutuel wagering as well as games of skill and or strategy such as chess, checkers, backgammon, ‘board’ games such as Monopoly and Scrabble, card games such as Pinochle, Hearts, Spades; *video based games such as Doom, Pong, Packman, Myst*; video games based on sports such as golf, baseball, football, basketball, soccer, rugby; arcade type games; non-house stake games between two or more players; games defined by IGRA (Indian Gaming Regulatory Act) as class II games.”). Wiltshire also includes other examples of real-time interactive games such as “video games based on sports such as golf, baseball, football, basketball, soccer, rugby” and “arcade type games.” *Id.*

50. Doom is not a game where the user clicks a button, watches a pre-rendered movie based on that click, clicks again, and watches another pre-rendered movie. As I discuss above, in Doom, the player’s perspective changes dynamically

based on what the user is doing in real time, and each image must be updated to reflect the current state of the player within the game world.

51. Finally, Patent Owner and Dr. Hart argue that Saha's MPEG disclosure is limited to off-line encoding, and that a POSITA would not have understood how to use MPEG for live, real-time interactive games disclosed in Wiltshire. POR, 30-31; Ex. 2009 (Hart Decl.) ¶¶ 69-79 (opining that Wiltshire and Saha do not disclose details including how to generate "B frames" using subsequent "I or P frames," how to provide "low latency," or the "additional hardware subsystem" or "software encoding" needed to provide "real-time MPEG encoding of live streams"). I disagree.

52. Notably, both Wiltshire and the '109 patent have the same level of detail regarding MPEG compression. For example, Wiltshire says transmitting a "compressed video MPEG stream" when describing box 230 of Figure 2. Ex. 1004 (Wiltshire) at 7:13-17. Similarly, Figure 2D of the '109 patent's box 66 simply says "Compress the image data." Ex. 1001 ('109 patent), Fig. 2D:

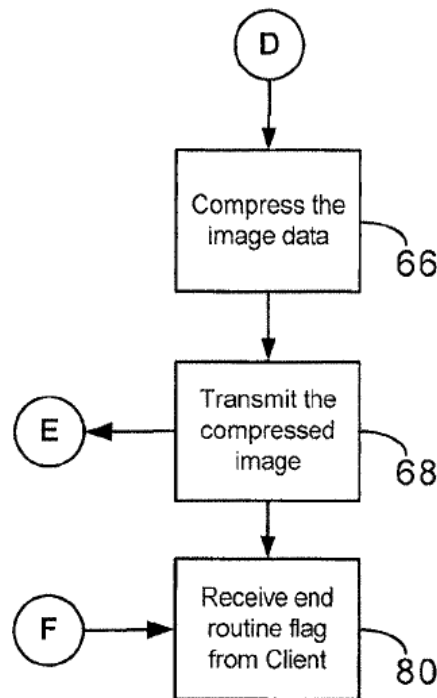


Fig. 2D

53. Dr. Hart testified that the box 66 labeled “compress the image data” (shown above) is sufficient to disclose all the details to implement MPEG encoding to a POSITA. Ex. 1025 (Hart Depo. Tr.), 146:17-149:5. I agree that such details were already in the knowledge of a POSITA in 2001. Further, as explained in my first declaration, real-time image compression (including by using MPEG) was already well known before the ’109 patent, as evidenced by the Levoy article. Ex. 1002 (First Fuchs Declaration) ¶ 27, Ex. 1016 (Levoy) at 21.

