UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Charter Communications, Inc.

Petitioner

v.

Sprint Communications Company

Patent Owner

Patent No. 6,754,907
Case No. IPR2019-01138

DECLARATION OF KEVIN ALMEROTH, PH.D.

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I. INTRODUCTION

1. I, Kevin Almeroth, Ph.D., submit this declaration to state my opinions on the matters described below.

2. I have been retained by Petitioner Charter Communications, Inc. as an independent expert in this proceeding before the United States Patent and Trademark Office.

3. I understand that this proceeding involves U.S. Patent No. 6,754,907 ("the '4907 patent"), and I have been asked to provide my opinions as to the patentability of the claims of the '4907 patent. I have been informed that a copy of the '4907 patent is attached to the petition as Exhibit 1001.

4. This declaration sets forth the opinions that I have formed in this proceeding based on my study of the evidence, my understanding as an expert in the field, and my education, training, research, knowledge, and personal and professional experience.

5. I am being compensated for my time at the rate of $700 per hour for my work. This compensation is not contingent in any way upon the nature of my findings, the presentation of my findings in testimony, or the outcome of this proceedings, nor does it affect the substance of my statements in this declaration.

6. I have no financial interest in the Petitioner, the Patent Owner Sprint Communications Company, or the '4907 patent, and I have not had any contact

with any of the named inventors of the '4907 patent, James Schumacher, Mike O'Brien, or Jay Cee Straley.

7. In forming my opinions, in addition to any materials cited in this declaration, I have reviewed the following materials:

- U.S. Patent No. 6,754,907
- File History for U.S. Patent No. 6,754,907
- U.S. Patent No. 7,913,278 ("*Ellis*")
- WO 92/22983 ("*Browne*")
- U.S. Patent No. 6,182,094 ("*Humpleman*")
- Claim Construction Order from *Comcast Cable Commc'ns, LLC v. Sprint Commc'ns Co., LP*, Case No. 2:12-cv-859-JD, Dkt. 162 (Aug. 15, 2014, E.D. Pa.) ("Comcast Claim Construction Order")
- Sprint's Opening Claim Construction Br. from *Comcast Cable Commc'ns, LLC v. Sprint Commc'ns Co., LP*, Case No. 2:12-cv-859-JD, Dkt. 162 (Aug. 15, 2014, E.D. Pa.) ("Sprint Claim Construction Br.")

8. I understand that this is one of multiple *inter partes* reviews against the '4907 patent.

9. I expect to testify further, if requested, regarding the subject matter set forth in this declaration.

II. QUALIFICATIONS AND BACKGROUND

10. Based upon my educational and work experience, I believe I am well qualified to serve as a technical expert in this matter. I summarize in this section my educational background, career history, publications, and other relevant

qualifications. My qualifications can be found in my *curriculum vitae*, which I understand is attached to this Petition as Exhibit 1003, including details about my employment history, fields of expertise, and publications.

11. I am currently a Professor in the Department of Computer Science at the University of California, Santa Barbara ("UCSB"). I also hold an appointment and am a founding member of the Computer Engineering (CE) Program at UCSB. I am also a founding member of the Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP) at UCSB. I also served as the Associate Director of the Center for Information Technology and Society (CITS) at UCSB from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

12. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June, 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June, 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia Systems), minor in Telecommunications Public Policy, earned in June, 1997. During my education, I have taken a wide variety of courses as demonstrated by

my minor. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

13. One of the major concentrations of my research has been the delivery of multimedia content and data between computing devices and users. In my research I have studied large-scale content delivery systems and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds, or even thousands, of users simultaneously. I have also studied smaller-scale content delivery systems in which content, including interactive communication like voice and video data, is exchanged between individual computers and portable devices. As a broad theme, my work has examined how to exchange content more efficiently across computer networks, including the devices that switch and route data traffic. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

14. In 1992, the initial focus of my research was the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems, in particular, how to

aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream to broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the development of new techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

15. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was designed mostly for text-based non-real time applications, the interest in sharing multimedia content quickly developed. Multimedia-based applications ranged from downloading content to a device for streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques because multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called "multicast," first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-

many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP. Multicast has also been used as the delivery mechanism in systems that perform local filtering (i.e., sending the same content to a large number of users and allowing them to filter locally content in which they are not interested).

16. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

17. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously

selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the existing channels and watch the content at the point it was currently being transmitted.

18. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also attempted to connect the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

19. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (i.e., when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors

in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

20. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in showing how to provide greater communication capability to "lightweight devices," i.e., small form-factor, resource-constrained (e.g., CPU, memory, networking, and power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight protocols we envisioned were similar in nature to protocols like Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA).

21. Recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content being shared and cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks.

22. I am an author or co-author of approximately 200 technical papers, published software systems, IETF Internet Drafts and IETF Request for Comments (RFCs). A list of these papers is included in my CV, which is attached as Exhibit A.

23. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement

(WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

24. Furthermore, in the courses I teach at UCSB, a significant portion of the curriculum covers aspects of the Internet and network communication, including each of the layers of the Open System Interconnect (OSI) protocol stack commonly used in the Internet, as well as standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). These layers include the physical and data link layers and their handling of signal modulation, error control, and data transmission. The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. I teach the configuration and operation of switches, routers, and gateways including routing and forwarding and the numerous respective protocols as they are standardized and used throughout the Internet. Topics include a wide variety of standardized Internet protocols at the Network Layer (Layer 3), Transport Layer (Layer 4), and above. My research and courses cover a range of physical infrastructures for delivering content over

networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL).

25. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

26. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

27. Additional details about my employment history, fields of expertise, and publications are further included in my CV, which I understand is attached the Petition as Exhibit 1003.

III. THE '4907 PATENT

A. Overview of the '4907 Patent

28. The '4907 patent was filed February 9, 2000. I am not aware of any claim by Sprint to an earlier priority date and I am currently not aware of any evidence that would support an earlier priority date. To the extent Sprint may argue the '4907 patent is entitled to an earlier priority date, I reserve the right to respond to such a claim in a reply declaration.

29. The '4907 patent includes twenty-five claims. Of the twenty-five claims, there are three independent claims—claims 1, 10, and 19. These three independent claims are all generally directed to methods and systems for using a computer to remotely control a video-on-demand system. ('4907 patent, 6:28-47, 7:6-21, 8:3-21.) By using the claimed video-on-demand system, the user has the choice of displaying video content on either a computer or on a television. (*Id*.) Like the prior art discussed in Section VII, the '4907 patent recognized limitations in using set-top boxes for remotely controlling a video-on-demand system. ('4907 patent, 1:24-43.) The '4907 patent, in summarizing the invention, attempted to improve on video-on-demand systems by replacing the set-top box with a "portable

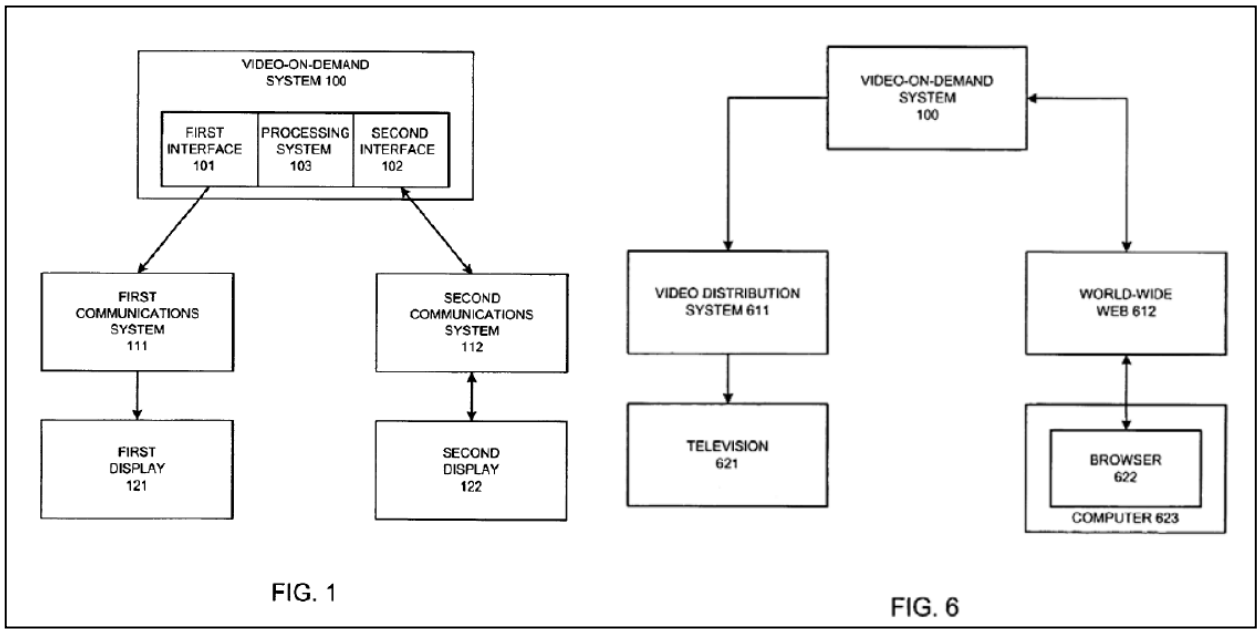
computer [that] has many other uses and eliminates the cost of a special television set-top box." (*Id*.)

30. The '4907 patent claims require a "first communication system," which the patent defines as including "optical fiber systems, wire cable systems, and wireless link systems." ('4907 patent, 2:28-34.) The '4907 patent also requires a "second communication system," which the patent defines as the "Internet," and "in particular, the World-Wide Web." (*Id*.) The '4907 patent requires that the "first communication system" and the "second communication system" interact with each other and each communication system is coupled to its own display, e.g., the first communication system is coupled to a television and the second communications system to a portable computer with a browser. ('4907 patent, 2:32-34.)

31. The '4907 patent describes a known video-on-demand system that is "configured with software and conventional communication interfaces." ('4907 patent, 2:35-37.) In the disclosed video-on-demand system, the second communication system, e.g., the Internet, is used to transmit the user's request for video signals to the video-on-demand system. ('4907 patent, 2:47-53.) The video-on-demand system then transmits certain video signals to a display over either communications systems, e.g., coaxial cable or the Internet, in response to a request from the user. ('4907 patent, 2:54-58.)

32. The ’4907 patent claims are directed to a method for controlling the two communications systems using two separate communication interfaces, wherein each interface is coupled to a particular communication system. (’4907 patent, 2:54-64.) The video-on-demand system transmits a “user control signal” to the user over a second communications system, the user then transmits “video control signals” to the video-on-demand system over a communication interface that is coupled to a particular communications system, and in response, the video-on-demand system transmits “video content signals” over the user’s selected communications system, either the first or the second communication system. (’4907 patent, 2:15-67.)

33. Figure 1 of the ’4907 patent, reproduced below, demonstrates the interaction of the various claimed systems, interfaces, and displays. Figure 6, also reproduced below, depicts a preferred embodiment of the invention.



B. Prosecution History

34. During prosecution, the Examiner rejected the pending claims under the doctrine of obviousness-type double patenting as being unpatentable over the claims of copending Application No. 09/501,055 (issued as U.S. Patent No. 6,757,907). (September 3, 2003 Office Action at 2-4.) In response, the applicant filed a terminal disclaimer. (October 24, 2003 Terminal Disclaimer.)

35. In a series of rejections, the Examiner also rejected the pending claims under § 103(a). In response, the applicant made a number of amendments to the claims and argued, "[the prior art] does not teach or suggest transferring video content signals to either a first communication interface or a second communication interface, based on a video control signal received from the second

communication interface." (October 28, 2003 Response to Office Action at 8.) The Examiner agreed and issued a Notice of Allowance. (Notice of Allowability.)

IV. LEGAL STANDARDS

36. I have been told that the following legal principles apply to analysis of patentability based on 35 U.S.C. § 102 or 35 U.S.C. § 103. I also have been told that, in an *inter partes* review proceeding, a patent claim may be deemed unpatentable if it is shown by a preponderance of the evidence that the claim was either anticipated by one prior art patent or publication under § 102 or rendered obvious by one or more prior art patents or publications under § 103.

37. I have been informed by counsel that for a claim to be anticipated under § 102, every limitation of the claimed invention must be found in a single prior art reference. I have also been informed that there is a set process as follows: (a) the claims of the patent are properly construed, (b) then, you must compare the claim language to the prior art on a limitation-by-limitation basis. I understand that an anticipatory reference does not have to recite word-for-word what is in the anticipated claims. Rather, anticipation can occur when a claimed limitation is "inherent" in the relevant reference. I have been advised that if the prior art necessarily functions in accordance with, or includes, the claim limitations, it can anticipate even though the limitation is not expressly recited.

38. I have been told that under 35 U.S.C. § 103(a), "[a] patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

39. When considering the issues of obviousness, I have been told that I am to do the following:

a. Determine the scope and content of the prior art;

b. Ascertain the differences between the prior art and the claims at issue;

c. Resolve the level of ordinary skill in the pertinent art; and

d. Consider evidence of secondary indicia of non-obviousness (if available).

40. I have also been advised that, where a party alleges obviousness based on a combination of references, that party must identify a reason why a person skilled in the art would have been motivated to combine the asserted references in the manner recited in the claims and to explain why one skilled in the art would have had a reasonable expectation of success in making such combinations.

