

Petition for *Inter Partes* Review of U.S. Patent 10,681,109

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Filed on behalf of Sony Interactive Entertainment LLC

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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

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,681,109
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Mandatory Notices.....	1
A.	Real Party-in-Interest	1
B.	Related Matters.....	1
C.	Counsel	2
D.	Service Information	2
III.	Certification of Grounds for Standing	2
IV.	Overview of Challenge and Relief Requested.....	2
A.	Prior Art Patents and Printed Publications.....	2
B.	Grounds for Challenge	3
V.	Discretion Under 35 U.S.C. §§ 314(a) and 325(d).....	4
A.	Factor 1: “Whether a stay exists or is likely to be granted if a proceeding is instituted”	4
B.	Factor 2: “Proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision”.....	5
C.	Factor 3: “Investment in the parallel proceeding”	6
D.	Factor 4: “Overlap between issues raised in the petition and in the parallel proceeding”	7
E.	Factor 6: “Other circumstances that impact the Board’s exercise of discretion, including the merits”.....	8
VI.	Brief Description of Background Technology	8
VII.	Overview of the ’109 patent	10
A.	Alleged Problem.....	10
B.	Alleged Invention.....	12
C.	The Challenged Claims	13
VIII.	Level of Ordinary Skill In The Art	14
IX.	Overview of the Prior Art	14
A.	Wiltshire	14
B.	Chen.....	17

C.	Saha	18
D.	PC Magazine	18
X.	Claim Construction	18
XI.	Specific Grounds for Petition.....	19
A.	Ground I: Claims 1, 3-13, and 15-18 are rendered obvious by Wiltshire and Saha	19
1.	Claim 1	19
2.	Claim 3	34
3.	Claim 4	37
4.	Claim 5	37
5.	Claim 6	39
6.	Claim 7	41
7.	Claim 8	42
8.	Claim 9	45
9.	Claim 10	49
10.	Claim 11	50
11.	Claim 12	50
12.	Claim 13	51
13.	Claim 15	55
14.	Claim 16	55
15.	Claim 17	56
16.	Claim 18	56
B.	Ground II: Claims 2 and 14 are obvious in view of Wiltshire, Saha, and Chen	58
1.	Claim 2	59
2.	Claim 14	65
C.	Ground III: Claims 6, 11, and 12 are obvious in view of Wiltshire, Saha, and PC Magazine	66
1.	Claim 6	66
2.	Claim 11	71
3.	Claim 12	72

XII. Conclusion	73
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TABLE OF AUTHORITIES

	Page(s)
 Federal Cases	
<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)	4, 7
<i>Comcast Cable Commnc'ns., LLC v. Rovi Guides, Inc.</i> , IPR2019-00231, Paper 14 (PTAB May 20, 2019)	8
<i>Dolby Labs, Inc. v. Intertrust Techs. Corp.</i> , IPR2020-00660, Paper 14 at 16 (PTAB October 15, 2020)	6
<i>Illumina Inc. v. Natera, Inc.</i> , IPR2019-01201, Paper 19 (PTAB Dec. 18, 2019)	8
<i>Intellectual Pixels Limited v. Sony Interactive Entertainment LLC</i> , Case No. 8:19-cv-01432-JVS-KES (C.D. Cal.)	1
<i>SPEX Techs., Inc. v. Kingston Tech. Corp.</i> , 2018 WL 2446801, (C.D. Cal. May 16, 2018)	5
 Federal Statutes	
35 U.S.C. § 102(a)	3
35 U.S.C. § 102(b)	17
35 U.S.C. § 103	3
35 U.S.C. §§ 311-19	1
35 U.S.C. § 314(a)	4, 8
35 U.S.C. §§ 325(d)	4
 Regulations	
37 C.F.R. § 42.104(b)(4)-(5)	19
37 C.F.R. § 42.1 <i>et seq.</i>	1

Other Authorities

37 C.F.R. § 42.104(a).....	2
37 C.F.R. § 42.22(a)(1) and 42.104(b)(1)-(2).....	2

Sony Interactive Entertainment LLC (“Petitioner”) respectfully requests *Inter Partes* Review of claims 1-18 of U.S. Patent No. 10,681,109 (“’109 patent”) (Ex. 1001) pursuant to 35 U.S.C. §§ 311-19 and 37 C.F.R. § 42.1 *et seq.*

I. INTRODUCTION

The ’109 patent is directed to a well-known technique for executing an application on a server, generating and compressing an image, and transmitting the compressed image to a client device for display. Such techniques were well known in the prior art, and the references relied upon in this Petition render obvious claims 1-18 of the ’109 patent.

II. MANDATORY NOTICES

A. Real Party-in-Interest

Sony Interactive Entertainment LLC, Sony Corporation, Sony Corporation of America, and Sony Interactive Entertainment Inc. are the real parties-in-interest.

B. Related Matters

Intellectual Pixels Limited (“Patent Owner”) has asserted the ’109 patent against Petitioner in *Intellectual Pixels Limited v. Sony Interactive Entertainment LLC*, Case No. 8:20-cv-01422-JVS-KES (C.D. Cal.) (the “-01422 Action”).

The ’109 patent is a continuation of U.S. Patent No. 8,667,093 (“’093 patent”), which was asserted against Petitioner in *Intellectual Pixels Limited v. Sony Interactive Entertainment LLC*, Case No. 8:19-cv-01432-JVS-KES (C.D. Cal.) (the “-01432 Action”). Petitioner has filed a petition challenging the ’093 patent in

IPR2020-1248 (the “’093 IPR”).

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Petitioner consents to service by email on lead and back-up counsel.

III. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies pursuant to Rule 42.104(a) that the ’109 patent is available for *inter partes* review and that Petitioner is not barred or estopped from challenging the patent claims on the grounds identified in this Petition.

IV. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner challenges claims 1-18 of the ’109 patent.

A. Prior Art Patents and Printed Publications

The following references are pertinent to the grounds of unpatentability:

1. U.S. Patent No. 6,409,602 (“Wiltshire”) (Ex. 1004), filed on

November 24, 1998, and issued on June 25, 2002, is prior art under 35 U.S.C.

§ 102(e).¹

2. U.S. Patent No. 6,404,817 (“Saha”) (Ex. 1005), filed on November 20, 1997, and issued on June 11, 2002, is prior art under 35 U.S.C. § 102(e).

3. Chen, “The Development and Standardization of Asymmetrical Digital Subscriber Line,” IEEE Communications Magazine (May 1999) (“Chen”) (Ex. 1006) is prior art under 35 U.S.C. §§ 102(a) and 102(b).

4. PC Magazine, Vol. 18:16 (September 21, 1999) (“PC Magazine”) (Ex. 1007) is prior art under 35 U.S.C. §§ 102(a) and 102(b).

B. Grounds for Challenge

Petitioner requests cancellation of claims 1-18 as unpatentable under 35 U.S.C. § 103 based on the following grounds:

- **Ground I:** Claims 1, 3-13, and 15-18 are obvious in view of Wiltshire and Saha.
- **Ground II:** Claims 2 and 14 are obvious in view of Wiltshire, Saha, and Chen.
- **Ground III:** Claims 6, 11, and 12 are obvious in view of Wiltshire, Saha,

¹ Because the ’109 patent issued from a patent application filed before the America Invents Act (“AIA”), pre-AIA statutes apply.

and PC Magazine.

This Petition, supported by the declaration of Dr. Henry Fuchs (Ex. 1002), demonstrates a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim. 35 U.S.C. § 314(a). Petitioner respectfully requests institution on all challenged claims and grounds.

V. DISCRETION UNDER 35 U.S.C. §§ 314(A) AND 325(D)

Discretionary denial is not appropriate under §§ 314(a) and 325(d). The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 weigh against discretionary denial:

A. Factor 1: “Whether a stay exists or is likely to be granted if a proceeding is instituted”

It is reasonably likely that the -01422 Action will be stayed if this IPR Petition is instituted.

Judge Selna, who presides over the -01422 Action, entered a stay in the related -01432 Action pending final resolution of Petitioner’s ’093 IPR petition. Ex. 1010. This stay was based on Petitioner and Patent Owner’s stipulation that “all remaining claims asserted in this action are subject to the IPR” and that “staying this action will avoid the potential waste of Court and Party resources that would otherwise be spent litigating issues that the IPR may fully or partially moot.” Ex. 1011. The same is true here. This Petition challenges all claims asserted in the -01422 Action and may fully resolve the case.

Judge Selna has also granted stays in cases that were significantly further along than the -01422 Action. In *SPEX Technologies Inc. v. Kingston Technology Corp.*, he granted a stay because “[t]here can be little doubt that the results of the IPR review hold potential to simplify if not resolve much of the case.” Ex. 1012 (*SPEX Techs., Inc. v. Kingston Tech. Corp.*, No. 16-cv-07349-JVS-AGRx, 2018 WL 2446801, at *2 (C.D. Cal. May 16, 2018)). He granted this stay even though *SPEX* had progressed beyond both *Markman* and fact discovery at the time the IPR was instituted. *Id.* The facts here are far more likely to result in a stay than in *SPEX*. The Patent Office just recently issued the ’109 patent and IPL has no competing product (and thus no likelihood of irreparable harm). Fact discovery is scheduled to continue through August 23, 2021—months after the expected decision on institution. Ex. 1013, 1. Trial is scheduled for April 5, 2022, more than sixteen months from now. *Id.* And, as explained below for Factor 2, this trial date may not hold due to the extraordinary impact of COVID-19 on courts’ ability to safely conduct jury trials.

B. Factor 2: “Proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision”

Trial in district court is scheduled for April 5, 2022, approximately two months before the projected statutory deadline for final written decision. Due to COVID-19, this date may be pushed back to after the FWD. All jury trials in the Central District of California have been indefinitely suspended. Ex. 1014, 2.

When jury trials eventually do resume, existing trial dates are expected to be continued to permit older cases that have already had to be postponed to be tried first, and with criminal trials being prioritized over civil ones. Thus, there is little chance of trial before the final written decision. Accordingly, this factor weighs against discretionary denial.

C. Factor 3: “Investment in the parallel proceeding”

There has been no significant investment in the district court case. The Court recently dismissed Patent Owner’s complaint with leave to amend, and thus there is currently no operative complaint. Ex. 1015, 5-6. Discovery has just begun, there have been no depositions, the parties have yet to exchange any terms for construction much less begin *Markman* briefing, the *Markman* hearing is not scheduled until May 10, 2021, neither side has disclosed any experts, expert discovery is not scheduled to close until October 28, 2021, and dispositive motions are not due until November 5, 2021. Ex. 1013, 1.

Further, Petitioner diligently filed this Petition, which comes less than six months after the ’109 patent issued, approximately three months after IPL’s initial complaint was served, one month after Patent Owner served infringement contentions identifying the asserted claims, and more than two weeks *before* invalidity contentions. Such diligence weighs against discretionary denial. *Dolby Labs, Inc. v. Intertrust Techs. Corp.*, IPR2020-00660, Paper 14 at 16 (“If the

evidence shows that the petitioner filed the petition expeditiously, such as promptly after becoming aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution under *NHK*") (quoting *Fintiv I*, Paper 11 at 11); *Apple Inc. v. Seven Networks LLC*, IPR2020-00156, Paper 10 at 11-12 (finding that petitioner acted diligently in filing "four months in advance of the statutory bar date" and "fourteen weeks after its initial invalidity contentions").

D. Factor 4: "Overlap between issues raised in the petition and in the parallel proceeding"

Because the -01422 Action has just begun and IPL has yet to narrow the set of patent claims that will actually be tried,² it is not presently possible to determine the extent of overlap between the issues raised in this Petition and the issues to be tried in the -01422 Action. On the other hand, resolving the invalidity of the challenged claims through this IPR would preserve judicial and party resources by efficiently reducing or eliminating entirely the need for a jury to perform this work—as recognized by Petitioner and Patent Owner's stipulation to stay the -01432 Action. Ex. 1011, 1.

² Pursuant to the parties' joint proposal, the Court has set a hearing to determine the process for narrowing claims. Ex. 1013, 2.

E. Factor 6: “Other circumstances that impact the Board’s exercise of discretion, including the merits”

The grounds in this Petition are particularly strong, which weighs against discretionary denial. *Illumina Inc. v. Natera, Inc.*, IPR2019-01201, Paper 19 at 8 (instituting when “the strength of the merits on the present record outweighs relatively weaker countervailing considerations of efficiency”); *Comcast Cable Commc’ns., LLC v. Rovi Guides, Inc.*, IPR2019-00231, Paper 14 at 11 (instituting because the proposed grounds are “sufficiently strong to weigh in favor of not denying institution based on §314(a)”).

In sum, the *Fintiv* factors weigh against discretionary denial under § 314(a).³ Further, because the prior art and the grounds in this Petition have not previously been considered by the Patent Office, denial under § 325(d) would also be inappropriate.

VI. BRIEF DESCRIPTION OF BACKGROUND TECHNOLOGY

The ’109 patent is directed to the concept of image processing on a client-server computer system using conventional image compression techniques. Ex. 1001, 1:29-34; 6:55-60.

³ Factor 5 (relating to the fact Petitioner is the defendant in the district court action) is outweighed by factors 1, 2, 3, 4, and 6, which weigh against discretionary denial, as discussed above.

A known prior art approach was to offload processing of a program to a remote server and send compressed image data to a client. Ex. 1016, 21 (describing in 1995 that “[t]his can be accomplished straightforwardly by rendering on the server, then compressing and transmitting an image stream to the client. The client decompresses and displays the image stream”)⁴; Ex. 1004, Abstract (describing a gaming system where a remote server executes games and streams images to client computers); Ex. 1002 ¶ 27.

These solutions were made possible in part due to video compression standards developed in the mid-1990s, such as “MPEG,” which allowed for “compression and decompression of full motion video images.” Ex. 1005, 1:64-66; Ex. 1008; Ex. 1009⁵; Ex. 1002 ¶¶ 28-30.