C. Wiltshire And Saha Discloses Transmitting A “[Compressed] Frame.”

54. As set forth in my first declaration, the combination of Wiltshire and

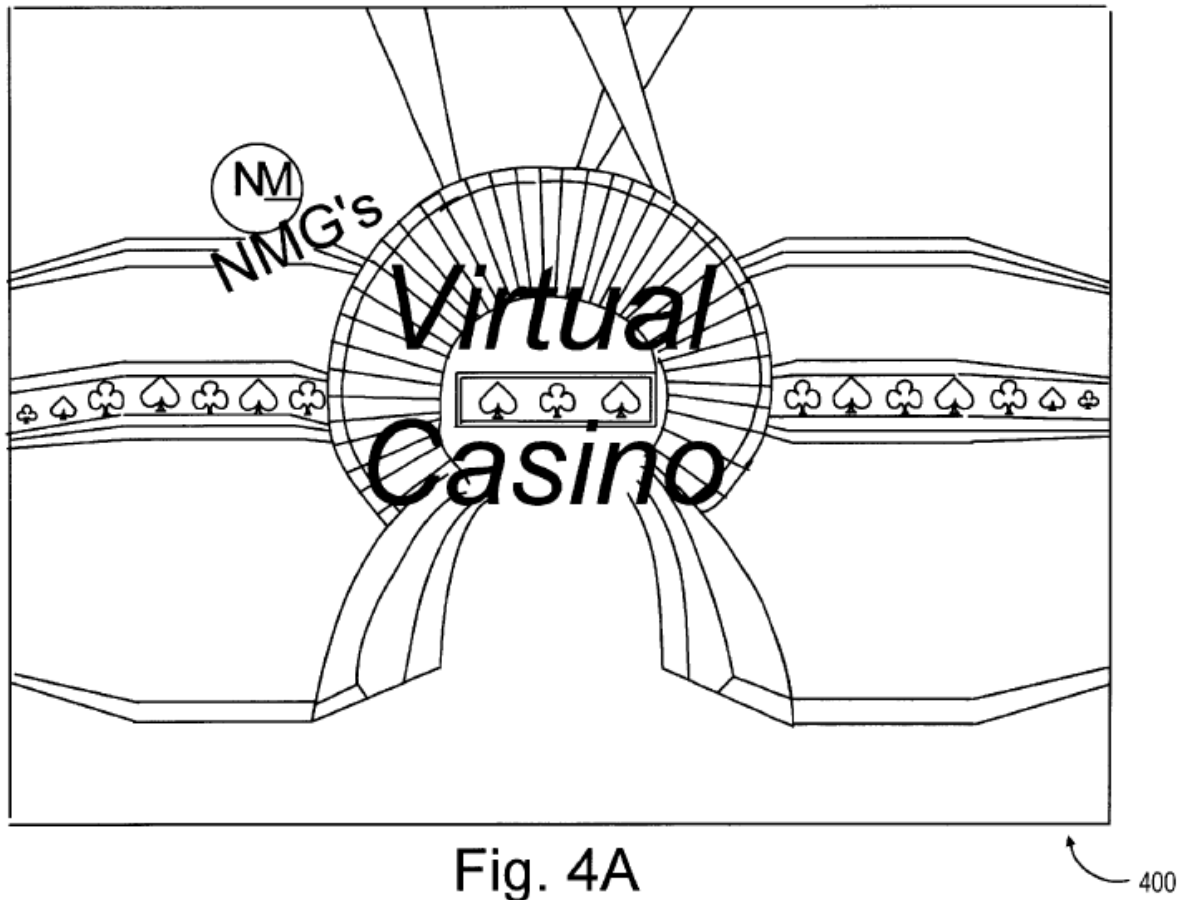
Saha discloses transmitting a “compressed frame” (claim 1) and a “frame” (claim 8). Ex. 1002 (First Fuchs Declaration) ¶¶ 80-99 (claim 1); ¶¶ 135-138 (claim 8). I disagree with Patent Owner and Dr. Hart’s arguments to the contrary, as set forth below. See POR at 32-39; Ex. 2009 (Hart Decl.) ¶¶ 83-87.

55. First, Patent Owner argues that the prior art does not disclose a “frame” under its proposed construction. As I explained above, I disagree with Patent Owner’s construction of “frame.” See Section V.A.1. Under the plain and ordinary meaning of “frame” (“the still images that are ordered in a sequence to produce a video or animated sequence” (Ex. 1002 (First Fuchs Declaration) ¶¶ 31, 89))—a POSITA would understand that Saha discloses frames and compressed frames using MPEG, as Saha expressly uses the term “frames” throughout the reference. See, e.g., Ex. 1005 (Saha), 2:19-35 (“MPEG compression ... *compress[es] frames in the sequence* ...”), 1:64-2:1; see also Ex. 1002 (First Fuchs Declaration) ¶¶ 82-99.