41. I have been advised that combining familiar elements according to known methods and in a predictable way may suggest obviousness when such a

combination would yield nothing more than predictable results. I understand, however, that a claim is not obvious merely because every claim element is disclosed in the prior art and that a party asserting obviousness must still provide a specific motivation to combine the references as recited in the claims and explain why one would have reasonably expected to succeed in doing so.

42. I have been advised that two references are considered to be in the same field of art when the references are either (1) in the same field of endeavor, regardless of the problems they address, or (2) reasonably pertinent to the particular problem being solved by the inventor in his patent.

43. I have been informed that in *inter partes* review proceedings, such as this one, the party challenging the patent bears the burden of proving unpatentability by a preponderance of the evidence. I understand that a preponderance of the evidence means "more likely than not."

V. LEVEL OF ORDINARY SKILL

44. In rendering the opinions set forth in this declaration, counsel asked me to consider the patent claims and the prior art through the eyes of a person of ordinary skill in the art. I considered factors such as the educational level and years of experience of those working in the pertinent art; the types of problems encountered in the art; the teachings of the prior art; patents and publications of other persons or companies; and the sophistication of the technology.

45. Counsel asked me to assume a person of ordinary skill in the art is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors I discuss above.

46. Taking these factors into consideration, it is my opinion that a person of ordinary skill in the art as of the time of the purported invention of the '4907 patent would have held a bachelor's degree in electrical engineering, computer science, or a related field with at least 5 years of experience or research in interactive systems applicable to digital television, including video-on-demand for cable and Internet delivery.

VI. CLAIM CONSTRUCTION

47. I understand that Sprint asserted the '4907 patent in another district court litigation against different parties. *Comcast Cable Commc'ns, LLC v. Sprint Commc'ns Co., LP*, Case No. 2:12-cv-859-JD (E.D. Pa.). I understand that the parties in that case proposed constructions and the district court in that case construed various terms in the '4907 patent. (*Comcast Cable Commc'ns, LLC v. Sprint Commc'ns Co., LP*, Case No. 2:12-cv-859-JD, Dkt. 162 (Aug. 15, 2014, E.D. Pa.) ("Claim Construction Order").) For the purposes of this proceeding, it is my opinion that the Board does not need to expressly construe the claims.

A. "A video-on-demand system" (claim 1) / "operating a video-on-demand system" (claims 10 and 19)

48. I set forth below Sprint's proposed construction and the *Comcast* court's construction for these terms from *Comcast v. Sprint*. (Claim Construction Order at 28-33.)

Sprint	*Comcast* Claim Construction Order
Plain and ordinary meaning, or Should the Court deem a construction of the ordinary meaning necessary: *operating a system that provides video-on-demand*	*operating a video-on-demand system without the use of a set-top box for remote control of the video-on-demand system*

49. For the reasons I discuss in Section VII, it is my opinion that the challenged claims are unpatentable under both the *Comcast* court's construction and Sprint's proposed construction in the prior case. However, it is my opinion that the *Comcast* court's construction is confirmed by the '4907 patent. The disagreement between these two constructions is whether the claimed methods for operating a video-on-demand system must exclude the use of a set-top box for remote control of the video-on-demand system. In my opinion, this difference between these constructions do not impact the outcome of this proceeding, because the prior art, to the extent a set-top box is disclosed, does not use a set-top box for remote control of the video-on-demand system.

50. I understand that the *Comcast* court found the "Background of the Invention" and "Summary of the Invention" sections of the patent disclaim the use of a set-top box for remote control. (Claim Construction Order at 29.) I have reviewed the sections of the '4907 patent cited by the *Comcast* court and agree that the patentee disclaimed the use of a set-top box for remote control. For example, in describing the prior art, the patentee noted that "[v]ideo-on-demand systems use a television set-top box for remote control," which allows the "viewer [to] view a video content menu on the television," "order video control from display on the television," and "play, stop, pause, rewind, and fast forward the video content on the television." ('4907 patent, 1:24-30.) The patentee further explained that the problem with this arrangement is that "the set-top box is a special component that is closely coupled to the television" and "does not have other uses." ('4907 patent, 1:30-32.) The patentee sought to solve these shortcomings by disclosing an enhanced video-on-demand system whereby a user "use[s] a portable computer connected over a second communications system for remote control" such that the user "can control the video display using [his or her] portable computer." ('4,907 patent, 1:35-44.) Accordingly, it is my opinion that the *Comcast* court's construction for these terms is supported by the specification.

51. These terms are found in the preambles of independent claims 1, 10, and 19, and therefore, in construing these terms, I understand that the preambles

are limiting. (Claim Construction Order at 32.) Therefore, my opinions set forth in Section VII of the challenged claims include an analysis of the preambles.

B. "video control signal" (claims 1, 10, 19)

52. I set forth below Sprint's proposed construction and the *Comcast* court's construction for this term from *Comcast v. Sprint*. (Claim Construction Order at 34-35.)

Sprint	***Comcast* Claim Construction Order**
Plain and ordinary meaning, or Should the Court deem a construction of the ordinary meaning necessary: *a signal relating to the control of a video*	*a video control signal generated and processed without the involvement of a set-top box for remote control of the video-on-demand system*

53. For the reasons I discuss in Section VII, it is my opinion that the challenged claims are unpatentable under both the *Comcast* court's construction and Sprint's proposed construction in the prior case. Nonetheless, I have reviewed the '4907 patent and it is my opinion that the *Comcast* court's construction is confirmed by the '4907 patent. The construction of "video control signal" involves a similar dispute to the one for "video-on-demand system" in the prior term. Specifically, whether a video control signal can be generated without the use of a set-top box for remote control of the video-on-demand system. For the reasons set forth above, I agree with the *Comcast* court's construction that if disclaimer applies

to "a video-on-demand system" and "operating a video-on-demand system," it also applies to this term.[1] (Claim Construction Order at 34-35.)

C. "transfer the video content signal" (claim 1) / "transferring [video content signals/the video content signals]" (claims 10, 19)

54. I set forth below Sprint's proposed construction and the *Comcast* court's construction for these terms from *Comcast v. Sprint*. (Claim Construction Order at 36-38.)

Sprint	*Comcast* Claim Construction Order
Plain and ordinary meaning, or Should the Court deem a construction of the ordinary meaning necessary: *sending [video content signals/the video content signals]*	*in response to the video control signal, transferring [video content signals/the video content signals]*

55. For the reasons I discuss in Section VII, it is my opinion that the challenged claims are unpatentable under both the *Comcast* court's construction and Sprint's proposed construction in the prior case. Nonetheless, I have reviewed the '4907 patent and it is my opinion that the *Comcast* court's construction is confirmed by the '4907 patent. As the *Comcast* court noted, there is no

[1] I note that Comcast in *Comcast v. Sprint* proposed construing "video control signal" as "a video control signal generated and processed without the involvement of a set-top box." (Claim Construction Order at 34.) The prior district court, however, found that "[t]he specification does not disparage the use of a set-top box for other purposes, such as for 'decod[ing a video signal] and present[ing] it to a television.'" (Claim Construction Order at 35 (quoting Sprint's counsel at the

disagreement in the construction about what it means to transfer a video content signal; rather, the constructions differ on the issue of whether the video signal must be sent in response to a video control signal. (Claim Construction Order at 37.) It is my opinion that the *Comcast* court correctly found that as described in the '4907 specification, the video content signals are transferred in response to the video control signal received from the computer. (Claim Construction Order at 36-37; '4907 patent, Abstract, 2:54–67, 3:11–20, 3:30–4:60, 5:1–14, 5:36–6:8.)

D. Agreed Constructions in Comcast Claim Construction Order

56. I understand that the parties in *Comcast v. Sprint* agreed that: (1) "control screen signal" should be construed as "a signal that defines a control screen" and (2) "implementing a viewer control selection" should be construed as "in response to the video control signal, implementing a viewer control selection." (Claim Construction Order at 42.) I have applied these constructions in my analysis of the claims and the prior art in Section VII.

VII. DETAILED ANALYSIS

A. PRIOR ART CONSIDERED

57. I was asked to consider whether the following references, which I have been advised constitute prior art, anticipate and/or render obvious claims 1-25

Markman hearing).) The prior district court's construction permits the use of a set-top box in the video-on-demand system for uses other than for remote control.

of the ’4907 patent. For the reasons discussed in the next section, it is my opinion that they do.

1. *Ellis*

58. *Ellis* “relates to interactive television program guide video systems, and more particularly, to interactive television program guide systems that provide remote access to program guide functionality.” (*Ellis*, 1:19-22.) *Ellis* explains that “[i]nteractive television program guides are typically implemented on set-top boxes located in the homes of users.” (*Ellis*, 1:37-38.) The problem with set-top boxes, as explained in *Ellis*, is that set-top boxes are not portable, and therefore, “the user cannot use the program guide to adjust program reminder settings, to select programs for recording, to purchase pay-per-view programs, or to perform other program guide functions without that user being physically located in the same room in the home.” (*Ellis*, 1:40-45.) The invention in *Ellis* seeks to “provide an interactive television program guide system in which the program guide may be remotely accessed by the user.” (*Ellis*, 2:23-28.)

59. The system disclosed in *Ellis* is connected to one or more remote program guide devices that display the remote access interactive television program guide over a remote access link. (*Ellis*, 2:37-46.) “When a user indicates a desire to access program guide features by using an appropriate command to remote program guide access device, remote program guide access device may, for

example, access stored program guide information or obtain program guide information from interactive television program guide equipment via remote access link . . . and generate an appropriate display screen for display using user interface." (*Ellis*, 14:3-12.) This generated remote access program guide may, for example, provide a user with an opportunity to remotely play a stored program or a currently broadcasted program (*i.e.*, video signals) on the remote program access device or send and play the video signals on user television equipment. (*Ellis*, 2:47-60, 5:9-12, Fig. 2d.)

2. *Browne*

60. *Browne* teaches a " large capacity, random access, multi-source audio and video recorder player which is capable of receiving a plurality of simultaneous input signals" that allows a user to later request and view the recorded input signals on one or more output monitors. (*Browne*, 1, 13.) In order to view recorded input signals, the recorder's controller generates a virtual control screen, which is placed on any screen for a user to control playback. (*Browne*, 13.) Browne teaches that when the control screen appears, "the user selects the output to which the signals are to be sent" and "then selects from the signal selection the types of signals which will be output by the output selected . . . ." (*Browne*, 27, Fig. 7.) Specifically, *Browne* teaches that a control screen can include "[a] list of programs stored and set for storing" and "may be viewed by choosing the stored program list

option from the main user control menu." (*Browne*, 24, Fig. 2.) "When this option is selected, a sorted program list screen is output by controller to output." (*Browne*, 24, Fig. 2.)

3. *Humpleman*

61. *Humpleman* teaches a method and system for generating and storing on a first home device a program guide for a home network. (*Humpleman*, Abstract.) *Humpleman* also teaches that a second home device, which is browser based, can be connected to the home network and can display the program guide for a user. (*Humpleman*, Abstract.) *Humpleman* discloses that once the program guide is displayed on the second home device, the user can control a home device by selecting icons that have hyperlinks to control the program displayed. (*Humpleman*, 7:18-23.) From the second home device, the user can control the home devices that are connected to the home network, such as playing a movie. (*Humpleman*, 14:5:14.) The user can choose which home device, including the home device displaying the program guide, on which to view the selected video. (*Humpleman*, 15:25-47, 18:45-51, Figs. 10, 11, 12A, 12B.)

B. Ground 1: *Ellis* Anticipates Claims 1-25 Under § 102

1. Independent Claim 1

a. Preamble: "A video-on-demand system"

62. It is my opinion that, to the extent the preamble limits the claims, *Ellis* teaches the preamble. For example, the '4907 patent discloses that a "video-on-

demand system offers an individual viewer various selection from a video content library for viewing on-demand. Some examples of video content include movies, television shows, documentaries, news, and sports." ('4907 patent, 1:12-17.)

63. It is my opinion that *Ellis* discloses "a video-on-demand system." For example, *Ellis* discloses "an interactive television program guide system with remote access" that accesses and transmits video data from multiple sources, such as "television program listings data (e.g., program times, channels, titles, and descriptions) and other program guide data for additional services other than television program listings (e.g., pay-per-view information, weather information, associated Internet web links, computer software, etc.)," including allowing a user "to remotely order a pay-per-view program or package." (*Ellis*, 2:47-60, 4:40-53, 25:4-18.) *Ellis* also discloses "providing a user with access to remotely-played video or audio." (*Ellis*, 25:36-37.) In particular, *Ellis* discloses that the user, through the remote control, can control the video display to play a program in real-time or a previously stored program. (*Ellis*, 25:67-26:2.)

