

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HULU, LLC,

Petitioner,

v.

PIRANHA MEDIA DISTRIBUTION, LLC,

Patent Owner.

Case No. IPR2025-00082

U.S. Patent 10,986,403

Declaration of Henry H. Houh, Ph.D.

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I, Henry H. Houh declare as follows:

1. My name is Henry Houh. I am a technical consultant at Houh Consulting Inc. I have prepared this report as an expert witness retained by Hulu, LLC. In this report I give my opinions as to whether certain claims of U.S. Patent No. 10,986,403 (“the ’403 patent”) are invalid. I provide technical bases for these opinions as appropriate.

2. This report contains statements of my opinions formed to date and the bases and reasons for those opinions. I may offer additional opinions based on further review of materials in this case, including opinions and/or testimony of other expert witnesses. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

I. OVERVIEW OF THE TECHNOLOGY

3. For decades, advertisements have been integrated into media content, allowing advertisers to reach consumers naturally and engagingly. This practice dates back to the era of printed media, such as magazines. Over the years, advertisement integration had evolved beyond print to include various platforms and formats, including television programs, eBooks, and audio/video streaming services.

4. By the late 1990s, advertisements were integrated with audio/video media based on content structures. For example, when media content was organized into playlists, advertisements were inserted in between tracks of the playlist. Alternatively, media content included avails (available slots for ads), which were designated times or spaces within media content for ad insertion, such as commercial breaks in TV programs.

5. In the late 1990s, the advent of video recording devices such as Personal Video Recorders (PVRs) revolutionized the media content viewing experience. These devices offered increased flexibility for advertisement insertion, enabling providers to tailor ads to individual users and dynamically control their timing. Advertisers developed various approaches to schedule ads to optimize impact and engagement. *See, e.g.,* Ex-1010, ¶33; Ex-1011, ¶41, 61; Ex-1012, ¶6. For example, advertisements were placed into advertisement queues, which are organized lists of advertisements waiting to be served based on criteria like user identity and behavior, the subject or type of the media content, or the time of viewing. When an avail occurred or a track in a playlist ended, a most appropriate advertisement was selected from the queue, ensuring optimal alignment with the viewer's profile and the advertiser's objectives. The selection of advertisements dynamically adapted to changing conditions. *See, e.g.,* Ex-1004, ¶16, ¶30.

6. Simultaneously, video recording technologies enabled viewers to skip commercials, altering the traditional advertising model. In response, providers implemented various measures to counteract ad-skipping. Commonly used techniques included disabling user control such as skipping and fast forwarding during commercial breaks. Ex-1012, ¶10. The techniques also included strategies to provide alternatives in response to user actions skipping advertisements. For example, while a user might be allowed to skip an advertisement, a replacement would be displayed to the user at an alternative time. Types of replacements included the same advertisement, a different advertisement, or an advertisement in another format or state (e.g., overlay or pop-ups, shorter versions). By 2002, various techniques had been developed to select and schedule replacement advertisements. *See, e.g.*, Ex-1014, ¶¶10-11.

II. THE '403 PATENT

A. Overview

7. The '403 patent “relates generally to the distribution of audio, video, and print media content via digital replication and delivery channels.” Ex-1001, 1:16-25. The '403 patent discusses inserting and displaying advertisements within media content. Ex-1001, 7:37-47.

8. The '403 patent does not purport to invent the process of displaying advertising content within media content, which it admits was known in the art.

Ex-1001, 6:64-7:10 (“[A]udio ads are inserted into audio content as they have traditionally been heard in radio broadcasts, video ads are spliced into video content as they have traditionally been seen in television broadcasts, and print ads are interspersed with print content as they have traditionally appeared in newspapers and magazines.”).

9. The purportedly inventive concept of the ’403 patent is to adaptively select and re-sequence ads in response to user playback controls. *See* Ex-1001, 7:37-47, 14:63-15:10, 28:48-60. By doing so, the ’403 patent claims to ensure ads playing without user interruption and allow users to access free media content in exchange of exposure to ads. *See, e.g.*, Ex-1001, 6:56-63, 8:38-50, 14:29-52, 14:63-15:10.

10. However, the idea of selecting and re-sequencing ads for display was known and applied in media streaming well before the ’403 patent. *Supra* §I. In addition, the patent admits that gaining free access to media content in exchange for exposure to ads is a “traditional [] business model.” Ex-1001, 8:24-37, 42:34-50.

B. Prosecution History

11. The ’403 patent has a prosecution history spanning 18 years, including multiple Office Actions under §§ 101, 102, 103 and 112. Ex-1002, 000116-126, 000167-179, 000222-237, 000265-278, 000336-349, 000386-404,

000566-574, 000626-643, 000952-958. In the last Office Action with a prior-art rejection, the examiner rejected pending independent claims as obvious over U.S. Pat. App. Pub. No. 2001/0042249 (Knepper) in view of U.S. Patent No. 7,761,327 (Hannah) and U.S. Pat. App. Pub. No. 2002/0191950 (Wang). Ex-1002, 000632. The Applicant appealed the examiner's decision, contending that the prior-art references do not teach the limitation "at least one of the one or more alternatively sequenced insertion points being different than the one or more initially sequenced insertion points relative to the digital media content[.]" Ex-1002, 000727-767. The PTAB agreed with the Applicant, reasoning that it did not see where Knepper teaches that "when a user does not follow the pre-set order of the playlist, by skipping media files in the sequence, the order of the play list changes [and] the position of the ad file also changes within the playlist" and "adaptively modifying or re-sequencing the presentation position in response to user input[.]" Ex-1002, 000895-96. As explained below, Ground 1 provides the teachings that the PTAB found to be lacking in Knepper.

C. Priority Date

12. The '403 patent was filed on June 26, 2003 and claims priority to U.S. Provisional Patent Application Nos. 60/393,193 and 60/392,232, both filed on June 27, 2002. For purposes of this Declaration, I have analyzed obviousness of the claims at issue as of June 27, 2002. I do not offer an opinion as to whether the '403

patent is entitled to a certain priority date. My invalidity opinions would not change if a later date (e.g., June 26, 2003) was determined to be the correct priority date because the prior art relied upon in this declaration would still be prior art.

D. Challenged Claims

13. I understand that Petitioner is challenging the validity of claims 1, 2, 4-11, 13-15, 17-19, 21-23 of the '403 patent in the Petition for Inter Partes Review to which this declaration will be attached. Those claims are reproduced in Appendix 3. While this Declaration are directed to the challenged claims, I have considered all claims 1-23 of the '403 patent, as well as portions of the '403 patent prosecution history in forming my opinions.

III. LEVEL OF ORDINARY SKILL IN THE ART

14. I have analyzed the '403 patent and determined that the field of the patent is media display. *See, e.g.*, Ex-1001, Abstract (“A system and method for displaying digital media files is disclosed.”), 1:16-25 (“This invention relates generally to the distribution of audio, video, and print media content via digital replication and delivery channels.”).

15. In determining the characteristics of a hypothetical person of ordinary skill in the art (“POSITA”) of the '403 patent at the time of the claimed invention, I considered several things, including various prior art techniques relating to media display, the type of problems that such techniques gave rise to, and the rapidity

with which innovations were made. I also considered the sophistication of the technologies involved, and the educational background and experience of those actively working in the field at the time. I also considered the level of education that would be necessary to understand the '403 patent. Finally, I placed myself back in the relevant period of time and considered the engineers and programmers that I have worked with and managed in the field of media display.

16. I came to the conclusion that a person of ordinary skill in the field of art of the '403 patent would have been a person with a bachelor's degree in electrical engineering, computer science, or a similar field with at least two years of experience in media display or a person with a master's degree in electrical engineering, computer science, or a similar field with a specialization in media display. A person with less education but more relevant practical experience may also meet this standard.

17. In the 2002 timeframe, a POSITA would have had the knowledge and skills to:

- Understand and apply known techniques for transmitting, storing, and displaying media content and advertisements;
- Apply known techniques for inserting advertisements into media content including, for example, inserting advertisements into avails

within a media stream and inserting advertisements between media tracks such as music tracks;

- Implement algorithms for adaptively selecting advertisements for insertion into media content based on factors such as characteristics of the media, user profiles, and timing;
- Implement algorithms for scheduling and sequencing advertising content within media content including, for example, arranging advertisements in queues and determining the timing for inserting each advertisement.

IV. CLAIM CONSTRUCTION

18. For purposes of this inter partes review, I have considered the claim language, specification, and portions of the prosecution history, to determine the meaning of the claim language as it would have been understood by a person of ordinary skill in the art at the time of the invention. The “plain and ordinary meaning” or *Phillips* standard has traditionally been applied in district court litigation, where a claim term is given its plain and ordinary meaning in view of the specification from the viewpoint of a person of ordinary skill in the art at the time of the patent.

19. I have applied the *Phillips* standard in my analysis. Unless otherwise stated, I have applied the plain and ordinary meaning to claim terms.

A. “intersplicer”

20. Based on my review of the claims and specification of the ’403 patent, it is my opinion that a POSITA would have understood “intersplicer” to mean “software that selects advertising content and controls insertion and conveyance of advertising content in media content.”

21. Claims of the ’403 patent recite that the intersplicer controls the insertion and conveyance of advertising content in media content, including, for example, “controlling one or more insertion points of the digital advertising content into the digital media content thereby sequencing the digital media content and the digital advertising content” and “adaptively select[ing]” “the one or more alternatively sequenced insertion points[.]” Ex-1001, cl. 1.

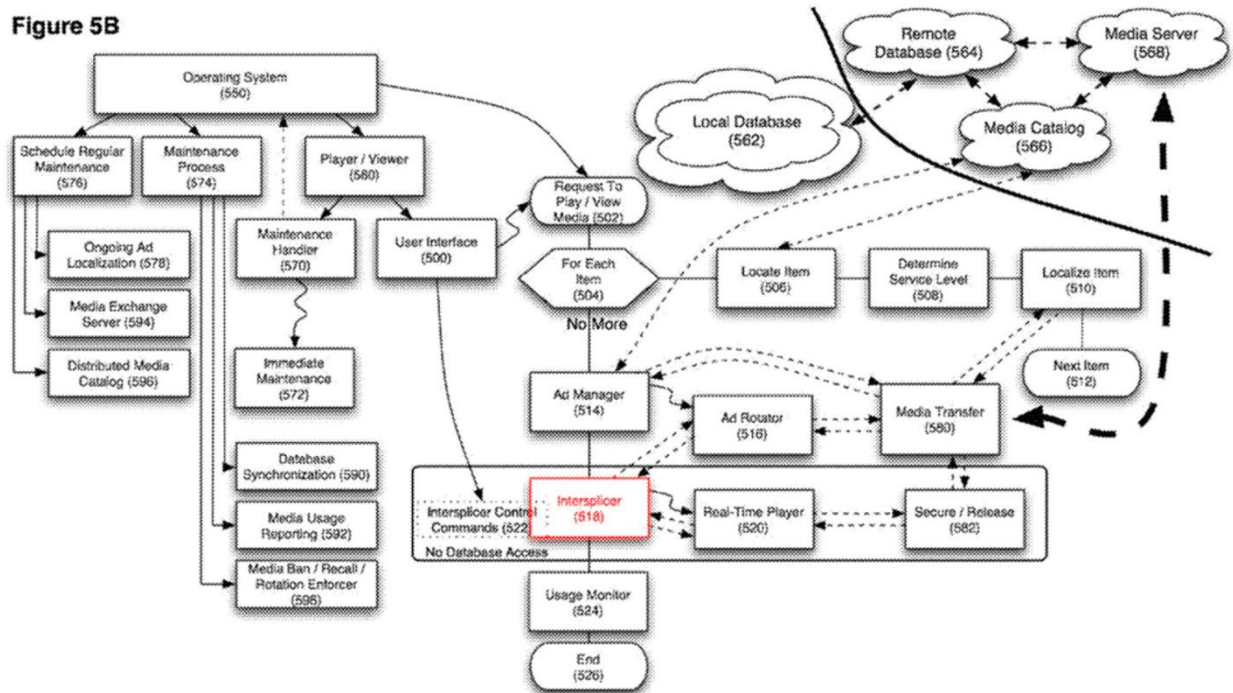
22. The construction is confirmed by the specification of the ’403 patent, which states that the intersplicer “select[s] ... the ads to be shown” and controls the insertion and conveyance of ads by, for example, “automatically edits the selected advertisements into the presentation stream,” “disabling certain user playback controls while the ads are running” and “re-sequenc[ing] the ads to be shown in response to the user’s navigational actions.” Ex-1001, 7:37-47; *see also, e.g.*, Abstract (“The intersplicer combines the media files with the ad files by providing control signals to the media player[.]”), 14:63-15:10 (“The intersplicer also has the ability to adaptively regroup and re-sequence the insertion of ad blocks

extemporaneously (i.e. ‘on the fly’), in response to the consumer’s arbitrary direction of the playback within the requested content, by means of playback controls.”).

23. I understand that, in the district court litigation, Patent Owner proposed to construe “intersplicer” as “digital rights management software that enforces the conveyance of advertisements inserted into a digital media stream for presentation during the course of media playback to allow for free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user.” Ex-1015, 000006, 000012-13. This construction is incorrect because it imports unsupported limitations. First, the claims do not recite that the intersplicer is “digital rights management software” or that the intersplicer “allow[s] for free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user.” *Id.*; Ex-1001, 44:2-50:19.

24. Second, Patent Owner’s construction improperly attributes the specification’s description of the player/viewer software to one of its many components, the intersplicer. The specification states that the player/viewer software has digital rights management functionalities and has the ability to provide means for unlimited free viewing. *E.g.*, Ex-1001, 6:46-55 (“The player/viewer software applies digital rights management techniques to control consumer use of media in a novel way.”), 14:29-41 (“Novelty arises in the

player/viewer software's particular ability to control use of media content while providing the means for unlimited free viewing of requested media, through a general licensing process that is transparent to the user.”). However, the intersplicer is just one of many components of the player/viewer software. Ex-1001, 22:15-29, 23:35-46, Fig. 5A (showing “the logic by which the player/viewer software processes a user request,” where the intersplicer corresponds to step 518), 24:20-25, Fig. 5B (showing “logical components of the player/viewer” including the intersplicer 518 among various others):



The specification states that another module (i.e., the real-time player module) provides digital rights management functionalities. Ex-1001, 14:53-62 (“There is a novel ‘intersplicer’ module in the player viewer software that launches,

communicates with, and strictly controls *a digital rights management enabled real-time player module*, while the player module handles the actual playback and viewing of the media content through the player/viewer software.”).

25. Furthermore, nowhere does the specification teach that the intersplicer’s use is limited to providing free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user. In fact, the specification discloses a variety of service levels that specifically includes a purchased service level with advertisements. *E.g.*, Ex-1001, 26:65-27:13 (“This license verification system offers and keeps track of a wide variety of service types, which ultimately affect the service level determination result. For instance, on a user-by-user basis, each title may be offered and licensed as free for use with commercial interruptions, free for use without commercial interruptions but with requested user support, *included (with or without ads) as part of a specific subscription package, specifically purchased for uninterrupted use on a short-term basis (fixed time period or total number of uses)*, and/or purchased outright for permanent uninterrupted use.”).

26. Patent Owner’s proposed construction is also inconsistent with its Infringement Contentions for the ’403 patent. The Infringement Contentions allege that an “Ad Insertion MPD Manipulator is an intersplicer for controlling one or more insertion points of the digital advertising content into the digital media

content” (Ex-1016, 000019) and that “the ‘Manifest Generation’ ... is an intersplicer that controls the insertion points of digital advertising content[.]” (*id.*, 000024). The Infringement Contentions do not assert that the Ad Insertion MPD Manipulator or the “Manifest Generation” block is “digital rights management software,” that it “enforces the conveyance of advertisements inserted into a digital media stream,” or that it “allow[s] for free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user.” Ex-1016, 000019-28.

V. INVALIDITY GROUNDS

27. There are a number of patents and publications that constitute prior art to the ’403 patent. I have reviewed and considered the prior art discussed in this section, along with the materials listed in Appendix 2.