56. Second, even under Patent Owner’s incorrect construction requiring that a “frame” requires taking up the full screen of the client display, Wiltshire and Saha still disclose a “frame.” Wiltshire provides multiple examples of “images” that are “*displayed on a screen* of a client/terminal computer.” Ex. 1004 (Wiltshire), 3:23-57, Figs. 4-9. Each of these images are full displays (e.g., the scene, the entire card table, or the entire slot machine), not partial displays like a

single button or banner. *Id.*, Figs. 4-9.

57. For example, Figure 4A of Wiltshire is shown below to include the full display image from the application to be displayed on the client/terminal computer's screen:



Specifically, Wiltshire says that “FIG. 4A is an image *displayed on a screen* of a client/terminal computer of FIG. 1 in attract mode.” Ex. 1004 (Wiltshire) at 3:20-21; 8:42-44; *see also* 8:38-41 (“FIGS. 4A, 4B, 5A, 5B, 6A, 6B, 7A, 7B, 8A, 8B, 9A, 9B, 9C and 9D illustrate the images *displayed on screen* 140 of client/terminal computer 120 during operation 200 of computer gaming system 100.”). A

POSITA would understand from this disclosure that each image is displayed on the full screen of the client computer.

58. Moreover, Wiltshire discloses that the primary embodiment uses “full screen refreshes” on the client display. Ex. 1004 (Wiltshire) at 8:1-7 (explaining that “in some embodiments, to further reduce the amount of network bandwidth, ... image updates ... are limited to areas of the screen that are actually modified rather than *full screen refreshes*”). In other words, by disclosing alternative embodiments that uses “partial screen” updates, Wiltshire discloses that its default embodiment of transmitting images from the server to the client results in “full screen refreshes” on the client. This means the compressed frame transmitted from the server to the client is for the full client screen, further confirming that a POSITA would understand Wiltshire’s images to be full screen images.

59. Finally, as mentioned above (Section V.A.1), Dr. Hart also has a different construction that a frame is a “full image *generated by the application* at any given instance in time,” regardless of whether it takes up the entire client display. Ex. 2009 (Hart Decl.) ¶ 48; Ex. 1025 (Hart Depo. Tr.), 68:15-69:10. Wiltshire still discloses a “frame” under Dr. Hart’s view as well. As explained above, every “image” example in Wiltshire is a full image output from the game application, showing the full display of an application. Ex. 1004 (Wiltshire) at 3:23-57, Figs. 4-9. There is nothing in Wiltshire to suggest to a POSITA that the