Additionally, by the mid-1990s, broadband transmission technology such as ADSL (“Asymmetric Digital Subscriber Line”) was developed, which used separate communication channels so that bandwidth could be utilized as efficiently

⁴ Ex. 1016 was publicly available by October 18, 1995, and is thus prior art under § 102(b). Ex. 1003 ¶¶ 83-89.

⁵ Ex. 1008 was publicly available by October 11, 1994, and is thus prior art under § 102(b). Ex. 1003 ¶¶ 54-60. Ex. 1009 was publicly available by July 5, 2000, and is thus prior art under § 102(a). Ex. 1003 ¶¶ 90-94.

as possible. Ex. 1006, 69. In 1999, ADSL was recognized as the “ideal vehicle for Internet access and telecommuting applications.” *Id.*, 69; Abstract (describing in 1999 that “[i]t has been almost a decade since the original proposal of ADSL”); Ex. 1002 ¶¶ 34-35.

VII. OVERVIEW OF THE '109 PATENT

A. Alleged Problem

The '109 patent is directed to “computer graphics and a graphical image display system that use [sic] a visual server to generate and transmit images to a client.” Ex. 1001, 1:29-33. As shown in annotated Figure 1 below, the image display system 10 includes visual server 12 (blue) that communicates with a plurality of client devices 16, 18, and 20 (red):

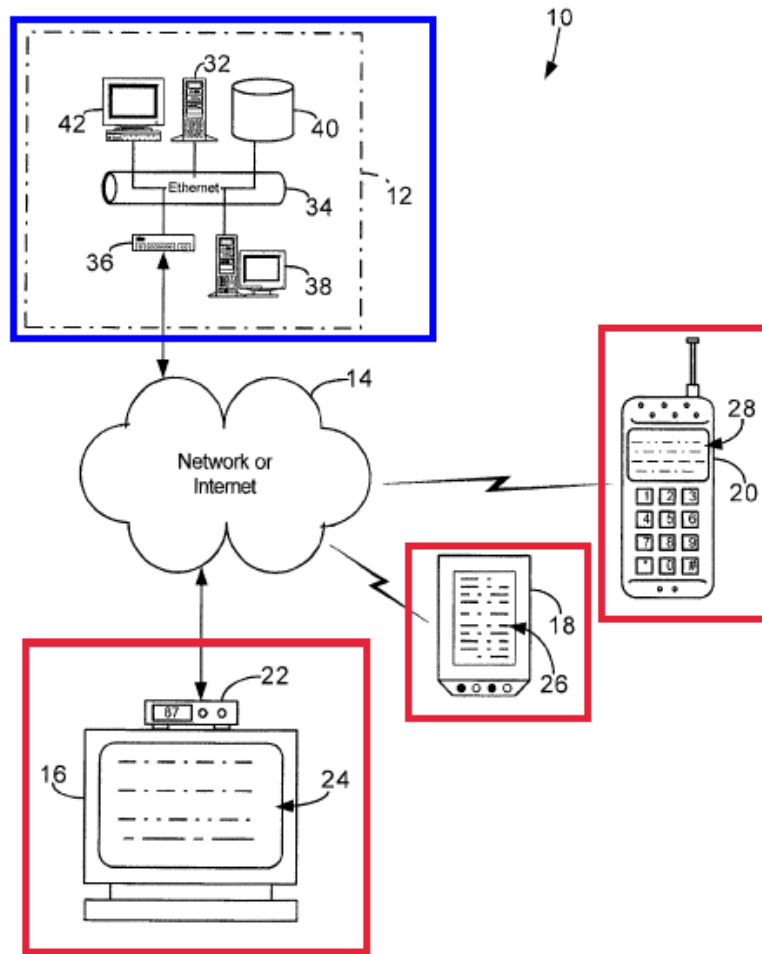


Fig. 1

Id., Figure 1.⁶ The '109 patent acknowledges that existing systems used a client and server to “process and render images at a client display with the assistance of server resources.” *Id.*, 1:56-57. According to the '109 patent, existing systems had several problems, including because they “require[] a relatively high bandwidth connection even if real-time image compression and decompression is employed”

⁶ Color annotations in figures have been added unless otherwise noted.

(*id.*, 1:58-61) and purportedly “make[] inefficient use of available transmission bandwidth and available client storage and computing resources, and the client resources are taxed.” *Id.*, 2:64-67. The ’109 patent thus seeks to provide “an improved system and method of displaying images on a client consumer device utilizing the resources of a visual server....” *Id.*, 3:34-37; Ex. 1002 ¶ 37.

B. Alleged Invention

The ’109 patent’s claimed solution, however, does not address any of the foregoing issues; nor is it new.⁷ Rather, the claimed solution merely recites the routine steps of hosting an interactive application at a server, receiving at the server user input signals from a client device, updating the state of the application based on the received user input signals, generating updated images at the server, compressing those images, and sending them to the client where the images can be decompressed and displayed. *E.g.*, Ex. 1001, claim 1. As explained below, this purported invention was already disclosed and well-known prior to the ’109 patent.

⁷ In the -01432 Action for the *parent* of the ’109 patent, Patent Owner alleged that requirements such as “image-modifying data,” “predetermined durations,” and not performing “three-dimensional graphics processing” at a client device addressed the purported problems in the prior art. Ex. 1017 ¶¶ 32-35. The ’109 claims recite *none* of these requirements.

Ex. 1002 ¶¶ 38-39.

C. The Challenged Claims

Independent claim 1 of the '109 patent is shown below:

1[Preamble] 1. A method of hosting an interactive software application comprising:

1[a] running at a server the interactive software application;

1[b] receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the state of the interactive software application;

1[c] generating at least one updated image at the server in response to updating the state of the interactive software application;

1[d] 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 compressed frame that can be decompressed and displayed as an updated image at the client device.

The challenged dependent claims merely add well-known features, such as using asymmetric bandwidths (e.g., claim 2), or receiving user input data and transmitting compressed images “with a plurality of client devices” (e.g., claim 4). All the challenged claims are unpatentable over the prior art, as explained below.

Id. ¶¶ 40-41.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art at the time of the alleged invention would have had at least (1) an undergraduate degree in computer science, electrical engineering, or an equivalent subject, together with two years of post-graduate experience in computer graphics; or (2) a master's degree in computer science, electrical engineering, or equivalent subject, together with one year of post-graduate experience in computer graphics. *Id.* ¶ 23.

IX. OVERVIEW OF THE PRIOR ART

A. Wiltshire

Wiltshire is a U.S. patent filed on November 24, 1998, and is thus prior art to the '109 patent under § 102(e). Like the '109 patent, Wiltshire discloses a client-server system that generates graphics on a server, compresses those graphics, and transmits them to one or more clients for display:

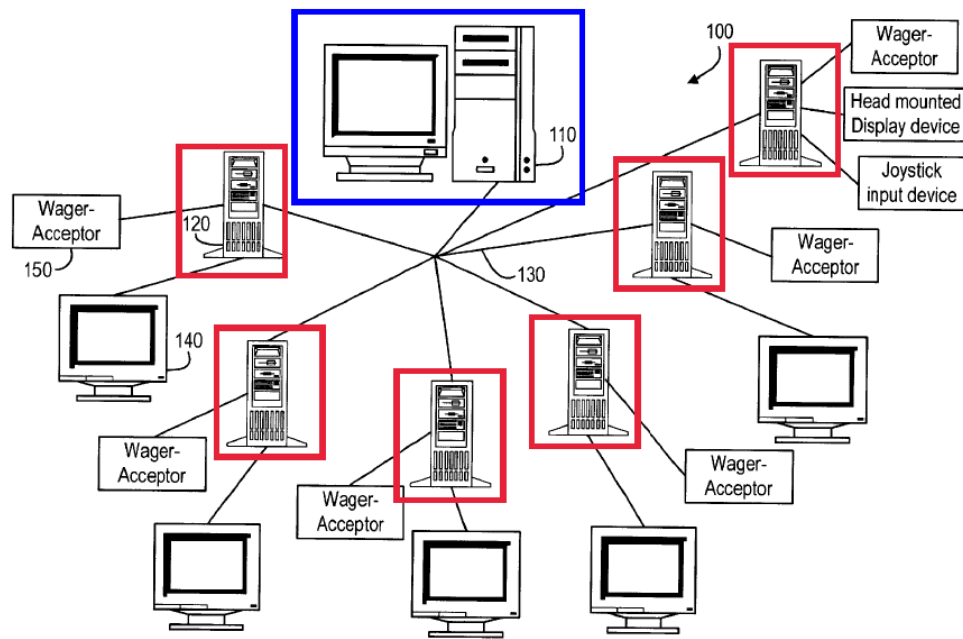


Fig. 1D

Ex. 1004, Figure 1D (showing server 110 (blue) and a plurality of clients 120 (red)). Figure 2 summarizes the main operation of Wiltshire's system:

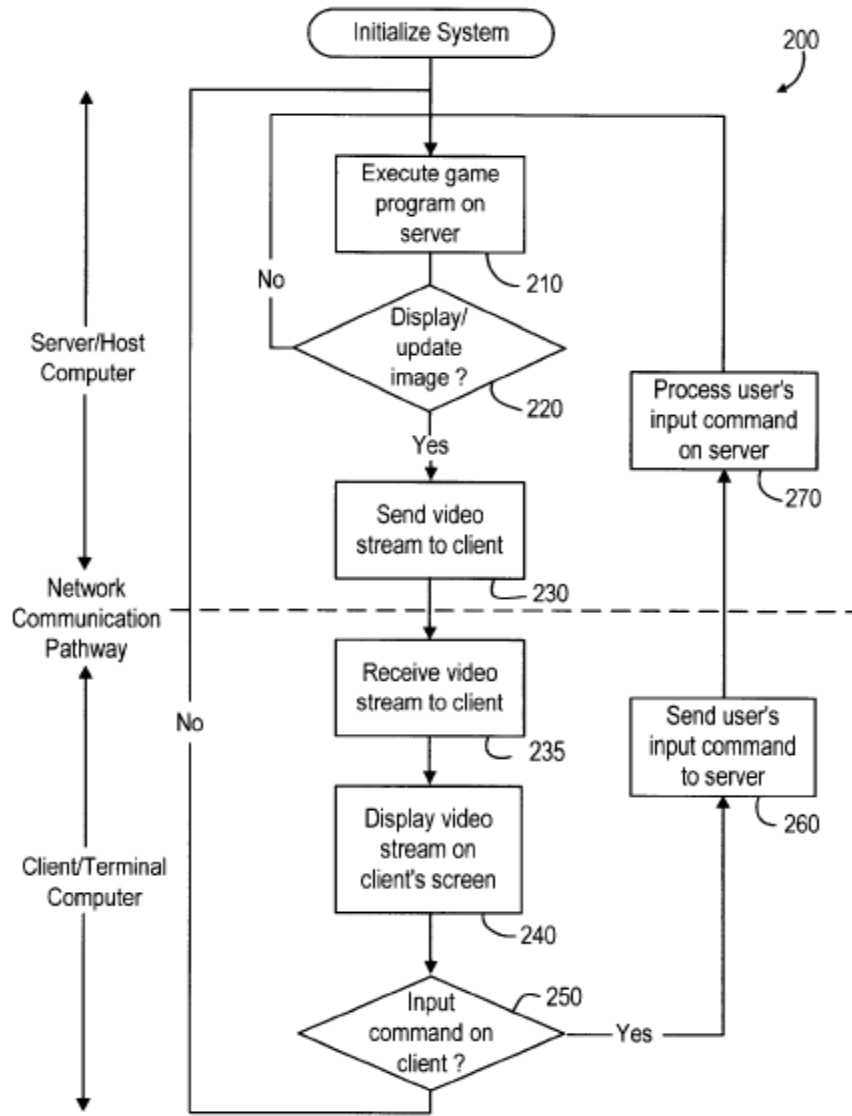


Fig. 2

As Figure 2 shows (e.g., in step 210), Wiltshire’s server executes a “game program.” *Id.*, Fig. 2. The server receives user “input commands” from a client. *Id.*, (Steps 250, 260). Based on the received commands, the server updates the state of the game program. *Id.*, 7:40-43 (“In stage 270, game program 122 processes the input command and updates the state of the game accordingly.”).

Based on the updated state, the server generates an updated image, which is then sent as a compressed MPEG “video stream” to the client. *Id.*, 8:61-65 (“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.”); Fig. 2 (Step 230); 7:13-18 (“In stage 230, an image is sent from server/host computer 110 to client/terminal computer 120. The image may include ... a ***compressed video MPEG stream.***”).⁸ Finally, the client device receives and displays the graphics on the client’s display. *Id.*, 7:25-27 (“Client/terminal program 120 then causes the images to be displayed on a screen of the client/terminal computer 120.”); Figure 2 (Steps 235, 240).

B. Chen

Chen was published in the May 1999 IEEE Communications Magazine. Ex. 1006. Chen was publicly available, cataloged, and indexed at the Linda Hall Library by May 18, 1999. Ex. 1003 ¶¶ 61-72. Accordingly, Chen is prior art under § 102(b).

Chen describes ADSL, which was well-known for a decade before the ’109 patent. Ex. 1006, Abstract. ADSL is “a broadband transmission system” built upon telephone connections. *Id.*, 68. ADSL “add[s] asymmetry to a DSL” by

⁸ Bold-italicized emphases are added to quotations unless otherwise specified.

using an upstream channel and a downstream channel with different bitrates. *Id.*, 69. Further, ADSL is “an ideal vehicle for Internet access,” and “well suited” for “video-on-demand” applications where the upstream control data require less throughput than the downstream video data. *Id.* ADSL is thus well-suited for a system such as Wiltshire. Ex. 1002 ¶¶ 46-48.