28. Based on my review and analysis of the materials cited herein, my opinions regarding the understanding of a POSITA in the relevant timeframe, and my training and experience, it is my opinion that the challenged claims of the ’403 patent are invalid in view of the following grounds:

Grounds	Claims	Statutory Basis	Prior Art
1	1, 2, 4–11, 13–15, 17–19, 21–23	§ 103	Eldering-I in view of Eldering-II

2	2, 15	§ 103	Eldering-I in view of Eldering-II and Crow
3	13	§ 103	Eldering-I in view of Eldering-II and Kocher

A. Ground 1: Claims 1, 2, 4–11, 13–15, 17–19, and 21–23 Are Rendered Obvious by Eldering-I in view of Eldering-II

29. It is my opinion that a POSITA would have found claims 1, 2, 4–11, 13–15, 17–19, and 21–23 obvious based on the teachings of Eldering-I and Eldering-II.

1. U.S. Patent Application Publication No. 2002/0083439 (“Eldering-I”) (Ex-1004)

30. I have reviewed the Eldering-I reference. I understand that Eldering-I was not cited or considered during prosecution of the ’403 Patent, based primarily on the fact that Eldering-I is not cited on the face of the patent, nor have I seen the reference discussed in the prosecution history.

31. Eldering-I was filed December 21, 2000 as application 09/742,852, and later published. I understand that Eldering-I is prior art under pre-AIA §102(e) because it was filed before June 27, 2002.

32. Eldering-I “pertains to targeted advertising, such as in television programming delivery systems utilizing set top boxes for each subscriber.” Ex-

1004, ¶3. Eldering-I provides digital media content (e.g., TV programming, recorded programming) to users and teaches “[a] system for inserting advertisement into channels of media programming[.]” Ex-1004, Abstract, ¶¶25-27, ¶70, Fig. 1, Fig. 2:

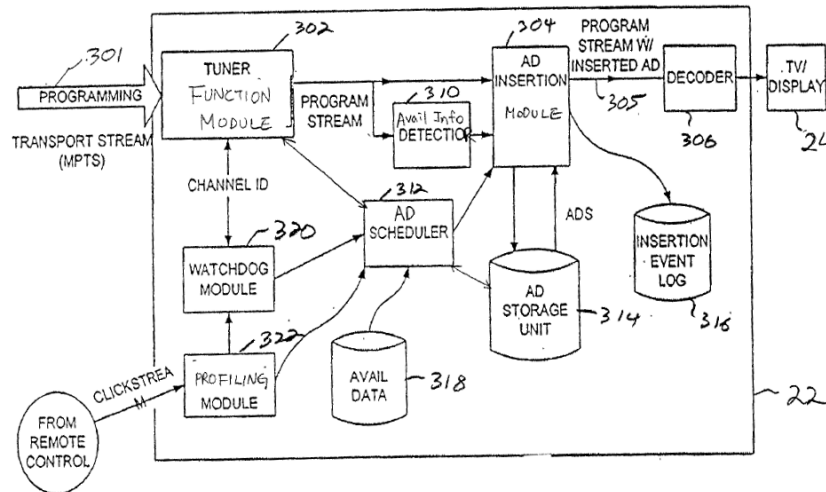


Figure 2

Eldering-I applies its teachings to streaming and recorded programming, such as video-on-demand. *E.g.*, Ex-1004, ¶¶70-72, ¶27.

33. Eldering-I teaches an ad scheduler that selects advertisements and schedules insertion of advertisements. *E.g.*, Ex-1004, Abstract, ¶44, Fig. 2. “The ad scheduler[] provides a schedule of ads to be inserted in the form of a queue or other forms.” Ex-1004, ¶¶49-50. The ad scheduler re-selects and reschedules advertisements in real time when there are changes to viewing parameters such as channel selection, viewer identity, and the type of program being watched. *E.g.*,

Ex-1004, ¶16, ¶30, ¶32. The selecting and scheduling is based on a hybrid orthogonal-linked sponsorship model. Ex-1004, ¶¶76-82.

34. Eldering-I teaches an ad insertion module that “inserts the advertisements into the programming channels according to the stored ordered list.” Ex-1004, Abstract, Fig. 2. The ad insertion module receives the ordered list about the next advertisement from the ad scheduler, and in response requests ads from local storage and inserts them into media content. Ex-1004, Abstract, ¶11, ¶17, ¶33, ¶¶46-49.

35. Eldering-I is in the same field of endeavor as the ’403 patent (media display). *See supra* §III; *e.g.*, Ex-1004, ¶3 (“[T]he invention pertains to targeted advertising, such as in television programming delivery systems utilizing set top boxes for each subscriber.”), ¶17 (“The set top box inserts the ads into the incoming programming channel according to the ad insertion schedule, and displays the programming channel with the inserted advertisements on the display device.”).

2. U.S. Patent Application Publication No. 2003/0149975 (“Eldering-II”) (Ex-1005)

36. I have reviewed the Eldering-II reference. I understand that Eldering-II was not cited or considered during prosecution of the ’403 Patent, based primarily on the fact that Eldering-II is not cited on the face of the patent, nor have I seen the reference discussed in the prosecution history.

37. Eldering-II was filed February 5, 2002 as application 10/068,771, and published August 7, 2003. I understand that Eldering-II is prior art under at least pre-AIA §102(e) because it was filed before June 27, 2002.

38. Eldering-II “is related to a method, system, apparatus, and computer program for presenting targeted advertisements to a subscriber along with content selected by the subscriber in a content on demand (CoD) system.” Ex-1005, ¶52. Eldering-II “[s]elect[s] targeted advertisements to be presented to subscribers along with selected video in a video on demand (VoD) system.” Ex-1005, Abstract.

39. Eldering-II teaches a user interface implemented through a set top box, which receives user input such as skipping, fast forwarding, rewinding, pausing, and stopping playback. Ex-1005, ¶74, ¶¶109-110. Eldering-II implements its functionalities in the VoD system that includes STB (set top box) and PVR

(personal video recorder). Ex-1005, ¶54, Fig. 5:

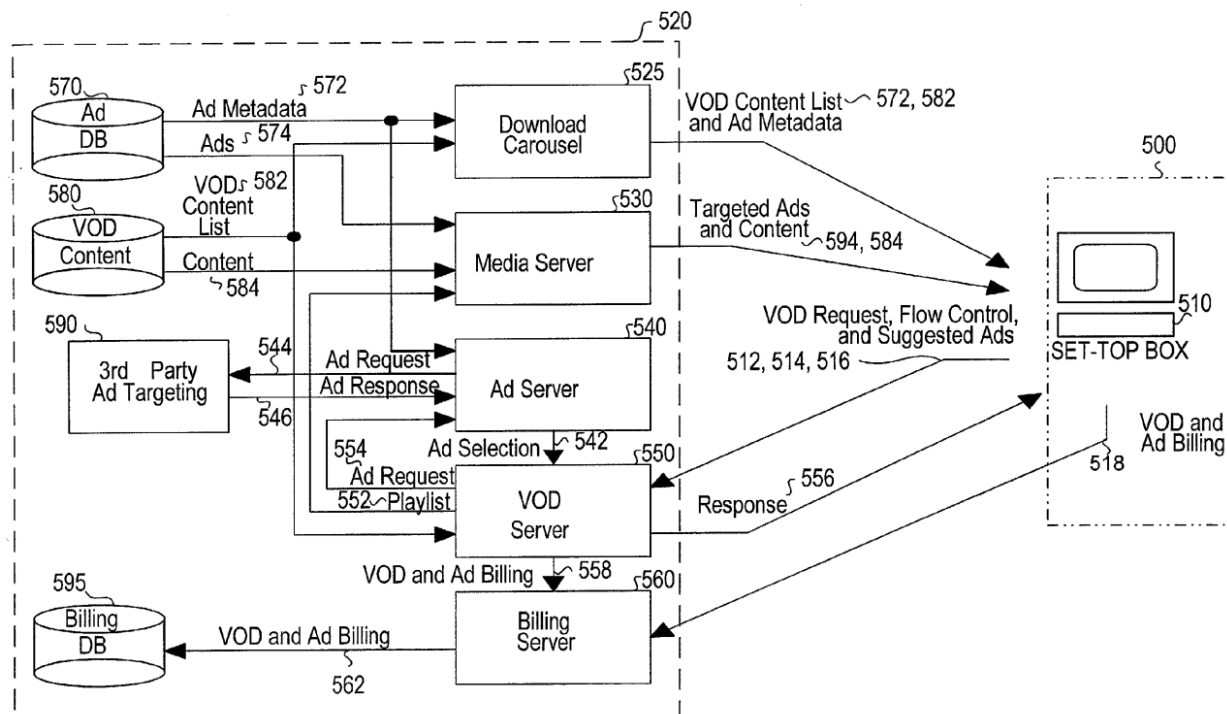


FIG. 5

40. Eldering-II teaches disabling navigation control functions or displaying an alternative advertisement when a user fast forwards or skips an existing advertisement. *E.g.*, Ex-1005, Abstract, ¶58 (“According to one embodiment, the subscriber can not skip or fast forward the advertisements. According to an alternative embodiment, when the subscriber attempts to skip or fast forward the ad they are presented with an alternative ad in place of or in conjunction the targeted ad.”), ¶¶69-70, ¶110, ¶138, ¶¶165-179, Figs. 9-10.

41. Eldering-II is in the same field of endeavor as the ’403 patent (media display). *See supra* §III; *e.g.*, Ex-1005, Abstract (“Selecting targeted

advertisements to be presented to subscribers along with selected video in a video on demand (VoD) system”), ¶52 (“The present invention is related to a method, system, apparatus, and computer program for presenting targeted advertisements to a subscriber along with content selected by the subscriber in a content on demand (CoD) system. The content may be video, audio, data, computer applications, or other content that would be known to one of ordinary skill in the art.”).

3. Independent Claims 1, 17, 21, 22

[1a] A digital media player device for controlling digital media presentations, the digital media player device comprising:

[17a] A computer-implemented system for controlling digital media presentations, the system comprising:

[21a] A computer-implemented method for controlling digital media presentations using an improved digital media player system, the method comprising:

[22a] A computer-implemented method for controlling digital media presentations using an improved digital media player system, the method comprising:

42. I understand that a preamble generally does not state a claim limitation. However, to the extent that Patent Owner argues that the preamble states a limitation, it is my opinion that Ground 1 teaches the preambles of claims 1, 17, 21 and 22.

43. Eldering-I teaches **a digital media player device/a computer-implemented system** (e.g., subscriber system)¹ ([1a]/[17a]) that provides digital media content to users. Ex-1004, ¶¶25-26 (“A ‘*subscriber system*’ is a system at the subscriber’s end which receives, processes, and/or displays media signals (e.g., TV Programs) including advertisement signals. Examples of the subscriber system may include, but are not limited to, an entertainment system (e.g., TV, VCR, personal video recorder (PVR), etc.) including or coupled to a set top box or the like, a personal computer, or a computer work station.”),² ¶¶5-8, ¶¶29-30, ¶¶33-37, ¶39, ¶47, Fig.1:

¹ To the extent Patent Owner argues that “a digital media player device” excludes, for example, a TV coupled to a set top box, it is satisfied by a set top box with PVR functionalities, which provides the core functions of the subscriber system. Ex-1004, ¶8 (“In digital set-top boxes with local storage, also known as Personal Video Recorders or PVRs, it is possible to store advertisements and create unique presentation streams for each user.”). As used herein, “subscriber system” refers to the subscriber system as well as its core component, a set top box with PVR functionalities.

² All annotations/emphasis added unless otherwise noted.

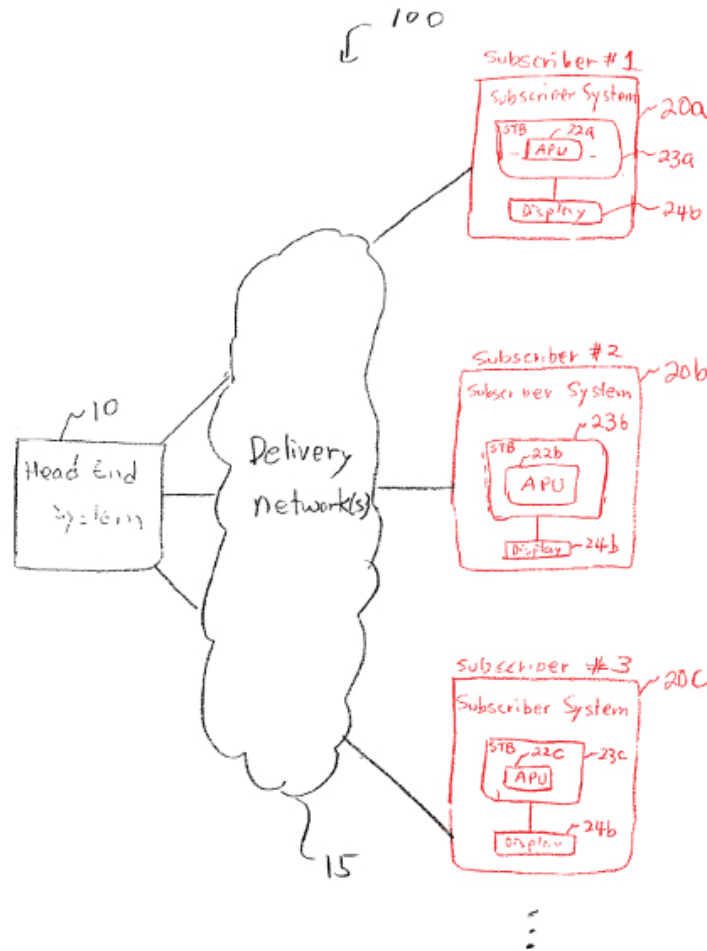


FIGURE 1

44. Elderling-I's subscriber system **controls digital media presentations** because it controls how media content is played back based on user inputs such as volume and channel change. Ex-1004, ¶32, ¶36, ¶38, ¶59, ¶61 (“[T]he profiling module 322 may identify the current viewer of the TV programming channels by processing information such as data from remote control operation through the profiling module 322 (e.g., a volume control and/or channel change control), time of day, and program being watched.”), Fig. 1.

45. Operations of Eldering-I's subscriber system, as modified based on Eldering-II's teachings, teach steps of **a computer-implemented method for controlling digital media presentations using an improved digital media player system**. *Infra* §§V.A.3[21b-l]/[22b-l]. Eldering-I teaches a computer-implemented method for controlling digital media presentations by controlling how media content is played back. *E.g.*, Ex-1004, ¶¶9-10, ¶11 ("It is still another object of the present invention to provide *a method* and system for inserting targeted advertisements into television program channels according to the ad insertion schedule."), ¶12 ("It is still another object of the present invention to provide *a method* and system for rescheduling advertisements to be inserted into television program channels when a change in one or more of certain viewing parameters (e.g., channel selection, viewer identity, etc.) occurs."), ¶¶13-18.

46. For reasons explained above, Ground 1 teaches the preambles of claims 1, 17, 21 and 22.

[1b] one or more processors for receiving data comprising digital media content and digital advertising content;

[17b] one or more processors;

[21b] receiving, on a digital media player system, data comprising digital media content and digital advertising content,

[22b] transmitting, by at least one remote system to a digital media player system, data comprising digital media content and digital advertising content,

47. Eldering-I teaches that the subscriber system receives media signals from a remote head end system via a network. Ex-1004, ¶25 (“A ‘head end system’ is a system that originates the media signals and directs them to the subscriber systems. Examples of the head end system may include, but are not limited to, service providers such as a television service provider (e.g., ABC network, a local network), a cable television service provider, a Web TV service provider, a telephone service provider, an Internet service provider, a Direct Broadcast Satellite (DBS) service provider, a wireless television service provider, etc.”), ¶26 (“The media signals may be communicated between the head end system and the subscriber systems through one or more delivery networks, e.g., two-way cable network, analog cable network, digital cable network, the Internet, Hybrid Fiber Coaxial (HFC) network, switched digital video (SDV) network, DBS network, or wireless network such as MMDS (Multichannel Multipoint Distribution System) or LMDS (Local Multipoint Distribution System).”), ¶37 (“The subscriber systems 20

receive the media signals from the head end system 10, select and process one or more channels and display them to the subscribers.”).

48. The media signals include media content and advertising content. Ex-1004, ¶36 (“The head end system 10 generates media signals (e.g., video signals including TV programming streams and/or advertisement signals) and may transmit the media signals to the subscriber systems 20 on a plurality of channels through the delivery network 15.”). Eldering-I teaches the content being digital and transmitted via networks for digital media such as “digital cable network” and “the Internet.” Ex-1004, ¶26, ¶¶5-8, ¶35, ¶39, ¶47. Thus, Eldering-I teaches **receiving, on a digital media player system** (e.g., subscriber system), **data comprising digital media content and digital advertising content** (e.g., TV/recorded programming streams and advertisement signals) ([21b]) and **transmitting, by at least one remote system** (e.g., head end system) **to a digital media player system, data comprising digital media content and digital advertising content** ([22b]).