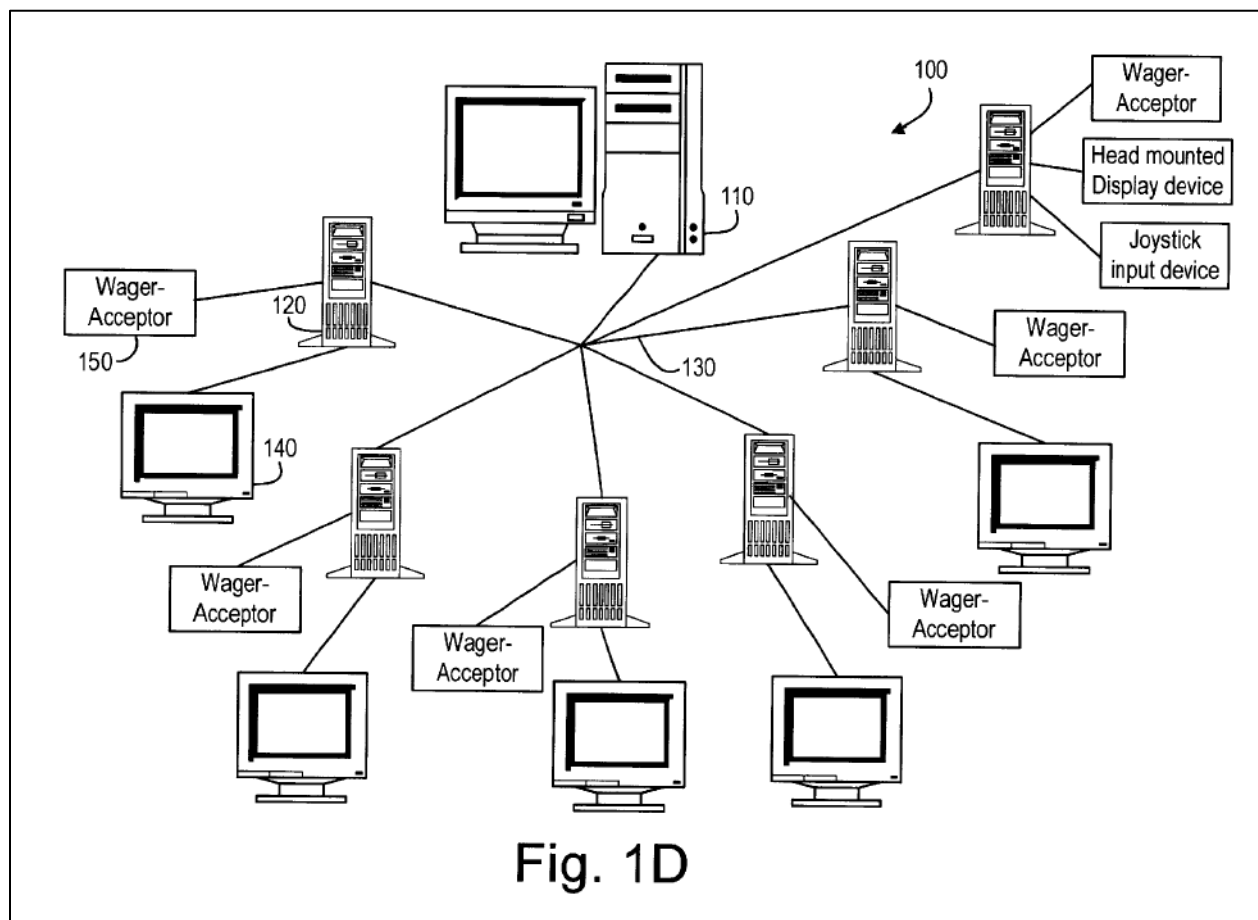
images shown in Figure 4-9 are partial outputs of an application such as a single button or banner that is alter combined at the client to for the full output. In addition, it would make no sense to a POSITA to run games such as Doom on the server (Ex. 1004 (Wiltshire), 1:26-43) and output something other than the image generated by the Doom application. In Wiltshire, a POSITA would understand the Doom application running on the server would output its full image at any given instance in time for transmission to the client for display. The same applies to the other games set forth in Wiltshire.

D. Wiltshire Discloses A “Mobile Device.”

60. As set forth in my first declaration, Wiltshire discloses a “mobile device” as recited in claims 6, 11, and 12. Ex. 1002 (First Fuchs Declaration) ¶¶ 118-121 (claim 6); ¶¶ 151-154 (claim 11); ¶¶ 155-158 (claim 12). I disagree with Patent Owner and Dr. Hart’s arguments to the contrary, as set forth below. *See* POR at 39-44; Ex. 2009 (Hart Decl.) ¶¶ 88-93.

61. First, Patent Owner argues that where Wiltshire refers to “wireless communication pathways” when describing a “mobile gaming environment,” “communication pathway” is referring to the connection between the head-mounted display and joystick with an immobile client device. POR at 41; Ex. 2009 (Hart Decl.) ¶¶ 90-91. I disagree. As shown in Figure 1D of Wiltshire, the “communication pathways” are the lines labeled 130 connecting each client (12) to

the server (110)—**not** the lines connecting the head mounted display and joystick to the client:



Ex. 1004 (Wiltshire), Fig. 1D. Consistent with the figure above, Wiltshire defines “communication pathway” 130 as the “pathways suitable for connecting *server/host* computer 100 to the *client/terminal* computers 120.” Ex. 1004

(Wiltshire), 5:38-51. Still further, Wiltshire says that the communication pathway between clients and server can include “RF links,” which are wireless connections (i.e., radio frequency links). Ex. 1004 (Wiltshire), 3:67-4:3. Nowhere in Wiltshire does it ever use the term “communication pathway” to mean anything different.

Thus, when Wiltshire discloses “wireless communication pathways” that allow “a mobile gaming environment” (Ex. 1004 (Wiltshire), Abstract), a POSITA would have understood that the pathways are wireless connections between the clients and the servers. A wireless connection allows the players to roam wirelessly with the client computers (which can be held or worn as a backpack, for example), consistent with Wiltshire’s disclosure that such a configuration “allows a patron to participate in a mobile gaming environment.” Ex. 1004 (Wiltshire), Abstract.