64. It is my opinion that *Ellis* discloses "a video-on-demand system" under the *Comcast* court's construction. *Ellis* discloses operating the video-on-demand system without the use of a set-top box for remote control of the video-on-demand system. (*Ellis*, 7:53-65, 8:10-20, 9:4-6.) It is my opinion that the remote program guide access device of the video-on-demand system in *Ellis* does not use a

"set-top box." For example, the '4907 patent discloses that a "set-top box is a special component that is closely coupled to the television" and "does not have other uses." ('4907 patent, 1:30-32.) It is my opinion that the remote controller in *Ellis* is not "closely coupled to the television" as it is explicitly implemented and performed without a set-top box and is separate from any set-top box. (*Ellis*, 7:53-65, 8:10-20, 9:4-6.) Additionally, the remote program guide access device in *Ellis* does not have a single use, but instead displays video-on-demand on the remote program guide access device and/or on the television, as well as controls other devices ("personal computer" or "multiple installations of user television equipment 22 within the home connected via an in-home network"). (*Ellis*, 8:51-9:7.)

65. While *Ellis* discloses using a set-top box for control in some embodiments, I note that *Ellis* explicitly discloses these embodiments are "alternative" embodiments and explicitly teaches *not* using the set-top box for control in the other embodiments. (*Ellis*, 7:53-65, 8:10-20, 9:4-6.) For example, *Ellis* discloses "[t]he functions of control circuitry 42 *may* be provided using the set-top box arrangement of FIGS. 2 *a* and 2 *b*. *Alternatively, these functions may be integrated into an advanced television receiver, personal computer television (PC/TV), or any other suitable arrangement*." (*Ellis*, 9:2-6 (emphases added).) It is my opinion that these disclosures confirm *Ellis* only discloses the use of a set-

top box in alternative embodiments without ever requiring the use of a set-top box. This is further confirm by *Ellis* disclosing embodiments without a set-top box in Figures 2c and 2d. (*Ellis*, 5:64-6:36, Figs. 2c-2d.) Thus, it is my opinion that it is clear to a POSITA that *Ellis* discloses not using a set-top box for remote control of the video-on-demand system.

66. Additionally, it is my opinion that *Ellis* also discloses "a video-on-demand system" under Sprint's construction. As explained above, *Ellis* discloses operating a system that provides video-on-demand. (*Ellis*, 2:47-60, 4:40-53, 25:4-18.) For example, *Ellis* discloses providing pay-per-view content or other video content on demand to a user. (*Ellis*, 4:40-53, 25:4-18.) Based on these disclosures, it is my opinion that a POSITA would understand *Ellis* discloses "a video-on-demand system" under Sprint's construction.

67. Therefore, based on the above disclosures, it is my opinion that *Ellis* discloses "a video-on-demand system."

b. Element [A]: "a first communication interface configured to transfer video content signals to a first communication system"

68. It is my opinion that *Ellis* discloses "transfer[ring] video content signals," as required under Sprint's construction, and transferring those video content signals in response to the video control signal without the involvement of a set-top box for remote control, as required under the *Comcast* court's construction.

For example, *Ellis* discloses that video television signals (the claimed "video content signals") are sent to a display device 45 in response to user instructed video control signals. For example, *Ellis* discloses: "The user *controls the operation of user television equipment 22 with user interface 46*. User interface 46 may be a pointing device, wireless remote control, keyboard, touch-pad, voice recognition system, or any other suitable user input device. To watch television, *the user instructs control circuitry 42 to display a desired television channel on display device 45*. Display device 45 may be a television, monitor, or other suitable display device." (*Ellis*, 9:8-15 (emphasis added).) It is therefore my opinion that *Ellis* discloses "transfer[ring] video content signals."

69. It is also my opinion that *Ellis* discloses a "first communication interface configured to transfer that transfers video content signals to a first communication system." For example, *Ellis* discloses that television distribution facility 16, which includes program guide distribution equipment 21, is responsible for transferring video content signals over communications path 20. For example, *Ellis* discloses: "Each user has *user television equipment 22 for displaying the television program listings information and other program guide data using a local interactive television program guide*. There are typically multiple pieces of user television equipment 22 and multiple associated communications paths 20, although only one piece of user television equipment 22 and communications path

20 are shown in FIGS. 2a-2d to avoid overcomplicating the drawing. *Television distribution facility 16 may distribute television programming to user television equipment 22 via communications path 20*. If desired, *television programming may be provided over separate communications paths* (not shown)." (*Ellis*, 6:61-7:5 (emphasis added).) Based on this disclosure, it is my opinion that *Ellis* discloses a "first communication interface configured to transfer that transfers video content signals to a first communication system."

70. It is also my opinion that, as shown in annotated Figure 2B below, *Ellis* discloses that the program guide distribution equipment 21 is the "first communication interface," as it receives video content signals from the source main facility 12, as shown in Figure 1, and transfers those video content signals to the user television equipment 22 via the communications path 20, the "first communication system":

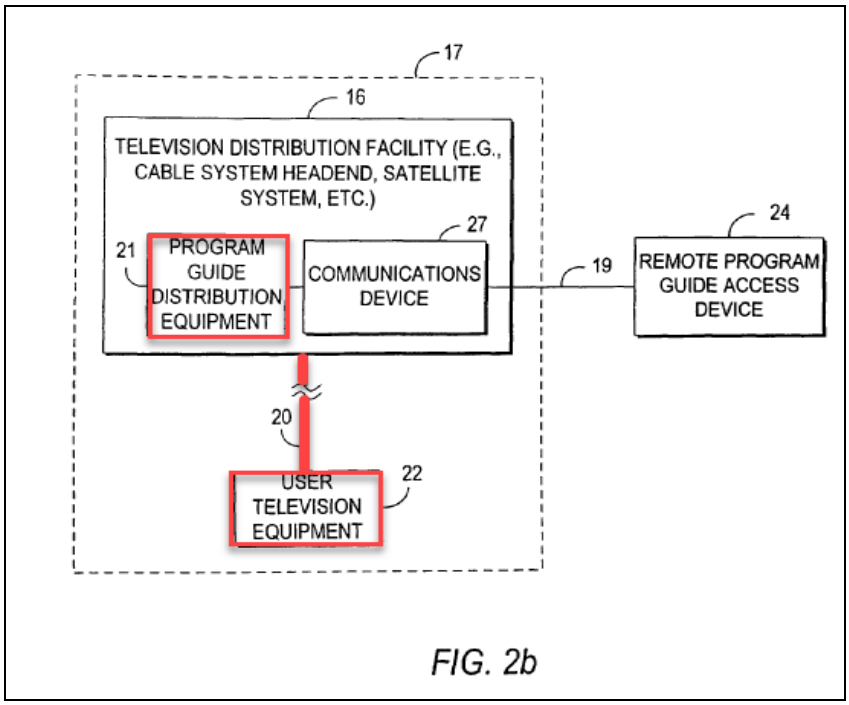

17
16
TELEVISION DISTRIBUTION FACILITY (E.G., CABLE SYSTEM HEADEND, SATELLITE SYSTEM, ETC.)
21
PROGRAM GUIDE DISTRIBUTION EQUIPMENT
27
COMMUNICATIONS DEVICE
19
24
REMOTE PROGRAM GUIDE ACCESS DEVICE
20
22
USER TELEVISION EQUIPMENT

FIG. 2b

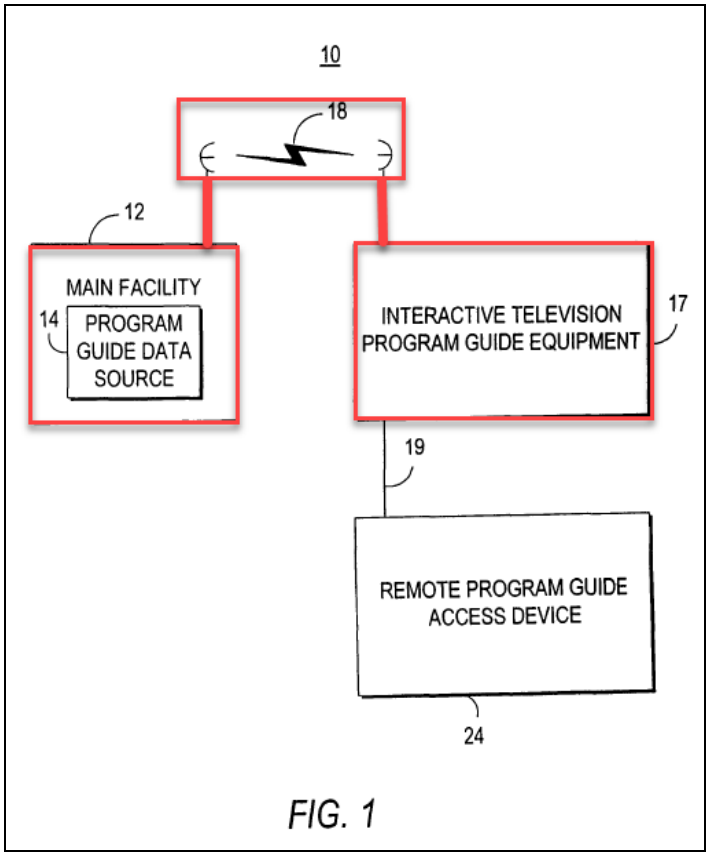

10
18
12
MAIN FACILITY
14
PROGRAM GUIDE DATA SOURCE
INTERACTIVE TELEVISION PROGRAM GUIDE EQUIPMENT
17
19
REMOTE PROGRAM GUIDE ACCESS DEVICE
24

FIG. 1

71. Based on the above disclosures, it is my opinion that *Ellis* discloses this limitation.

c. Element [B]: "a second communication interface configured to transfer the video content signals to a second communication system, transfer a control screen signal to the second communication system, and receive a video control signal from the second communication system"

72. It is my opinion that *Ellis* discloses "transfer[ing] video content signals," as required under Sprint's construction, and transferring those video content signals in response to the video control signal without the involvement of a set-top box for remote control, as required under the *Comcast* court's construction. For example, *Ellis* discloses that video television signals are sent to the remote program guide access device in response to user instructed video control signals: "*providing a user with access to remotely-played video or audio*. At step 2200, *the remote access program guide may obtain video or audio information from the interactive television program guide implemented on interactive television program guide equipment 17 via remote access link 19*. This may occur, for example, *in response to the user selecting a video or audio listing displayed by remote program guide access device 24*." (*Ellis*, 25:36-43 (emphasis added).) This is also disclosed in Fig. 2d of *Ellis* below:

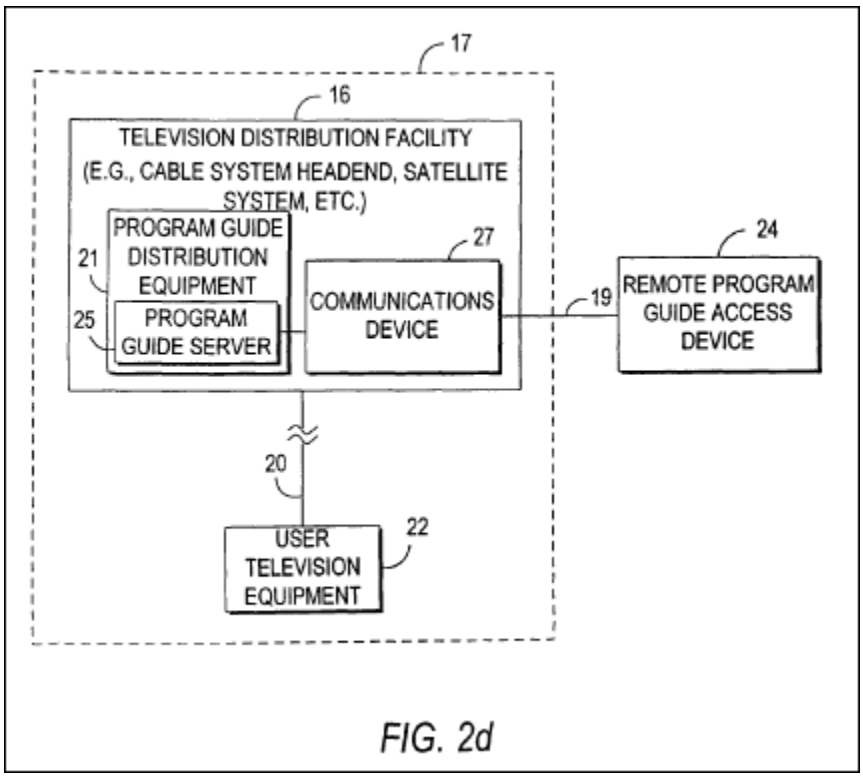


FIG. 2d

73. It is my opinion that *Ellis* further discloses "a second communication interface configured to transfer the video content signals to a second communication system." For example, *Ellis* discloses that remotely stored video and audio content signals are transferred from the television distribution facility 16, which includes the program guide distribution equipment 21 and communications device 27 (collectively the claimed "second communication interface"), to the remote program guide access device 24 over remote access link 19 (the claimed "second communication system") in response to a user selection to playback or tune to a specified content. This is shown by *Ellis*'s disclosure that "[t]he remote access program guide may also provide the user with an opportunity to remotely access video and audio (either together or separately) that is being

distributed to the local interactive television program guide or which has been stored by the local interactive television program guide on user television equipment 22 or at a remote server . . . The remote access program guide may provide the user with the opportunity to select a directory entry or may, for example, provide the user with an opportunity to select a program listing of a television program that is being broadcast. *In response to either selection, the remote access program guide may issue an appropriate access communication to the interactive television program guide to play back or tune to the selection and transmit it back to remote program guide access device 24 over remote access link 19. Remote program guide access device 24 may play the video or audio for the user*." (*Ellis*, 19:6-30 (emphasis added).)