49. Eldering-I teaches that the subscriber system comprises **one or more processors** ([1b], [17b]). Ex-1004, ¶¶42-43 (“The APU 22 can be realized as a combination of both hardware and software and includes components which are typically used as part of a television set-top including *a microprocessor*, Random Access Memory (RAM), and in the case of a Personal Video Recorder, a hard

drive.”), ¶62 (“It should be understood that the components shown in FIG. 2 represent functional aspects of the APU 22 and that each of these components may be implemented using analog circuits and/or digital circuits, including finite state machines, *digital signal processors*, computers, *central processing units*, application specific integrated circuits (ASICs), and *programmed general purpose processors*.”).

50. The one or more processors are **for receiving data comprising digital media content and digital advertising content** ([1b]) because they are used to execute the functionalities of the subscriber system and its APU, which includes receiving digital media content and digital advertising content. *E.g.*, Ex-1004, ¶26 (“A ‘subscriber system’ is a system at the subscriber’s end which *receives, processes, and/or displays media signals (e.g., TV Programs) including advertisement signals*.”), ¶¶42-43 (“FIG. 2 is an exemplary functional block diagram of the ad processing unit (APU) 22 which may be included in the set top box 23 of the subscriber system 20 according to the present invention. As shown in FIG. 2, the APU 22 may include a tuner function module 302 for *receiving at least one programming stream 301 ...*”), ¶62, Figs. 1-2.

51. For reasons explained above, Eldering-I teaches limitations [1b], [17b], [21b], and [22b].

- [1c] a user interface input for allowing a user to control a course of presentation of the digital media content received;**
- [17c] a user interface for allowing a user to control a course of presentation of the digital media content;**
- [21c] the digital media player system having a user interface and an intersplicer, the user interface configured to allow a user to control a course of presentation of the digital media content received,**
- [22c] the digital media player system having a user interface and an intersplicer, the user interface configured to allow a user to control a course of presentation of the digital media content received,**

52. Eldering-I teaches that its subscriber system includes a user interface (input) ([1c], [17c], [21c], [22c]) implemented through a set top box. Ex-1004, ¶37 (“In accordance with one embodiment, each of the subscriber systems 20 includes a set top box 23a, 23b or 23c, and a display device 24a, 24b or 24c coupled to the set top box. ... Each of the set top boxes 23 may further include components typically found in set top boxes, such as a tuner, *a user interface*, a CPU, ROM, RAM, etc.”), ¶25, ¶34, Fig. 1. Eldering-II similarly teaches a user interface implemented with a set top box. *E.g.*, Ex-1005, ¶74 (“The interaction device 110 is the interface for the subscriber 100 to select content that they wish to receive.”), ¶75 (“The interaction device 110 may be ... a set top box (STB) ...”), Fig. 1.

53. Eldering-I’s user interface input is **for allowing a user to control a course of presentation of the digital media content received** because, as explained above, Eldering-I teaches user input causing the subscriber system to

perform operations such as volume and channel change. *See supra*

§V.A.3[1a]/[17a]/[21a]/[22a]; *e.g.*, Ex-1004, ¶32, ¶36, ¶38, ¶59, ¶61, Fig. 1.

54. Eldering-II teaches additional user input for skipping, fast forwarding, rewinding, pausing, and stopping playback of digital media content. *E.g.*, Ex-1005, ¶109 (“VoD systems allow a subscriber to use VCR functions (i.e., *rewind, pause, fast-forward, stop the playback*) while viewing an on-demand program.”), ¶110 (“the fast-forward and skip functions...”). These operations control a course of presentation of digital media content (e.g., flow of content), for example, by bypassing portions of the digital media content, changing its play position, changing its playback speed, or controlling the time for playback. Ex-1005, ¶109 (“Thus, when the STB 510 begins receiving content from the media server 530, the subscriber can manage the flow of content (flow control) by implementing the VCR functions.”).

55. A POSITA would have realized that control functionalities such as skipping and fast forwarding were common and readily applicable to Eldering-I’s subscriber system. Eldering-I teaches implementing its subscriber system with a set-top box having PVR functionalities and contemplates using it for providing video-on-demand (VOD) services. Ex-1004, ¶8 (“In digital set-top boxes with local storage, also known as Personal Video Recorders or PVRs, it is possible to store advertisements and create unique presentation streams for each user. PVRs

can be used in conjunction with a large number of delivery systems including digital cable, Direct Broadcast Satellite (DBS), and VDSL platforms.”), ¶72 (“The present invention can also be utilized in Video on Demand (VoD) systems in which advertising plays a role. As with the PVR model, the VoD Systems may utilize ads inserted into the programming, prepended ads, postpended ads, etc.”), ¶¶25-27, ¶¶70-71.

56. Well-known control functionalities such as skipping and fast forwarding were commonly implemented on devices such as set top boxes with PVR functionalities. For example, Eldering-II teaches implementing these functionalities in the VoD system that includes STB and PVR. Ex-1005, ¶54 (“According to one embodiment in which the CoD system is a VoD system, the advertisement profiles will be downloaded to the STB (or personal video recorder (PVR)) and the STB will make a determination as to which advertisements should be presented to the subscriber along with the video that the subscriber selected.”), ¶109 (“VoD systems allow a subscriber to use VCR functions (i.e., rewind, pause, fast-forward, stop the playback) while viewing an on-demand program.”). Eldering-I teaches applying its teachings to a VoD system. Ex-1004, ¶72 (“The present invention can also be utilized in Video on Demand (VoD) systems in which advertising plays a role.”). A POSITA would have understood that Eldering-I contemplates that its set top box/PVR includes common user control

functionalities. To the extent Eldering-I does not explicitly mention these terms, it would have been obvious to implement these functionalities on Eldering-I's subscriber system. A POSITA would have been motivated to do so because these control functionalities improve users' flexibility in controlling the presentation of the media content (e.g., by allowing the user to skip a boring part and move to a more interesting part of a program). Since Eldering-I and Eldering-II teach the same types of devices (e.g., set top box with PVR functionalities), which Eldering-II teaches to have the control functionalities, a POSITA would have had a reasonable expectation of success when implementing Eldering-II's teachings to Eldering-I.

57. As explained below, the combination of Eldering-I and Eldering-II further teaches **an intersplicer** ([21c], [22c]). *Infra* §V.A.3[1d]/[17d]/[21d]/[22d]. Therefore, the combination of Eldering-I and Eldering-II teaches limitations [1c], [17c], [21c], and [22c].

- [1d] an intersplicer for controlling one or more insertion points of the digital advertising content into the digital media content thereby sequencing the digital media content and the digital advertising content, the sequencing comprising ordering one or more data blocks of the digital media content and one or more data blocks of the digital advertising content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising one or more initially sequenced insertion points at which the digital advertising content is scheduled to be presented relative to the digital media content during play;**
- [17d] an intersplicer for controlling one or more insertion points of digital advertising content into the digital media content thereby sequencing the digital media content and digital advertising content, the sequencing comprising ordering one or more data blocks of the digital media content and one or more data blocks of the digital advertising content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising one or more initially sequenced insertion points at which the digital advertising content is scheduled to be presented relative to the digital media content during play;**
- [21d] and the intersplicer configured to control one or more initially sequenced insertion points of the digital advertising content into the digital media content;**
- [22d] and the intersplicer for controlling one or more insertion points of the digital advertising content into the digital media content;**
- [21e] sequencing the digital media content, using the intersplicer, the sequencing comprising ordering one or more data blocks of the digital media content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising a media section that comprises at least some of the digital media content, the content stream further comprising an advertising block within which at least some of the digital advertising content is scheduled to be presented, the advertising block being arranged within the content stream at an initially defined insertion position relative to the media section during play;**

[22e] sequencing the digital media content, using the intersplicer, the sequencing comprising ordering one or more data blocks of the digital media content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising a media section that comprises at least some of the digital media content, the content stream further comprising an advertising block within which at least some of the digital advertising content is scheduled to be presented during play, the advertising block being arranged within the content stream at an initially defined insertion position relative to the media section;

58. While these limitations are wordy, they simply recite a software component “intersplicer” that controls the insertion of advertising content into existing media, such as video, so that it creates a sequence of video interspersed with advertisements. Eldering-I and Eldering-II teach such a software component.

59. Eldering-I teaches an intersplicer (e.g., ad scheduler) that controls insertion and conveyance of advertising content in media content. Ex-1004, ¶42 (“FIG. 2 is an exemplary functional block diagram of the ad processing unit (APU) 22 which may be included in the set top box 23 of the subscriber system 20 according to the present invention. As shown in FIG. 2, the APU 22 may include ... an ad scheduler 312[.]”), Fig. 2:

a particular advertisement at the head end system”), ¶49 (“As discussed above, the queue, e.g., as shown in FIG. 3, is a stacked list of advertisement resource locators (ARLs) each indicating the location of a particular advertisement in the system, e.g., in the ad storage unit 314, and other information such as the duration of the stored advertisement.”), ¶¶34-35, ¶66, Fig. 3:

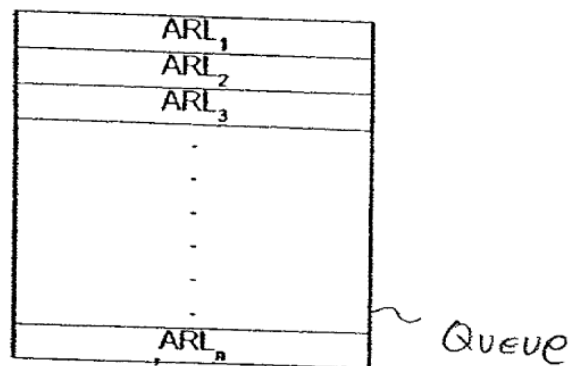


Figure 3

62. Eldering-I teaches that the ad scheduler selects advertisements and determines an initial ad insertion schedule. Ex-1004, Abstract (“The system includes an ad scheduler for identifying a predetermined order in which the advertisements are to be inserted into the channels of media programming.”), ¶29 (“An ad processing unit of the subscriber system can determine in advance which ads are to be inserted and in what order based on scheduling instructions from the head end system, or predetermined ad ordering and selection algorithms.”), ¶50 (“In accordance with one embodiment, the ad scheduler 312 can determine in

advance the ad insertion schedule based on scheduling instructions from the head end system 10 or predetermined scheduling algorithms. This can be accomplished as follows. The head end system 10 may transmit the avail information (e.g., timing/duration of upcoming avails, etc.) to the subscriber system 20 for storage in the avail storage unit 318. Based on the avail information in the storage unit 318 and other information (e.g., the time of day, characteristics of the subscriber), the scheduler 312 may prepare in advance the ad schedule in the form of a queue discussed above.”), ¶15, ¶63, Figs. 3-4.

63. According to the ad insertion schedule, advertisements are inserted into avails in digital media content and displayed. Ex-1004, Abstract (“The system further includes an ad insertion module which inserts the advertisements into the programming channels according to the stored ordered list.”), ¶15 (“The ad processing unit determines the next ad or ads to be inserted into the upcoming avails of the programming channel, and the order in which these ads are to be inserted into the programming channel. ... The ad processing unit then inserts the ads in the avails as they arrive.”), ¶17 (“The set top box inserts the ads into the incoming programming channel according to the ad insertion schedule, and displays the programming channel with the inserted advertisements on the display device.”), ¶33 (“In accordance with the invention, the subscriber system inserts the ads into the incoming programming channel according to the most current ad

insertion schedule, and displays the programming channel with the inserted advertisements on a display device such as a TV or computer monitor.”), ¶¶46-47.

64. Avails are intervals for inserting advertisements that each corresponds to a position or location within media content. Ex-1004, ¶28 (“[V]arious television programming channels or streams include open commercial breaks designated specifically for the insertion of ads by the television service provider. That is, the normal stream of information in the channel includes intervals with default ads (avails) which can be substituted with other advertisements. Alternatively there may be blank intervals so that an advertisement from a source separate from the channel data itself can be inserted into that interval.”), ¶46 (“The channel extracted by the tuner function module 302 carries avail time information (e.g., analog or digital cue tones) which is detected by the avail information detector 310 and indicates the location of an avail in the received program stream.”), ¶29, ¶44.

65. Eldering-I’s ad scheduler teaches an **intersplicer** because it selects advertising content and controls insertion and conveyance of advertising content in media content by scheduling and rescheduling advertisements. *Supra* §IV.A. Eldering-I’s ad scheduler **controls one or more insertion points** (e.g., one or more avails corresponding to one or more advertisements’ positions in the ad insertion schedule) **of the digital advertising content** (e.g., advertisements) **into**

the digital media content (e.g., TV programming, recorded programming) ([1d], [17d], [22d]).

66. Creating the initial ad insertion schedule causes digital media content and digital advertising content to be sequenced into **a content stream** (e.g., TV programming or recorded programming with advertisements) **that comprises one or more initially sequenced insertion points** (e.g., one or more avails corresponding to one or more advertisements' original positions in the ad insertion schedule) **at which the digital advertising content is scheduled to be presented relative to the digital media content during play** ([1d], [17d], [21e], [22e]). Ex-1004, ¶46 (“Once the avail is detected based on the avail time information, the advertisement insertion module 304, according to the ad insertion schedule provided by the ad scheduler 312, requests a particular advertisement from the advertisement storage unit 314 which then sends the requested advertisement to the advertisement insertion module 304.”), ¶47 (“The advertisement insertion module 304 inserts or splices the received advertisement into the avail of the programming stream channel. The resulting program stream channel 305 with the inserted advertisement is decoded by the decoder 306 and sent to the display device 24 for display to the viewer of the display device 24.”), Abstract, ¶15, ¶29, ¶50, ¶63, ¶72, Figs. 3-4. Here, the ad scheduler is **configured to control one or more initially sequenced**

insertion points of the digital advertising content into the digital media content ([21d]).

67. Avails in Eldering-I's content stream divides the stream into media sections (e.g., portions of the media content between two avails) and advertisement blocks (e.g., advertising content inserted in avails). Ex-1004, ¶15, ¶29, ¶¶46-47, ¶63, Fig. 4:

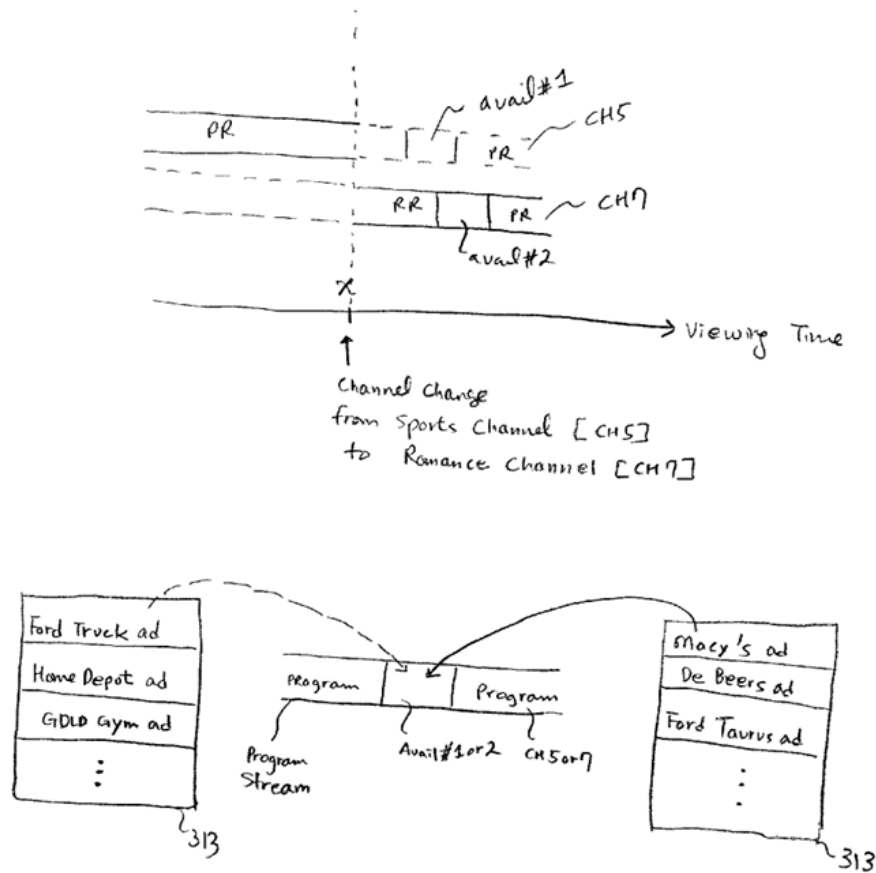


FIGURE 4

The ad scheduler sequences the digital media content and the digital advertising content ([1d], [17d], [21e], [22e]) by ordering one or more data

blocks of the digital media content and one or more data blocks of the digital advertising content into a content stream ([1d], [17d], [21e], [22e]).³ Elderling-I teaches that the content stream comprises a media section that comprises at least some of the digital media content, the content stream further comprising an advertising block within which at least some of the digital advertising content is scheduled to be presented during play, the advertising block being arranged within the content stream at an initially defined insertion position relative to the media section during play ([21e], [22e]).