C. Saha

Saha is a U.S. patent filed on November 20, 1997, and is thus prior art under § 102(e). Saha provides an overview of the “two predominant MPEG standards” in 1997, referred to as “MPEG-1” and “MPEG-2.” Ex. 1005, 2:5-14. As explained in Saha, these MPEG standards include “compression and decompression of full motion video images.” *Id.*, 1:64-2:1. Wiltshire describes using MPEG to transmit compressed video streams from the server to the client. Ex. 1004, 7:13-18.

D. PC Magazine

PC Magazine was publicly available, cataloged, and indexed at the Linda Hall Library by August 27, 1999, and is thus prior art under § 102(b). Ex. 1003 ¶¶ 94-104. PC Magazine was a well-known magazine describing personal computer systems including mobile laptops (*e.g.*, Ex. 1007, 9), like those Wiltshire contemplates using as client devices (Ex. 1004, 5:14-17). Ex. 1002 ¶ 50.

X. CLAIM CONSTRUCTION

For purposes of this proceeding only, Petitioner does not believe the claim

terms need to be construed to resolve the issues presented in this Petition.

Petitioner reserves the right to respond to any constructions that Patent Owner submits.

XI. SPECIFIC GROUNDS FOR PETITION

Pursuant to 37 C.F.R. 42.104(b)(4)-(5), the below sections, as confirmed by Dr. Fuchs (Ex. 1002), demonstrate in detail how the prior art renders obvious claims 1-18 of the '109 patent.

A. Ground I: Claims 1, 3-13, and 15-18 are rendered obvious by Wiltshire and Saha

1. Claim 1

a. 1[preamble]: “A method of hosting an interactive software application comprising:”

To the extent it is limiting, Wiltshire discloses the preamble.

Wiltshire discloses hosting an interactive software application (a “gaming program”) on a “server/host computer.” Ex. 1004, Abstract (“A patron of a client/terminal computer can access any of the ***gaming programs executed on the server/host computer.***”); 7:8-9 (“Initially, game program 112 is executed on ***server/host computer*** 110 in stage 210”); Fig 2. (stage 210 describing the step of “execut[ing] game program on server”); 2:35-44 (“This functionality is implemented by executing various gaming and related game management programs ***exclusively on a server/host computer....***”); Ex. 1002 ¶ 56.

Wiltshire’s hosted gaming programs are “interactive software applications.”

The gaming programs include games “such as faro, monte, roulette ... chess, checkers, backgammon ... Doom, Pong, Packman, [and] Myst,” which are interactive games. Ex. 1004, 1:26-43. The users/patrons interact with the gaming programs by sending input commands “such as mouse movements, mouse clicks or keystrokes” from a client to the server running the game program, which are used by the game program to “determine[] which images are to be displayed on a screen of the client/terminal computer...” Ex. 1004, 5:57-65; Ex. 1002 ¶ 57.

b. 1[a]: “running at a server the interactive software application;”

Wiltshire discloses this limitation.

Wiltshire discloses a computer gaming system with a “server” (a “server/host computer” 110 in blue):

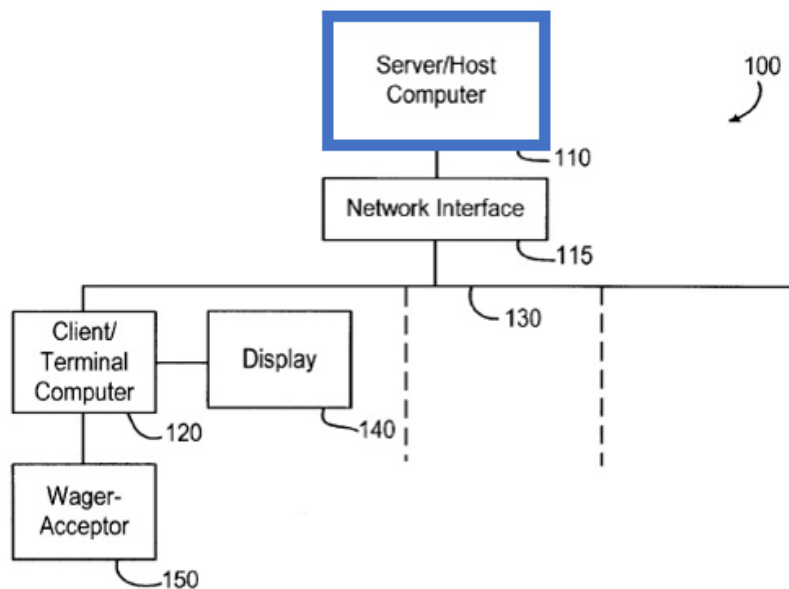


Fig. 1A

Ex. 1004, Figure 1A; 3:62-66 (“Computer gaming system 100 includes a **server/host computer 110** connected to a plurality of remote client/terminal computers 120 via network interface 115 and communication pathways 130.”); Figure 1D (depicting server/host computer 110); Ex. 1002 ¶ 60.

Wiltshire’s server “exclusively” executes the gaming programs, and thus discloses “running at the server the interactive software program.” Ex. 1004, 2:35-39 (“This functionality is implemented by **executing various gaming and related game management programs exclusively on a server/host computer ...**”); Abstract (“A patron of a client/terminal computer can access any of the **gaming programs executed on the server/host computer.**”); 7:8-9 (“[G]ame program 112 is **executed on server/host computer 110** in stage 210”); Fig 2. (stage 210 describing the step of “execut[ing] game program **on server**”). As explained above, the gaming program is an interactive software application because a player interacts with the gaming program. See Section X(A)(1)(a); Ex. 1002 ¶¶ 61-62.

c. 1[b]: “receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the state of the interactive software application;”

Wiltshire discloses this limitation.

First, Wiltshire discloses “receiving at the server user input signals from a client device”:

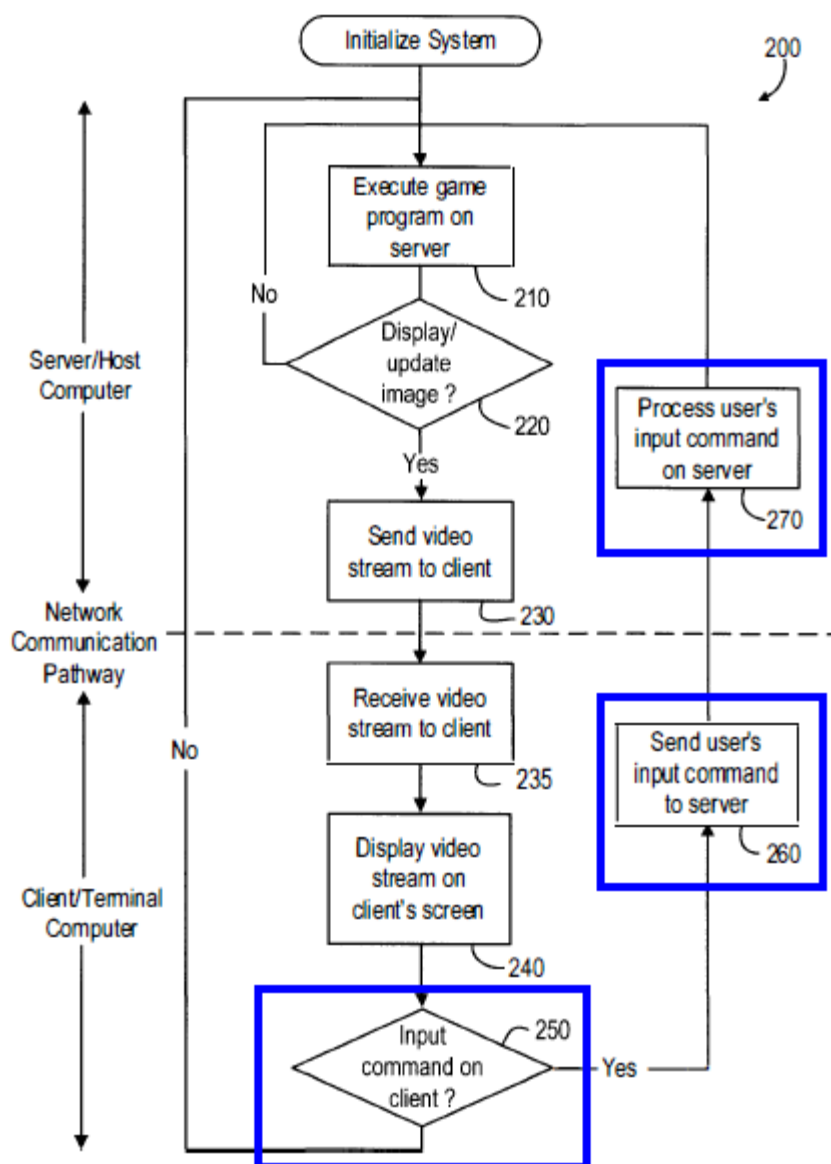


Fig. 2

Ex. 1004, Figure 2. Starting with stage 250 in Figure 2, Wiltshire discloses that an “input command” is detected at the client. Ex. 1004, 7:27-30 (“Stage 250 then determines whether *an input command* has been entered by the patron using *client/terminal computer* 120, in which case operation 200 proceeds to stage

260.”). The input command “may be a keystroke, movement or clicking of the mouse, a voice activated command or even the clicking of a ‘virtual button’ on a touch screen.” *Id.*, 7:31-34. Thus, the input commands (keystrokes, mouse clicks, or other input commands) detected at the client are “user input signals.” Ex. 1002 ¶¶ 65-66.

Next, as shown in stage 260 in Figure 2, “the client/terminal program 122 causes the input command detected in stage 250 to be *transmitted back to server/host computer 110* via communication pathways 130.” *Id.*, 7:34-37. “The command is thus received by the server/host interface program 114, that, in turn, passes the command back to game program 112.” *Id.*, 7:39-41. Thus, Wiltshire discloses “receiving at the server user input signals from a client device.” Ex. 1002 ¶ 67.

Second, Wiltshire discloses that “the user input signals are used to control updating of the state of the interactive software application.” The user input signals received by the server in Wiltshire are passed to the game program at the server to control updating the state of the game program. At stage 270 of Figure 2, the “game program 112 *processes the input command and updates the state of the game* accordingly.” *Id.*, 7:42-43; *see also* 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.”); 5:57-65 (“[I]nput commands ...

are sent directly to the server/host based game program *for context interpretive processing.*”); 12:44-51 (“[I]n response to the input command, the execution of the computer gaming program on the server/host computer is altered”); 13:51-59 (“[I]n response to the input command, altering the execution of the computer gaming program on the server/host computer”); Ex. 1002 ¶ 68.

d. 1[c]: “generating at least one updated image at the server in response to updating the state of the interactive software application;”

Wiltshire discloses this limitation.

As explained above for limitation 1[b], Wiltshire discloses “updating the state of the interactive software application” by updating the state of the gaming program in response to the user input commands sent by the client. *See* Section XI(A)(1)(c).

Wiltshire further discloses that the server generates updated images in response to the updated game state:

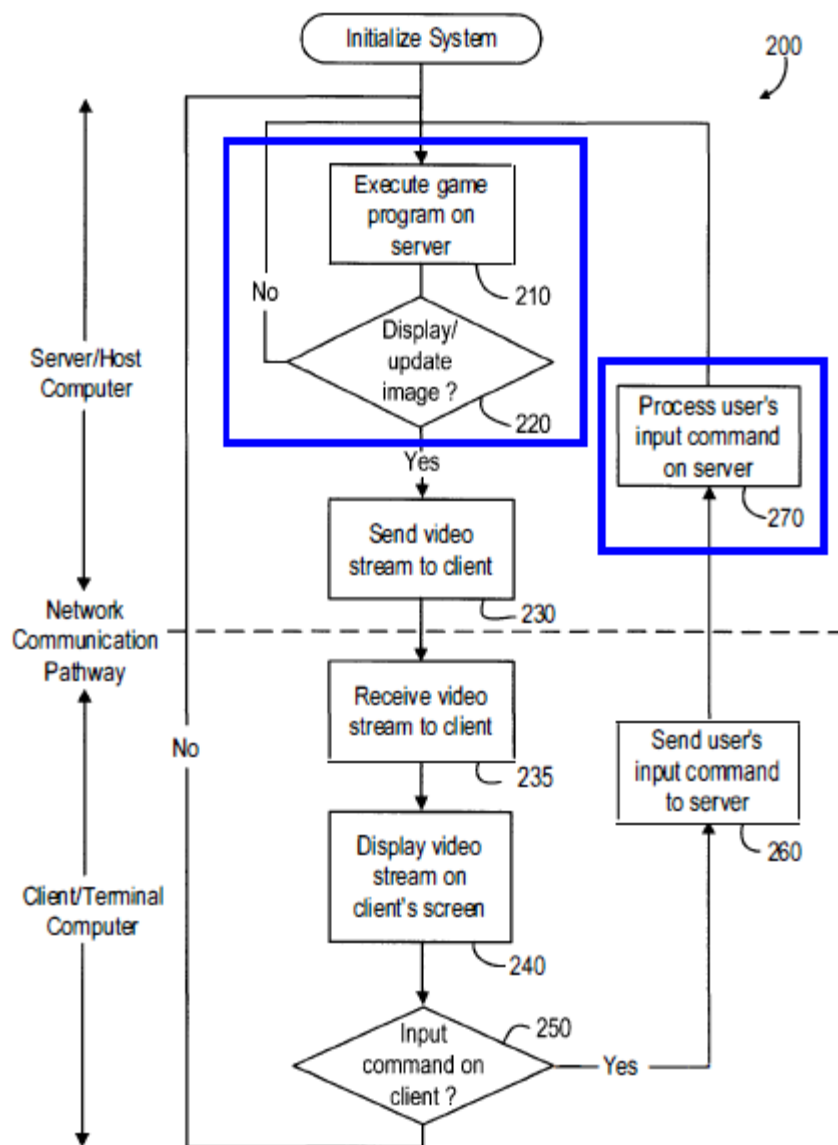


Fig. 2

Ex. 1004, Figure 2. First, as shown “[i]n stage 270, game program 112 processes the input command and updates the state of the game accordingly. Once the command has been processed, operation 200 proceeds back to stage 210 for further execution of the game program 112.” *Id.*, 7:41-45; Ex. 1002 ¶¶ 73-74.