74. It is my opinion that *Ellis* further discloses that the selected video or audio control signals are transferred from the second communication interface to the remote program guide access device over the remote access link 19 (the claimed "second communication system"): "[t]he remote access program guide may query the local interactive television program guide implemented on interactive television program guide equipment 17 for directory information *using one or more access communications that are sent over remote access link 19 (step 2210)*. The directory information may be contained, for example, in a media library directory for a media library that is stored on user television equipment 22,

or by television distribution facility 16. The *directory information may be provided back to the remote access program guide by exchanging one or more remote access communications between interactive television program guide equipment 17 and remote program guide access device 24 over remote access link 19, as is indicated by substep 2220*." (*Ellis*, 25:46-59 (emphasis added); *see also id*. at 2:47-56.)

75. It is my opinion that *Ellis* discloses "a second communication interface configured to . . . transfer a control screen signal to the second communication system." *Ellis* discloses "a control screen signal," because *Ellis* discloses program guide information that is displayed on a display screen for a user. For example, Elle discloses that the "remote program guide access device may, for example, access stored program guide information or obtain program guide information from interactive television program guide equipment via remote access link . . . and generate an appropriate display screen for display using user interface." (*Ellis*, 14:3-12.) *Ellis* additionally teaches "the *indicated program guide function may be remotely provided to the user visually* (at substep 1280), for example, by *using a monitor, LCD, or other display device*." (*Ellis*, 20:67-21:3 (emphasis added); Figs. 12-24.) This control screen signal is transferred from the television distribution facility 17, which includes program guide distribution equipment 21 and communications device 27 (collectively the claimed "second

communication interface), to the remote program guide access device via the remote link 19 (the claimed "second communication system"). This is confirmed by the following disclosure in *Ellis*: "[w]hen a user indicates a desire to access program guide features by issuing an appropriate command to remote program guide access device 24, remote program guide access device 24 may, for example, access stored program guide information or obtain program guide information from interactive television program guide equipment 17 via remote access link 19 using any of the approaches already described, and generate an appropriate display screen for display using user interface 52." (*Ellis*, 14:3-12; *see also id*. at 25:46-59.)

76. It is my opinion that *Ellis* discloses "a second communication interface configured to . . . receive a video control signal from the second communication system." *Ellis* discloses that a user generated control signal (the claimed "video control signal"), indicating the user's selected video or audio signals from the displayed program guide information, is sent over the remote access link 19 (the claimed "second communication system") and received at the television distribution facility 16, which includes the program guide distribution equipment 21 and communications device 27 (collectively the claimed "second communication interface"). (*Ellis*, 25:63-26:9, Fig. 2b.) For example, *Ellis* discloses that "the remote access program guide may provide the user with the

opportunity to select a video or audio for remote playing. The user may select a video or audio by, for example, selecting a listing that is indicated to the user by user interface 52. The user may be provided with an opportunity to play a program in real-time via the local and remote guides, or to play a stored program. *In response, the remote access program guide may obtain the selected video or audio from the local interactive television program guide using access communications that are sent over remote access link 19. The access communications may contain the video or audio in a suitable analog or digital format*. At step 2250, remote program guide access device 24 remotely plays the video or audio for the user using user interface 52." (*Ellis*, 25:63-26:9 (emphasis added).) This disclosure is also visually depicted in Figure 2b (annotated below), which demonstrates that the video control signal is generated and processed without the involvement of a set-top box for remote control of the video-on-demand system:

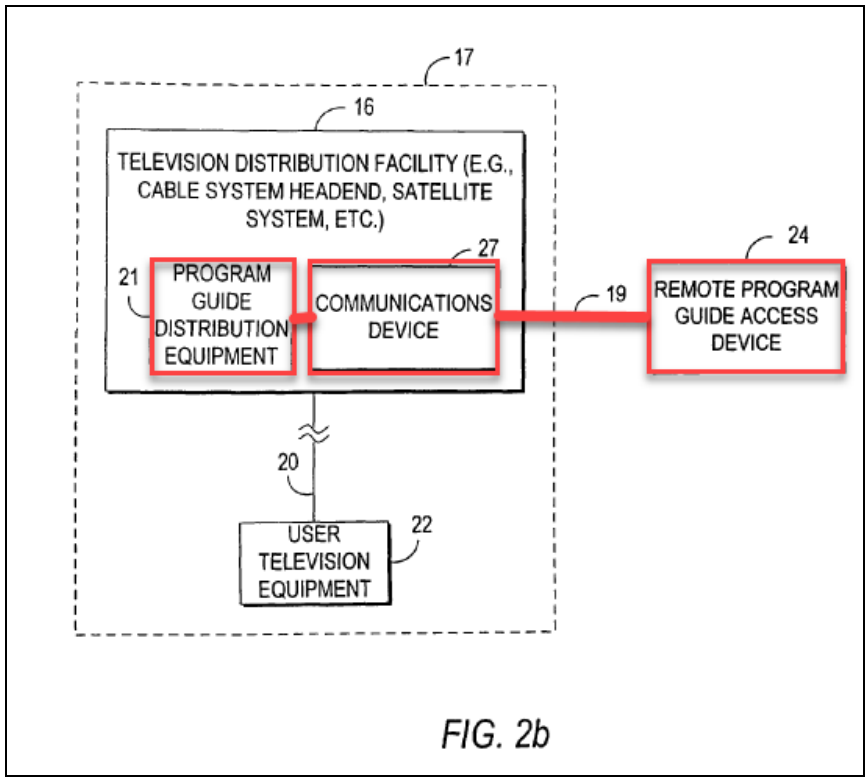


FIG. 2b

77. As shown above, *Ellis* discloses the "second communication interface" as the communications device 27 and program guide distribution equipment 21 in the interactive television program guide equipment 17, and the "second communication" as the remote link 19. Remote program guide access device 24 receives video content signals from the image sources interactive television program guide equipment 17 and main facility 12 with program guide data source 14 through the red annotated path in Figure 2b above and Figure 1 below. (*Ellis*, 25:36-26:9.)

78. Therefore, based on the above disclosures in *Ellis*, it is my opinion that Ellis anticipates this claim limitation.

d. Element [C]: "a processing system configured to transfer the control screen signal to the second communication interface, receive the video control signal from the second communication interface, implement a viewer-control selection indicated by the video control signal, and transfer the video content signals to the first communication interface if the first communication interface is indicated by the video control signal received from the second communication interface or transfer the video content signals to the second communication interface if the second communication interface is indicated by the video control signal"

79. It is my opinion that *Ellis* discloses "a processing system configured to transfer the control screen signal to the second communication interface." For example, Figure 1 in *Ellis* demonstrates that the television distribution facility 17 (the claimed "processing system") receives the stored program guide information (the claimed "control screen signal") from the main facility 12 and program guide data source 14. (*Ellis*, Fig. 1.) Television distribution facility 17 transfers the program guide information to the program guide distribution equipment 21 and communication device 27 (collectively the "second communication interface"), which ultimately transfers program guide information over remote link 19 to the remote program guide access device 24. (*Ellis*, Fig. 2b.) This is further disclosed in *Ellis* as follows: "An illustrative system 10 in accordance with the present invention is shown in FIG. 1. Main facility 12 provides interactive television program guide data from program guide data source 14 to interactive television

program guide equipment 17 via communications link 18." (*Ellis* at 4:29-33; *see also id*. at 7:6-10.)

80. It is my opinion that *Ellis* discloses "a processing system configured to . . . receive the video control signal from the second communication interface." As explained above, *Ellis* discloses that the video control signals (the control selections from the user) are transferred by the communications device 27 and program guide distribution equipment 21 (collectively the "second communication interface") and received by the processing system 16 and interactive television program guide 17. (*Ellis*, 25:63-26:9; *see also id*. at 6:26-36.) This is also disclosed in Figures 1 and Fig. 2b of *Ellis*, below:

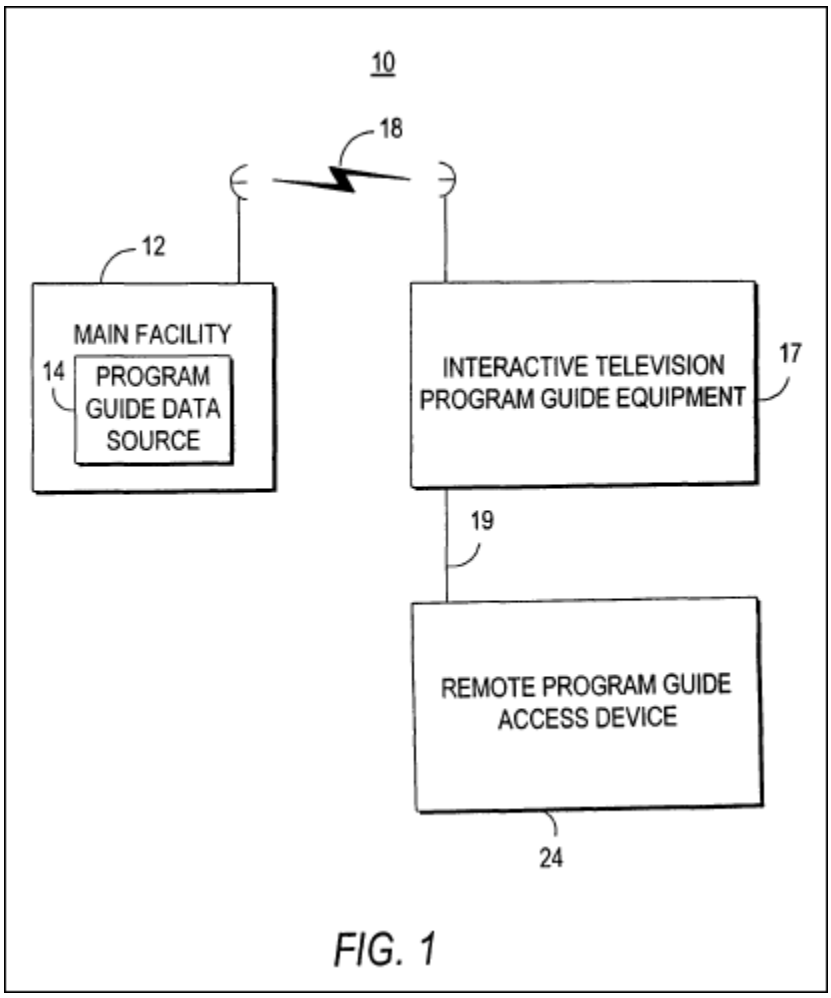

10
18
12
MAIN FACILITY
14
PROGRAM GUIDE DATA SOURCE
INTERACTIVE TELEVISION PROGRAM GUIDE EQUIPMENT
17
19
REMOTE PROGRAM GUIDE ACCESS DEVICE
24

FIG. 1

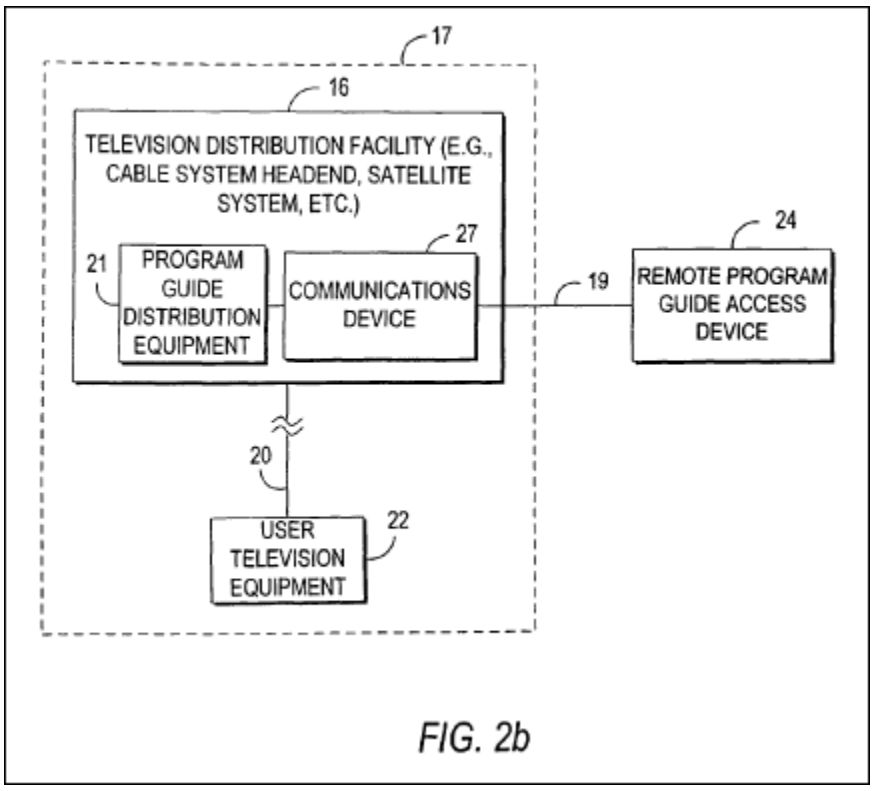


FIG. 2b

81. Additionally, it is my opinion that *Ellis* discloses "a processing system configured to . . . implement a viewer-control selection indicated by the video control signal." For example, *Ellis* discloses that a user generated control signal, indicating the user's selection of video or audio from the displayed program guide information (the claimed "viewer-control selection"), is sent over the remote access link 19 (the claimed "second communication system") and received at the television distribution facility 16 (the claimed "processing system"). (*Ellis*, 25:63-26:9, Fig. 2b, 6:26-33.) In response to receiving the user generated control signal, the television distribution facility 16, which includes the program guide server 25, implements the viewer control selection indicated in the user generated control signal. (*Id*.)