68. This content stream is **playable as audio or visual content perceivable by the user**. *E.g.*, Ex-1004, ¶¶25-26 (“The media signals

³ Digital media content in video or audio form was conventionally encoded and distributed in terms of data blocks. *See, e.g.*, Ex-1008, 1:34-41 (“In particular, since the data amount of a digital video signal is large, data is compression-encoded with variable length code. The encoded data is recorded in a fixed length that is an editing unit of for example of one frame period. ... The resultant packet is referred to as data block.”); Ex-1009, 5:54-65 (“The data streams[] are shown comprising a number of data blocks []. Each block[] generally represents a section of the recorded audio/video signal.”). Elderling-I and Elderling-II both teach communicating media and advertising content using conventional data formats that include data blocks. Ex-1004, ¶26 (“The media signals communicated between the head end system and the subscriber systems can be *digital (e.g., MPEG) or analog, and may be communicated in any well known form (e.g., packet data, video streams, etc.)*.”); Ex-1005, ¶161 (“In a preferred embodiment, when the VoD content is encoded it is encoded into several segments. FIG. 7 illustrates an exemplary encoding of content into multiple parts so that ads can be inserted therewithin. ... As illustrated several ads are inserted between the different segments of the content.”), ¶¶168-172 (explaining that, similar to digital media content, advertisements are made up of combination of segments of video and frames), Figs. 11A-11C, ¶82, ¶182, Fig. 7.

communicated between the head end system and the subscriber systems can be digital (e.g., MPEG) or analog, and may be communicated in any well known form (e.g., packet data, video streams, etc.).”), ¶27 (“It is equally applicable to inserting advertisements into recorded data, for example, from a VCR or PVR.”), ¶36 (“The head end system 10 generates media signals (e.g., video signals including TV programming streams and/or advertisement signals) and may transmit the media signals to the subscriber systems 20 on a plurality of channels through the delivery network 15.”).

69. It is my opinion that the combination of Eldering-I and Eldering-II teaches “intersplicer” even under Patent Owner’s proposed construction. *Supra* §IV.A; Ex-1015, 000006, 000012.

70. First, as explained above, Eldering-I’s ad scheduler selects and schedules advertisements. *E.g.*, Ex-1004, Abstract, ¶16, ¶30, ¶32, ¶44, ¶¶49-52, ¶¶56-61, ¶¶63-64, ¶75. Eldering-I teaches that the ad scheduler schedules advertisements based on an hybrid orthogonal-linked sponsorship model, which includes rules regarding the advertisements to select for different avails. *Infra* §V.A.3[1f]/[17f]/[21g]/[22g]; Ex-1004, ¶¶76-82. Therefore, Eldering-I teaches an intersplicer that **enforces the conveyance of advertisements** by scheduling their insertion into a digital media stream based on rules.

71. Eldering-II further teaches enforcing the conveyance of advertisements by disabling the user's ability to fast forward through or skip over them. Ex-1005, ¶110 ("If ads are included in the content it is likely that the subscriber would attempt to fast forward or skip through the ads. In order for the advertiser to get some value, the content provider may not allow the subscriber to fast-forward or skip ads. That is, according to one embodiment the network side 520 may not permit VCR functions during ads."), Abstract, ¶58, ¶165. As explained below, a POSITA would be motivated to apply Eldering-II's teachings to Eldering-I to limit the user's ability to skip over or fast forward through advertisements. *Infra* §V.A.3[1i]/[17i]/[21k-1]/[22k-1]. This additionally teaches **enforcing the conveyance of advertisements**.

72. Second, Eldering-I teaches the ad scheduler manages a user's access to digital media content by controlling when digital media content, as opposed to advertisements, are being presented. *E.g.*, Ex-1004, ¶44, ¶¶49-52. Furthermore, Eldering-II limits the user's access to digital media content, for example, by disabling fast-forwarding and skipping of advertisements. *E.g.*, Ex-1005, ¶58, ¶110, ¶165. Therefore, Eldering-I, as well as the combination of Eldering-I and Eldering-II, teaches **digital rights management software**.

73. Furthermore, digital rights management software, with functionalities such as encrypting and decrypting media content, was widely used for distribution

of digital media content in the 2002 timeframe. *See* Ex-1017; Ex-1018. Elderling-I teaches providing copyrighted content (e.g., television programming) to a user and allowing the capabilities of recording and playing back such content. *E.g.*, Ex-1004, ¶25 (“A ‘subscriber system’ is a system at the subscriber’s end which receives, processes, and/or displays media signals (e.g., TV Programs) including advertisement signals. ... A ‘head end system’ is a system that originates the media signals and directs them to the subscriber systems. Examples of the head end system may include, but are not limited to, service providers such as a television service provider (e.g., ABC network, a local network), a cable television service provider, a Web TV service provider, a telephone service provider, an Internet service provider, a Direct Broadcast Satellite (DBS) service provider, a wireless television service provider, etc.”). A POSITA would have understood digital rights management functionalities were often implemented on devices with capabilities to record and play back copyrighted content to manage access, copying, or sharing of the content and that it would have been obvious to apply such functionalities to the combination of Elderling-I and Elderling-II. *Infra* §V.A.11.

74. Finally, Patent Owner’s proposed construction of “intersplicer” requires the intersplicer “to allow for free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user.” I observe that this requirement is directed more to the intended use of a digital media player

device/system than any technical features thereof. In the 2002 timeframe, digital media content was commonly made available to the public on the Internet for free, unlimited use with the help of advertisement revenue. *See, e.g.*, Ex-1019, ¶¶13-14 (“[A] consumer may choose to receive intellectual property products over a telecommunications network after viewing and/or interacting with an interposed sponsor’s or advertiser’s message, wherein the interposed sponsor or advertiser may pay the holder of the underlying intellectual property either directly or through an intermediary such as a facilitator.”); Ex-1020, 1:57-65; Ex-1021, ¶11. This is confirmed by the ’403 patent’s “Description of Background Art” section. *See* Ex-1001, 1:60-2:10 (“By virtue of the advertising sponsorship, broadcasters need not be concerned about the large number of consumers who view the content for free, and in fact, they seek the widest audience they can obtain, knowing that greater viewership leads to greater advertising revenue.”).

75. Because Eldering-I’s ad scheduler enables inserting advertisements in media streams and selection of suitable advertisements at different points in time (*infra* §§V.A.3[1e-f]/[17e-f]/[21f-g]/[22f-g]), the combination enables playing suitable advertisements whatever content the user chooses to view and allows the copyright owner of the media streams to be rewarded by advertisement revenue. Furthermore, Eldering-II teaches allowing users to freely access any portion of media content and maintain control over the play position. *E.g.*, Ex-1005, ¶109

(“VoD systems allow a subscriber to use VCR functions (i.e., *rewind, pause, fast-forward, stop the playback*) while viewing an on-demand program.”); *supra* §V.A.3[1c]/[17c]/[21c]/[22c]. Conventional user control functionalities such as play, stop, pause, rewind, fast forward, and skip were readily available in the 2002 timeframe. Eldering-II does not limit the user’s ability to use these control functionalities other than when advertisements are being presented. Therefore, the scheduling software allows **for free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user** as long as it is used by a content provider that does not charge a fee or hide the licensing terms from users. The business practice of offering free, unlimited viewing of requested digital media through a general licensing process that is transparent to the user was commonplace in 2002.

- [1e] in response to user input updating a current play position in the content stream to a new play position in the content stream, the one or more processors using one or more adaptive preference rules to adaptively modify a presentation position of the digital advertising content from at least one of the one or more initially sequenced insertion points to one or more alternatively sequenced insertion points in the digital media content, at least one of the one or more alternatively sequenced insertion points being different than the one or more initially sequenced insertion points relative to the digital media content within the content stream;**
- [17e] in response to user input updating a current play position in the content stream to a new play position in the content stream, the one or more processors using one or more adaptive preference rules to adaptively modify, a presentation position of the digital advertising content from at least one of the one or more initially sequenced insertion points to one or more alternatively sequenced insertion points;**
- [21f] adaptively re-sequencing the content stream into a modified content stream to reflect a user input comprising updating a current play position to a new play position in the digital media content detected at the digital media player system, the modified content stream comprising an alternate insertion position of the advertising block relative to the media section, the adaptively re-sequencing comprising determining the alternate insertion position using one or more adaptive preference placement rules associated with the digital media content;**
- [22f] adaptively re-sequencing the content stream into a modified content stream to reflect a user input comprising updating a current play position to a new play position in the digital media content detected at the digital media player system, the modified content stream comprising an alternate insertion position of the advertising block relative to the media section, the adaptively re-sequencing comprising determining the alternate insertion position using one or more adaptive preference placement rules associated with the digital media content during play;**

76. Simply put, these limitations recite that, when a user activates a feature, such as fast forward or skip, the software changes at least one location within the video where an advertisement was initially going to be displayed.

77. **First**, the combination teaches changing the insertion points/positions of advertising content in response to user input (e.g., skipping, fast forwarding). As explained above, Eldering-I teaches that the content stream comprises one or more initially sequenced insertion points at which the digital advertising content is scheduled to be presented relative to the digital media content. *Supra* §V.A.3[1d]/[17d]/[21e]/[22e]; Ex-1004, Abstract, ¶15, ¶29, ¶¶46-47, ¶50, ¶63, Figs. 3-4.

78. Eldering-I teaches rescheduling advertisements in response to changes to viewing parameters. Ex-1004, Abstract (“The ad scheduler stores an ordered list corresponding to the identified order and modifies the stored ordered list whenever a modification requiring event occurs.”), ¶16 (“The ad processing unit may also readily change the ad insertion schedule so that the most appropriate ads are actually inserted into the incoming programming channel. Changes in one or more of certain viewing parameters may warrant a change in the ad insertion schedule since the currently scheduled ads may not be appropriate in view of the change in the viewing parameters.”), ¶18, ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶63, ¶75, ¶82, Fig. 4.

79. Eldering-I contemplates a broad range of viewing parameters, such as type of program being watched, characteristics of the next avail, identity of the current viewer, and the time of day. Ex-1004, ¶16 (“Such viewing parameters may include, but are not limited to, channel selection, viewer identity, and the type of program being watched.”), ¶30 (“Such viewing parameters may include, but are not limited to, the channel selections made by the current viewer, the identity of the current viewer, the type of program being watched by the current viewer, and the size of the next avail in the current programming channel.”), ¶51 (“Such circumstances may include, but are not limited to, the time of day, program or type of program being watched, channel selection, identity of the current viewer, and timing/duration of the upcoming avail. In the present specification, these circumstances are also referred to as viewing parameters.”), ¶75.

80. The rescheduling modifies advertisements’ positions in the queue (e.g., moving an advertisement to the top of the queue, moving the next ad in the queue down). *E.g.*, Ex-1004, ¶53 (“[T]he identity of the viewer may change so that a different person is watching the program. Then, depending on who the new viewer is, the next ad in the queue may not be appropriate to the new viewer (e.g., if the new viewer is a child). In such a case, the ad schedule may be changed so that another ad, which is more appropriate to the new viewer, is moved to the top of the queue for insertion.”), ¶54 (“[T]he type of program or channel being

watched may change, so that the next ad in the queue may not be appropriate for the new program or channel being watched. For instance, if the next ad at the top of the queue is for display during a football game on ESPN, this ad may not be most appropriate if the channel is suddenly switched to the Martha Stewart Show on PBS. At this time, the ad schedule change may be needed so that an ad that is more appropriate for display during the Martha Stewart Show can be moved to the top of the queue.”). Eldering-I teaches doing so by reordering ARLs of advertisements in the queue. Ex-1004, ¶56 (“The rescheduling of advertisements (i.e., changing the ad insertion schedule) in the queue may encompass reordering the entire list of ARLs, or selectively changing the first or few items on the queue list, which may vary depending on the application.”), ¶77.

81. For example, by way of the reordering, an advertisement is moved from an original lower position in the queue to the top of the queue. Before rescheduling, the advertisement is scheduled to be inserted in an avail corresponding to its original position in the ad insertion schedule. This is an initially sequenced advertisement insertion point/position. As the rescheduling moves the advertisement to the top of the queue, the advertisement is scheduled to be inserted in the first upcoming avail after the changes to the viewing parameters occur. This modifies the advertisement insertion point/position.

82. Eldering-I teaches performing rescheduling on a continuous, on-going, and real-time basis. Ex-1004, ¶32 (“Based on the detection of the changes in the viewing parameters, the ad processing unit may *modify the ad insertion schedule on a on-going, real-time basis* so that ads that are most appropriate to the current viewer are inserted and displayed to the current viewer.”), ¶63 (“In this manner, the rescheduling of ads may occur continuously so that ads that are most appropriate for the current viewer are inserted and played.”), ¶52, ¶55, ¶58, ¶75. In this way, the ad scheduler adaptively modifies advertisement insertion points based on changes to viewing parameters, making the new advertisement insertion point an alternatively sequenced advertisement insertion point.

83. Eldering-I teaches **adaptively modifying a presentation position of the digital advertising content from at least one of the one or more initially sequenced insertion points** (e.g., avail corresponding to an advertisement’s original position in the ad insertion schedule) **to one or more alternatively sequenced insertion points** (i.e., avail corresponding to the advertisement’s new position in the ad insertion schedule) **in the digital media content** ([1e], [17e]). Given the changing positions of an advertisement in the ad insertion schedule and different avails corresponding to the changing positions, Eldering-I teaches that **at least one of the one or more alternatively sequenced insertion points is different than the one or more initially sequenced insertion points relative to**

the digital media content within the content stream ([1e]). By modifying the ad insertion schedule based on changes to viewing parameters, Elderling-I teaches **adaptively re-sequences the content stream** (e.g., original content stream) **into a modified content stream** (e.g., content stream with rescheduled advertisements inserted), **where the modified content stream comprises an alternate insertion position of the advertising block** (i.e., avail corresponding to advertisement's new position in the ad insertion schedule) **relative to the media section** ([21f]/[22f]).

84. *Second*, the combination teaches **user input detected at the digital media player system that updates a current play position to a new play position in the stream of digital media content** ([1e], [17e], [21f], [22f]). As explained above, the combination teaches a user interface that allows user input for controlling a course of presentation of the digital media content to be detected. *Supra* §V.A.3[1c]/[17c]/[21c]/[22c]; e.g., Ex-1004, ¶8, ¶¶25-27, ¶¶70-72; e.g., Ex-1005, ¶109 (“VoD systems allow a subscriber to use VCR functions (i.e., *rewind, pause, fast-forward, stop the playback*) while viewing an on-demand program.”), ¶110 (“the fast-forward and skip functions...”), ¶54. These control functionalities allow the user to fast forward through or skip over advertisements. Ex-1005, ¶58 (“[W]hen the subscriber attempts to skip or fast forward the ad they are presented with an alternative ad in place of or in conjunction the targeted ad.”), ¶110 (“If ads

are included in the content it is likely that the subscriber would attempt to fast forward or skip through the ads.”), ¶112, ¶124, ¶165.