62. Second, Patent Owner argues that all the clients in Wiltshire require wager-acceptors, and thus cannot be mobile. POR at 42. But Wiltshire discloses that wager-acceptors are used only “in some embodiments,” and thus a POSITA would understand that wage-acceptors are not required in Wiltshire. Ex. 1004 (Wiltshire), 4:30-33. Further, wager-acceptors can include, for example, a “smart-card reader” or “credit card reader” (*id.*, 4:33) which could be used with laptops without preventing mobility since they do not hold cash or coins.

63. Third, Patent Owner ignores that Wiltshire discloses that the clients can run “Windows CE,” which is an operating system suitable for use in handheld devices. Ex. 1004 (Wiltshire) at 6:55-60 (“Client operating system 124 is any operating system that can be executed on hardware 126 of client/terminal computer 120. In some embodiments, operating system 124 is MS-DOS®, Windows98™ or Windows NT® 4.0, or Windows CE® available from Microsoft, Corp. of

Redmond, Wash.”); Ex. 1037 (PC Magazine Encyclopedia) (CE is “Microsoft’s version of Windows for *handheld* devices and embedded systems”); Ex. 1026 (Wang et al., Task-Drive Computing) at 6 (“As he enters the car, the system notices the existence of an auto PC with internet connection, a car phone, and a *handheld* Windows CE”). A POSITA understood in 2001 that Windows CE was a scaled down version of the Windows operating system designed for devices with less memory, storage, and slower processing speed, such as smaller handheld devices. Thus, even under Patent Owner’s proposed construction limiting “mobile devices” to handheld computing devices, a POSITA would understand that Wiltshire contemplates using handheld devices for its mobile gaming platform.

64. Finally, Patent Owner argues that even if a POSITA would have understood Wiltshire to disclose laptops, laptops would not be “mobile devices” under its narrow construction. POR at 44. As discussed above, I disagree with Patent Owner’s construction. *See* Section V.A.2. Under the plain meaning, which includes laptops, a POSITA would have understood that Wiltshire discloses a mobile device, such as laptops, because, as I have explained in my prior declaration, Wiltshire expressly discloses a “mobile gaming environment” using “wireless communication pathways” between the client and server, and because it discloses that any known computer—including one running Windows CE—could be used. *See* Ex. 1002 (First Fuchs Declaration) ¶¶ 118-121 (claim 6); ¶¶ 151-154

(claim 11); ¶¶ 155-158 (claim 12).

E. PC Magazine (Ex. 1007) Discloses A “Mobile Device.”

65. As set forth in my first declaration, PC Magazine also discloses a “mobile device” as recited in claims 6, 11, and 12. Ex. 1002 (First Fuchs Declaration) ¶¶ 215-227 (claim 6); ¶¶ 228-231 (claim 11); ¶¶ 232-236 (claim 12). I disagree with Patent Owner and Dr. Hart’s arguments to the contrary, as set forth below. POR at 45; Ex. 2009 (Hart Decl.) ¶¶ 106-107.

66. First, Patent Owner again relies on its narrow construction of “mobile device,” which is incorrect as explained above. *See* Section II.A.2. Under the plain meaning of “mobile device,” laptops are mobile devices, which is consistent with Patent Owner’s arguments from its filings in the related district court litigation. Ex. 1031 (Original Complaint) at 20:26-21:1 (“Claim 6 requires ‘the client device is a mobile device.’ ... The PC client devices that are supported ***include laptop computers, which are mobile devices.***”), at 30:19-24 (“Claim 6 requires ‘the client device is a mobile device.’ Remote Play satisfies this claim because Remote Play supports a variety of mobile client devices, including ... PC and Mac ***laptop computers, which are mobile devices.***”); Ex. 1032 (Amended Complaint) at 20:26-21:1, 30:19-24 (same). In short, a POSITA would have understood that the Apple iBook laptop, with its wireless capability, was a “mobile device.”

67. Second, Patent Owner points out that PC Magazine refers to the iBook as a “portable” computer, which it argues means that it cannot be a “mobile device.” POR at 45. I disagree. At the time of the ’109 patent, a POSITA would have understood that the Apple iBook laptop was both portable *and* mobile. In particular, the iBook design included features to allow it to be used in a mobile fashion, including its “wireless technology” and small form factor. Thus, I disagree with Patent Owner’s implied premise that a “portable device” cannot also be a “mobile device.” The two exemplary client devices described in the ’109 patent—mobile telephones and PDAs—are both portable and mobile.