82. It is my opinion that *Ellis* discloses "a processing system configured to . . . transfer the video content signals to the first communication interface if the first communication interface is indicated by the video control signal received from the second communication interface or transfer the video content signals to the second communication interface if the second communication interface is indicated by the video control signal." For example, *Ellis* discloses that a user can select video or audio for remote playing, by selecting a listing that is indicated to the user on the displayed program guide information. (*Ellis*, 25:63-26:9.) In response to this viewer-control selection, the television distribution facility 16 obtains the selected video or audio from the local interactive television program guide and transfers the selected video or audio to the user selected display. (*Id*.) *Ellis* discloses that in response to this viewer-control selection, the television distribution facility 16 may transmit selected video or audio using program guide distribution equipment 21 and communications device 27 (collectively the claimed "second communication interface") to the remote program guide access device for playback. (*Id*., *see also id*. at 19:6-30, Fig. 2b.) *Ellis* also discloses that in response to this viewer-control selection, the television distribution facility 16 may transmit selected video or audio using program guide distribution equipment 21 (the claimed "first communication interface") to television equipment 22 for playback. (*Ellis*, 6:61-7:5.) This is further disclosed in *Ellis*: "As shown in FIGS.

2*a*-2*d* interactive television program guide equipment 17 may include program guide distribution equipment 21 located at *television distribution facility 16* and user television equipment 22. *Television distribution facility 16 may be any suitable distribution facility (e.g., a cable system headend, a broadcast distribution facility, a satellite television distribution facility, or any other suitable type of television distribution facility). Television distribution facility 16 may distribute program guide data that it received from main facility 12 to multiple users via communications path 20*." (*Ellis*, 4:57-67 (emphasis added).)

83. Therefore, based on the above disclosures, it is my opinion that *Ellis* discloses this claim limitation.

2. Dependent Claim 2

"The video-on-demand system of claim 1 wherein the control screen signal includes a video display control menu comprising play and stop"

84. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses that the control screen signal, which is a signal that defines a control screen, includes a video display control menu comprising play and stop. For example, *Ellis* discloses that the remote access program guide may provide the user with the ability to control the user television equipment 22 remotely: "The remote access program guide may also provide a user with an opportunity to control user television equipment 22 remotely. A user may, for example, position highlight region 201 over a setting, select the setting, and change its value. The user may, for example,

change the current channel, the current volume, or *control user television equipment 22 in any other suitable manner*." (*Ellis*, 20:10-16 (emphasis added).)

85. It is my opinion that a POSITA would understand this "opportunity to control user television equipment 22 remotely" disclosed in *Ellis* would include the well-known and "suitable" controls such as a video display control menu comprising play and stop. Therefore, it is my opinion that, based on the above discloses, it is my opinion that *Ellis* discloses this limitation.

3. Dependent Claim 3

"The video-on-demand system of claim 2 wherein the viewer control selection comprises a video display control menu selection"

86. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses the viewer control selection comprises a video display control menu selection. For example, *Ellis* discloses that the remote access program guide provides the user with menu selections, thereby providing the user with a video display control menu selection: "The remote access program guide running on remote program guide access device 24 may *provide a user with an opportunity to remotely access program listings*." (*Ellis*, 14:26-28 (emphasis added).) *Ellis* discloses "[t]he program listings may also, for example, be *displayed in a program listings screen by a suitable display device*. A program listings screen may *contain one or more lists of programs organized according to one or more organization criteria* (e.g., by program type, theme, or any other predefined or user defined and selectable

criteria) and sorted in various ways (e.g., alphabetically). One approach is to organize program listings into a program listings grid." (*Ellis*, 14:37-44 (emphasis added); *see also id*. at 25:36-26:9, 16:59-17:7.) It is my opinion that a POSITA would understand the menu selections in *Ellis* are video display control menu selections. For example, based on these disclosures, *Ellis* discloses the ability of the user to choose different programs using the remote control and play these programs on the remote control. It is my opinion that a POSITA would understand these disclosures as teaching "the viewer control selection comprises a video display control menu selection."

87. Based on the above disclosures, it is my opinion that *Ellis* discloses this limitation.

4. Dependent Claim 4

"The video-on-demand system of claim 3 wherein the video display control menu further comprises pause, rewind, and fast forward"

88. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses that the video display control menu further comprises pause, rewind, and fast forward. For example, *Ellis* discloses that the video display control menu may provide the user with the ability to control the user television equipment 22 remotely: "[t]he remote access program guide may also provide a user with an opportunity to control user television equipment 22 remotely. A user may, for example, position highlight region 201 over a setting, select the setting, and change its value. The

user may, for example, change the current channel, the current volume, or *control user television equipment 22 in any other suitable manner*." (*Ellis*, 20:10-16 (emphasis added).) It is my opinion that a POSITA would understand the "control . . . in any other suitable manner" disclosed in *Ellis* includes pause, rewind, and fast forward control as these were well-known and suitable control.

89. Based on the above disclosures, it is my opinion that *Ellis* discloses this limitation.

5. Dependent Claim 5

"The video-on-demand system of claim 1 wherein the control screen includes a video content selection menu"

90. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses that the control screen includes a video content selection menu. For example, *Ellis* discloses that the remote access program guide (the claimed "control screen") "may *provide a user with an opportunity to remotely access program listings*. " (*Ellis*, 14:26-28 (emphasis added).) *Ellis* discloses that these program listings (the claimed "video content selection menu") allow a user to make selections based on program type, theme, or other selectable criteria. (*Ellis*, 14:37-44 (emphasis added).) The user is able to select a program listed in the program listings to play it. (*Ellis*, 25:36-26:9.) A POSITA would understand the program listings and selection feature in *Ellis* as a claimed "video content selection menu." For

example, the user in *Ellis* is able to view different video content in the program listings and select the program (video content) to play. (*Ellis*, 25:36-26:9.)

91. Therefore, it is my opinion that *Ellis* discloses this limitation.

6. Dependent Claim 6

"The video-on-demand system of claim 5 wherein second communications interface is configured to receive a video content menu selection signal from the second communications system, and the processing system is configured to process the video content selection signal to transfer selected video content in the video content signals"

92. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses that the second communications interface is configured to receive a video content menu selection signal from the second communications system, and the processing system is configured to process the video content selection signal to transfer selected video content in the video content signals. For example, as explained in detail above, *Ellis* discloses that television program guide equipment 17, which includes the television distribution facility 16, the program guide distribution equipment 21 and communications device 27, receives a user selected video or audio listing. (*Ellis*, 25:36-43, Fig. 2b.) In response to the user selection, the television program equipment processes and implements the selection to obtain and transfer the selected video or audio in the video content signals to either the remote program guide access device 24 or the television equipment 22. (*Id.*, *see also id*. at 19:6-30, 6:61-7:5, 4:57-67.)

93. It is my opinion that based on these disclosures, *Ellis* discloses this limitation.

7. Dependent Claim 7

"The video-on-demand system of claim 1 wherein the second communication interface is configured to interface with an internet"

94. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses that the second communication interface is configured to interface with an internet: "the interactive television program guide may obtain program guide data *from the Internet*." (*Ellis*, 7:21-23 (emphasis added).) *Ellis* further discloses that "[r]emote program guide access device 24 and interactive television program guide equipment 17 may *communicate*, for example, *using a protocol stack which includes Sequenced Packet Exchange/Internetwork Packet Exchange (SPX/IPX) layers, Transmission Control Protocol/Internet Protocol (TCP/IP) layers, Appletalk Transaction Protocol/Datagram Delivery Protocol (ATP/DDP) layers*, or any other suitable network and transport layer protocols or combination of protocols." (*Ellis*, 10:32-40 (emphasis added).) A POSITA would understand these exemplary protocols are all ways for interfacing with an internet. Additionally, *Ellis* discloses that "the remote access program guide may *provide the pay-per-view information via Internet service system 61*." (*Ellis*, 25:32-35 (emphasis added).) As disclosed in *Ellis*, the program guide distribution equipment 21 and communications device 27 are the "second communication interface" and

they interface with an internet, as they above disclosures clearly show they obtain the program guide information from the internet. (*Ellis*, 7:21-23, 10:32-40, 25:32-35.)

95. Therefore, it is my opinion that based on these disclosures, *Ellis* discloses this limitation.

8. Dependent Claim 8

"The video-on-demand system of claim 1 wherein the second communication interface is configured to interface with a world-wide web"

96. It is my opinion *Ellis* discloses this limitation. *Ellis* discloses that the second communication interface is configured to interface with a world-wide web. *Ellis* discloses that the second communication interface communicates over internet protocols and the Internet service system, which connect to the world-wide web. For example, *Ellis* discloses that "the interactive television program guide may obtain program guide data *from the Internet*." (*Ellis*, 7:21-23 (emphasis added).) *Ellis* also discloses that "[r]emote program guide access device 24 and interactive television program guide equipment 17 may *communicate*, for example, *using a protocol stack which includes Sequenced Packet Exchange/Internetwork Packet Exchange (SPX/IPX) layers, Transmission Control Protocol/Internet Protocol (TCP/IP) layers, Appletalk Transaction Protocol/Datagram Delivery Protocol (ATP/DDP) layers*, or any other suitable network and transport layer

protocols or combination of protocols." (*Ellis*, 10:32-40 (emphasis added).) Additionally, *Ellis* discloses that "the remote access program guide may *provide the pay-per-view information via Internet service system 61*." (*Ellis*, 25:32-35 (emphasis added).) Ellis discloses the program guide distribution equipment 21 and communications device 27 are the "second communication interface" and they interface with a world-wide web, as the above disclosures show that the program guide distribution equipment 21 and communications device 27 obtain the program guide information from the world-wide web through an internet browser. (*Ellis*, 7:21-23, 10:32-40, 25:32-35.) Specifically, *Ellis* discloses the use of the internet includes using an internet browser using the world-wide web. (*Ellis*, 27:20-30.)

97. It is my opinion that based on these disclosures, *Ellis* discloses this limitation.

9. Dependent Claim 9

"The video-on-demand system of claim 1 wherein the control screen comprises a web page"

98. It is my opinion that *Ellis* discloses this limitation. *Ellis* discloses the control screen comprises a web page. For example, *Ellis* discloses that "[a]s shown in FIG. 24, a remote access device may provide the user with *access to a browser application by displaying*, for example, *browser screen 700 of a remote access browser application*." (*Ellis*, 27:20-23 (emphasis added).) Figure 24 is

shown below, with the "Home Page" annotated in yellow designating the web page:

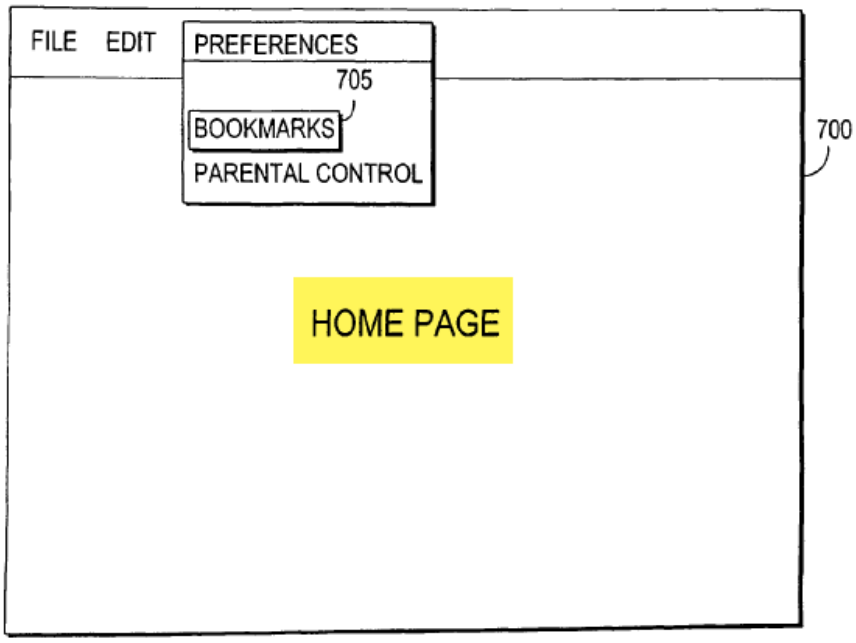


FIG. 24

99. The above home page is a web page that acts as a control screen, as shown in the above Figure that allows for "Parental Controls" or other user controls.

100. It is my opinion that based on these disclosures, *Ellis* discloses this limitation.

10. Independent Claim 10

101. Independent claim 10 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.B.1. *Compare* '4907 patent, 6:29-27 *with* '4907 patent, 7:6-20.) The

following chart cross references the limitations of claim 1 to the limitations of claim 10, demonstrating claim 10 is anticipated for the same reasons as claim 1:

Cross-Referenced Limitations in Claims 1 and 10		**Disclosure in the prior art**
Claim 1	Claim 10	
1 preamble	10 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d
1a	10d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	10a, 10b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24
1c	10c, 10d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b

102. Therefore, it is my opinion that claim 10 is unpatentable for the same reason as claim 1 based on the above disclosures in *Ellis*.