Next, the operation proceeds to stage 220, during which the game program on the server “**determines whether an image is to be displayed** on the screen of client/terminal computer 120, in which case operation 200 proceeds to stage 230.” Ex. 1004, 7:9-12; *see also id.*, 5:59-65; Ex. 1002 ¶ 75.

The determination of whether an image is to be displayed at stage 220 includes deciding whether to “update” the image. As shown in Figure 2, stage 220 will “display/**update** [the] image” in response to updates to the game state. Ex. 1004, Figure 2 (stage 220). Wiltshire explains that the decision to update an image is tied to the updated game state. *Id.*, 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.”). Thus, a POSITA would understand that the game program at the server will determine whether to generate an updated image in response to the updated game state. Ex. 1002 ¶ 76.

Wiltshire further makes clear that the updated image is generated by the server. Ex. 1004, 7:8-9 (“Initially, **game program 112 is executed on server**/host computer 110 in stage 210.”); 7:18-20 (“[t]he image is **generated by game computer program 112** and passed to server/host interface program 114”); 2:45-46 (“display generation programs are executed entirely on the server/host computer”); 5:44-46 (“Game program 112 is any type of gaming program that runs on an operating system 116 **executed on server**/host computer 110.”); 2:35-39 (“This

functionality is implemented by *executing various gaming and related game management programs exclusively on a server/host computer*”). Because the server is responsible for executing the game program itself, when the updated image is generated by the game program, the server generates the updated image. Ex. 1002 ¶ 77.

Notably, Wiltshire more closely describes this limitation than the ’109 specification itself. For example, the ’109 specification does not refer to “the state of the interactive software application” or even use the term “state.” See Ex. 1001; Ex. 1002 ¶ 78.

e. 1[d]: “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 compressed frame that can be decompressed and displayed as an updated image at the client device.”

The combination of Wiltshire and Saha discloses this limitation.

First, Wiltshire discloses “compressing the at least one updated image and transmitting the compressed updated image to the client device.” Wiltshire discloses that after an image is “update[d]” at stage 220 of Figure 2 (which is updated in response to the updated game state as described above for limitation 1[c]), the operation proceeds to stage 230, where the updated image “is sent from server/host computer 110 to client/terminal computer 120.” Ex. 1004, 7:13-14. Wiltshire explains that to reduce bandwidth requirements, the server may compress

the updated images as “a compressed video MPEG Stream.” *Id.*, 7:15-18; 7:62-64 (explaining that the “bandwidth requirement can be reduced *using data compression techniques*”). As recognized by the ’109 patent, MPEG is an example of compressing an image. Ex. 1001, 6:56-62; Ex. 1002 ¶ 81.

Second, Wiltshire combined with Saha discloses “wherein the server transmits the updated image as a compressed frame that can be decompressed and displayed as an updated image at the client device.” Ex. 1002 ¶ 82.

Wiltshire discloses that the updated images may be transmitted to the client as “a compressed video MPEG stream,” and the client “causes the image[s] to be displayed on a screen of the client/terminal computer.” Ex. 1004, 7:15-18, 7:26-27. A POSITA would understand from Wiltshire that the client device must therefore be capable of decompressing the compressed MPEG stream (including the compressed image frame) because without decompression, the compressed MPEG stream would not be able to be displayed at the client as described in Wiltshire. While Wiltshire does not discuss the details of MPEG decompression at the client, a POSITA would have known these details based on their knowledge of the well-understood MPEG standard as Saha confirms. Ex. 1002 ¶¶ 83-84; Ex. 1008; Ex. 1009. Indeed, the ’109 specification also does not mention the details of decompressing a compressed frame using MPEG. *See* Ex. 1001; Ex. 1002 ¶ 85.

Saha provides an overview of the two “predominant MPEG standards” at the

time of Wiltshire's filing in 1998: MPEG-1 and MPEG-2. Ex. 1005, 2:5-14

("MPEG-2 standard is similar to the MPEG-1 standard, but includes extensions to cover a wider range of applications, including ... HDTV"). Saha explains that these MPEG standards describe an encoder to generate compressed "frames" (also called "pictures"). Ex. 1005, 2:19-35 ("MPEG compression ... encode[s] or *compress[es] frames* in the sequence.... An MPEG stream includes three types of pictures, referred to as the Intra (I) *frame*, the Predicted (P) *frame*, and the Bi-directional Interpolated (B) *frame*. The I (intra) frames ... are generally only *moderately compressed*. Predicted frames ... *receive a fairly high amount of compression* ... Bi-directional pictures include the *greatest amount of compression*...."); 1:64-2:1 (MPEG uses "*interframe and intraframe compression techniques*."); Ex. 1002 ¶¶ 49, 88.

Saha further discloses that MPEG decoders—which may be located remotely from the encoder—receive the compressed frames and decompress the compressed frames for display. Ex. 1005, 1:64-2:1 (MPEG includes "*decompression* of full motion video images"); 4:9-13 ("The final compressed video data is then ready to be transmitted ... over a transmission medium for reception and *decompression by a remotely located decoder*."); 4:51-58 ("The video decoding process is generally the inverse of the video encoding process and is employed to reconstruct a motion picture sequence from a compressed and

encoded bitstream.”); 4:63-5:4 (“When the MPEG decoder receives the encoded stream, the MPEG decoder reverses the above operations ... to re-create the temporally compressed frames.”); 5:43-45; 5:28-37; Ex. 1002 ¶ 90.

As Saha confirms in the above passages, a POSITA would have known that MPEG includes “compressed frames” and provides a method for both compression of frames and decompression of compressed frames. Ex. 1002 ¶ 91; Ex. 1008; Ex. 1009. Indeed, the ’109 patent admits that MPEG was an “industry standard” form of video compression that was “already present” in client devices before the patent. Ex. 1001, 9:32-38; Ex. 1002 ¶ 91.

A POSITA would thus have understood Wiltshire’s disclosure of “a compressed video MPEG Stream” as teaching compression of image frames by “server/host computer 110,” transmission of those compressed frames to a “client/terminal computer 120,” and decompression of those frames by the client before displaying the image. Ex. 1004, 6:56-62, 7:13-18, 7:25-27, and 7:62-64. At a minimum, a POSITA would have been motivated to apply Saha’s teaching of MPEG decompression of compressed frames to Wiltshire’s client for the following reasons. Ex. 1002 ¶¶ 92-93.

First, Wiltshire teaches that the system may use the MPEG standard for compressing the updated images that are sent to the client (Ex. 1004, 7:15-19), and thus provides an express motivation to combine with Saha, which describes the

predominant MPEG standards known at the time of Wiltshire, including additional details that MPEG includes decompressing compressed frames. If Patent Owner argues that a POSITA would not already have known that MPEG streams must be decompressed to be displayed, a POSITA would have been motivated to look to Saha for those additional details. As explained above, Wiltshire explains that the server compresses the image into an MPEG stream that is displayed at a remote client device, and Saha teaches that MPEG includes compressed frames and decompression of the compressed frames at a remotely-located device for display. Ex. 1004, 7:15-18; Ex. 1005, 2:21-35; 4:9-13. Wiltshire's teaching that a client displays frames that had been compressed by a server using MPEG would thus have motivated a POSITA to incorporate Saha's teaching to decompress the compressed frames of an MPEG video stream sent by a server to display those image at the client. Ex. 1002 ¶ 94.

Second, decompressing an MPEG stream at the client is one of just a finite number of identified and predictable solutions known to a POSITA. Given Wiltshire's disclosure that the images are sent to the client using a compressed MPEG video stream for display on the client, a POSITA would have recognized that decompressing the stream using MPEG such that the image can be displayed at the client would have been an obvious (if not the only) choice. At a minimum, having read Wiltshire's express teaching to compress an image using MPEG and

transmit the compressed image to the client for display, it would have been obvious to try decompressing that image also using MPEG so that it can be displayed, as described in Saha. *Id.* ¶ 95.

Third, there would have been a reasonable expectation of success in applying Saha’s teachings of MPEG’s decompression of a compressed frame to the teachings of Wiltshire. Wiltshire describes using MPEG to reduce the bandwidth when sending a video stream to the client. Saha’s teaching of how MPEG includes compressed frames and decompression of those frames would be used for its intended purpose of providing compression for various applications such as HDTV, DVDs, and video games. Ex. 1005, 2:10-13; 5:46-56. The combination thus uses MPEG in the intended manner that both Saha and Wiltshire instruct—to reduce the bandwidth requirements when sending a video stream from a video source to another device. Ex. 1004 (Wiltshire), 7:62-65 (“This bandwidth requirement can be further reduced using data compression techniques....”); Ex. 1005, 4:9-13 (“The final compressed video data is then ready to be transmitted ... over a transmission medium for reception and decompression by a remotely located decoder.”).

Thus, a POSITA would have fully expected that MPEG decompression of compressed frames would work as intended in Wiltshire and produce the predictable result of reducing bandwidth requirements as explained in Wiltshire.

Ex. 1002 ¶ 96.

Finally, Saha and Wiltshire are analogous art to the '109 patent and are thus properly used for the obviousness combination described above. *See* MPEP 2141.01(a). The '109 patent describes its “Field of Invention” as follows: “The present invention generally relates to computer systems. More particularly, the present invention relates to computer graphics and a graphical image display system that use a visual server to generate and transmit images to a client.” Ex. 1001, 1:29-33. Saha relates to the same field of endeavor as the '109 patent because Saha describes MPEG, a technology used for transmission of images and video. Ex. 1005, 1:64-2:13; 4:9-12; Ex. 1001, 6:55-60; Ex. 1002 ¶ 97. Saha is also reasonably pertinent to the problem of the '109 patent because, like the '109 patent, Saha's MPEG compression minimizes the bandwidth needed to transmit the images described in the '109 patent. Ex. 1005, 1:64-2:1; Ex. 1001, 6:55-60; Ex. 1002 ¶ 97. Wiltshire relates to the same field of endeavor as the '109 patent because Wiltshire also describes a client-server system that generates images on a server and transmits those images to one or more clients. Ex. 1004, Abstract, Figures 1D, 2. Wiltshire is also reasonably pertinent to the problem of the '109 patent because Wiltshire's client-server system uses MPEG to minimize the bandwidth needed for image transmission and minimizes the need to modify or upgrade client devices to execute game programs. Ex. 1004, 2:45-51; Ex. 1001,

6:55-62; 9:39-53; Ex. 1002 ¶ 98. Finally, as explained above, Wiltshire’s disclosure of “a compressed video MPEG Stream” points directly toward using MPEG as disclosed in Saha. Ex. 1004, 7:15-18; Ex. 1005, 1:64-2:13; Ex. 1002 ¶ 98.

Thus, claim 1 is unpatentable over Wiltshire combined with Saha. Ex. 1002 ¶ 100.

2. Claim 3

a. 3: “The method as recited in claim 1 wherein the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image.”

Claim 3 depends on claim 1, which is rendered obvious by the combination of Wiltshire and Saha. Wiltshire discloses the additional limitations of claim 3. Ex. 1002 ¶ 101.

First, Wiltshire discloses a system where the “server is configured for ... communications with a plurality of client devices.” As shown in Wiltshire’s annotated Figure 1D below, the server 110 (blue) communicates with a plurality of client devices 120 (red):

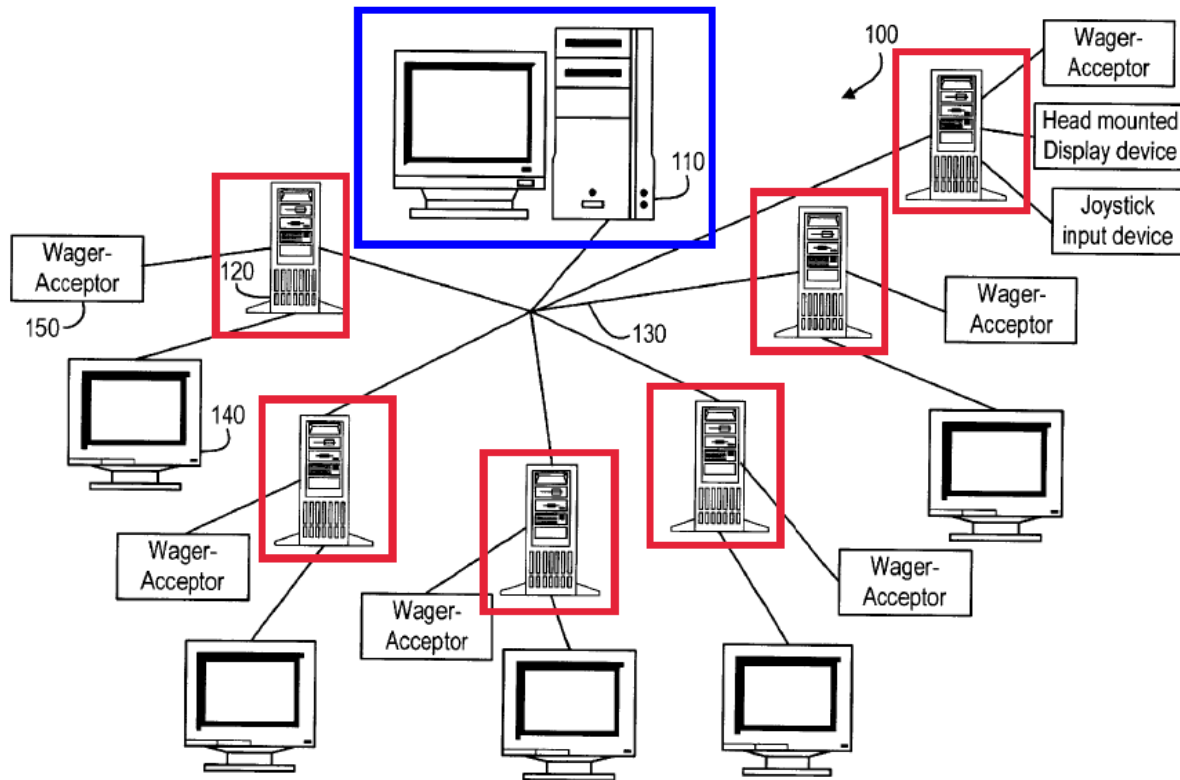


Fig. 1D

Ex. 1004, Figure 1D; 3:62-66 (“Computer gaming system 100 includes *a server/host computer 110 connected to a plurality of remote client/terminal computers 120 via network interface 115 and communication pathways 130.*”); 4:52-59 (server is configured “to support the plurality (e.g., at least eight) of client/terminal computers 120). Ex. 1002 ¶ 102.