68. Finally, even under Patent Owner’s construction that the mobile device must be “handheld,” the iBook would still satisfy Patent Owner’s definition. As mentioned above, the iBook was designed to be used wirelessly while holding the computer and walking around. When the Apple iBook was first unveiled during MacWorld in 1999 (*see* Ex. 1007 at 10 (mentioning that the iBook was presented at “New York’s recent MacWorld trade show”), Steve Jobs demonstrated its mobile and wireless capability by browsing multiple websites while holding the iBook in one hand, as shown in the following screen captures from the presentation. The pertinent part of the video can be seen at <https://youtu.be/3iTNWZF2m3o?t=876>. I have provided below screen captures where Steve Jobs demonstrated how to use the iBook while holding it in his hand:



In the screen shot above, Mr. Jobs is holding the iBook in his left hand while using the touch pad with his right hand. The camera man shows a close up shot in the following screen shot:

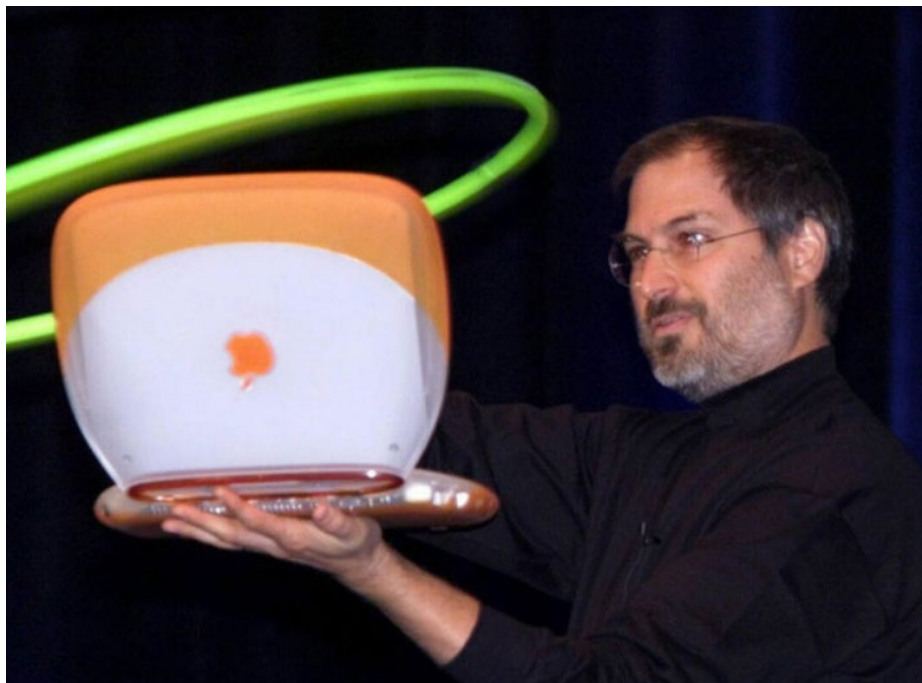


During this action, Mr. Jobs navigates to a website while still holding the iBook in his left hand, which successfully loads, demonstrating how the iBook could be used to browse the Internet wirelessly.

69. Below is a screen capture from an alternative view of the same presentation (<https://youtu.be/HFngngjy4fk?t=57>), showing Mr. Jobs browsing the web while holding the iBook with one hand:



70. The below photo (<https://www.raqwe.com/see-rare-video-with-jobs-presenters-wi-fi-in-1999/>) also shows Mr. Jobs holding the iBook with one hand while passing a hoop around the device to show that it is indeed wireless.



71. In sum, as set forth in my first declaration, PC Magazine (Ex. 1007)

discloses a “mobile device,” both under the correct plain and ordinary meaning, as well as under Patent Owner’s narrower construction that it must be a handheld computing device.