11. Dependent Claims 11-18

103. Aside from depending ultimately from independent claim 10, dependent claims 11-18 are identical to dependent claims 2-9. (*Compare* '4907 patent, 6:48-7:5 *with* '4907 patent, 7:21-8:2.) Therefore, dependent claims 11-18 are unpatentable for the same reasons as set forth above for claims 2-9. (*See supra* Section VII.B.2-9.) The following chart cross references the limitations of claims 2-9 to the limitations of claims 11-18, and the disclosures in the prior art for each cross-referenced limitation that anticipate claims 11-18 for the same reasons:

Cross-Referenced Limitations in Claims 2-9 and 11-18	**Disclosure in the prior art**

Claim	Claim	
2	11	*Ellis*, 16:59-17:7, 20:10-16
3	12	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	13	*Ellis*, 20:10-16
5	14	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	15	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
7	16	*Ellis*, 7:21-23, 10:32-40, 25:32-35
8	17	*Ellis*, 7:21-23, 10:32-40, 25:32-35, 27:20-30
9	18	*Ellis*, 27:20-23, Fig. 24

104. Therefore, it is my opinion that claims 11-18 are unpatentable for the same reasons as claims 2-9 based on the above disclosures in *Ellis*.

12. Independent Claim 19

105. Independent claim 19 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.B.1.) Each of the non-preamble limitations discussed above for claim 1 are included nearly identically in claim 19. (*Compare* '4907 patent, 6:29-27 *with* '4907 patent, 8:7-21.)

106. Claim 19 differs from claim 1 only in its preamble, which recites "[a] product comprising a processor-readable storage medium storing processor-executable instructions for performing a method for operating a video-on-demand system." ('4907 patent, 8:3-6.) To the extent the preamble limits the claims, *Ellis* discloses the preamble for the same reasons set forth above in Section VII.B.1.a above, but also for the additional reasons set forth below.

107. *Ellis* discloses "a product comprising a processor-readable storage medium storing processor-executable instructions for performing a method *for operating a video-on-demand system*," as it discloses that a "remote program guide access device 24 may be any suitable personal computer (PC), portable computer (e.g., a notebook computer), palmtop computer, handheld personal computer (H/PC), display remote, touch-screen remote, automobile PC, personal digital assistant (PDA), or other suitable computer based device. Remote program guide access device 24 may have user interface 52, processing circuitry 54, storage 56, and communications device 58. User interface 52 may be any suitable input or output device or system, and may include a pointing device, keyboard, touch-pad, touchscreen, pen stylus, voice recognition system, mouse, trackball, cathode ray tube (CRT) monitor, liquid crystal display (LCD), voice synthesis processor and speaker, or any other suitable user input or output device. Processing circuitry 54 may include any suitable processor, such an Intel 486 or Pentium®) microprocessor. Remote program guide access device 24 may also have storage 56. Storage 56 may be any suitable memory or other storage device, such as RAM, ROM, flash memory, a hard disk drive, etc." (*Ellis*, 9:44-62.) The following chart cross references the limitations of claim 1 to the limitations of claim 19, and the disclosures in the prior art for each cross-referenced limitation that anticipate claim 19 for the same reasons:

Cross-Referenced Limitations in Claims 1 and 19		**Disclosure in the prior art**
Claim 1	Claim 19	
1 preamble	19 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d
1a	19d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	19a, 19b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24
1c	19c, 19d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b

108. Therefore, it is my opinion that claim 19 is unpatentable for the same reason as claim 1 based on the above disclosures in *Ellis*.

13. Dependent Claims 20-25

109. Aside from depending ultimately from independent claim 19, dependent claims 20-25 are identical to dependent claims 2-6, and 9. (*Compare* '4907 patent, 6:48-64, 7:4-5 *with* '4907 patent, 8:22-40.) Therefore, dependent claims 20-25 are unpatentable for the same reasons as set forth above for claims 2-6, and 9. (*See supra* Section VII.B.2-6, Section VII.B.9.) The following chart cross references the limitations of claims 2-6 and 9 to the limitations of claims 20-25, and the disclosures in the prior art for each cross-referenced limitation that anticipate claims 20-25 for the same reasons:

Cross-Referenced Limitations in Claims 2-6, 9 and 20-25		**Disclosure in the prior art**
Claim	Claim	
2	20	*Ellis*, 16:59-17:7, 20:10-16
3	21	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	22	*Ellis*, 20:10-16
5	23	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	24	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
9	25	*Ellis*, 27:20-23, Fig. 24

110. Therefore, it is my opinion that claims 20-25 are unpatentable for the same reason as claims 2-6 and 9 based on the above disclosures in *Ellis*.

C. Ground 2: *Ellis* and *Browne* Render Obvious Claims 1-25 Under § 103

111. *Ellis* anticipates claims 1-25 for the same reasons as discussed in connection with Ground 1. Nevertheless, to the extent that Sprint may argue that *Ellis* alone does not teach "transfer a control screen signal to the second communications system" as set forth in claims 1, 10, and 10, *Ellis* in view of *Browne* teaches these limitations and would have rendered claims 1-25 obvious.

112. A POSITA would be motivated to combine *Ellis* and *Browne* such that the combination implements the video-on-demand system and remote control device of *Ellis* with the control screen and video control menus of *Browne* on the remote control of *Ellis*. As discussed below, it is my opinion that a POSITA would

have understood this combination to have been an implementation of *Ellis*'s teachings in view of *Browne*.

113. It is my opinion that a POSITA would readily have combined *Ellis* and *Browne* for a variety of reasons. *Ellis* expressly discloses an interactive television program guide with multiple video sources that displays the video content on either a television or a remote control device. (*Ellis*, Abstract.) *Ellis* expressly teaches a POSITA that other control configurations can be implemented, all of which do not use a set-top box. (*Ellis*, 9:4-7, 28:21-24.) Such alternative control configurations for use in an image display system include the video-on-demand system and control device disclosed in *Browne*. The video-on-demand system and control device in *Browne* was well-known before the filing date of the '4907 patent and, in fact, were well-known to work in tandem with an image display system like the one disclosed in *Ellis*. This is expressly disclosed, for example, by *Browne*. *Browne* describes a video-on-demand system where the controller generates a virtual control screen, which is placed on any screen for a user to control playback and allows the user to select different menu and video sources to display on the controller or television. (*Browne*, 13, 27, Fig. 7.) *Ellis* discloses a control screen, and therefore, a POSITA would have been motivated to combine *Browne*'s generation and transfer of a control screen with the control screen framework already disclosed in *Ellis*. A POSITA, starting with the video-

on-demand system with a remote control taught by *Ellis*, would have naturally been motivated to replace the remote control of *Ellis*'s video-on-demand system with a remote control using the control screen and menu disclosed in *Browne* to allow for more diverse controls of the video content and screen. Indeed, *Ellis* already discloses a remote control with a control screen with menus, and in view of the teachings of *Browne*, it would have been a trivial and obvious choice to use the control screen signals and menus in *Browne* with the video-on-demand remote control in *Ellis*. It is my opinion that a POSITA would have combined *Ellis* and *Browne* because, for example, the market for video-on-demand and interactive television systems demonstrated an increase in demand for systems with different content sources and remote controls. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Browne*, 13, 27, Fig. 7.) A POSITA would have understood that, based on the history of remote controls developing new functionality and controls to interface with new functionalities and features implemented on media systems, the use of controls or signals used in a remote control in *Browne* would merely be adding these known features and such a remote control would be interchangeable with the remote control in *Ellis*. A POSITA would have recognized combining an a video-on-demand system with a remote control, like the one in *Ellis*, with a remote control screen and menu, like the one in *Browne*, was a natural fit.

114. Combining *Ellis* with *Browne* would have been obvious to a POSITA for a variety of reasons, including the following:

115. ***Ellis* and *Browne* are in the same field of endeavor as the '4907 patent.** *Ellis*, *Browne*, and the '4907 patent describe and teach video and audio systems that allow a user to select different video content from different sources, including the world wide web. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Browne*, 1, 13, 24, 27; *'4907 patent*, 2:28-34, 6:28-47, 7:6-21, 8:3-21.) A POSITA would readily understand that *Ellis*, and *Browne* are in the same field of endeavor as the '4907 patent.

116. ***Ellis* and *Browne* are aimed at solving the same perceived problem as the '4907 patent.** *Ellis*, *Browne*, and the '4907 patent address the problem of using single-purpose set-top boxes to control video-on-demand selections. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Browne*, 1, 13, 24, 27; '4907 patent, 1:31-40.) A POSITA would readily understand that *Ellis and Browne* are aimed at solving the same perceived problem as the '4907 patent.

117. ***Ellis* and *Browne* use similar techniques to solve the same problem.** As described above, *Ellis* and *Browne* disclose and teach video and audio systems that allow a user to select different video content from different sources, including the world wide web, without the use of a set-top box. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49 *Browne*, 1, 13, 24, 27.) A POSITA would have

commonly looked to the teachings of a video-on-demand system in *Ellis* to use with other conventional video and audio system teachings, like *Browne*, because they rely on similar video and audio sources and use a computer to access and control the delivery of the video and audio content to solve the same problem of the limitations of control when using a set-top box. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Browne*, 1, 13, 24, 27.) A POSITA would readily understand that *Ellis* and *Browne* use similar techniques to solve the same problem.

118. **Combining *Ellis* with *Browne* would have been a predictable combination.** Given the disclosures in *Ellis* and *Browne*, it would have been entirely predictable to a POSITA to combine *Ellis* with *Browne*. Specifically, a POSITA would have seen an incentive to use *Browne*'s disclosure of a controller with a control screen to access and play video-on-demand content, with the general video and audio systems described in *Ellis* to improve upon *Ellis*'s control of the video-on-demand content without the use of any box connected to a television. In addition, a POSITA would have been motivated to use a controller with a control screen, as taught by *Browne*, in *Ellis*. (*Browne*, 1, 13, 24, 27.) A POSITA would have also been motivated by *Browne*'s stated aim of providing "the user greater flexibility and control over the recording and replaying of programs" to improve upon *Ellis*. (*Browne*, 2.)

119. **Combining *Ellis* with *Browne* would have yielded no unexpected results.** Combining *Ellis* with *Browne* would have yielded predictable results at least because a POSITA would have readily understood that combining these references would have allowed the video-on-demand content and controller elements of *Ellis* and *Browne* to operate without interference. Moreover, the combination of the teachings of *Ellis* with *Browne* would not have resulted in any inoperable combination because it would simply be adding a well-known video source and controller, as disclosed in *Ellis*, to the video and audio system controller system of *Ellis*.

120. **A POSITA would have had a reasonable expectation of success in combining *Ellis* with *Browne*.** A POSITA would have had at least a reasonable expectation of success when combining *Ellis* with *Browne* in this manner. All the above reasons—the predictability of this combination, that there would have be no unexpected results, and the similarity in the disclosure of the three references—would have led a POSITA to have a reasonable expectation of success.

1. Independent Claim 1

a. Preamble: "A video-on-demand system"

121. *Ellis* discloses this limitation as described above in Claim 1, Preamble. (*See supra* Section VII.B.1.a.)

b. Element [A]: "a first communication interface configured to transfer video content signals to a first communication system"

122. *Ellis* discloses this limitation as described above in Claim 1, Element [A]. (*See supra* Section VII.B.1.b.)

c. Element [B]: "a second communication interface configured to transfer the video content signals to a second communication system, transfer a control screen signal to the second communication system, and receive a video control signal from the second communication system"

123. *Ellis* discloses this limitation as described above in Claim 1, Element [B]. (*See supra* Section VII.B.1.c.)

124. To the extent Sprint argues *Ellis* does not disclose "a second communication interface configured to . . . transfer a control screen signal to the second communication system," *Browne* teaches this limitation. The system in *Browne* allows a user to later request and view recorded input signals on one or more output monitors. (*Browne*, 1, 13.) *Browne* teaches that the disclosed recorder's controller generates a virtual control screen, which is placed on any output monitor screen for a user to control playback. (*Browne*, 13.) *Browne* teaches that when the control screen appears, "the user selects the output to which the signals are to be sent" and "then selects from the signal selection the types of signals which will be output by the output selected . . . ." (*Browne*, 27, Fig. 7.) Specifically, *Browne* teaches that a control screen can include "[a] list of programs

stored and set for storing" and "may be viewed by choosing the stored program list option from the main user control menu." (*Browne*, 24, Fig. 2.) "When this option is selected, a sorted program list screen is output by controller to output." (*Browne*, 24, Fig. 2.) As explained above, a POSITA would have been motivated to combine *Ellis* with *Browne* to disclose this limitation.

d. Element [C]: "a processing system configured to transfer the control screen signal to the second communication interface, receive the video control signal from the second communication interface, implement a viewer-control selection indicated by the video control signal, and transfer the video content signals to the first communication interface if the first communication interface is indicated by the video control signal received from the second communication interface or transfer the video content signals to the second communication interface if the second communication interface is indicated by the video control signal"

125. *Ellis* discloses this limitation as described above in Claim 1, Element [C]. (*See supra* Section VII.B.1.d.)