85. Skipping over content updates the play position from a position preceding the skipped over portion to a position subsequent to the skipped over portion. *See, e.g.*, Ex-1014, ¶21; Ex-1023, ¶34, ¶36, Fig. 5; Ex-1022, ¶¶10-15, Fig. 1. Fast forwarding updates a current play position where the fast forwarding starts to a new play position where the fast forwarding ends. *See, e.g.*, Ex-1014, ¶19 (“Portions of digital content may also be bypassed by increasing the play out speed. When increasing the play out speed, the device omits rendering portions of content and quickly jumps from one frame to another frame further in content.”). The updating of the play position occurs when at least part of an advertisement is bypassed. *See, e.g.*, Ex-1014, ¶21 (“The command may also configure the device to skip 30 seconds of content irrespective of whether the original advertisement is shorter or longer than 30 seconds. The advertisement is in this case either fully or partially skipped.”); Ex-1023, ¶36 (“[W]hen fast-forwarding or skipping, it is typical that the viewer will not be able to precisely skip to the beginning of the program material 505. When examining viewer behavior, most viewers will skip forward 506, then back up 504 into the preceding commercial break a few seconds in order to view all of the program material from the point where it starts 505.”), ¶34, Fig. 5.

86. As explained above, a POSITA would have found it obvious to implement user control functionalities such as skipping and fast forwarding, as taught by Eldering-II, on Eldering-I's digital media player device/system. *Supra* §V.A.3[1c]/[17c]/[21c]/[22c]. In light of the teachings of Eldering-I and Eldering-II, a POSITA would have found it obvious and been motivated to reschedule advertisements in response to user inputs such as skip and fast forward because, as explained below, such user inputs change viewing parameters. The combination thus teaches adaptively modifying a presentation position of the digital advertising content **in response to user input** updating a current play position in the content stream ([1e], [17e]) and adaptively re-sequencing the content stream into a modified content stream **to reflect user input** ([21f], [22f]).

87. A POSITA would have understood that a user input such as skip or fast forward changes the viewing parameters. For example, as was commonly known to those skilled in the art, different sections of a digital media stream may include different types of programs. For example, a television channel may show a sports program followed by a news program or a movie followed by a talk show. When skipping over or fast forwarding through the program (e.g., recorded TV or VOD program) changes it from one section to another, thereby changing the type of program being watched, it would have been obvious to reschedule advertisements in light of Eldering-I's teachings. *E.g.*, Ex-1004, ¶51.

88. As another example, Eldering-II teaches the skipping or fast forwarding operation allows a user to bypass advertisements. Ex-1005, ¶58, ¶110, ¶112, ¶124, ¶165. Because the advertisements are inserted in avails, this teaches bypassing one or multiple avails, causing a different avail to follow the updated play position. *E.g.*, Ex-1005, ¶148, ¶¶162-164, ¶178, ¶182. A POSITA would have found it obvious to reschedule advertisements to accommodate the characteristics of the new avail, including its size, which may be different from the avails that are bypassed. *E.g.*, Ex-1004, ¶30.

89. As yet another example, Eldering-I teaches identifying a viewer based on the viewer's viewing habits as shown by inputs. Ex-1004, ¶61 ("In accordance with the one embodiment, the profiling module 322 may identify the current viewer of the TV programming channels by processing information such as data from remote control operation through the profiling module 322 (e.g., a volume control and/or channel change control), time of day, and program being watched. By prestoring viewing habits of each viewer in the subscriber household and analyzing the currently receiving viewing habits of the viewer with the prestored viewing habits, the current viewer may be identified."). The ad scheduler reschedules advertisements based on changes to viewer identity. Ex-1004, ¶61 ("The profiling module 322 outputs the viewer change information to the ad scheduler 312 which uses this information to determine whether to reschedule

ads.’’). Inputs like skipping and fast forwarding, as taught in Eldering-II, pertain to viewers’ viewing habits. Such inputs, for example, demonstrate a viewer’s lack of interest in certain types of content. As another example, such inputs indicate a viewer’s habits of either watching full programs or skipping to specific parts of interest. These habits can be used to determine the viewer’s identity. The combination of Eldering-I and Eldering-II teaches rescheduling advertisements based on user inputs such as skipping or fast forwarding where such inputs indicate a change to viewer identity.

90. Because user inputs such as skipping and fast forwarding change the viewing parameters, a POSITA would have found it obvious and been motivated to apply Eldering-II’s teachings to Eldering-I, such that advertisements are rescheduled based on these user inputs. Eldering-I explains that changes to viewing parameters may render currently scheduled advertisements no longer appropriate and warrant rescheduling the advertisements, so that the most appropriate advertisements are inserted into the digital media content:

The ad processing unit may also readily change the ad insertion schedule so that the most appropriate ads are actually inserted into the incoming programming channel. Changes in one or more of certain viewing parameters may warrant a change in the ad insertion schedule since the currently scheduled ads may not be appropriate in view of the change in the viewing parameters. Such viewing parameters may

include, but are not limited to, channel selection, viewer identity, and the type of program being watched.

Ex-1004, ¶16, ¶32, ¶52, ¶82. User inputs such as skipping and fast forwarding are exactly the types of input that warrant changing a currently scheduled advertisement. As explained above, skipping over or fast forwarding through a portion of the content stream, may lead to the change in the type of program being watched, change the characteristics of the upcoming avails, or indicate that the viewer has changed.

91. These factors all suggest that the currently scheduled advertisements may not be appropriate anymore and rescheduling is needed to ensure appropriate advertisements are displayed at the upcoming avails. For example, if the user input causes the displayed media content to change from a news program to a sports program, this warrants reordering the ad insertion schedule to prioritize an advertisement related to sports. As another example, the user input may change the play position, such that the upcoming avail is 20 seconds rather than 30 seconds in length. This warrants bringing a shorter advertisement to the top of the queue. As yet another example, based on inputs of skipping or fast forwarding, it may be determined that the viewer has changed, which warrants prioritizing an advertisement of interest to the new viewer.

92. Eldering-I teaches that “any change in one of the viewing parameters or multiple changes in a combination of the viewing parameters may trigger rescheduling of advertisements[.]” Ex-1004, ¶56. Because user inputs of skipping or fast forwarding changes one or a combination of viewing parameters, it is obvious to reschedule advertisements in response to such inputs. The resulting sequence of media content and advertising content in the content stream reflects the user input. A POSITA would have found it obvious and been motivated to reschedule advertisements based on user inputs of skipping or fast forwarding because doing so would have advanced Eldering-I’s goal of ensuring that appropriate advertisements are scheduled and displayed.

93. Rescheduling advertisements based on user inputs of skipping or fast forwarding does not change the principle of operation of either reference. Eldering-I explicitly uses open-ended language to indicate that conditions that would trigger the rescheduling of advertisements are not limited to the enumerated examples (e.g., channel change). Ex-1004, ¶16 (“Such viewing parameters may include, *but are not limited to*, channel selection, viewer identity, and the type of program being watched.”), ¶30, ¶51, ¶75. Treating skipping and fast forwarding operations as triggering conditions for rescheduling advertisements would have fallen within the scope contemplated by Eldering-I. Eldering-II teaches displaying an alternative advertisement when a user fast forwards through or skips over an original

advertisement. Ex-1005, Abstract, ¶58 (“[W]hen the subscriber attempts to skip or fast forward the ad they are presented with an alternative ad in place of or in conjunction the targeted ad.”), ¶110 (“[T]he fast-forward and skip functions are not disabled but instead are modified to present the subscriber with a short alternative advertisement in place of a fast-forwarding ad (or may be in conjunction with the fast forwarding ad).”). Because rescheduling advertisements causes different advertisements to be displayed at different avails, rescheduling advertisements in response to skipping or fast forwarding inputs is consistent with the teachings of Eldering-II.

94. Triggering advertisement rescheduling based on fast forwarding or skipping inputs would have been well within the knowledge and skills of a POSITA. *Supra* §III. Doing so would have been simply combining prior art elements (e.g., Eldering-I’s rescheduling advertisements, Eldering-II’s skipping and fast forwarding inputs) according to known methods (e.g., triggering rescheduling of advertisements based on changes to viewing parameters) to yield predictable results (e.g., rescheduling advertisements in response to skipping or fast forwarding inputs). Since Eldering-I teaches rescheduling advertisements based on certain inputs (e.g., channel change), implementing the system according to the combination of Eldering-I and Eldering-II involves a simple substitution of one known element (e.g., channel change input) for another (e.g., skipping or fast

forwarding input) to obtain predictable results. A POSITA would have had a reasonable expectation of success in implementing a system based on the combination of Eldering-I and Eldering-II.

95. Furthermore, Eldering-I and Eldering-II have the same first-named inventor and Eldering-II explicitly incorporates Eldering-I in its entirety by reference. Ex-1004, 00001; Ex-1005, 00001, ¶2, ¶32. Both Eldering-I and Eldering-II are directed to devices (e.g., set top box, PVR) that present media content and advertisements to users. Eldering-II's incorporation of Eldering-I and the similarities between Eldering-I and Eldering-II provide strong indications that their technical features are compatible and intended to be used together. A POSITA would have had a reasonable expectation of success when implementing these related features together and would have understood that doing so does not change the principle of operation of either reference.

96. The combination further teaches or suggests that the operation of adaptively modifying a presentation position of digital advertising content is performed by **one or more processors** executing software instructions ([1e], [17e]). Eldering-I teaches using one or more processors to carry out the operations of the subscriber system and its APU. *Supra* §V.A.3[1b]/[17b]; Ex-1004, ¶26, ¶¶42-43, ¶62, Figs. 1-2. Eldering-I further teaches implementing the ad scheduler as part of the APU. Ex-1004, ¶42 (“As shown in FIG. 2, the APU 22 may include

... an ad scheduler 312 ...”). A POSITA would have found it obvious for one or more processors to carry out the operations of the ad scheduler, such as rescheduling advertisements.

97. As further explained below, the combination of Eldering-I and Eldering-II teaches that the one or more alternatively sequenced insertion points/alternate insertion positions are adaptively selected according to one or more adaptive preference rules. *See infra* §V.A.3[1f]/[17f]/[21g]/[22g]. The combination teaches **using one or more adaptive preference rules to adaptively modify a presentation position of the digital advertising content ([1e], [17e])** and that **the adaptively re-sequencing comprises determining the alternate insertion position using one or more adaptive preference placement rules associated with the digital media content during play**⁴ ([21f], [22f]).

98. The combination of Eldering-I and Eldering-II therefore teaches limitations [1e], [17e], [21f], and [22f].

⁴ The combination of Eldering-I and Eldering-II teaches that the alternate insertion position is determined “during play” because the advertising content is rescheduled “on a on-going, real-time basis” based on user input controlling a course of presentation of the media content. *E.g.*, Ex-1004, ¶32, ¶52, ¶55, ¶58, ¶63, ¶75.

- [1f] the one or more alternatively sequenced insertion points being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference rules taking into account the new play position and at least one of a length of time associated with playing the digital media content and a number of digital media data blocks of the digital media content to be played,**
- [17f] the one or more alternatively sequenced insertion points being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital media content to be played, and a point in time the digital media content is to be played,**
- [21g] the alternate insertion position being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference placement rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital media content to be played, and a point in time the digital media content is to be played,**
- [22g] the alternate insertion position being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference placement rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital media content to be played, and a point in time the digital media content is to be played,**

99. In a nutshell, these limitations are directed to changing where advertisements are played based on rules and taking into account time factors such as where in the media stream the user skips to, and when and how much media to play. Eldering-I's teachings about rescheduling advertising content to be displayed

after media playback resumes based on sponsorship model rules satisfy these limitations.

100. Eldering-I teaches **the one or more alternatively sequenced insertion points/alternate insertion position being adaptively selectable by the intersplicer according to selection criteria** (e.g., criteria based on linked-sponsorship parameters) **defined by the one or more adaptive preference rules**⁵ (e.g., rules of the hybrid orthogonal-linked sponsorship model) ([1f], [17f], [21g], [22g]).

101. Eldering-I teaches the ad scheduler adaptively selecting, scheduling, and rescheduling advertisements to be inserted into avails based on changes to viewing parameters such as channel selection, viewer identity, and the type of program being watched. *Supra* §V.A.3[1d-e]/[17d-e]/[21d-f]/[22d-f]; Ex-1004, Abstract, ¶16, ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶¶63-64, ¶75.

102. Eldering-I teaches adaptively selecting and scheduling advertisements to present for each avail based on a hybrid orthogonal-linked sponsorship model, taking into account the viewing parameters. Ex-1004, ¶¶76-82. Eldering-I explains that an orthogonal sponsorship model “allows targeted ads to be delivered to

⁵ Claims 21 and 22 recites “adaptive preference placement rule.” Because the specification of the ’403 patent does not mention this term or explain its difference from “adaptive preference rule,” I assume this term to have the same meaning as “adaptive preference rule.”

appropriate viewers without such ads being linked to program/time, so that viewers will always see targeted ads even if they change channels or view programs at different times.” Ex-1004, ¶76. According to the traditional linked sponsorship model, “each advertisement is ‘linked’ to a particular point within a particular channel.” Ex-1004, ¶5. Eldering-I explains that its system enables combining the orthogonal sponsorship model “with the traditional linked sponsorship model to create hybrid orthogonal-linked sponsorship models.” Ex-1004, ¶76.

103. The hybrid orthogonal-linked sponsorship incorporates linked sponsorship parameters into the queue of advertisements:

In hybrid orthogonal-linked sponsorship models, the orthogonal sponsorship based queue can be provided with one or more linked sponsorship parameters. Some of these parameters may identify, e.g., time dependence (signifying a specific time), time-of-day dependence (e.g. morning, afternoon, prime time), viewer dependence, or any combination thereof.

Ex-1004, ¶77, ¶80 (“By providing the advertiser the ability to add linked sponsorship parameters to the queue, the present invention allows the use of combination of linked and orthogonal sponsorship parameters[.]”). An ad queue according to the hybrid orthogonal-linked sponsorship model is shown in Figure 6:

AD QUEUE	TIME OF DAY	PROGRAMS	VIEWER
FORD	6-9PM		
MACY'S			A
KRAFT	9-12AM	SOAPS	
WALMART			
:			
SEARS	6-9PM	BUFFY	B

FIG. 6

Ex-1004, Fig. 6, ¶81:

FIG. 6 illustrates an example of an ad queue which may be used to implement the various sponsorship models of the present invention. As shown in FIG. 6, the ad queue can contain additional columns which indicate linked sponsorship parameters such as the time of day, programs in which the advertisement should be shown, and the viewer to which the advertisement should be shown. ... [I]f any one or more linked sponsorship columns are filled, then it indicates that the associated ads should be inserted into the programming streams

according to the hybrid orthogonal-linked model depending on which column is filled.

This enables “hybrid of orthogonal and linked sponsorships,” which “increases the effectiveness of targeted advertising.” Ex-1004, ¶82. The linked sponsorship parameters apply to Eldering-I’s subscriber system.

104. Changes to viewing parameters may affect whether one or more of the linked sponsorship parameters is satisfied, triggering rescheduling of advertisements according to the rules of the hybrid orthogonal-linked sponsorship model. As a first example, a user input of skipping or fast forwarding may move the play position to a different section of a digital media stream, which includes a different type of program. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]. For instance, the user input may change the program shown from a news program to a soap opera. In the scenario shown in Figure 6, this change warrants moving the “KRAFT” advertisement from the third place in the queue to the top of the queue⁶ because its linked sponsorship parameter “SOAPS” is satisfied by the current viewing parameter (e.g., a soap opera is being presented). Ex-1004, Fig. 6. Moving this advertisement to the top of the queue determines its alternatively sequenced insertion point/alternate insertion position to be the upcoming avail. This alternate

⁶ Moving the “KRAFT” advertisement to the top of the queue also depends on the linked sponsorship parameter “9-12 am.” For this example, I assume that this parameter is satisfied.

insertion point/position is determined by rules of the hybrid orthogonal-linked sponsorship model.

105. As a second example, based on a user input of skipping or fast forwarding, Eldering-I's profiling module may determine that the viewer has changed and that the new viewer is viewer A. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]. In the scenario shown in Figure 6, this change warrants moving the "MACY'S" advertisement from the second place in the queue to the top of the queue because its linked sponsorship parameter "A" is satisfied by the current viewing parameter (e.g., the viewer being A). Ex-1004, Fig. 6. Moving this advertisement to the top of the queue determines its alternate insertion point/position to be the upcoming avail. This alternate insertion point is determined by rules of the hybrid orthogonal-linked sponsorship model based on the requirement that the linked sponsorship parameter "A" is satisfied.