Second, the connection between the server and the plurality of client devices is “bidirectional” because data is transmitted from the server to the client device in one direction and from the client device to the server in the other direction. Ex.

1004, 7:13-15 (“In stage 230, *an image is sent from server/host computer 110 to client/terminal computer 120.*”); 7:34-39 (“In stage 260, *client/terminal program 122 causes the input command detected in stage 250 to be transmitted back to server/host computer 110 via communication pathways 130*”); *see also* Figure 2 (showing data transmissions from the server to the client (step 230) and from the client to the server (step 260)). Therefore, the server is configured for bidirectional communication with a plurality of client devices. Ex. 1002 ¶ 103.

Third, the bidirectional communications include “receiving at the server user input signals and transmitting the compressed updated image.” Ex. 1004, 7:13-15 (“In stage 230, *an image is sent from server/host computer 110 to client/terminal computer 120.*”); 7:34-39 (“In stage 260, *client/terminal program 122 causes the input command detected in stage 250 to be transmitted back to server/host computer 110 via communication pathways 130*”); *see also* Section XI(A)(1)(b) (further describing the server receiving user input signals from the client). As discussed for limitations 1[c]-1[d], the updated image transmitted from server 110 to the client terminal 120 is a compressed image. *See* Section XI(A)(1)(d)-(e); Ex. 1002 ¶ 104.

Accordingly, claim 3 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 105.

3. Claim 4

- a. 4: “The method as recited in claim 1 wherein the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices.”***

Claim 4 depends on claim 1, which is rendered obvious by the combination of Wiltshire and Saha. Wiltshire discloses the additional limitations of claim 4.

Ex. 1002 ¶ 106.

As discussed above for claim 3, Wiltshire’s server is “configured to receive user input data and transmit compressed updated images” with “a plurality of client devices.” *See* Section XI(A)(2); Ex. 1004, 7:13-15; 7:34-39; Fig. 1D; *see also* Sections XI(A)(1)(c)-(e) (describing receiving user input signals (i.e., user input data) and transmitting compressed updated images); Ex. 1002 ¶ 107.

Accordingly, claim 4 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 108.

4. Claim 5

- a. 5: “The method as recited in claim 1 wherein at least two of the plurality of client devices include different device platforms.”***

Claim 5 depends on claim 1, which is rendered obvious by the combination of Wiltshire and Saha. Wiltshire discloses the additional limitation of claim 5 to a POSITA.

As explained above for claim 3, Wiltshire discloses a system with a “plurality of client devices.” *See* Section XI(A)(2); Ex. 1002 ¶ 110.

Wiltshire further discloses that the plurality of client devices may include “different device platforms.” Wiltshire’s clients can be “*any type* of cost effective ... computer such as an Intel® x86 or Pentium® based computer, a Mac® PowerPC computer, a Sun® SPARC®, etc. ... the client/terminal computers 120 only need to have minimal storage, memory and processing power to ensure optimum functional operation of the overall multi-computer system 100, since the overwhelming majority of the gaming related and regulated processing is performed on the server/host computer 110.” Ex. 1004, 5:14-23. A POSITA would understand that Intel x86 or Pentium based computers, Mac PowerPC computers, and Sun SPARC computers are examples of different device platforms. Wiltshire also discloses that its clients may use different operating systems known in the art. *Id.*, 6:55-7:6. Therefore, Wiltshire discloses that its system is designed to work with clients regardless of their device platform (hardware and/or software), and thus discloses that at least two of the plurality of client devices would include different device platforms. *See also* Ex. 1004, claims 11, 18, 19 (requiring “at least one” of the clients—not all—to have certain hardware capabilities). Ex. 1002 ¶ 111.

At a minimum, a POSITA would have been motivated to use at least two client devices of different device platforms in connection with Wiltshire’s server, including because it would allow more players using different client platforms to

access and play the same hosted game, thereby potentially increasing the game provider's revenue. Ex. 1002 ¶ 113.

Further, using at least two different device platforms as client devices would have been obvious to try because of the finite number of known options—either all the devices are of the same platform, or at least one device is of a different platform. Either option would have led to a reasonable expectation of success. Wiltshire discloses that “any” client platform can be used, and a user need only “download[] a copy of [the] client/terminal program” onto the client to interact with the server. Ex. 1004, 8:24-33; Fig. 3; Fig. 1C; 4:43-48; 6:44-48. Wiltshire thus contemplates a common interface for the server to communicate with client devices of different device platforms. Thus, a POSITA would have expected that including at least two client devices of different device platforms would have operated predictably and as intended. Ex. 1002 ¶ 115.

Accordingly, claim 5 is unpatentable over Wiltshire in combination with Saha. *Id.* ¶ 117.

5. Claim 6

a. 6: “The method as recited in claim 1 wherein the client device is a mobile device.”

Claim 6 depends on claim 1, which is rendered obvious by the combination of Wiltshire and Saha. Wiltshire discloses the additional limitation of claim 6 to a POSITA. *Id.* ¶ 118.

Wiltshire discloses that the client device can be “a mobile device” because Wiltshire’s clients can include “wireless communication pathways” to “allow[] a patron to participate in a *mobile* gaming environment.” Ex. 1004, Abstract; *see also id.*, 13:20-25 (“at least one client/terminal computer further comprises: ... wireless communication pathways”). Based on this disclosure, a POSITA would understand that Wiltshire’s client devices with wireless communication capabilities must be mobile devices in order to be used in the described “mobile gaming environment.” This is confirmed by Wiltshire’s disclosure that “[c]lient/terminal computers 120 can also be *any type of cost effective special purpose or general purpose computer* such as an Intel® x86 or Pentium® based computer [or] a Mac® PowerPC computer ... etc.” *Id.*, 5:14-17. A POSITA understood that such computers could be, for example, laptops, and that those laptops could be used in a “mobile gaming environment” as Wiltshire describes. Ex. 1007 (PC Magazine), 9 (describing PowerPC laptop with wireless connectivity); Ex. 1020 (1996 PC Magazine), 7-12 (describing other suitable mobile laptops)⁹; Ex. 1002 ¶¶ 119-120.

Accordingly, claim 6 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 121.

⁹ Ex. 1020 was publicly available by April 30, 1996, and is thus prior art under §102(b). Ex. 1003 ¶¶ 73-82.

6. **Claim 7**

- a. 7: ***“The method as recited in claim 1 wherein the interactive software application is an interactive game that is configured to run at the server, which is in bidirectional communication with a plurality of client devices, and wherein said updating the state of the software application includes updating the game state of the interactive game.”***

Claim 7 depends on claim 1, which is rendered obvious by the combination of Wiltshire and Saha. Wiltshire discloses the additional limitations of claim 7. *Id.* ¶ 122.

First, as discussed for limitation 1[a], Wiltshire discloses that “the interactive software application is an interactive game that is configured to run at the server.” *See* Section XI(A)(1)(b); Ex. 1002 ¶ 123.

Second, as discussed for claim 3, the server is “in bidirectional communication with a plurality of client devices.” *See* Section XI(A)(2); Ex. 1002 ¶ 124.

Finally, as discussed for limitation 1[c], Wiltshire discloses that “updating the state of the software application includes updating the game state of the interactive game.” *See* Section XI(A)(1)(d); Ex. 1002 ¶ 125.

Accordingly, claim 7 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 126.

7. **Claim 8**

a. *8[preamble]: “An image display system, comprising:”*

To the extent the preamble is limiting, Wiltshire discloses “an image display system,” as shown below (red):

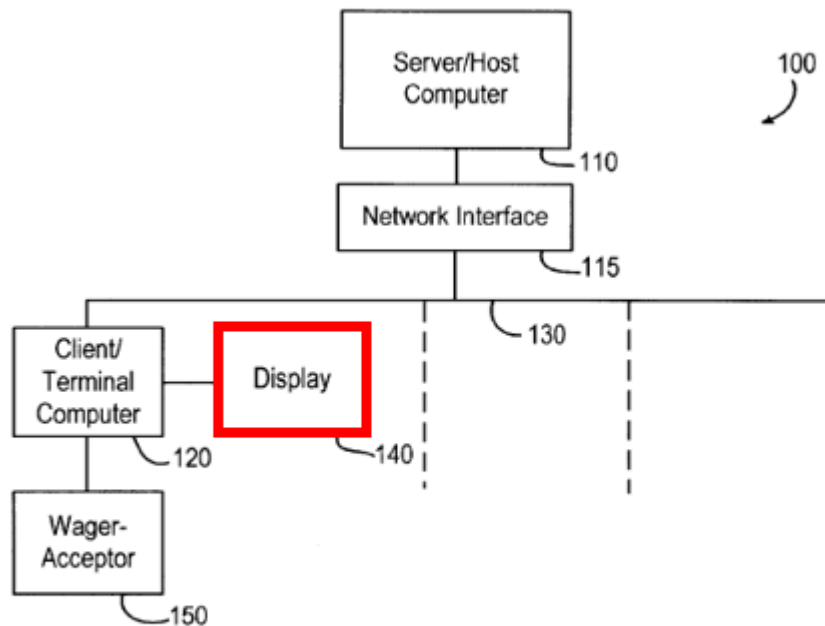


Fig. 1A

Ex. 1004, Figure 1A; *see also* Figures 1D, 2; 3:66-67 (“Each of client/terminal computers 120 is connected to a *display device* 140.”); 7:25-27 (“Client terminal program 122 then causes *the image to be displayed* on a screen of client/terminal computer 120 in stage 240.”); Ex. 1002 ¶ 127.

b. 8[a]: “a server having a processor and memory configured to execute an interactive software application and further configured for:”

Wiltshire discloses this limitation.

As explained for claim 1, Wiltshire discloses that the system includes a “server” (Wiltshire’s server/host computer) that runs an interactive software application. *See* Sections XI(A)(1)(a)-(b); Ex. 1002 ¶ 130.

Wiltshire discloses that the server can be any type of computer “having a processor and memory configured to execute an interactive software application” (Wiltshire’s game program). Ex. 1004, 4:49-65 (“The server/host computer 110 can be any type of general purpose computer.... [S]erver/host computer 110 should have sufficient storage, *memory* and *processing power*, to support the plurality (e.g., at least eight) of client/terminal computers 120 ... *in order to provide acceptable response time to random inputs from all the patrons*. For instance, in some embodiments, the *server/host computer 110* has the following hardware configuration: ... *400 Mhz Pentium® II processors, 512 MB of 100 Mhz SDRAM....*”); Ex. 1002 ¶ 131.

c. 8[b]: “receiving at the server user input signals from a client device, wherein the user input signals are used to control updating the state of the interactive software application;”

As explained for limitation 1[b], Wiltshire’s server is configured for “receiving at the server user input signals from a client device, wherein the user

input signals are used to control updating the state of the interactive software application.” See Section XI(A)(1)(c); Ex. 1002 ¶ 133.

d. 8[c]: “generating at least one updated image at the server in response to updating the state of the interactive software application running on the server by the user input signals;”

As explained for limitations 1[b] and 1[c], Wiltshire discloses that the server is configured for “generating at least one updated image at the server in response to updating the state of the interactive software application running on the server by the user input signals.” See Sections XI(A)(1)(c)-(d); Ex. 1002 ¶ 134.

e. 8[d]: “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 and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.”

As explained for limitation 1[d], Wiltshire in combination with Saha discloses that the server is configured for “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 and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.” See Section XI(A)(1)(e).

First, as explained for limitation 1[d], Wiltshire discloses a server that is configured for transmitting the updated image as an encoded image in a “compressed MPEG video stream,” and thus discloses that the server is configured

for “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.” *See* Section XI(A)(1)(e).

Second, as explained for limitation 1[d], the combination of Wiltshire and Saha discloses that the client device receiving and displaying the compressed MPEG stream is configured “for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.” *See* Section XI(A)(1)(e). A POSITA would have been motivated to combine Wiltshire and Saha to arrive at this limitation, with a reasonable expectation of success, to form the claimed combination. *See id.*; Ex. 1002 ¶¶ 135-138.

Thus, claim 8 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 139.

8. Claim 9

a. 9: “The image display system of claim 8, wherein the user input signals are generated at the client device to update the state of the interactive software application from the state that initiated the current image displayed on the display coupled to the client device.”