126. To the extent Sprint argues *Ellis* does not disclose "***processing system configured to transfer the control screen signal to the second communication interface***," *Browne* teaches this limitation. The system in *Browne* allows a user to later request and view recorded input signals on one or more output monitors. (*Browne*, 1, 13.) *Browne* teaches that the disclosed recorder's controller generates a virtual control screen, which is placed on any output monitor screen for a user to

control playback. (*Browne*, 13.) *Browne* teaches that when the control screen appears, "the user selects the output to which the signals are to be sent" and "then selects from the signal selection the types of signals which will be output by the output selected . . . ." (*Browne*, 27, Fig. 7.) Specifically, *Browne* teaches that a control screen can include "[a] list of programs stored and set for storing" and "may be viewed by choosing the stored program list option from the main user control menu." (*Browne*, 24, Fig. 2.) "When this option is selected, a sorted program list screen is output by controller to output." (*Browne*, 24, Fig. 2.) Accordingly, *Browne* discloses that the processing system transfers the control screen signal to the second communication interface. A POSITA would have been motivated to combine *Ellis* with *Browne*'s disclosure of transferring a control screen, as *Ellis* discloses transferring a program guide with a program guide listing and program guide information. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.) As explained above, a POSITA would have been motivated to combine *Ellis* with *Browne* to disclose this limitation.

2. Dependent Claim 2

"The video-on-demand system of claim 1 wherein the control screen signal includes a video display control menu comprising play and stop"

127. *Ellis* discloses this limitation as described above. (*See supra* Section VII.B.2.) To the extent Sprint argues *Ellis* does not disclose this limitation, *Browne* teaches this limitation. *Browne* discloses, in providing the video content,

the disclosed recorder's controller generates a virtual control screen, which is placed on any screen for a user to control playback. (*Browne*, 13.) *Browne* discloses that this control screen signal is used for "control of any one or more playback or recording processes." (*Browne*, 13.) *Browne* discloses the controller includes a "play" and "stop" feature. (*Browne*, 33, Figure 14 part 1405.) A POSITA would have been motivated to combine *Ellis* with *Browne*'s disclosure of the control screen signal, as *Ellis* discloses transferring an interactive program guide with a program guide listing and program guide information and discloses that the interactive program guide provides the user with the ability to control the user television equipment 22 remotely. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.)

3. Dependent Claim 3

"The video-on-demand system of claim 2 wherein the viewer control selection comprises a video display control menu selection"

128. *Ellis* discloses the subject matter in this claim for the same reasons as discussed above. (*See supra* Section VII.B.3.)

4. Dependent Claim 4

"The video-on-demand system of claim 3 wherein the video display control menu further comprises pause, rewind, and fast forward"

129. *Ellis* discloses this limitation as described above. (*See supra* Section VII.B.4.) To the extent *Ellis* does not disclose this limitation, *Browne* teaches this limitation. In providing the video content, *Browne* teaches the disclosed recorder's

controller generates a virtual control screen, which is placed on any screen for a user to control playback. (*Browne*, 13.) *Browne* discloses that this control screen signal is used for "control of any one or more playback or recording processes." (*Browne*, 13.) *Browne* discloses the controller includes a "pause," "rewind," and "fast forward" feature. (*Browne*, 33, Figure 14 part 1405.) A POSITA would have been motivated to combine *Ellis* with *Browne*'s disclosure of the video display control menu, as *Ellis* discloses transferring an interactive program guide with a program guide listing and program guide information and discloses that the interactive program guide provides the user with the ability to control the user television equipment 22 remotely. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.)

5. Dependent Claims 5-9

130. *Ellis* discloses the subject matter in these claims as discussed above. (*See supra* Section VII.B.5-9.)

6. Independent Claim 10

131. Independent claim 10 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.C.1. *Compare* '4907 patent, 6:29-27 *with* '4907 patent, 7:6-20.) The following chart cross references the limitations of claim 1 to the limitations of claim 10, and the disclosures in the prior art for each cross-referenced limitation that render claim 10 obvious for the same reasons:

Cross-Referenced Limitations in Claims 1 and 10		**Disclosure in the prior art**
Claim 1	Claim 10	
1 preamble	10 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d
1a	10d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	10a, 10b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24; *Browne*, 1, 13, 24, 27, Figs. 2, 7
1c	10c, 10d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b; *Browne*, 1, 13, 24, 27, Figs. 2, 7

7. Dependent Claims 11-18

132. Aside from depending ultimately from independent claim 10, dependent claims 11-18 are identical to dependent claims 2-9. (*Compare* '4907 patent, 6:48-7:5 *with* '4907 patent, 7:21-8:2.) Therefore, dependent claims 11-18 are unpatentable for the same reasons as set forth above for claims 2-9. (*See supra* Section VII.C.2-5.) The following chart cross references the limitations of claims 2-9 to the limitations of claims 11-18, and the disclosures in the prior art for each cross-referenced limitation that render claims 11-18 obvious for the same reasons:

Cross-Referenced Limitations in Claims 2-9 and 11-18		**Disclosure in the prior art**
Claim	Claim	
2	11	*Ellis*, 16:59-17:7, 20:10-16 ; *Browne*, 13, 33, Fig. 14
3	12	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	13	*Ellis*, 20:10-16; *Browne*, 13, 33, Fig. 14
5	14	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	15	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
7	16	*Ellis*, 7:21-23, 10:32-40, 25:32-35

8	17	*Ellis*, 7:21-23, 10:32-40, 25:32-35, 27:20-30
9	18	*Ellis*, 27:20-23, Fig. 24

8. Independent Claim 19

133. Independent claim 19 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.C.1.) Each of the non-preamble limitations discussed above for claim 1 are included nearly identically in claim 19. (*Compare* '4907 patent, 6:29-27 *with* '4907 patent, 8:7-21.)

134. Claim 19 differs from claim 1 only in its preamble, which recites "[a] product comprising a processor-readable storage medium storing processor-executable instructions for performing a method for operating a video-on-demand system." ('4907 patent, 8:3-6.) To the extent the preamble limits the claims, *Ellis* and *Browne* disclose the preamble for the same reasons set forth above in Section VII.C.1.a above and *Ellis* discloses the preamble for the same reasons set forth in Section VII.B.19. The following chart cross references the limitations of claim 1 to the limitations of claim 19, and the disclosures in the prior art for each cross-referenced limitation that render claim 19 obvious for the same reasons:

Cross-Referenced Limitations in Claims 1 and 19		**Disclosure in the prior art**
Claim 1	Claim 19	
1 preamble	19 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d

1a	19d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	19a, 19b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24; *Browne*, 1, 13, 24, 27, Figs. 2, 7
1c	19c, 19d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b; *Browne*, 1, 13, 24, 27, Figs. 2, 7

9. Dependent Claims 20-25

135. Aside from depending ultimately from independent claim 19, dependent claims 20-25 are identical to dependent claims 2-6, and 9. (*Compare* '4907 patent, 6:48-64, 7:4-5 *with* '4907 patent, 8:22-40.) Therefore, dependent claims 20-25 are unpatentable for the same reasons as set forth above for claims 2-6, and 9. (*See supra* Section VII.C.2-5.) The following chart cross references the limitations of claims 2-6 and 9 to the limitations of claims 20-25, and the disclosures in the prior art for each cross-referenced limitation that render claims 20-25 obvious for the same reasons:

Cross-Referenced Limitations in Claims 2-6, 9 and 20-25		**Disclosure in the prior art**
Claim	Claim	
2	20	*Ellis*, 16:59-17:7, 20:10-16; *Browne*, 13, 33, Fig. 14
3	21	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	22	*Ellis*, 20:10-16; *Browne*, 13, 33, Fig. 14
5	23	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	24	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
9	25	*Ellis*, 27:20-23, Fig. 24

D. Ground 3: *Ellis* and *Humpleman* Render Obvious Claims 1-25 Under § 103

136. *Ellis* anticipates claims 1-25 for the same reasons as discussed in connection with Ground 1. Nevertheless, to the extent that Sprint may argue that *Ellis* alone does not teach "transfer a control screen signal to the second communications system" as set forth in claims 1, 10, and 10, *Ellis* in view of *Humpleman* teaches these limitations and would have rendered claims 1-25 obvious.

137. The combination of *Ellis* and *Humpleman* implements the video-on-demand system and remote control device of *Ellis* with the control screen and video control menus of *Browne* on the remote control of *Humpleman*. As discussed below, it is my opinion that a POSITA would have understood this combination to have been an implementation of *Ellis*'s teachings in view of *Browne*.

138. A POSITA would readily have combined *Ellis* and *Humpleman* for a variety of reasons. *Ellis* expressly discloses an interactive television program guide with multiple video sources that displays the video content on either a television or a remote control device. (*Ellis*, Abstract.) *Ellis* expressly teaches a POSITA that other control configurations can be implemented, all of which do not use a set-top box. (*Ellis*, 9:4-7, 28:21-24.) Such alternative control configurations for use in an image display system include the video-on-demand system and

control device disclosed in *Humpleman*. The video-on-demand system and control device in *Humpleman* was well-known before the filing date of the '4907 patent and, in fact, were well-known to work in tandem with an image display system like the one disclosed in *Ellis*. This is expressly disclosed, for example, by *Humpleman*. *Humpleman* describes a video-on-demand system where the controller can be in the form of a computer that generates a virtual control screen and allows a user to control playback and select different menu and video sources to display on the controller or television. (*Humpleman*, Abstract, 7:18-23, 14:5-33, 15:25-47, 18:45-51.) *Ellis* discloses a control screen, and therefore, a POSITA would have been motivated to combine *Humpleman's* generation and transfer of a control screen with the control screen framework already disclosed in *Ellis*. A POSITA, with the interactive television system of *Ellis*, would have naturally been motivated to use additional features in the controller used in *Ellis*, such as the control configurations taught by *Humpleman*. (*Ellis*, 9:4-7, 28:21-24; *Humpleman*, Abstract, 7:18-23, 14:5-33, 15:25-47, 18:45-51.) Indeed, *Ellis* already discloses using control signals and control screens in the interactive television system, and in view of the teachings of *Humpleman*, it would have been a trivial and obvious choice to use additional control features and control signals.

139. A POSITA would have combined *Ellis* and *Humpleman* because, for example, the market for video-on-demand and interactive television systems

demonstrated an increase in demand for systems with different content sources and remote controls and the need to harmonize the control of these diverse devices. *Ellis* and *Humpleman* explicitly disclose implementing the video-on-demand systems and controllers in their disclosures with other available systems, such as computers, televisions, home entertainment systems, and internet content. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Humpleman*, 1:45-2:7.) A POSITA would have understood that, based on the history of remote controls developing new functionality and controls to interface with new functionalities and features implemented on media systems, the use of controls or signals used in a remote control in *Humpleman* would merely be adding these known features and such a remote control would be interchangeable with the remote control in *Ellis*. A POSITA would have recognized combining an a video-on-demand system with a remote control, like the one in *Ellis*, with a remote control screen and menu, like the one in *Humpleman*, was a natural fit.

140. Combining *Ellis* with *Humpleman* would have been obvious to a POSITA for a variety of reasons, including the following:

141. ***Ellis* and *Humpleman* are in the same field of endeavor as the '4907 patent.** *Ellis*, *Humpleman*, and the '4907 patent describe and teach video and audio systems that allow a user to select different video content from different sources, including the world wide web. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49;

Humpleman, Abstract, 7:18-23, 14:5-33, 15:25-47, 18:45-51; '4907 patent, 2:28-34, 6:28-47, 7:6-21, 8:3-21.) A POSITA would readily understand that *Ellis* and *Humpleman* are in the same field of endeavor as the '4907 patent.

142. ***Ellis* and *Humpleman* are aimed at solving the same perceived problem as the '4907 patent.** *Ellis*, *Humpleman*, and the '4907 patent address the problem of using single-purpose set-top boxes to control video-on-demand selections. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Humpleman*, Abstract, 7:18-23, 14:5-33.) A POSITA would readily understand that *Ellis* and *Humpleman* are aimed at solving the same perceived problem as the '4907 patent.

143. ***Ellis* and *Humpleman* use similar techniques to solve the same problem.** As described above, *Ellis* and *Humpleman* disclose and teach video and audio systems that allow a user to select different video content from different sources, including the world wide web, without the use of a set-top box. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Humpleman*, 7:18-23, 14:5-33, 15:25-47, 18:45-51.) A POSITA would have commonly looked to the teachings of a video and audio system in *Humpleman* to use with other conventional video and audio system teachings, like *Ellis*, because they rely on similar video and audio sources using a computer to access and control the delivery of the video and audio content to solve the same problem of the limitations of control when using a set-top box. (*Ellis*, 1:37-45, 2:47-60, 5:9-12, 9:42-49; *Humpleman*, 7:18-23, 14:5-33, 15:25-47,

18:45-51.) A POSITA would readily understand that *Ellis* and *Humpleman* use similar techniques to solve the same problem.