106. As a third example, Eldering-I further explains the scheduling and rescheduling of advertisements being based on "time dependence (signifying a specific time)." Ex-1004, ¶77. The "time dependence" linked sponsorship parameter indicates a particular time or position in the media content. Ex-1004, ¶5 ("In essence, each advertisement is 'linked' to a particular point within a particular channel. If any particular viewer is not viewing the particular channel at the particular time, he or she will not see the advertisement."). The satisfaction of this

parameter depends on the timing of an upcoming avail. Ex-1004, ¶¶50-51. A user input of skipping or fast forwarding may adjust the play position such that one of the upcoming avails corresponds to a particular time in the media content specified by the “time dependence” parameter. Based on rules of the hybrid orthogonal-linked sponsorship model, a determination that the avail satisfies the “time dependence” parameter causes an advertisement with this linked sponsorship parameter to be moved to a position in the queue that corresponds to the avail and assigned an alternate insertion point/position corresponding to the avail.

107. As a fourth example, the scheduling and rescheduling of advertisements can also be based on “time-of-day dependence (e.g., morning, afternoon, prime time)[.]” Ex-1004, ¶77. A user input, such as fast forward, can take a period of time, where the time that the input completes is different from when it starts. For instance, such a user input may begin before 6 pm and finish right after 6 pm. In the scenario shown in Figure 6, this change warrants moving the “SEARS” advertisement from its current place in the queue to a higher position (e.g., right after the “FORD” advertisement)⁷ because its linked sponsorship parameter “6-9 PM” is satisfied by the current viewing parameter (e.g., the time of the day is within 6-9 pm). Ex-1004, Fig. 6. Moving this advertisement to the top of

⁷ Moving the “SEARS” advertisement up also depends on the linked sponsorship parameters “BUFFY” and “B.” For this example, I assume that these parameters are satisfied.

the queue determines its alternatively sequenced insertion point/alternate insertion position to be the second upcoming avail. This alternate insertion point/position is determined by rules of the hybrid orthogonal-linked sponsorship model.

108. Therefore, Eldering-I teaches that the alternatively sequenced insertion points/alternate insertion positions are adaptively selectable by the intersplicer according to selection criteria (e.g., criteria based on linked-sponsorship parameters) defined by one or more adaptive preference rules (e.g., rules of the hybrid orthogonal-linked sponsorship model).

109. Eldering-I's teachings regarding the ad scheduler selecting, scheduling, and rescheduling advertisements into avails by rules of the hybrid orthogonal-linked sponsorship model fall within the scope of the plain and ordinary meaning of "an adaptive preference rule." The '403 patent indicates that "adaptive preference rules" "include ad preference tables [] and ad preference parameters" (Ex-1001, 32:60-67) and are "rules by which the intersplicer can perform adaptive ad selection and sequencing extemporaneously" (Ex-1001, 33:13-27). Eldering-I's hybrid orthogonal-linked sponsorship model includes rules by which the intersplicer (e.g., ad scheduler) can perform adaptive ad selection and sequencing extemporaneously. Ex-1004, ¶¶76-82. The '403 patent's description of adaptive preference rules is consistent with Eldering-I's rules of the hybrid orthogonal-linked sponsorship model.

110. Eldering-I further teaches **taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital media content to be played, and a point in time the digital media content is to be played in** selecting the alternatively sequenced insertion points/alternate insertion positions.

111. First, as explained above, the combination of Eldering-I and Eldering-II teaches rescheduling advertisements based on user input such as skip or fast forward, because such a user input would have changed viewing parameters such as the type of program and characteristics of the upcoming avail. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]. Both the type of program and the upcoming avail depend on the new play position. By taking into account these viewing parameters, the combination teaches **taking into account the new play position**.

112. Second, the linked sponsorship parameters include time dependence, which indicates a particular time in the media content (e.g., a particular point in the media content associated with a channel), where an advertisement can be inserted. Ex-1004, ¶5, ¶77. The satisfaction of this parameter depends on the timing of an upcoming avail—if the timing of the next avail matches the specific time in the media content for presenting an advertisement, the advertisement is selected for display. Ex-1004, ¶51 (“[T]he relative appropriateness of the prepared ad schedule may change as circumstances change. Such circumstances may include, but are not

limited to, the time of day, program or type of program being watched, channel selection, identity of the current viewer, and *timing/duration of the upcoming avail.*”), ¶50. Therefore, Eldering-I teaches that the adaptive preference rule (e.g., rules of the hybrid orthogonal-linked sponsorship model) is applied based on a linked sponsorship parameter regarding time dependence and a viewing parameter regarding the timing of an avail. The time dependence parameter signifies a specific time in the digital media content. Ex-1004, ¶77, ¶5. The signified time corresponds to **a length of time associated with playing the digital media content** (e.g., the length of time between the new play position and the signified time).

113. Eldering-I teaches that digital media content includes avails with predetermined time or location in the media content. Ex-1004, ¶44 (“In accordance with one embodiment, the avail data storage unit 318 stores therein avail information (e.g., avail size, avail ID, etc.) directed to the avails of the upcoming programming channels, which may be known in advance since avails, such as commercials breaks for TV programs, are predetermined by the TV networks.”), ¶13, ¶27, ¶35, ¶46, ¶50.

114. Because the timing or location of the avails are predetermined, there is a fixed portion of digital media content between an upcoming avail and the new play position. Ex-1004, ¶13, ¶27, ¶35, ¶44, ¶46, ¶50; Ex-1021, ¶33 (“The ad/avail

information[] may identify a list of ads to be scheduled as well as avail time information such as avail sizes, time durations between adjacent avails in a presentation stream, ad insertion window times, etc.”), ¶38, ¶40 (“An ad insertion window in the television art is known to be a window of time located on either side of the start of an avail, during which an ad insertion unit may anticipate the arrival of a cue tone or other ad insertion indicator known in the art.”), Figs. 5-6. A POSITA would have found it obvious to quantify this portion of the media content in terms of a number of data blocks of digital media content. *Supra* V.A.3[1d]/[17d]/[21e]/[22e] (explaining that media content is conventionally encoded and distributed in terms of data blocks). Inserting advertising content at the avails therefore takes into account **a length of time associated with playing the digital media content and a number of digital media data blocks of the digital media content to be played.**

115. Third, the linked sponsorship parameters include time-of-day dependence. Ex-1004, ¶77. Rescheduling advertisements based on this parameter takes into account **a point in time the digital media content is to be played.**

116. The combination therefore teaches limitations [1f], [17f], [21g], and [22g].

- [1g] such that at least one of the alternatively sequenced insertion points is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position; and**
- [17g] such that at least one of the alternatively sequenced insertion points is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;**
- [21h] such that the alternate insertion position is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;**
- [22h] such that the alternate insertion position is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;**

117. These limitations require that advertising content is inserted a predetermined amount of time/data after the position in media content to which the user has jumped or skipped.

118. As explained above, the combination of Eldering-I and Eldering-II teaches rescheduling advertisements into avails in response to a user input. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]. For example, an advertisement that is moved from an

original lower position in Eldering-I's ad insertion schedule to the top of the schedule is rescheduled from an avail corresponding to the original position to the first upcoming avail. *Id.* Depending on an advertisement's position in the updated ad insertion schedule, it is rescheduled to a corresponding upcoming avail. *Id.*

119. Eldering-I teaches that the locations of avails in media content are predetermined. Ex-1004, ¶44 (“In accordance with one embodiment, the avail data storage unit 318 stores therein avail information (e.g., avail size, avail ID, etc.) directed to the avails of the upcoming programming channels, which may be known in advance since avails, such as commercials breaks for TV programs, are *predetermined* by the TV networks.”), ¶46 (“The channel extracted by the tuner function module 302 carries avail time information (e.g., analog or digital cue tones) which is detected by the avail information detector 310 and indicates the location of an avail in the received program stream.”), ¶13, ¶27, ¶29, ¶35, ¶50. Because the locations of avails in media content is predetermined, for a new play position chosen by the user, the length of time or amount of media content between each upcoming avail and the new play position is fixed and predetermined. The amount of media content includes a fixed and predetermined number of data blocks. *Supra* V.A.3[1d]/[17d]/[21e]/[22e] (explaining that media content is conventionally encoded and distributed in terms of data blocks).

120. Eldering-I also teaches rescheduling based on linked sponsorship parameters including time dependence, which is satisfied when the timing of an avail matches the time for presenting an advertisement specified by the time dependence parameter. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]; Ex-1004, ¶5, ¶¶50-51, ¶77. The time dependence parameter predetermines the position in media content where an advertisement can be displayed, leading to a predetermined length of time and amount of content between this position and the new play position.

121. The combination of Eldering-I and Eldering-II teaches or suggests that **an alternatively sequenced insertion point/alternate insertion position is positioned at a play position** (e.g., position of avail corresponding to the advertisement's new position in the ad insertion schedule) **in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position and the play position being a predetermined number of digital media data blocks after the new play position** ([1g], [17g], [21h], [22h]).

122. Furthermore, Eldering-I teaches rescheduling advertisements based on the time of the day. Ex-1004, ¶51 (“However, the relative appropriateness of the prepared ad schedule may change as circumstances change. Such circumstances may include, but are not limited to, the time of day, program or type of program being watched, channel selection, identity of the current viewer, and

timing/duration of the upcoming avail.”), ¶77 (“time-of-day dependence (e.g. morning, afternoon, prime time)”), ¶79, ¶81, Fig. 6. A POSITA would have understood that the time of the day can be specified in different granularity. For example, it was obvious to specify the time of the day in terms of ranges of multiple hours (e.g., morning hours) or fractions of hours. Furthermore, a POSITA would have known that, traditionally, television advertisements were often scheduled at certain times of the hour such as top of the hour or half-past the hour. Accordingly, a POSITA would have found it obvious to specify times of the hour for displaying advertisements based on Eldering-I’s teachings because this is consistent with the conventional approach of inserting television advertisements. A POSITA would have been motivated to do so because specifying the time of the hour, as opposed to merely in terms of ranges of hours, improves the ability to flexibly controlling the timing for displaying advertisements and facilitates inserting advertisements at times that fit users’ viewing patterns. The combination thus teaches or suggests **the play position being at a predetermined time of the hour after the new play position.**

- [1h] a user interface output for causing presentation of the content stream during a play period associated with one or more states of play such that a part of the digital advertising content is adaptively played at the one or more alternatively sequenced insertion points, instead of at the one or more initially sequenced insertion points; and**
- [17h] a user interface output for causing presentation of the content stream during a play period associated with one or more states of play such that a part of the digital advertising content is adaptively played at the one or more alternatively sequenced insertion points, instead of the one or more initially sequenced insertion points; and**
- [21i] causing presentation of the modified content stream at the digital media player system during a play period associated with one or more states of play;**
- [22i] causing presentation of the modified content stream at the digital media player system during a play period associated with one or more states of play;**
- [21j] causing adaptive presentation of a required part of the digital advertising content at the alternate insertion position, instead of at the one or more initially sequenced insertion points;**
- [22j] causing adaptive presentation of a required part of the digital advertising content at the alternate insertion point, instead of the initially defined insertion position;**

123. These limitations basically require playing media and advertising content based on the modified sequence. Eldering-I's digital media player device/system (e.g., subscriber system) has a user interface, such as one provided by a set-top box for display by a television. Ex-1004, ¶25 ("A 'subscriber system' is a system at the subscriber's end which receives, processes, and/or displays media signals (e.g., TV Programs) including advertisement signals. Examples of the subscriber system may include, but are not limited to, an entertainment system

(e.g., TV, VCR, personal video recorder (PVR), etc.) including or coupled to a set top box or the like, a personal computer, or a computer work station.”), ¶37 (“In accordance with one embodiment, each of the subscriber systems 20 includes a set top box 23a, 23b or 23c, and a display device 24a, 24b or 24c coupled to the set top box. ... Each of the set top boxes 23 may further include components typically found in set top boxes, such as a tuner, *a user interface*, a CPU, ROM, RAM, etc.”), ¶34, Fig. 1. Eldering-I’s digital media player device/system therefore includes **a user interface output**.

124. Eldering-I further teaches that its user interface output **causes presentation of the content stream**, original and modified, **during a play period** ([1h], [17h], [21i], [22i]). *E.g.*, Ex-1004, ¶17 (“The set top box inserts the ads into the incoming programming channel according to the ad insertion schedule, and displays the programming channel with the inserted advertisements on the display device.”), ¶32 (“Based on the detection of the changes in the viewing parameters, the ad processing unit may modify the ad insertion schedule on a on-going, real-time basis so that ads that are most appropriate to the current viewer are inserted and displayed to the current viewer.”), ¶33 (“In accordance with the invention, the subscriber system inserts the ads into the incoming programming channel according to the most current ad insertion schedule, and displays the programming

channel with the inserted advertisements on a display device such as a TV or computer monitor.”), ¶25, ¶37, ¶47, ¶82.

125. As explained above, the combination teaches adaptively modifying a presentation position of the digital advertising content from one or more initially sequenced insertion points to the one or more alternatively sequenced insertion points/alternate insertion positions. *Supra* §V.A.3[1e]/[17e]/[21f]/[22f]. By presenting the modified content stream, the user interface output **causes adaptive presentation/playback of part of the digital advertising content** (e.g., rescheduled advertising content) **at the alternatively sequenced insertion points/alternate insertion position, instead of the initially sequenced insertion points** ([1h], [17h], [21j], [22j]). As explained below, the combination teaches that the part of the digital advertising content is **required** ([21j], [22j]). *Infra* §V.A.3[1i]/[17i]/[21k]/[22k].

126. The combination further teaches that the **play period is associated with one or more states of play** ([1h], [17h], [21i], [22i]). As explained below, Eldering-II teaches specifying that an advertisement can be played, is preferred to be played, or is required to be played. *Infra* §V.A.3[1i]/[17i]/[21k-1]/[22k-1]; Ex-1005, ¶155. Thus, the combination teaches that the play period for presenting the content stream is associated with at least three states of play: a state when media content is in progress, a state when optional advertising content (e.g.,

advertisements that can or are preferred to be played) is in progress, and a state when required advertising content is in progress.⁸

127. The combination therefore teaches limitations [1h], [17h], [21i-j], and [22i-j].

⁸ The '403 patent specification confirms this by broadly describing “state of play.” Ex-1001, 23:60-24:3 (“The logic for this behavior lies in step 518, which keeps settings in memory to indicate the current state of play, including a value to indicate whether or not a required ad or ad block is in progress.”).

- [1i] at least a first memory for storing a setting to indicate a first state of play, the setting including a first value to indicate presentation of a required part of the digital advertising content is in progress during presentation of the content stream such that responsive to detecting the first value in the first memory, the user interface input is disabled to prevent commands comprising at least one of a user volume control or a user navigation control from altering a course of presentation of the content stream while presentation of the required part of the digital advertising content is in progress.**
- [17i] at least a first memory for storing a setting to indicate a first state of play, the setting including a first value to indicate presentation of a required part of the digital advertising content is in progress during presentation of the content stream such that responsive to detecting the first value in the first memory, the user interface is disabled to prevent commands comprising a user navigation control from altering a course of presentation of the content stream.**
- [21k] keeping a setting, in at least a first memory of the digital media player system, to indicate a first state of play, the setting including a first value to indicate presentation of the required part of the digital advertising content is in progress during presentation of the modified content stream; and**
- [22k] keeping a setting, in at least a first memory of the digital media player system, to indicate a first state of play, the setting including a first value to indicate presentation of the required part of the digital advertising content is in progress during presentation of the modified content stream; and**
- [21l] responsive to detecting the first value in the first memory, disabling user interface commands comprising a user navigation control that enables the user to alter a course of presentation of the modified content stream.**
- [22l] responsive to detecting the first value in the first memory, disabling user interface commands comprising a user navigation control that enables the user to alter a course of presentation of the content stream.**

128. Simply put, these limitations require using a stored setting to disable control and disallow the user to skip while a required advertisement is being played. The combination of Eldering-I and Eldering-II teaches this feature by disabling user navigation control functionalities for required advertisements.

129. Eldering-II teaches that certain advertisements are required where others are optional. Ex-1005, ¶155 (“The associated ads portion of the VoD content list 582 may indicate ads that can, are preferred, or *are required to be played*, or ads that cannot, are disfavored, or are banned from being played in conjunction with the VoD content. For example, for the movie “Mission Impossible” ads for Pepsi and McDonalds may be played, ads for Ford and Burger King are preferred (i.e., premium fees for placement), while ads for BMW are required (i.e., advertiser paid fee to have their ad played every time this content is selected).”).