F. A POSITA Would Have Been Motivated To Combine PC Magazine With Wiltshire And Saha.

72. As set forth in my first declaration, a POSITA would have been motivated to combine PC Magazine with Wiltshire and Saha with a reasonable expectation of success to render obvious claims 6, 11, and 12 (reciting a “mobile device”). Ex. 1002 (First Fuchs Declaration) ¶¶ 217-227 (claim 6); ¶¶ 228-231 (claim 11); ¶¶ 232-236 (claim 12). I disagree with Patent Owner and Dr. Hart’s arguments to the contrary, as set forth below. POR at 46-52; Ex. 2009 (Hart Decl.) ¶¶ 107-113.

73. First, Patent Owner incorrectly states that Wiltshire’s clients all require wager acceptors that take coins or cash, which discourages using a laptop like the iBook, including because it presents security risks. POR at 46-48; Ex. 2009 (Hart Decl.) ¶¶ 111-112. As I explained above, a POSITA would not understand Wiltshire’s clients to require wager acceptors, but instead would understand that wager acceptors are optional. Ex. 1004 (Wiltshire), 4:30-33 (wager-acceptors are used only “in *some* embodiments”). Also, Patent Owner ignores that wager acceptors can include card readers, which would not carry any cash, and thus is incorrect in its notion that laptops present a security risk. *Id.*

74. Second, I disagree with Patent Owner's argument that Wiltshire is limited to a casino environment, where mobile devices would not typically be used. POR at 49-51; Ex. 2009 (Hart Decl.) ¶ 111. A POSITA would understand Wiltshire's system to be broadly applicable to many contexts, not just casinos. At the outset of the disclosure, Wiltshire broadly defines the terms "game" and "gaming" to include non-casino games. Ex. 1004 (Wiltshire), 1:26-43 (defining "game" and "gaming" as including "video based games such as Doom, Pong, Packman, Myst" and "video games based on sports"). Wiltshire expressly contemplates "non-casino games" (Ex. 1004 (Wiltshire), 12:11), and specifically describes games such as "Doom" and "Myst," neither of which are casino games. Ex. 1004 (Wiltshire), 1:26-43; Ex. 1025 (Hart Depo. Tr.), 36:1-25. This is confirmed by Wiltshire's definition of the "scope of the invention" at the end of the disclosure, where it claims "[a] computer gaming system" without any limitation as to being used in a casino or similar environment. Ex. 1004 (Wiltshire), 12:21-43. Further, Wiltshire discloses input commands "such as mouse movements, mouse clicks or keystrokes" (Ex. 1004 (Wiltshire), 5:59-65), which a POSITA would understand applies to non-casino gaming like playing Doom or Myst, for example, and not something like a slot machine or other casino machine. Patent Owner seems to rely on the fact that Wiltshire describes various casino applications, but a POSITA would not have read Wiltshire in such a limited

fashion, and would have understood based on all the non-casino teachings set forth in Wiltshire that its system applies to these other contexts, including using a laptop as the client device in a user's home or other building while the game is running on a remote server.

75. Finally, Patent Owner also criticizes my statement in my first declaration that “the personal computer industry had already begun shifting towards offering viable mobile laptop products to the general public” and calls it a “bald statement.” POR at 50. I disagree. In my declaration, I specifically cited to PC Magazine (Ex. 1007), one of the most popular PC publications at the time, which contained numerous advertisements and articles about laptops for use with both businesses and consumers, which demonstrates that there was already a substantial market for laptops by September 1999. I also personally used laptops in 2001, as did Dr. Hart. Ex. 1025 (Hart Depo. Tr.), 36:1-5; 169:8-170:25.

G. A POSITA Would Have Been Motivated to Combine Chen with Wiltshire and Saha

76. As set forth in my first declaration, a POSITA would have been motivated to combine Chen with Wiltshire and Saha with a reasonable expectation of success to render obvious claim 2. Ex. 1002 (First Fuchs Declaration) ¶¶ 192-208. I disagree with Patent Owner and Dr. Hart's arguments to the contrary, as set forth below. POR at 53-63; Ex. 2009 (Hart Decl.) ¶¶ 95-105.

77. First, Patent Owner essentially makes two arguments for why a

POSITA would not combine Chen with Wiltshire: (1) that Wiltshire is limited to commercial casino establishments, and (2) that Chen is limited to residential applications. POR, 53-59. I disagree with both arguments. As explained above in Section IV.F, a POSITA would not understand that Wiltshire is limited to commercial gambling establishments like casinos, but rather it discloses a gaming system that could be used in a variety of contexts, including in homes and including for video games.