144. **Combining *Ellis* with *Humpleman* would have been a predictable combination.** Given the disclosures in *Ellis* and *Humpleman*, it would have been entirely predictable to a POSITA to combine *Ellis* with *Humpleman*. Specifically, a POSITA would have seen an incentive to use *Humpleman*'s disclosure of a controller with a control screen to access and play different video content, with the general video and audio systems described in *Ellis* to improve upon *Ellis*'s control of the video-on-demand content without the use of any box connected to a television. In addition, a POSITA would have been motivated to use a controller with a control screen, as taught by *Humpleman* with the systems described in *Ellis*. (*Humpleman*, 7:18-23, 14:5-33, 15:25-47, 18:45-51.) A POSITA would have also been motivated by *Humpleman*'s stated aim of "generating a program guide for a home network environment wherein at least one multi-media device is connected to a home network, and wherein the data provided thereby is provided to a user either at that device or at another device connected to the home network" to improve upon the systems described in *Ellis*. (*Humpleman*, 2:8-13.)

145. **Combining *Ellis* with *Humpleman* would have yielded no unexpected results**. Combining *Ellis* with *Humpleman* would have yielded predictable results at least because a POSITA would have readily understood that

combining these references would have allowed the video-on-demand content and controller elements of *Ellis* and *Humpleman* to operate without interference. Moreover, the combination of the teachings of *Ellis* with *Humpleman* would not have resulted in any inoperable combination because it would simply be adding a well-known video source and controller to the video and audio system controller system of *Ellis*.

146. **A POSITA would have had a reasonable expectation of success in combining *Ellis* with *Humpleman*.** A POSITA would have had at least a reasonable expectation of success when combining *Ellis* with *Humpleman* in this manner. All the above reasons—the predictability of this combination, that there would have be no unexpected results, and the similarity in the disclosure of the two references—would have led a POSITA to have a reasonable expectation of success.

1. Independent Claim 1

a. Preamble: "A video-on-demand system"

147. *Ellis* and *Yosuke* disclose this limitation as described above in Claim 1, Preamble. (*See supra* Section VII.C.1.a.)

b. Element [A]: "a first communication interface configured to transfer video content signals to a first communication system"

148. *Ellis* discloses this limitation as described above in Claim 1, Element [A]. (*See supra* Section VII.B.1.b.)

c. Element [B]: "a second communication interface configured to transfer the video content signals to a second communication system, transfer a control screen signal to the second communication system, and receive a video control signal from the second communication system"

149. *Ellis* discloses this limitation as described above in Claim 1, Element [B]. (*See supra* Section VII.B.1.c.)

150. To the extent Sprint argues Ellis does not disclose "a second communication interface configured to . . . transfer a control screen signal to the second communication system," *Humpleman* teaches this limitation. In providing video content to a requesting user, *Humpleman* teaches transferring a "human interface for the home network" that "comprises a screen for displaying HTML pages." (*Humpleman*, 5:60-63.) *Humpleman* teaches the use of a "HTML file" for control, where "[e]ach HTML file contains specific control and command information for a respective home device. The HTML files enable the browser based DTV 102 to graphically display control and command information to a user for a particular home device." (*Humpleman*, 6:55-63.)

151. *Humpleman* discloses that a display device connected to the home network "may receive and interpret the HTML files associated with the home devices connected to the home network, and graphically display the information contained therein using a GUI on its screen." (*Humpleman*, 7:30-35.) Using this GUI, a user can control video display. As explained above, a POSITA would have

been motivated to combine *Ellis* with *Humpleman*'s disclosure of transferring a control screen, as *Ellis* discloses transferring a program guide with a program guide listing and program guide information. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.) Additionally, as explained above, a POSITA would have been motivated to combine *Ellis* with *Humpleman* to disclose this limitation.

d. Element [C]: "a second communication interface configured to transfer the video content signals to a second communication system, transfer a control screen signal to the second communication system, and receive a video control signal from the second communication system"

152. *Ellis* discloses this limitation as described above in Claim 1, Element [C]. (*See supra* Section VII.B.1.c.) To the extent *Ellis* does not disclose "***a processing system configured to transfer the control screen signal to the second communication interface***," *Humpleman* teaches this limitation. In providing video content to a requesting user, *Humpleman* teaches a "human interface for the home network" that "comprises a screen for displaying HTML pages." (*Humpleman*, 5:60-63.) *Humpleman* teaches the use of a "HTML file" for control, where "[e]ach HTML file contains specific control and command information for a respective home device. The HTML files enable the browser-based DTV 102 to graphically display control and command information to a user for a particular home device." (*Humpleman*, 6:55-63.)

153. *Humpleman* discloses that a display device connected to the home network "may receive and interpret the HTML files associated with the home devices connected to the home network, and graphically display the information contained therein using a GUI on its screen." (*Humpleman*, 7:30-35.)

154. *Humpleman* further discloses that the GUI for the control screen is implemented using information that resides in a server. (*Humpleman*, 8:5-11.) A POSITA would have been motivated to combine *Ellis* with *Humpleman*'s disclosure of transferring a control screen, as *Ellis* discloses transferring a program guide with a program guide listing and program guide information. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.) Additionally, as explained above, a POSITA would have been motivated to combine *Ellis* with *Humpleman* to disclose this limitation.

2. Dependent Claim 2

"The video-on-demand system of claim 1 wherein the control screen signal includes a video display control menu comprising play and stop"

155. *Ellis* discloses this limitation as described above in Claim 2. (*See supra* Section VII.B.2.) To the extent Sprint argues *Ellis* does not disclose this limitation, *Humpleman* teaches this limitation. *Humpleman* discloses "the control screen signal includes a video display control menu comprising play and stop." In providing the video content, *Humpleman* teaches the disclosed recorder's controller generates a virtual control screen, which is placed on any screen for a user to control playback. (*Humpleman,* 6:55-63.) *Humpleman* discloses that this

control screen signal is used to "graphically display control and command information to a user for a particular home device." (*Humpleman*, 6:55-63.) *Humpleman* discloses the controller includes a "play" and "stop" feature. (*Humpleman*, 18:34-44, Figure 13 parts 1006 and 1044.) A POSITA would have been motivated to combine *Ellis* with *Humpleman*'s disclosure of the control screen signal, as *Ellis* discloses transferring an interactive program guide with a program guide listing and program guide information and discloses that the interactive program guide provides the user with the ability to control the user television equipment 22 remotely. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.)

3. Dependent Claim 3

"***The video-on-demand system of claim 2 wherein the viewer control selection comprises a video display control menu selection***"

156. *Ellis* discloses the subject matter in this claim for the same reasons as discussed above. (*See supra* Section VII.B.3.)

4. Dependent Claim 4

"The video-on-demand system of claim 3 wherein the video display control menu further comprises pause, rewind, and fast forward"

157. *Ellis* discloses this limitation as described above in claim 4. (*See supra* Section VII.B.4.) To the extent Sprint argues *Ellis* fails to disclose this limitation, *Humpleman* discloses this limitation. *Humpleman* discloses that "the video display control menu further comprises pause, rewind, and fast forward." In providing the video content, *Humpleman* teaches the disclosed recorder's

controller generates a virtual control screen, which is placed on any screen for a user to control playback. (*Humpleman*, 55-63.) *Humpleman* discloses that this control screen signal is used to "graphically display control and command information to a user for a particular home device." (*Humpleman*, 6:55-63.) *Humpleman* discloses the controller includes pause, rewind, and fast forward features. (*Humpleman*, 18:34-44, Figure 13 parts 1006 and 1044.) A POSITA would have been motivated to combine *Ellis* with *Humpleman*'s disclosure of the video display control menu, as *Ellis* discloses transferring an interactive program guide with a program guide listing and program guide information and discloses that the interactive program guide provides the user with the ability to control the user television equipment 22 remotely. (*Ellis*, 2:37-46, 5:9-12, 14:3-12.)

5. Dependent Claims 5-9

158. *Ellis* discloses the subject matter in claims 5-9 for the same reasons discussed in Section VII.B.5-9.

6. Independent Claim 10

159. Independent claim 10 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.D.1. *Compare* '4907 patent, 6:29-27 *with* '4907 patent, 7:6-20.) The following chart cross references the limitations of claim 1 to the limitations of

claim 10, and the disclosures in the prior art for each cross-referenced limitation that render claim 10 obvious for the same reasons:

Cross-Referenced Limitations in Claims 1 and 10		**Disclosure in the prior art**
Claim 1	Claim 10	
1 preamble	10 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d
1a	10d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	10a, 10b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24; *Humpleman*, 1:16-18, 5:39-67, 6:55-63, 7:30-35
1c	10c, 10d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b; *Humpleman*, 1:16-18, 5:39-67, 6:55-63, 7:30-35, 8:5-11

7. Dependent Claims 11-18

160. Aside from depending ultimately from independent claim 10, dependent claims 11-18 are identical to dependent claims 2-9. (*Compare* '4907 patent, 6:48-7:5 *with* '4907 patent, 7:21-8:2.) Therefore, dependent claims 11-18 are unpatentable for the same reasons as set forth above for claims 2-9. (*See supra* Section VII.D.2-5.) . The following chart cross references the limitations of claims 2-9 to the limitations of claims 11-18, and the disclosures in the prior art for each cross-referenced limitation that render claims 11-18 obvious for the same reasons:

Cross-Referenced Limitations in Claims 2-9 and 11-18		**Disclosure in the prior art**
Claim	Claim	
2	11	*Ellis*, 16:59-17:7, 20:10-16; *Humpleman*, 6:55-63, 18:34-44, Figure 13
3	12	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	13	*Ellis*, 20:10-16; *Humpleman*, 6:55-63, 18:34-44, Figure 13
5	14	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	15	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
7	16	*Ellis*, 7:21-23, 10:32-40, 25:32-35
8	17	*Ellis*, 7:21-23, 10:32-40, 25:32-35, 27:20-30
9	18	*Ellis*, 27:20-23, Fig. 24

8. Independent Claim 19

161. Independent claim 19 is very similar to independent claim 1 and is unpatentable for the same reasons as set forth above for claim 1. (*See supra* Section VII.D.1.) Each of the non-preamble limitations discussed above for claim 1 are included nearly identically in claim 19. (*Compare* '4907 patent, 6:29-27 *with* '4907 patent, 8:7-21.)

162. Claim 19 differs from claim 1 only in its preamble, which recites "[a] product comprising a processor-readable storage medium storing processor-executable instructions for performing a method for operating a video-on-demand system." ('4907 patent, 8:3-6.) To the extent the preamble limits the claims, *Ellis* and *Humpleman* disclose the preamble for the same reasons set forth above in Section VII.D.1.a above and *Ellis* discloses the preamble for the same reasons set

forth in Section VII.B.19. The following chart cross references the limitations of claim 1 to the limitations of claim 10, and the disclosures in the prior art for each cross-referenced limitation that render claim 10 obvious for the same reasons:

Cross-Referenced Limitations in Claims 1 and 10		**Disclosure in the prior art**
Claim 1	Claim 10	
1 preamble	10 preamble	*Ellis*, 2:47-60, 4:40-53, 5:64-6:36, 7:53-65, 8:10-20, 8:51-9:7, 25:4-18, 25:36-37, 25:67-26:2, Figs. 2c-2d
1a	10d	*Ellis*, 6:61-7:5, 9:8-15, Figs. 1 and 2b
1b	10a, 10b	*Ellis*, 2:47-56, 14:3-12, 19:6-30, 20:67-21:3, 25:36-26:9, Figs. 2b, 2d, 12-24; *Humpleman*, 1:16-18, 5:39-67, 6:55-63, 7:30-35
1c	10c, 10d	*Ellis*, 4:29-33, 4:57-67, 6:26-36, 6:61-7:10, 19:6-30, 25:63-26:9, Figs. 1, 2b; *Humpleman*, 1:16-18, 5:39-67, 6:55-63, 7:30-35, 8:5-11

9. Dependent Claims 20-25

163. Aside from depending ultimately from independent claim 19, dependent claims 20-25 are identical to dependent claims 2-6, and 9. (*Compare* '4907 patent, 6:48-64, 7:4-5 *with* '4907 patent, 8:22-40.) Therefore, dependent claims 20-25 are unpatentable for the same reasons as set forth above for claims 2-6, and 9. (*See supra* Section VII.D.2-4.) The following chart cross references the limitations of claims 2-6 and 9 to the limitations of claims 20-25, and the disclosures in the prior art for each cross-referenced limitation that render claims 20-25 obvious for the same reasons:

Cross-Referenced Limitations in Claims 2-6, 9 and 20-25		**Disclosure in the prior art**
Claim	Claim	
2	20	*Ellis*, 16:59-17:7, 20:10-16; *Humpleman*, 6:55-63, 18:34-44, Figure 13
3	21	*Ellis*, 14:26-28, 14:37-44, 16:59-17:7, 25:36-26:9
4	22	*Ellis*, 20:10-16; *Humpleman*, 6:55-63, 18:34-44, Figure 13
5	23	*Ellis*, 14:26-28, 14:37-44, 25:36-26:9
6	24	*Ellis*, 4:57-67, 6:61-7:5, 19:6-30, 25:36-43, Fig. 2b
9	25	*Ellis*, 27:20-23, Fig. 24

VIII. CONCLUSION

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

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

DATED: May 29, 2019 By: Kevin C. Almeroth

Kevin C. Almeroth, Ph.D.