130. Eldering-II teaches two ways to handle user input for skipping over or fast forwarding through advertisements: disabling such control functions or displaying an alternative advertisement. Ex-1005, Abstract (“The system may either disable the fast-forwarding and skipping of the targeted ads or may present an alternative ad if the subscriber attempts to fast forward or skip the ad.”), ¶130 (“As previously discussed, the cost model may disable[] the VCR functions for the ads or alternatively may replace ads with alternative ads (ADhance system) when

the VCR functions are invoked.”), ¶165 (“As previously discussed the VoD system may not enable the subscribers to fast forward or skip advertisements that are delivered with the VoD content. Alternatively, the subscriber may be presented with a short alternative ad when the subscriber attempts to fast forward or skip the advertisement[.]”), ¶58, ¶110, ¶124.

131. In light of Eldering-II’s teachings, a POSITA would have found it obvious to disable user control functions such as skip and fast forward when a required advertisement is in progress, while an optional advertisement may be skipped and replaced with an alternative advertisement. As Eldering-II explains, an advertiser may pay a fee to ensure that an advertisement is displayed every time certain media content is selected. Ex-1005, ¶155. Prohibiting the user from skipping over or fast forwarding through such an advertisement is consistent with Eldering-II’s goal of ensuring that required advertisements are displayed.

132. Commands of user interface input such as skip and fast forward are navigation controls that control and alter a course of presentation of the content stream. *Supra* §V.A.3[1c]/[17c]/[21c]/[22c]. An obvious and straightforward way to prevent the user from fast forwarding through or skipping over rescheduled advertising content involves disabling the user interface input. Temporarily disabling user interface input was commonly and conventionally done to deactivate user commands. Eldering-II thus teaches or suggests that, when a required part of

the digital advertising content is in progress during presentation of the content stream, **the user interface input is disabled to prevent commands comprising a user navigation control** (e.g., skip, fast forward) **from altering a course of presentation of the content stream while presentation of the required part of the digital advertising content** (e.g., required advertisements) **is in progress** ([1i], [17i]). In doing so, Eldering-II teaches or suggests **disabling user interface commands comprising the user navigation control that enables the user to alter a course of presentation of the (modified) content stream** (e.g., skip, fast forward) ([21i], [22i]).

133. A POSITA would have been motivated to apply Eldering-II's teachings to Eldering-I such that certain advertisements are designated as required and user navigation control functions such as skip and fast forward are disabled when required advertisements are displayed because the modification would have advanced Eldering-I's goals. Eldering-I "pertains to targeted advertising" (Ex-1004, ¶3) with a goal of "improv[ing] the effectiveness of targeted advertising" (*id.*, ¶18). Eldering-I explains that it is desirable to allow an advertiser to "purchase[] a particular avail because it is in a program that has viewers which are of interest to that advertiser." Ex-1004, ¶78. Eldering-II teaches that an advertisement may pay a fee to have an advertisement played (Ex-1005, ¶155) and disabling user control functions allows "the advertiser to get some value" (*id.*,

¶110). A POSITA would have understood that, when navigation control functions such as skip and fast forward are available (*supra* §§V.A.3[1c, e]/[17c, e]/[21c, f]/[22c, f]), the user may use these functions to frequently bypass advertisements, which reduces the system's ability to deliver value to advertisers. Ex-1005, ¶110 (“If ads are included in the content it is likely that the subscriber would attempt to fast forward or skip through the ads.”). Applying Eldering-II's teachings of disabling user navigation control functions for required advertisements would have addressed this issue and ensured that value is provided to advertisers for purchasing a particular avail. Ex-1005, ¶110.

134. Applying Eldering-II's teachings to Eldering-I would have been obvious because it simply involves applying a known technique (e.g., disabling navigation control functions when required advertising content is displayed) to a known device/system (e.g., subscriber system) ready for improvement to yield predictable results. A POSITA would have had a reasonable expectation of success because disabling user control was a conventional function that a POSITA would have been able to implement using software. Eldering-II teaches this functionality in the context of providing VoD (“video on demand”) services. Ex-1005, Abstract ¶124, ¶130, ¶165. A POSITA would have found it obvious to apply this functionality to Eldering-I, whose disclosure is applicable to VoD systems. Ex-1004, ¶72 (“The present invention can also be utilized in Video on Demand (VoD)

systems in which advertising plays a role.”). Applying Eldering-II’s teachings to Eldering-I would not have changed the principle of operation of either reference because it uses a known technique (e.g., disabling navigation control functions when required advertising content is displayed) to improve a similar device/system in the same way that the technique is taught. According to the combination, when a required advertisement is in progress, user commands such as skip and fast forward are disabled according to Eldering-II’s teachings. When an optional advertisement is in progress, the user is allowed to skip the advertisement, and advertising content is rescheduled for upcoming avails according to Eldering-I’s teachings.

135. Eldering-I teaches generating and storing an advertisement insertion log, which indicates “the schedule of the ads inserted and whether or not they were inserted successfully and/or displayed.” Ex-1004, ¶48, Fig. 2:

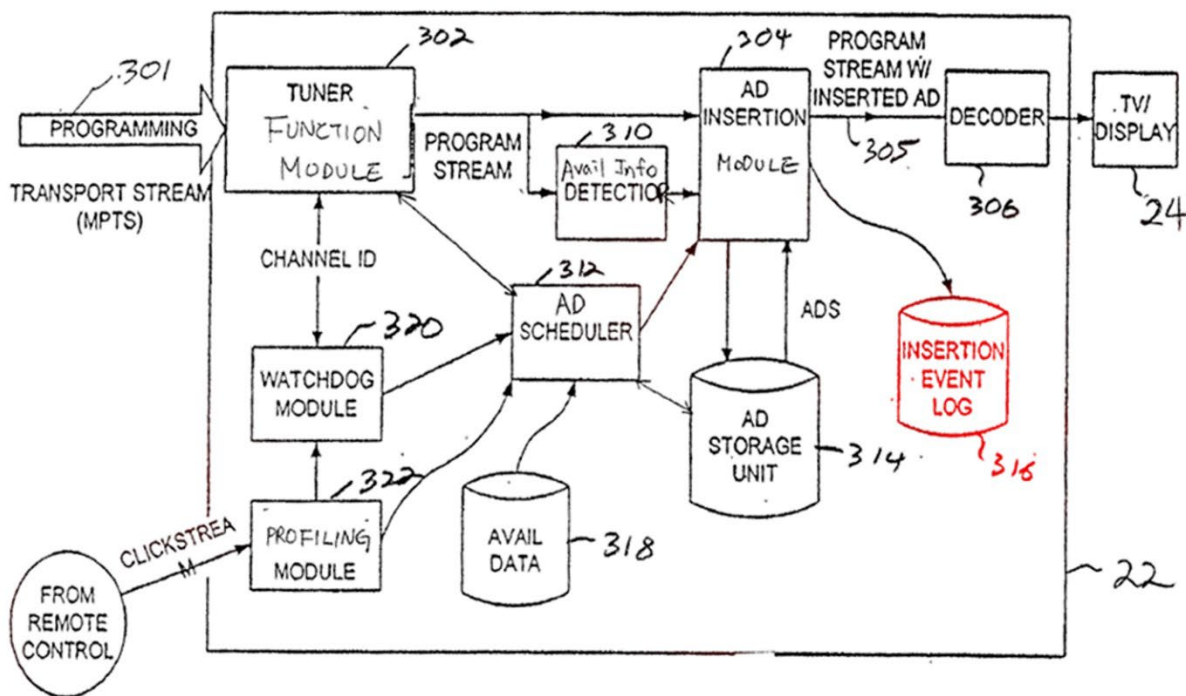


Figure 2

Eldering-II similarly teaches tracking viewing activity of media and advertising content. Ex-1005, ¶111 (“The STB 510 tracks the content and the ads that are viewed. The tracking of ads includes the ads that were received and whether the ads or the alternative ads were viewed.”). As a POSITA would have understood, by tracking viewing activities, Eldering-I and Eldering-II teach or suggest recording information in memory that indicate media or advertising content that has been viewed and how much they have been viewed (e.g., if an advertisement was skipped within the first five seconds versus fully watched).

136. By tracking the display of media and advertising content, Eldering-I and Eldering-II teach or suggest storing information about the content currently in

progress. For example, a POSITA would have found it obvious for the last or newest entry of Eldering-I's advertisement insertion log to correspond to an advertisement that is currently in progress. Alternatively, it was equally obvious for information about an advertisement that is in progress to be stored temporarily in memory and transferred to the advertisement insertion log after the content is displayed. Under either approach, information about the advertisement in progress is stored in memory. Ex-1004, ¶43 ("The APU 22 can be realized as a combination of both hardware and software and includes components which are typically used as part of a television set-top including a microprocessor, *Random Access Memory (RAM)*, and in the case of a Personal Video Recorder, *a hard drive.*"), ¶70. Checking the stored information provides a straightforward and obvious way to determine the state of play (e.g., what type of content is in progress).

137. A POSITA would have found it obvious to store the information about advertisement in progress as a setting in memory because this approach is fundamental to conventional computer architecture. Conventionally, a processor executes instructions stored in memory to perform operations on data also stored in memory. Software instructions generated and updated settings to represent states, variables, parameters, or configurations related to software execution events and activities. The settings often contained values representing states of the program, such as active or completed tasks and processes. The programs monitored and

updated these values based on user input, software execution events, or rules, thereby indicating the actions taken by the device running the program.

138. A POSITA would have understood that applying Eldering-II's teaching of disabling navigation control functions would have required determining that a required advertisement is in progress and a straightforward and obvious method to do so is to check the setting in memory containing such information. In fact, Patent Owner's Infringement Contentions indicate a belief that storing such a setting in the memory is necessary for the function of disabling user control when advertisement is shown. Ex-1016, 00065 ("When the Hulu client plays the ad, the user is unable to navigate past the ad, reflecting a state of play during an ad. Thus, Hulu necessarily keeps a setting in the memory of its digital media player system to indicate that advertising content is being played.").

139. The combination of Eldering-I and Eldering-II thus teaches or suggests **storing/keeping a setting** (e.g., setting in memory with information about the advertisement in progress) **in a first memory of the digital media player device/system to indicate a first state of play** (e.g., a state when required advertising content is in progress), **the setting including a first value** (e.g., information corresponding to the required advertising content) **to indicate that a required part of the digital advertising content** (e.g., required advertising content) **is in progress during presentation of the (modified) content stream**

such that responsive to detecting the first value in the first memory, user interface input/user commands are disabled ([1i], [17i], [21k], [22k]).

4. Dependent Claims 2, 15

2. The digital media player device as in claim 1, wherein the user interface input comprises a graphical user interface that includes a time bar to allow the user to control the course of presentation of the digital media content received to a specific point in the presentation past at least one of the one or more initially sequenced insertion points.

15. The device as in claim 1, wherein the user interface input includes a time bar configured to control the intersplicer to alter a course of presentation of the content stream in response to the user dragging the time bar, the dragging of the time bar enabling at least one of fast-forward play, skipping forward, backward skipping to a fixed point, slow motion play, and frame advance play.

140. The combination of Eldering-I and Eldering-II teaches the digital media player device of claim 1 (*supra* §V.A.3), and further teaches or suggests the additional limitations of claims 2 and 15.

141. Claims 2 and 15 are directed to time bar in a graphical user interface that allows basic user control such as skipping forward. Time bar (alternatively called progress bar or slider) was a common and conventional user interface component and has been used in media player software since the 1990s. The time bar allows user to track the progress of media playback visually and to rewind, skip, or fast forward through media content.

142. The combination of Eldering-I and Eldering-II teaches a user interface input that allows the user to control the course of presentation of the digital media

content using input such as skip or fast forward. *Supra* §V.A.3[1c]. **The user interface input includes a graphical user interface** (claim 2) as Eldering-I teaches that the user interface includes visual content (e.g., TV or recorded programming) that is displayed on a display device (e.g., TV). Ex-1004, ¶25 (“A ‘subscriber system’ is a system at the subscriber’s end which receives, processes, and/or displays media signals (e.g., TV Programs) including advertisement signals. Examples of the subscriber system may include, but are not limited to, an entertainment system (e.g., TV, VCR, personal video recorder (PVR), etc.) including or coupled to a set top box or the like, a personal computer, or a computer work station.”), ¶34, ¶37, Figs. 1-2. Commands such as skip and fast forward were conventionally carried out by a user dragging a slider to a desired point. *See, e.g.*, Ex-1023, ¶31, ¶45, Figs. 1, 2, 4, 9. A POSITA would have realized that manipulation of a time bar was one of a very limited number of conventional user interface designs that allow a user to skip or fast forward and found it obvious to implement the graphical user interface with a time bar.

143. The combination of Eldering-I and Eldering-II teaches rescheduling advertisements in response to a user input updating a current play position to a new play position and bypassing an original advertisement. *Supra* §V.A.3[1e]; Ex-1005, ¶58, ¶110, ¶112, ¶124, ¶165. Thus, the combination teaches or suggests **a time bar that allows the user to control the course of presentation of the**

digital media content received to a specific point (e.g., new play position) in the presentation past at least one of the one or more initially sequenced insertion points (claim 2).

144. The combination of Eldering-I and Eldering-II further teaches an intersplicer that sequences and re-sequences digital media content and digital advertising content, thereby controlling a course of presentation of the content stream in response to user input. *Supra* §§V.A.3[1d-e]. The combination therefore teaches or suggests **a time bar configured to control the intersplicer to alter a course of presentation of the content stream in response to the user dragging the time bar, the dragging of the time bar enabling at least one of fast-forward play, skipping forward, backward skipping to a fixed point, slow motion play, and frame advance play (claim 15).**

5. Dependent Claims 4, 5

4. The digital media player device as in claim 1, wherein the digital media content comprises at least one media file.

5. The digital media player device as in claim 1, wherein the digital advertising content comprises at least one advertisement file.

145. The combination teaches the digital media player device of claim 1 (*supra* §V.A.3), and further teaches the additional limitations of claims 4 and 5.

146. Eldering-II teaches that digital media content and digital advertising content are stored as files and transmitted to users. Ex-1005, ¶99 (“The ad database

570 stores ad metadata (in simple terms descriptions of the ads) 572 and *ad media files* (ads) 574. The VoD content database 580 stores a VoD content list 582 and *VoD media files* (VoD content) 584. ... As one skilled in the art would recognize, the download carousel 525 transmits the files that need to be updated to the subscriber at appropriate times (i.e., every night, every 8 hours) or when the content is required.”), ¶153, ¶163.