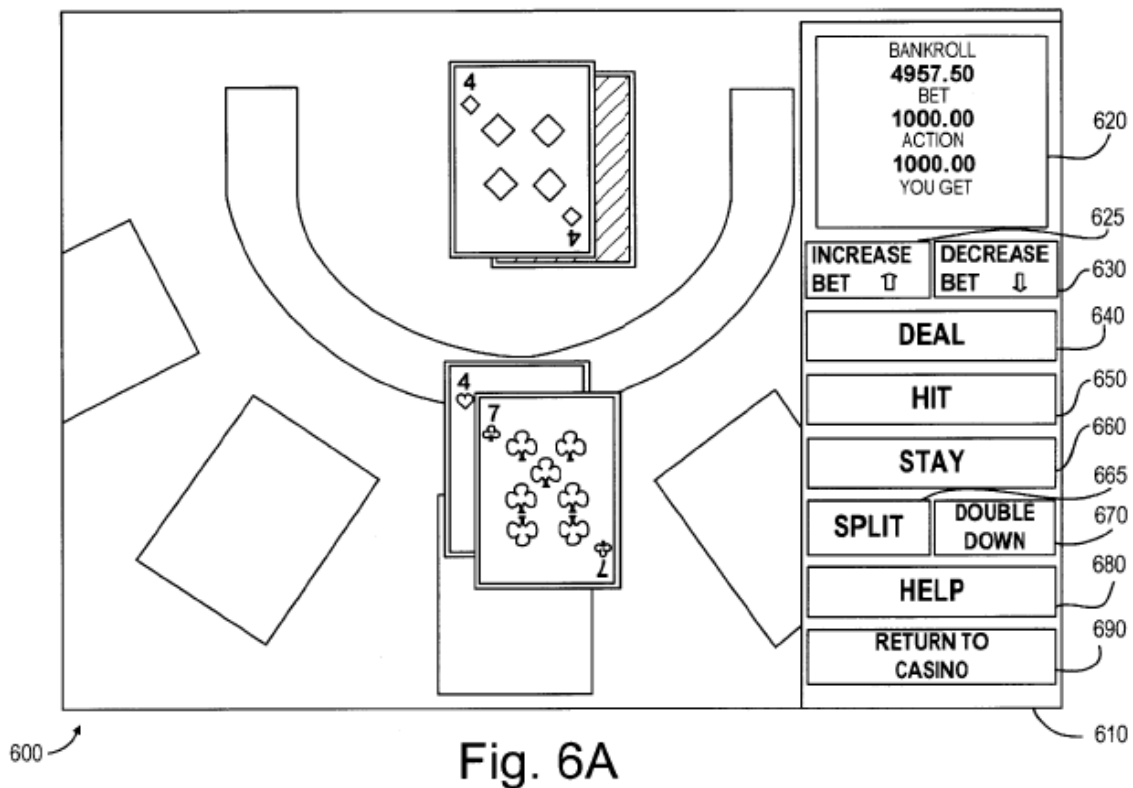
Claim 9 depends on claim 8, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitation of claim 9. *Id.* ¶ 140.

As explained for limitations 1[c] and 1[d], Wiltshire discloses that (1) user

input signals are generated at the client device, (2) those user input signals update the state of the game at the server, (3) an updated image is generated at the server and transmitted to the client as a compressed MPEG video stream, and (4) the updated image is displayed on the client device. *See* Section XI(A)(1)(c)-(d); Ex. 1002 ¶ 141.

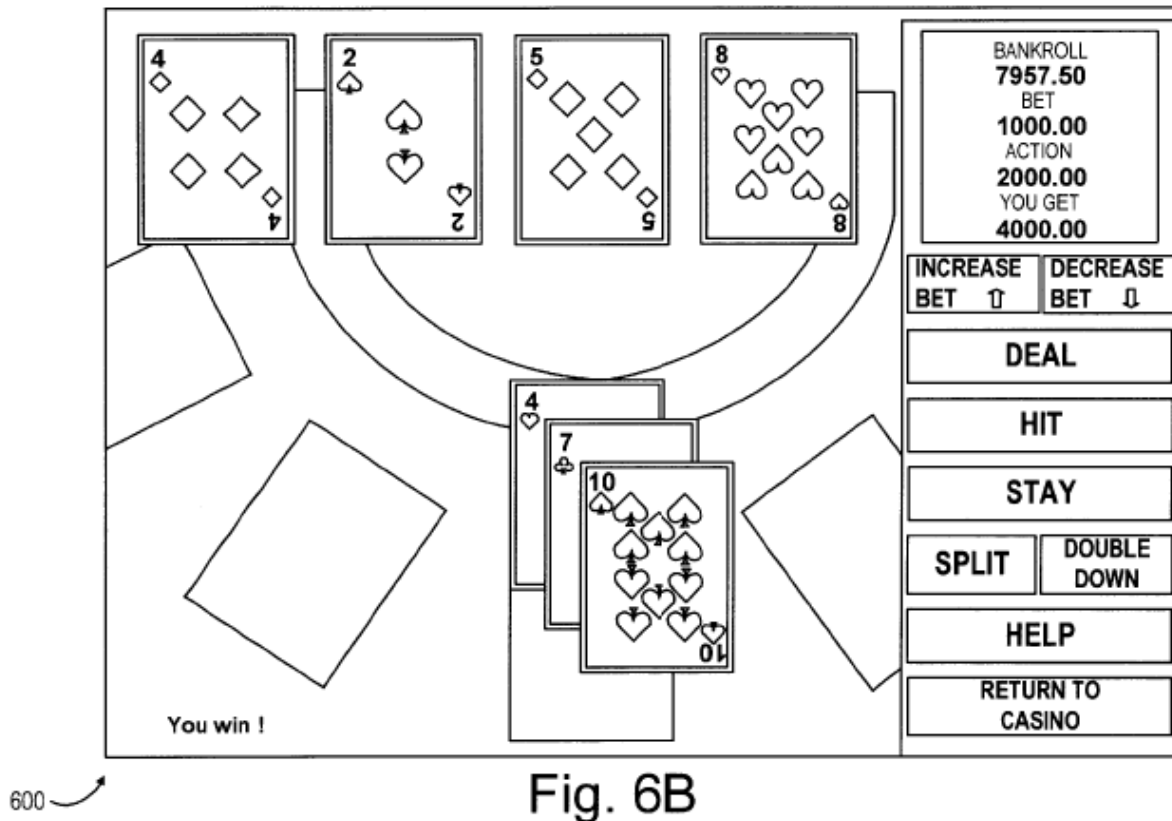
Wiltshire further discloses that “the user input signals are generated at the client device to update the state of the interactive software application from the state that initiated the current image displayed on the display coupled to the client device.” Wiltshire provides examples showing how a user input signal at the client is generated to update the current image displayed at the client display with a new state of the game, based on the operation shown in Figure 2 and described for limitations 1[c] and 1[d]. Ex. 1004, 8:39-11:54 (describing various games that “illustrate the images displayed on screen 140 of client/terminal computer 120 during operation 200 of computer gaming system 100”); *id.*, 7:7-8 (“FIG. 2 is a flow diagram of operation 200....”); Ex. 1002 ¶ 142.

One example is a blackjack game that initially shows an image of a blackjack table on a display coupled to the client device, as depicted in Figure 6A:



Ex. 1004, Fig. 6A; 9:13-14 (“FIG. 6A illustrates black jack table image 600, that is displayed in response to the patron pressing blackjack virtual button 430 (FIG. 4B).”); 7:25-27 (“Client/terminal program 122 then causes the image to be displayed on a screen of client/terminal computer 120 in stage 240.”). Figure 6A thus shows a current image on the client display based on an initial state of the blackjack game. Ex. 1002 ¶ 143.

Wiltshire discloses that when the user presses the “double down button” (button 670 of Figure 6B), the button press action is transmitted to the server as a user input signal, updating the state of the game, and causing a modified image of the black jack table to be displayed at the client display, shown in Figure 6B:



Ex. 1004, Fig. 6B; 9:63-65 (“FIG. 6B illustrates black jack table image 600 after the patron has elected to double down by pressing double down button 670.”).

Wiltshire explains Figures 6A and 6B illustrate the operation described in Figure 2.

Ex. 1004, 8:39-41 (explaining that Figures 6A and 6B are examples using “operation 200,” which is described in Figure 2 and corresponding descriptions).

As explained for claim 1, Figure 2 and the corresponding descriptions show that the user input signals generated from the client device (e.g., pressing the “double down” button) are sent to the game program at the server to update the state of the game, resulting in a modified image at the client (e.g., the updated black jack table shown in Figure 6B). *See* Sections XI(A)(1)(b)-(e); Ex. 1002 ¶ 144.

Accordingly, claim 9 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 145.

9. **Claim 10**

a. ***10: “The image display system of claim 8 wherein the server is configured to exchange user input data and compressed updated images with a plurality of client devices.”***

Claim 10 depends on claim 8, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitation of claim 10. *Id.* ¶ 146.

As explained for claim 1, Wiltshire discloses that the server receives user input signals (i.e., user input data) from a client and transmits compressed updated images to a client. *See* Sections XI(A)(1)(c), XI(A)(1)(e); Ex. 1002 ¶ 147.

As explained for claim 3, Wiltshire discloses that the system includes a plurality of client terminals. *See* Section XI(A)(2); Ex. 1002 ¶ 148.

Thus, Wiltshire discloses that the compressed images are “exchange[d] ... with a plurality of client devices.” *See also* Ex. 1004, 7:65-8:2 (“In some embodiments, ***images transmitted between server/host computer 110 and client/terminal computers 120*** are cached on client/terminal computers 120 to reduce the amount of network bandwidth required for the operation of computer gaming system 100.”); Ex. 1002 ¶ 149.

Accordingly, claim 10 is unpatentable over Wiltshire in combination with

Saha. Ex. 1002 ¶ 150.

10. Claim 11

a. 11: “The image display system of claim 8 wherein the interactive software application is a game and wherein the client device is a mobile device.”

Claim 11 depends on claim 8, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitation of claim 11.

Id. ¶ 151.

As discussed for claim 1, the interactive software application in Wiltshire is a game program. *See* Section XI(A)(1)(a)-(b); Ex. 1002 ¶ 152.

As discussed for claim 6, Wiltshire discloses that the client device can be a mobile device. *See* Section XI(A)(5); Ex. 1002 ¶ 153.

Accordingly, claim 11 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 154.

11. Claim 12

a. 12: “The image display system of claim 10 wherein the interactive software application is a game and wherein at least one of the plurality of client devices is a mobile device.”

Claim 12 depends on claim 10, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitation of claim 12.

Id. ¶ 155.

As discussed for claim 1, the interactive software application is a game program. *See* Section XI(A)(1)(a)-(b); Ex. 1002 ¶ 156.

As discussed for claim 6, Wiltshire discloses that at least one of the plurality of client devices can be a mobile device. *See* Section XI(A)(5); Ex. 1002 ¶ 157.

Accordingly, claim 12 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 158.

12. Claim 13

a. 13[preamble]: “A method of displaying interactive video, comprising:”

To the extent the preamble is limiting, Wiltshire discloses the preamble.

As explained in for claim 1, Wiltshire discloses a method of hosting and executing an interactive game. *See* Sections XI(A)(1)(a); Ex. 1002 ¶ 160.

The interactive game is displayed as an interactive video. Wiltshire discloses that images for the interactive game are sent to the client device as a “video stream.” Ex. 1004, Figure 2 (describing operations “Send **video** stream to client” and “Receive **video** stream [from] client”); *see also* Section XI(A)(1)(e) (describing how the server sends a “compressed **video** MPEG stream” to the client). As explained for claim 1, the video stream is received at the client device, and the user interacts with the video stream via keyboard, mouse, buttons, or other input commands, which are sent back to the game program executing on the server. *See* Sections XI(A)(1)(c)-(d). Thus, a POSITA would understand that the video stream displayed on the client device is an “interactive video” and that Wiltshire discloses a method of displaying “interactive video.” Ex. 1002 ¶ 161.

- b. 13[a]: “receiving at a server user input control signals from a client device, wherein the user input control signals are used to control at least one image in a sequence of images generated from the running of a software gaming application on the server;”***

Wiltshire discloses this limitation.

First, as explained for limitation 1[b], Wiltshire discloses “receiving at a server user input control signals from a client device.” *See* Section XI(A)(1)(c) (describing how Wiltshire discloses user input control signals in the form of “input commands”); Ex. 1002 ¶ 164.

Second, Wiltshire discloses that “the user input control signals are used to control at least one image.” Wiltshire describes that the game program running on the server “*responds to input command 112* by updating the *state of the game and possibly modifying the image displayed on screen 140*.” Ex. 1004, 8:61-63; *see also* Section XI(A)(1)(d) (describing Wiltshire’s disclosure of generating an update image). Thus, Wiltshire discloses that “the user input control signals are used to control at least one image” by modifying that image. Ex. 1002 ¶ 165.

Third, the “at least one image” is part of a “sequence of images generated from the running of a software gaming application on the server.” Wiltshire discloses that the modified image generated by the server is a video stream produced by the game program on the server. Ex. 1004 Figure 2 (describing operations “Send video stream to client” and “Receive video stream [from]

client”); Section XI(A)(1)(d)-(e) (describing how the server sends a “compressed video MPEG stream” to the client based on updating the game state on the server). A POSITA would have understood that a video stream is made up of a sequence of images and thus the modified image generated by Wiltshire’s server is part of a sequence of images generated from the running of a software gaming application on the server. Ex. 1002 ¶ 166.

c. 13 [b]: “generating a modified image at the server in response to the user input control signals;”

Wiltshire discloses this limitation.

As explained for limitations 1[b] and 1[c], Wiltshire discloses “generating a modified image at the server in response to the user input control signals.” See Sections XI(A)(1)(c)-(d) (explaining how the server generates an updated image in response to the updated game state, which is in turn in response to the “input commands” received from the client). Ex. 1002 ¶ 169.

d. 13[c]: “and transmitting the modified image to the client device for display as compressed data, wherein the transmitting step comprises compressing the at least one modified image and sending the compressed modified image to the client device once the modified image is generated, and wherein the client device is configured for decompressing of the compressed modified image and displaying the modified image on a display coupled to the client device.”

Wiltshire combined with Saha discloses this limitation.