78. As to Patent Owner's argument that Chen is limited to residential applications, Chen discloses more than just ADSL in residential contexts, but also for business applications. Ex. 1006 (Chen), 69 ("The capabilities of ADSL are also well suited to application such as network computing, where software and database records could be stored on network servers ... and tele-education, where a specialist can be shared with a large student population"). In particular, it was common for businesses at the time of the Chen article (1999) to use network computing applications where software and database records could be stored on network servers. This was not, however, a common residential use at the time of the Chen article. Tele-education, likewise, was a business use of ADSL. Further, it was well known that ADSL could be used for the "last mile" connection to both "businesses and residences." Ex. 1029 (Ahamed 1995), Abstract; *see also* Ex. 1030 (Kompatsiaris 2000), Abstract ("(DSL) technologies enable the use of the

twisted pair copper telephone lines, that reach practically every home *and business....*”).

79. Second, Patent Owner argues that Wiltshire requires transmitting multiple, concurrent MPEG video streams to multiple clients, and that Chen’s description of ADSL could only provide one MPEG video stream. POR at 61-62; Ex. 2009 (Hart Decl.) ¶ 103. But both Dr. Hart and I agree that Wiltshire discloses a system with only one client in one embodiment. Ex. 1004 (Wiltshire), claim 1 (claiming “*one* or more client/terminal computers”); Ex. 1025 (Hart Depo. Tr.), 32:7-12 (“I believe Wiltshire discloses the use of one client terminal computer”). Further, both Dr. Hart and I agree that claim 2 of the ’109 patent does not require more than one client computer. Ex. 1001 (’109 patent), claim 2, Ex. 1025 (Hart Depo. Tr.), 156:18-23 (agreeing that claim 2 does not require multiple client devices). Thus, it is immaterial whether ADSL could support more than one concurrent MPEG video stream, since claim 2 does not require multiple client devices and Wiltshire discloses an embodiment with only one client device coupled to the server. In any event, a POSITA would understand that any given application in Wiltshire need not consume the entire 1.3 Mbps bandwidth used for MPEG’s full motion video (over ADSL’s 1.544 Mb/s downstream link). The fact that an MPEG stream may require rates of 1.3 Mb/s for “full motion video” using MPEG (Ex. 1006 (Chen), 69) does not mean that this full 1.3 Mb/s will be required

for all uses or all applications. To the contrary, it was common, especially in 2001 and earlier, to use much lower transmission rates. For example, Wiltshire contemplates games like Pong or simpler games that could stream multiple concurrent MPEG videos that total much less than 1.3 Mbps. Pong's graphics were rudimentary and would have required a small fraction of the full 1.3Mbps bandwidth.

80. Finally, Patent Owner contends that ADSL was not just one of a finite number of options for Internet connectivity, as I opined in my first declaration. POR at 62; Ex. 1002 (First Fuchs Declaration) ¶ 201. I disagree. In my declaration, I cited the PC Magazine article (Ex. 1007) which included an article stating that “[c]able modems and DSL lines are proliferating faster than anyone predicted.” Ex. 1002 (First Fuchs Declaration) ¶ 201. In other words, cable and DSL were the two common solutions for Internet connectivity at the time of Wiltshire. Patent Owner and Dr. Hart contend that the reference to “DSL” could have meant different types of DSL, not necessarily ADSL. Ex. 2009 (Hart Decl.) ¶ 98. But a POSITA would have understood the reference to “DSL” in PC Magazine to mean “ADSL.” As stated in Chen (Ex. 1006), which was published the same year as PC Magazine, *ADSL* was already recognized as the “ideal” vehicle for providing Internet Access. Ex. 1006 (Chen), 69. Thus, a POSITA would have understood general references to “DSL” at the time to mean “ADSL.”

For example, the '109 patent also uses the shorter term “DSL” when describing asymmetric DSL (ADSL). Ex. 1001 ('109 patent), 6:14-16.

VI. AVAILABILITY FOR CROSS-EXAMINATION

81. In signing this declaration, I recognize that the declaration will be filed as evidence in a case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

VII. RIGHT TO SUPPLEMENT

82. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

Jurat

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: November 23, 2021



Henry Fuchs, Ph. D.