First, as explained for limitation 1[d], Wiltshire discloses “transmitting the

modified image to the client device for display as compressed data, wherein the transmitting step comprises compressing the at least one modified image and sending the compressed modified image to the client device once the modified image is generated.” Section XI(A)(1)(d)-(e) (explaining how Wiltshire discloses generating a modified image, and once generated, compressing the modified image as an MPEG video stream for transmission to the client device). Ex. 1002 ¶ 172.

Second, as explained for limitation 1[d], Wiltshire combined with Saha discloses “wherein the client device is configured for decompressing of the compressed modified image and displaying the modified image on a display coupled to the client device.” Section XI(A)(1)(e); Ex. 1004, 3:66-67 (“Each of client/terminal computers 120 is ***connected to a display device*** 140.”); 7:25-27 (“Client terminal program 122 then causes ***the image to be displayed*** on a screen of client/terminal computer 120 in stage 240.”). For the reasons provided for limitation 1[d], a POSITA would have been motivated to apply Saha’s teaching of MPEG decompression to Wiltshire’s client device, with a reasonable expectation of success, to form the claimed combination. Section XI(A)(1)(e); Ex. 1002 ¶¶ 173-174.

Accordingly, Wiltshire in combination with Saha discloses this limitation. Ex. 1002 ¶ 175.

Thus, claim 13 is unpatentable over Wiltshire in combination with Saha. *Id.*

¶ 176.

13. Claim 15

- a. 15: “The method as recited in claim 13 wherein the server is configured to exchange user input data and compressed modified images with a plurality of client devices.”***

Claim 15 depends on claim 13, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitations of claim 15.

Id. ¶ 177.

As explained for claim 10, Wiltshire discloses that its server is configured to exchange user input data (Wiltshire’s input commands) and compressed modified images with a plurality of client devices. Section XI(A)(9); Ex. 1002 ¶ 178.

Accordingly, claim 15 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 179.

14. Claim 16

- a. 16: “The method as recited in claim 15 wherein at least two of the plurality of client devices include different platforms.”***

Claim 16 depends on claim 15, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitations of claim 16 to a POSITA. *Id.* ¶ 180.

As discussed for claim 5, Wiltshire discloses that “at least two of the plurality of client devices include different platforms,” and at a minimum, a POSITA would have been motivated to implement the system of Wiltshire to

arrive at this limitation with a reasonable expectation of success with a reasonable expectation of success. *See* Section XI(A)(4); Ex. 1002 ¶ 181.

Accordingly, claim 15 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 182.

15. Claim 17

a. 17: “The method as recited in claim 1 wherein the interactive software application is a game running on the server and wherein updating of the state of the interactive software application includes changing the game state.”

Claim 17 depends on claim 1, which is rendered obvious by Wiltshire in combination with Saha. Wiltshire discloses the additional limitations of claim 17. *Id.* ¶ 183.

As discussed for claim 7, Wiltshire discloses that “the interactive software application is a game running on the server and wherein updating of the state of the interactive software application includes changing the game state.” Section XI(A)(6); Ex. 1002 ¶ 184.

Accordingly, claim 17 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 185.

16. Claim 18

a. 18: “The method as recited in claim 13 wherein the user input control signals are used to control a plurality of images in the sequence of images generated from the running of a software gaming application on the server.”

Claim 18 depends on claim 13, which is rendered obvious by Wiltshire in

combination with Saha. Wiltshire discloses the additional limitations of claim 18. *Id.* ¶ 186.

As discussed for limitation 13[a], Wiltshire discloses that the user input signals are used to control at least one image in a sequence of images (video stream) generated from running the game on the server. *See* Section XI(A)(12)(b); Ex. 1002 ¶ 187.

Wiltshire further discloses that the user input control signals are used to control a **plurality** of images in the sequence of images. In particular, Wiltshire discloses that the game program—in response to user input commands—determines which “images” are to be displayed on the screen of the client. Ex. 1004, 5:59-65 (“[T]he game program determines which **images** are to be displayed on a screen of the client/terminal computer and that input commands such as mouse movements, mouse clicks or keystrokes or lever activation detected by the client/terminal computer are sent directly to the server/host based game program for context interpretive processing.”). Further, because Wiltshire discloses that an updated image can be a “video stream,” a POSITA would understand that there would be a plurality of updated images because a stream consists of multiple images. Ex. 1004, Figure 2 (describing operations “Send **video** stream to client” and “Receive **video** stream [from] client”); Section XI(A)(1)(e), (describing how the server sends a “compressed **video** MPEG stream” to the client); Ex. 1002

¶ 188.

As another example, Wiltshire describes a virtual casino slot machine game using the system described in Figure 2, which provides an animated sequence of images in response to user input control signals sent by the client. Ex. 1004, 11:7-30 (“To play the virtual slot machine, ... [t]he patron then presses pull button 875, causing reels 850 to ‘*spin*.’ ... Prize window 890 ... displays an *animated* and *dynamically variable image* of a prize that also appears on reels 850.”); 8:39-41 (explaining the slot machine game is an example using “operation 200,” which is described in Figure 2 and corresponding descriptions); Ex. 1002 ¶ 189.

Thus, Wiltshire discloses that in response to user input control signals, the server can control a plurality of images (such as in an animation or output stream of images). *See also* Ex. 1004, 2:39-44 (“Each client/terminal computer comprises a client/terminal program that allows the computer gaming program executed on the server/host computer to *accept input from the patrons*, and *control* the gaming content of an *output information stream* directed to the client/terminal computers.”); Ex. 1002 ¶ 190.

Accordingly, claim 18 is unpatentable over Wiltshire in combination with Saha. Ex. 1002 ¶ 191.

B. Ground II: Claims 2 and 14 are obvious in view of Wiltshire, Saha, and Chen

As explained in Ground I, Wiltshire in combination with Saha renders

obvious claims 1, 3-13, and 15-18. Section XI(A). Claims 2 and 14 depend on claims 1 and 13, respectively. Thus, the arguments in Ground I are incorporated into Ground II. As described below, Chen discloses the additional limitations of claims 2 and 14, and a POSITA would have been motivated to combine the teachings of Chen with Wiltshire and Saha to render obvious claims 2 and 14. Ex. 1002 ¶ 192.

1. **Claim 2**

- a. 2: “The method as recited in claim 1 wherein a first bandwidth for transmitting the user input data between the client device and the server and a second bandwidth for transmitting the compressed updated image from the server to the client device are asymmetric.”*

Claim 2 depends on claim 1, which is rendered obvious by Wiltshire in combination with Saha. The combination of Chen with Wiltshire and Saha discloses the additional limitations of claim 2. *Id.* ¶ 193.

As discussed for limitations 1[b]-1[d] and claim 4, Wiltshire discloses (1) transmitting user input signals between the client and the server and (2) transmitting the compressed updated image from the server to the client. Ground I, Sections XI(A)(1)(c)-(e), XI(A)(3). While Wiltshire does not expressly disclose using a first bandwidth for the client to server transmissions and a second different bandwidth for the server to client transmissions, Chen does do so. Ex. 1002 ¶ 194.

Chen describes the ADSL standard, which uses a first (upstream) bandwidth

and a second (downstream) bandwidth that are asymmetric.¹⁰ Ex. 1006, 69 (“ADSL was proposed as having the traditional duplex POTS channels, occupying the frequency band between 300 Hz to 4 kHz, *an upstream control channel of 16-64 kb/s, occupying the frequency band between 10 kHz to 50 kHz*, and a *downstream channel of 1.544 Mb/s, occupying the frequency band between 100 and 500 kHz*.”). Chen thus discloses a “first bandwidth” for upstream transmissions (16-64 kb/s) and “second bandwidth” for downstream transmissions (1.544 Mb/s) and that the bandwidths are “asymmetric” (the upstream bandwidth of 16-64 kb/s is different than the downstream bandwidth of 1.544 Mb/s). Indeed, the ’109 patent admits that “a DSL” is an example of an asymmetric bandwidth connection. Ex. 1001, 6:14-16 (“However, *the client bandwidth can be asymmetric*, with the high-bandwidth reserved for visual server 12 to client 16, 18, 20 communication, *an example being a DSL*.”); Ex. 1002 ¶ 195.

A POSITA would have been motivated to apply Chen’s teaching of a first bandwidth and a second bandwidth that are asymmetric to Wiltshire in combination with Saha, and would have had a reasonable expectation of success in

¹⁰ Chen refers to transmissions from client to server as “upstream” transmissions, and refers to transmissions from server to client as “downstream” transmissions. Ex. 1006, 68-69.

doing so, for the following reasons. Ex. 1002 ¶ 196.

First, Wiltshire describes using a communication pathway between the server and clients such as the Internet, and Chen teaches that ADSL is an “ideal vehicle for Internet access” and other “telecommuting applications.” Ex. 1004 (Wiltshire), 5:30-32 (“The communication pathways 130 is any type of local area, wide area or global communication pathways, *including the Internet and the World Wide Web.*”); Ex. 1006 (Chen), 69 (“Most recently, *ADSL has been considered as an ideal vehicle for Internet access* and telecommuting applications.”). Wiltshire and Chen thus teach toward one another, and a POSITA would have been motivated to apply Chen’s ADSL teachings to implement the Internet communication access described in Wiltshire. Ex. 1002 ¶ 197. A POSITA would also have been aware that Saha’s MPEG compression and decompression would be compatible for use with Wiltshire (which explicitly mentions MPEG) (Ex. 1004, 7:15-18) and Chen’s ADSL (which also mentions MPEG)(Ex. 1006, 69); *see also* Section XI(A)(1)(e); Ex. 1002 ¶ 197.

Second, as described in Chen, ADSL is “well suited to the concept of video-on-demand service” and Wiltshire’s system provides a form of “video-on-demand”—again teaching toward the combination of the references. Ex. 1006 (Chen), 69. As explained in Chen, ADSL is well suited for video-on-demand because the upstream control signals for interactive commands (e.g., pause, play,

etc.) only need “low transmission throughput” relative to the higher bandwidth requirements of downstream video and audio transmissions. Ex. 1006, 69 (“[O]nly ***a low transmission throughput upstream control channel*** is necessary ***to send back control signals for interactive commands such as pause, play,*** and so forth.”); *id.* (“The video, an audio channel, and associated overhead can be transmitted within a 1.5 Mb/s signal.”); Ex. 1002 ¶ 198.

ADSL is thus well-suited to exchange the same type of information (i.e. user input controls on one hand and image/video data on the other) as disclosed in Wiltshire. For example, ADSL is configured “to send back control signals for interactive commands such as pause, play, and so forth,” and “[t]he video ... can be transmitted within a 1.5 Mb/s signal.” Ex. 1006, 69. As discussed for claim 1, Wiltshire’s system also includes sending user input commands to the server and transmitting an updated image to the client device. Sections XI(A)(1)(c)-(e). Wiltshire explains that the user input commands are “mouse movements, mouse clicks or keystrokes.” Ex. 1004, 5:57-65. A POSITA would understand that these upstream input commands would—like the pause and play commands referenced in Chen—require less bandwidth than the downstream video transmissions. Ex. 1002 ¶¶ 199-200 (citing Ex. 1018 (Sutton)). A POSITA would therefore have understood that ADSL described in Chen is well-suited for use as the communication pathway in Wiltshire’s client-server system, including its use of

MPEG in server-to-client communications as also taught by Saha. *Id.* ¶ 200.

Third, using ADSL would have been just one of a finite number of known options for providing Internet connectivity described in Wiltshire. Specifically, at the time of Wiltshire, broadband Internet access was typically provided by one of two options: ADSL or cable networks. *Id.* ¶ 201 (citing Ex. 1007, 76). As explained in Chen, ADSL was recognized as the “ideal” vehicle for providing Internet Access, particularly for streaming video, and thus would have been, at a minimum, obvious to try with Wiltshire. Ex. 1006 (Chen), 69; Ex. 1002 ¶ 201.

Fourth, a POSITA would have had a reasonable expectation of success with the combination of Chen with Wiltshire and Saha. Wiltshire describes using a communication pathway such as the Internet. Ex. 1004, 5:30-32 (“The communication pathways 130 is any type of local area, wide area or global communication pathways, ***including the Internet*** and the World Wide Web.”). Chen discloses that ADSL is ideal for providing Internet access. Ex. 1006 (Chen), 69 (“Most recently, ***ADSL has been considered as an ideal vehicle for Internet access and telecommuting applications.***”). Further, Chen discloses that ADSL is configured to transmit control commands and video, and Wiltshire is also designed to transmit control commands and video. *Id.*, 69. Chen also contemplates video on demand applications using MPEG, just like Wiltshire. Ex. 1006 at 69 (“[T]he ISO Moving Pictures Experts Group (MPEG) recommendation ... provide full

motion video rates of around 1.3 Mb/s. The video, an audio channel, and associated overhead can be transmitted with a 1.5 Mb/s signal.”). As discussed above for claim 1, the combination of Wiltshire and Saha discloses a video on demand system that uses MPEG compression and decompression for transmitting video streams. Section XI(A)(1)(e). Thus, the combination of Chen with Wiltshire and Saha uses ADSL in the intended manner, and MPEG would be compatible with use of ADSL. Ex. 1002 ¶¶ 202-204.

Further, the Internet generally and ADSL in particular were well-understood technologies by the middle of the dot-com boom, 1998, when Wiltshire was filed. Ex. 1006, Abstract; Ex. 1002 ¶ 205.

Thus, a POSITA would have had a reasonable expectation of success in combining ADSL described in Chen with Wiltshire and Saha. Ex. 1002 ¶ 206.

Finally, Chen, Wiltshire, and Saha, are analogous art to the ’109 patent and are thus properly used for the obviousness combination described above. As discussed above for limitation 1[d], both Wiltshire and Saha are analogous art to the ’109 patent. *See* Section XI(A)(1)(e). Chen relates to the same field of endeavor as the ’109 patent because Chen describes a communications technology (ADSL) that is used for transmissions of images and video. Ex. 1006, 68; Ex. 1001, 1:29-33 (describing “Field of Invention” as including “a visual server to generate and transmit images to a client”). Further, Chen is reasonably pertinent

to the problem of the '109 patent because it describes a communications technology that provides asymmetric bandwidths for transmitting user input commands and video streams, just like the '109 patent. Ex. 1006, 68; Ex. 1001, 6:11-28; Ex. 1002 ¶ 207.

Accordingly, claim 2 is unpatentable over the combination of Wiltshire, Saha, and Chen. Ex. 1002 ¶ 208.

2. Claim 14

- a. 14: “The method as recited in claim 13 wherein a first bandwidth available for receiving user input control signals at the server and a second bandwidth available for transmitting the modified image to the client device is asymmetric with the second bandwidth available for transmitting the modified image from the server being greater than the first bandwidth.”*

Claim 14 depends on claim 13, which is rendered obvious by Wiltshire in combination with Saha. The combination of Chen with Wiltshire and Saha discloses the additional limitation of claim 14. *Id.* ¶ 209.

As discussed for limitations 13[a]-13[c], Wiltshire discloses receiving user input control signals at the server and transmitting the modified image to the client device. *See* Sections XI(A)(12)(b)-(d); Ex. 1002 ¶ 210.

As discussed for claim 2, Chen describes a first bandwidth and a second bandwidth that are asymmetric such that the second bandwidth is greater than the first bandwidth. Section XI(B)(1). As also discussed above for claim 2, a POSITA would have been motivated to apply Chen’s teachings of ADSL to Wiltshire in

combination with Saha, to arrive at the additional limitation recited in claim 14 and would have had a reasonable expectation of success in doing so. Section XI(B)(1); Ex. 1002 ¶ 211.

Accordingly, claim 14 is unpatentable over the combination of Wiltshire, Saha, and Chen. Ex. 1002 ¶ 212.

C. Ground III: Claims 6, 11, and 12 are obvious in view of Wiltshire, Saha, and PC Magazine

As explained in Ground I, Wiltshire in combination with Saha renders obvious claims 6, 11, and 12. Section XI(A)(5), XI(A)(10), XI(A)(11); Ex. 1002 ¶ 213.

Even if Patent Owner argues that Wiltshire does not disclose the “mobile device” limitations of claims 6, 11, and 12, these claims would also have been obvious in view of the combination of PC Magazine with Wiltshire and Saha. Claim 6 depends on claim 1, and claims 11 and 12 depend on claim 8. Ground III thus incorporates the arguments set forth in Ground I for these claims. Ex. 1002 ¶ 214.

1. Claim 6

a. 6: “The method as recited in claim 1 wherein the client device is a mobile device.”

Claim 6 depends on claim 1, which is rendered obvious by Wiltshire in combination with Saha. *See* Section XI(A)(1). The combination of PC Magazine with Wiltshire and Saha discloses the additional limitation of claim 6. Ex. 1002

¶ 215.

PC Magazine discloses various laptop computers, including the Apple “iBook” shown below:



Ex. 1007, 9. PC Magazine describes the iBook as a “portable” laptop computer for mobile use, and it includes “wireless technology” that allows users to “roam up to 150 feet” from a base station. The article emphasizes the iBook’s 6-hour battery life, which a POSITA would understand to confirm that the iBook is a mobile device capable of operating when not connected to a power outlet. *Id.* Thus, a POSITA would understand that a laptop, such as the iBook, is a mobile device.

Ex. 1002 ¶¶ 216.

A POSITA would have been motivated to use laptops, such as the iBook disclosed in PC Magazine, as the “client/terminal computers” in Wiltshire (and as part of the combination of Wiltshire and Saha), and would have had a reasonable expectation of success in doing so, for the following reasons. Ex. 1002 ¶ 217.

First, Wiltshire describes that “[c]lient/terminal computers 120 can also be *any type* of cost effective special purpose or general purpose computer *such as* ... a *Mac® PowerPC computer* ... etc.” Ex. 1004, 5:14-17. The iBook in PC Magazine uses a PowerPC “G3 processor,” and is thus squarely within what Wiltshire teaches to use as “client/terminal computers.” Ex. 1007, 9; Ex. 1021 (Esfahani), 3:23-25 (G3 is a “PowerPC processor”);¹¹ Ex. 1019, Abstract (same).¹² Further, a POSITA would understand that Wiltshire’s disclosure that “any” general purpose computer can be used for the client includes the Apple iBook. Ex. 1002 ¶¶ 218.

Second, Wiltshire explains that its system can be used for “mobile gaming” when the client devices have “wireless communication pathways.” Ex. 1004,

¹¹ Ex. 1021 was filed on December 23, 1998, and is thus prior art to the ’109 patent under § 102(e).

¹² Ex. 1019 was publicly available by February 26, 1997, and is thus prior art under § 102(b). Ex. 1003 ¶¶ 105-112.

Abstract; 13:20-25; *see also* Section XI(A)(5). The iBook is equipped with wireless communication technology to allow users to “roam” (Ex. 1007, 9) and has sufficient hardware to play interactive games in Wiltshire’s system. Thus, a POSITA would have been further motivated to implement Wiltshire’s system using the iBook as the client devices to support “*mobile* gaming” as Wiltshire instructs. Ex. 1002 ¶ 219.

Third, using a mobile device for a client device would have been just one of a finite number of known options contemplated by a POSITA for use in Wiltshire—either the client devices can be non-mobile, or the client devices can be mobile. Given that mobile devices were well known at the time (as described in Ex. 1007, 9), using mobile devices would have been a predictable and identified option that was obvious to try. Ex. 1002 ¶ 220.

Fourth, using a known mobile device such as a laptop described in PC Magazine would have been a simple substitution of one known element for another to obtain predictable results. As explained above, PowerPC-based mobile laptops were well known before the ’109 patent, and Wiltshire expressly contemplates that “any” known PowerPC-based computer may be used. Ex. 1002 ¶ 221.

Fifth, there would have been a reasonable expectation of success in using the laptops described in PC Magazine as the “client terminal computers” of Wiltshire’s computing system. Wiltshire describes “a mobile gaming

environment” and describes using “any type of cost effective special purpose or general purpose computer such as ... a *Mac® PowerPC computer* ... etc.” Ex. 1004, Abstract, 5:14-17. PC Magazine explains that PowerPC laptops were commercially available well before the earliest date of the ’109 patent. Ex. 1007, 9 (noting iBook release in September 1999). Furthermore, a POSITA would have understood that the iBook’s “300-MHz G3 processor” would have been more than sufficient to decode MPEG-1 and MPEG-2 encoded video streams, as taught by the combination of Wiltshire and Saha. Ex. 1007, 9; Ex. 1002 ¶¶ 222-223 (citing Ex. 1019, 1020). Further, the iBook’s 300-MHz PowerPC G3 processor ran “MacOS” as its operating system, and the iBook’s wireless technology supports data rates of 11 megabits-per-second. Ex. 1007, 9; Ex. 1002 ¶ 50. Wiltshire’s stated bandwidth requirement may be as low as “100 KB/sec” (kilobytes per second), which is well under the iBook’s 11 megabits-per-second wireless data-rate (10 KB is .08 megabits). Ex. 1002 ¶ 224.

Finally, PC Magazine, Wiltshire, and Saha are analogous art to the ’109 patent and are thus properly used for the obviousness combination described above. As discussed above for limitation 1[d], Wiltshire and Saha are analogous art to the ’109 patent. *See* Section XI(A)(1)(e). PC Magazine relates to the same field of endeavor as the ’109 patent because it describes computer systems (laptops) that can operate as client devices to display images and video. Ex. 1007,

9 (iBook contains a 12.1 inch display, graphics chip, G3 processor, Ethernet, and wireless connectivity); Ex. 1001, 1:29-33 (describing “Field of Invention” as including “computer systems” and “a visual server to generate and transmit images to a client”). PC Magazine is also reasonably pertinent to the problem of the ’109 patent because the ’109 patent’s claimed invention involves “one or more client computers” (Ex. 1001, Abstract) and “common consumer client devices” (*id.*, 3:34-37), and PC Magazine describes known types of consumer computing devices (laptops). Ex. 1007, 9 (iBook “[t]argeted squarely at consumers and students”); Ex. 1002 ¶ 226.

Accordingly, claim 6 is unpatentable over the combination of Wiltshire, Saha, and PC Magazine. Ex. 1002 ¶ 227.

2. Claim 11

a. 11: “The image display system of claim 8 wherein the interactive software application is a game and wherein the client device is a mobile device.”

Claim 11 depends on claim 8, which is rendered obvious by Wiltshire in combination with Saha. Section XI(A)(7). The combination of PC Magazine with Wiltshire and Saha discloses the additional limitation of claim 11. Ex. 1002 ¶ 228.

As discussed for claim 1, Wiltshire discloses that the server runs a variety of games. Section XI(A)(1)(a); Ex. 1002 ¶ 229.

As discussed for claim 6, PC Magazine describes known PowerPC-based

laptops, which are mobile devices. Section XI(C)(1). As also discussed above for claim 6, a POSITA would have been motivated to use the laptops described in PC Magazine as the client devices in the combination of Wiltshire and Saha with a reasonable expectation of success. Section XI(C)(1); Ex. 1002 ¶ 230.

Accordingly, claim 11 is unpatentable over the combination of Wiltshire, Saha, and PC Magazine. *Id.* ¶ 231.

3. Claim 12

a. 12: “The image display system of claim 10 wherein the interactive software application is a game and wherein at least one of the plurality of client devices is a mobile device.”

Claim 12 depends on claim 10, which is rendered obvious by Wiltshire in combination with Saha. Section XI(A)(9). The combination of PC Magazine with Wiltshire and Saha discloses the additional limitation of claim 12. Ex. 1002 ¶ 232.

As discussed for claim 1, Wiltshire discloses that the server runs a variety of games. Section XI(A)(1)(a).

As discussed for claim 6, PC Magazine describes known PowerPC-based laptops, which are mobile devices. Section XI(C)(1). A POSITA would have been motivated to use the laptops described in PC Magazine as at least one of the plurality of client devices in the combination of Wiltshire and Saha with a reasonable expectation of success for the same reasons described above for claim 6. Section XI(C)(1); Ex. 1002 ¶ 235.

Accordingly, claim 12 is unpatentable over the combination of Wiltshire, Saha, and PC Magazine. *Id.* ¶ 236.

XII. CONCLUSION

Claims 1-18 of the '109 patent recite subject matter that is unpatentable. The Petitioner requests institution of an *inter partes* review to cancel these claims.

Respectfully Submitted,

/Joseph F. Haag/

Joseph F. Haag
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Table of Exhibits

Exhibit	Description
1001	U.S. Patent No. 10,681,109 (“109 patent”)
1002	Declaration of Dr. Henry Fuchs
1003	Declaration of Dr. Hall-Ellis
1004	U.S. Patent No. 6,409,602 (“Wiltshire”)
1005	U.S. Patent No. 6,404,817 (“Saha”)
1006	Chen, “The Development and Standardization of Asymmetrical Digital Subscriber Line,” IEEE Communications Magazine, May 1999 (“Chen”)
1007	PC Magazine, September 21, 1999 (“PC Magazine”)
1008	Baron et al., “MPEG Overview,” ITU/SMPTE Tutorial on Digital Terrestrial Broadcasting, January 1, 1994 (“Baron”)
1009	ITU-T Recommendation H.262 (“MPEG Standard”)
1010	Stay Order, Case No. 8:19-cv-01432-JVS-KES (C.D. Cal.), D.I.126
1011	Stay Stipulation, Case No. 8:19-cv-01432-JVS-KES (C.D. Cal.), D.I. 125
1012	<i>SPEX Techs., Inc. v. Kingston Tech. Corp.</i> , No. CV16-07349 JVS(AGRX), 2018 WL 2446801
1013	Scheduling Order, Case No. 8:20-cv-01422-JVS-KES (C.D. Cal.), D.I. 36
1014	In Re: Coronavirus Public Emergency Order Concerning Reopening of the Southern Division, C.D. Cal. General Order No. 20-12C.D. Cal. General Order 20-12
1015	Order Regarding Motion to Dismiss, Case No. 8:20-cv-01422-JVS-KES (C.D. Cal.), D.I. 42.

Petition for *Inter Partes* Review of U.S. Patent 10,681,109

Exhibit	Description
1016	“Polygon-Assisted JPEG and MPEG Compression of Synthetic Images,” by Marc Levoy (“Levoy”)
1017	First Amended Complaint, Case No. 8:20-cv-01432-JVS-KES (C.D. Cal.), D.I. 69
1018	U.S. Patent No. 5,771,238 (“Sutton”)
1019	“A G3 PowerPC™ Superscalar Low-Power Microprocessor,” IEEE 1997 (“PowerPC”)
1020	PC Magazine, April 23, 1996 (“1996 PC Magazine”)
1021	U.S. Patent No. 6,434,695 (“Esfahani”)

CERTIFICATE OF COMPLIANCE REGARDING WORD COUNT

I hereby certify that the foregoing, **Petition for *Inter Partes* Review of U.S. Patent No. 10,681,109**, contains 13,889 words as measured by the word processing software used to prepare the document, in compliance with 37 C.F.R. § 42.24 (d).

Respectfully submitted,

Dated: December 4, 2020

/Joseph F. Haag/
Joseph F. Haag
Registration No. 42,612

CERTIFICATE OF SERVICE

I hereby certify that on December 4, 2020 I caused a true and correct copy of the following materials:

- Petition for *Inter Partes* Review of U.S. Patent No. 10,681,109 under 35 U.S.C. § 312 and 37 C.F.R. § 42.104
- Table of Exhibits for Petition for *Inter Partes* Review of U.S. Patent No. 10,681,109
- Exhibits 1001-1021
- Certificate of Compliance Regarding Word Count
- Power of Attorney
- Fee Authorization

to be served via Federal Express on the following attorney of record as listed on PAIR:

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