147. Eldering-II teaches storing a piece of media program as one media file (e.g., .mpg file for “Scary Movie II” in Fig. 6). Ex-1005, ¶99, ¶128 (“In this exemplary playlist the content (Scary Movie II) is preceded by two ads and a preview (likely a VoD preview) and is proceeded by two ads.”), Fig. 6:

600 S	610 S	620 S	630 S
Media Name	Type	HHMMSS	URL
Ford Focus	Ad	000030	\\media \ads \ford \focus.mpg
Green Giant Corn	Ad	000030	\\media \ads \pillsbury \corn.mpg
Lord of the Rings	Preview	000300	\\media \previews \newline \lordofrings.mpg
Scary Movie II	Movie	012200	\\media \movies \disney \scarymovie2.mpg
Ford ZX2	Ad	000030	\\media \ads \ford \zx2.mpg
Progresso Soup	Ad	000030	\\media \ads \pillsbury \progresso.mpg

FIG. 6

Alternatively, Eldering-II teaches storing a piece of media program as multiple media files. Ex-1005, ¶161 (“In a preferred embodiment, when the VoD content is encoded it is encoded into several segments. FIG. 7 illustrates an exemplary encoding of content into multiple parts so that ads can be inserted therewithin. As illustrated the content 700 is broken into 4 distinct part 710, 720, 730, 740 and each of these parts is stored in the VoD content database 580.”), Fig. 7:

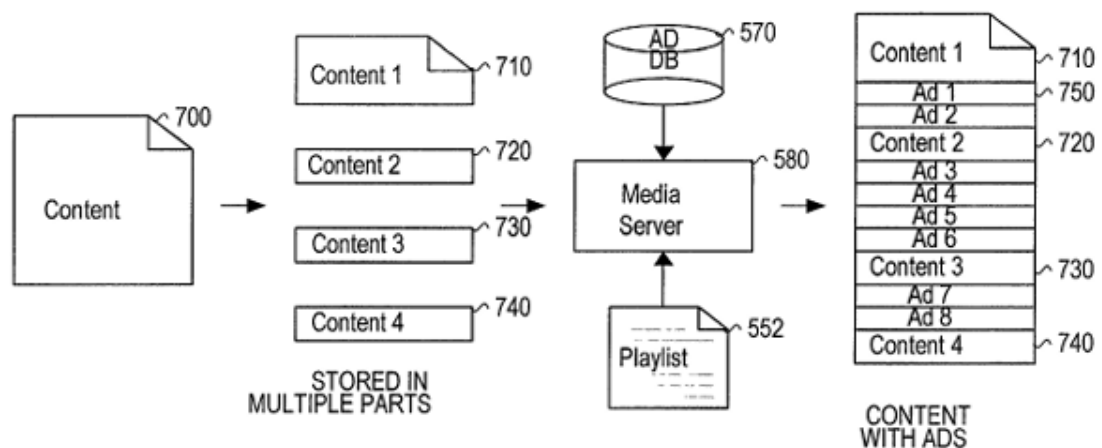


FIG. 7

148. A POSITA would have found it obvious that the approach of storing digital media content and digital advertising content as files were similarly applicable to Eldering-I because this was the most common, if not the only, manner to store data. Eldering-I also teaches encoding media and advertising content into MPEG files. *E.g.*, Ex-1004, ¶26 (“The media signals communicated between the head end system and the subscriber systems can be digital (e.g.,

MPEG) or analog, and may be communicated in any well known form (e.g., packet data, video streams, etc.).”). The combination of Eldering-I and Eldering-II thus teaches that **the digital media content comprises at least one media file** (e.g., a VOD media file) and that **the digital advertising content comprises at least one advertisement file** (e.g., an ad media file).

6. Dependent Claim 6

6. The digital media player device as in claim 5, wherein a sequence is generated by sub-dividing a media file into two or more segments, and wherein at least a part of the at least one of the advertising file is presented between two of the segments.

149. The combination teaches the digital media player device of claim 5 (*supra* §V.A.5), and further teaches the additional limitations of claim 6.

150. Eldering-I and Eldering-II both teach inserting advertising content within media content. Ex-1004, Abstract (“A system for inserting advertisement into channels of media programming are disclosed for improving effectiveness in targeted advertising.”), ¶27 (“A system for inserting advertisement into channels of media programming are disclosed for improving effectiveness in targeted advertising.”), ¶¶70-73 (“VoD Systems may utilize ads inserted into the programming[.]”), ¶¶28-29, ¶33, ¶47; Ex-1005, ¶100 (“As will be described in more detail later ads may be pre-pended or post-pended to the content, may be inserted in advertisement opportunities (avails) with the content, or may be the

type of ads that can displayed with the content (i.e., bugs).”), ¶126, ¶148, ¶¶159-161.

151. As explained above, Eldering-II teaches storing a piece of media program as one media file. *Supra* §V.A.5; Ex-1005, ¶99, ¶128, Fig. 6. Eldering-I and Eldering-II teach dividing a media program into multiple segments separated by avails. *Supra* §V.A.3[1d]; Ex-1004, ¶28 (“[V]arious television programming channels or streams include open commercial breaks designated specifically for the insertion of ads by the television service provider. That is, the normal stream of information in the channel includes intervals with default ads (avails) which can be substituted with other advertisements. Alternatively there may be blank intervals so that an advertisement from a source separate from the channel data itself can be inserted into that interval.”), ¶29, ¶¶46-47, ¶63, Fig. 4; Ex-1005, ¶100, ¶126, ¶148, ¶¶159-161. This teaches **sub-dividing the media file** (e.g., VOD media file for a movie) **into two or more segments** (e.g., segments before and after an avail respectively) and that **a sequence is generated**, where **at least a part of the at least one of the advertising file** (e.g., an ad media file inserted in an avail) **is presented between the two segments** (e.g., segments of the VOD media file before and after the avail).

7. Dependent Claim 7

7. The digital media player device as in claim 4, wherein the user input results in a change of a sequence of two or more media files by at least one of subtracting an existing media file and re-arranging the sequence of two or more media files in a change of sequence by adding a new media file.

152. The combination teaches the digital media player device of claim 4 (*supra* §V.A.5), and further teaches the additional limitations of claim 7.

153. Eldering-II teaches that user input such as skip and fast forward causes changes to the playlist defining a sequence of media and advertising content. Ex-1005, ¶101 (“The VoD Server 550 then prepares the playlist and forwards it to the media server 530. The media server 530 retrieves the ads 574 and the VoD content 584 from the respective databases 570, 580 based on a playlist 552. The media server 530 then delivers the data 574, 584 to the STB 510 in the order described in the playlist 552. The subscriber may fast-forward, rewind, pause, etc. the content by forwarding flow control commands 514 to the VoD server 550 to process.”).

154. The playlist is controlled by either a server or a subscriber device (e.g., PVR). Ex-1005, ¶101, ¶¶109-110 (“VoD systems allow a subscriber to use VCR functions (i.e., rewind, pause, fast-forward, stop the playback) while viewing an on-demand program. Thus, when the STB 510 begins receiving content from the media server 530, the subscriber can manage the flow of content (flow control)

by implementing the VCR functions. If the on demand content is downloaded (partially or completely) to a PVR prior to the subscriber beginning to view the content, the PVR can manage the flow control and flow control commands.”).

155. Elderling-II teaches a user’s skip or fast forward input resulting in rearranging a sequence of files (e.g., the playlist). This includes removing files that is skipped over or fast forwarded through, which are no longer displayed to the viewer, and adding files to be displayed to the viewer. For example, when an advertisement is skipped over or fast forwarded through, the file corresponding to the advertisement in the playlist is replaced with a file corresponding to an alternative advertisement. Ex-1005, ¶124, ¶165 (“For example, when a fast forward command is received, the playlist may be modified so that the alternative ad is transmitted instead of the ad. FIG. 9 illustrates an exemplary embodiment in which the playlist is modified as such. The modification of the playlist can either be accomplished by the VoD server 550 or the STB 510 (or PVR). In the PVR embodiment, the alternative ad may be contained on the PVR in which case the playlist will be modified to reflect that (regardless of whether the ad was on the PVR or the network)[.]”), Fig. 9:

ORIGINAL PLAYLIST

INDEX	DURATION	URL
001	000030	\\MEDIA\ADS\FOCUS.MPG
002	000030	\\MEDIA\ADS\CORN.MPG
...		

REPLACE AD IN PLAYLIST
WITH SHORT VERSION

NEW PLAYLIST

INDEX	DURATION	URL
001	000030	\\MEDIA\ADS\FOCUS_ADHANCE.MPG
002	000030	\\MEDIA\ADS\CORN.MPG
...		

FIG. 9

A POSITA would have understood that this approach is applicable regardless of whether the skip or fast forward operations affect advertising content or media content. For example, a user's skip or fast forward input may move the play position from a first piece of media content (e.g., a first episode of a TV show) to a second piece of media content (e.g., a second episode). This indicates that the user no longer wants to watch the first piece of media content and would like to switch to the next piece. In this case, a POSITA would have found it obvious, in light of Eldering-II's teachings, to remove media files associated with the first piece of media content and add media files associated with the second piece. Similarly, within one piece of media content, a user input of skipping or fast forwarding through a substantial part of the media content indicates a lack of interest in the

earlier content and a low likelihood of the user returning to the original play position. According to Eldering-II's teachings, a POSITA would have found it obvious to drop media files near the original play position in this scenario and add files near the new play position. Techniques that modifies a playlist based on user input were well known by the 2002 timeframe. Ex-1025, 7:16-30 ("Given the rich variety of viewers 450, a correspondingly rich set of user feedbacks can be provided to the feedback receiver 460. ... Such a feedback can include, but is not limited to, a command to skip ahead in the playlist, a command to skip back in the playlist, a command to generate a new playlist, a command to find scenes similar to the current scene and a command to play a longer scene related to the current scene."), 9:29-46 ("At 630, the method 600 can take an action based on the user feedback. For example, the method 600 can take actions including, but not limited to, moving forward in the playlist, moving backward in the playlist, searching for related media, and displaying a media item related to the scene. In some cases, the user feedback received at 620 and responded to at 630 may require the playlist to be updated."), 11:57-12:10 ("While a user watches media items identified in the playlist 1050, the user may decide to watch different videos and/or to update the playlist 1050."). A POSITA would have found it obvious that media files are removed from or added to a sequence as a result of user input.

156. As explained above, Eldering-II teaches storing media programs as multiple media files (*supra* §V.A.5; Ex-1005, ¶161, Fig. 7) and contemplates the scenario where a fast forward or skip input causes at least one media file to be bypassed (e.g., media files corresponding to movie bypassed when user moves to next movie, media files for part of a movie bypassed when user skips ahead). According to Eldering-II's teachings, it would have been obvious that the media file is removed from the playlist and replaced with media file(s) corresponding to content to be played at the new play position.

157. As explained above, a POSITA would have found it obvious to apply control functions (e.g., skip, fast forward) taught by Eldering-II to Eldering-I. *Supra* §V.A.3[1c]. A POSITA would have understood that Eldering-II's method of removing files from and adding files to a sequence based on user input is readily applicable to Eldering-I as well because this approach was well known and within the capabilities of a POSITA. For example, Eldering-I teaches that its disclosure is applicable to applications like video-on-demand. Ex-1004, ¶72. In the context of a VOD system, it is conventional to organize media files in a sequence and provide the user flexibility in choosing the content to view by arranging the playlist. It would have been obvious to implement user input such as skip and fast forward by replacing files in the sequence. The combination of Eldering-I and Eldering-II thus teaches or suggests that **the user input** (e.g., skip, fast forward) **results in a**

change of a sequence of two or more media files (e.g., VOD media files corresponding to a piece of media program) **by at least one of subtracting an existing media file** (e.g., a VOD media file corresponding to a skipped portion) **and re-arranging the sequence of two or more media files in a change of sequence by adding a new media file** (e.g., a VOD media file corresponding to a portion to be played at the new play position).

8. Dependent Claims 8, 9

- 8. The digital media player device as in claim 1, wherein the user input further comprises one or more navigational choices for the content stream.**
- 9. The digital media player device as in claim 8, wherein the one or more navigational choices are selected from a group consisting of: play, stop, pause/continue, reverse, rewind, fast-forward, slow-motion, track advance, frame-by-frame advance, go direct to point or page in sequence, advance chapter, page turn, change track, change media selection, shuttle knob, and one or more sound controls.**

158. The combination teaches the digital media player device of claim 1 (*supra* §V.A.3). As explained above, Eldering-II teaches that **the user input further comprises one or more navigational choices for the content stream** including, for example, **play, fast forward or go direct to point in sequence** (e.g., skip). *Supra* §V.A.3[1a], §§V.A.3[1c-d]; Ex-1005, Abstract, ¶58, ¶101, ¶109-110. The combination therefore teaches claims 8 and 9.

9. Dependent Claim 10

10. The digital media player device as in claim 1, further comprising: rotating, using an ad manager and an ad rotator, new advertising content into the content stream in response to the user input, the ad manager operative to receive ad files and select ad files for presentation from a database of ad files and the ad rotator configured to replace ad files with new ad files after the ad files have been presented.

159. While claim 10 uses terms such as “ad manager” and “ad rotator,” it is directed to software components that obtain advertisements from memory, provide them for presentation, and update advertisements. The combination teaches the digital media player device of claim 1 (*supra* §V.A.3), and further teaches the additional limitations of claim 10.

160. Eldering-I teaches an ad insertion module that inserts advertisements into media content. Ex-1004, Abstract (“The system further includes an ad insertion module which inserts the advertisements into the programming channels according to the stored ordered list.”), ¶42 (“FIG. 2 is an exemplary functional block diagram of the ad processing unit (APU) 22 which may be included in the set top box 23 of the subscriber system 20 according to the present invention. As shown in FIG. 2, the APU 22 may include a tuner function module 302 for receiving at least one programming stream 301, *an ad insertion module 304*, a decoder 306, an avail information detector 310, an ad scheduler 312, an ad storage unit 314, an insertion event log module 316, an avail data storage unit 318, a

watchdog module 320, and a profiling module 322, all operatively connected.”),

Fig. 2:

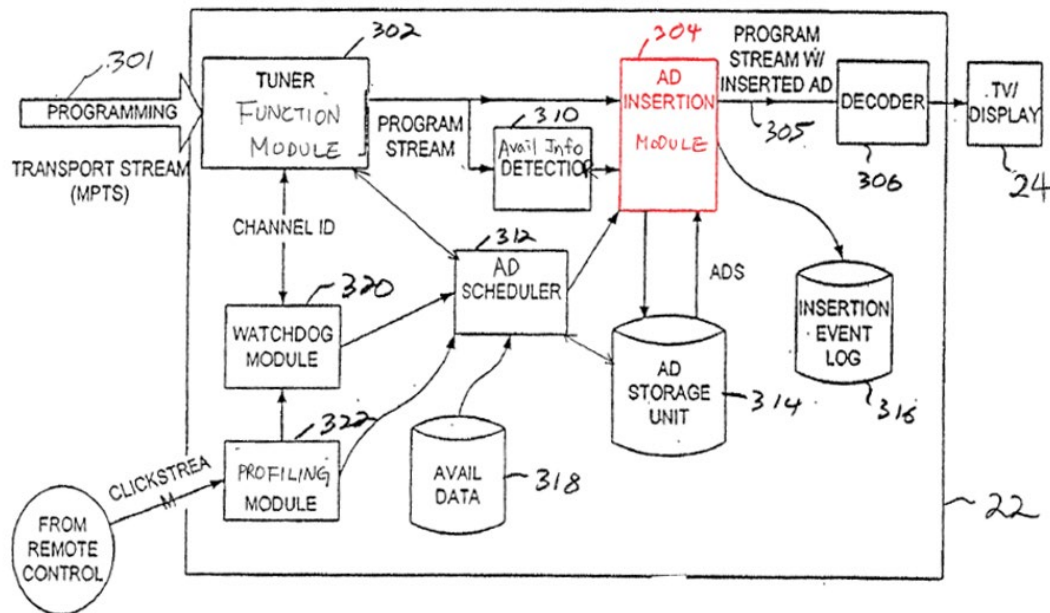


Figure 2

161. The advertisement insertion module receives an ad insertion schedule or information about the next advertisement from the ad scheduler, and in response, requests an advertisement from local storage and inserts it in digital media content. Ex-1004, ¶49 (“The ad scheduler 31 notifies the advertisement insertion module 304 of either the entire ad insertion schedule or the next advertisement to be inserted according to the ad insertion schedule.”), ¶46 (“[T]he advertisement insertion module 304, according to the ad insertion schedule provided by the ad scheduler 312, requests a particular advertisement from the advertisement storage unit 314 which then sends the requested advertisement to the

advertisement insertion module 304.”), ¶47 (“The advertisement insertion module 304 inserts or splices the received advertisement into the avail of the programming stream channel.”), ¶48, Abstract, ¶11, ¶17, ¶33, Fig. 2. In performing these operations, the advertisement insertion module selects advertisements that match the ad insertion schedule from those stored in local storage. Eldering-I thus teaches **receiving ad files and selecting ad files for presentation from a database of ad files** (e.g., advertisement storage unit).

162. As explained above, the combination of Eldering-I and Eldering-II teaches modifying the ad insertion schedule in response to user input. *Supra* §V.A.3[1e]; Ex-1004, Abstract, ¶16, ¶18, ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶63, ¶75, ¶82, Fig. 4. This causes the advertisement insertion module to insert different advertising content into digital media content. *E.g.*, Ex-1004, Abstract (“The ad scheduler stores an ordered list corresponding to the identified order and modifies the stored ordered list whenever a modification requiring event occurs. The system further includes an ad insertion module which inserts the advertisements into the programming channels according to the stored ordered list.”), ¶16 (“The ad processing unit may also readily change the ad insertion schedule so that the most appropriate ads are actually inserted into the incoming programming channel.”), ¶52 (“In view of the changes in one or more of the viewing parameters, it may be necessary or appropriate to change the ad schedule, some in real time, so that most

appropriate ads are actually inserted into the programming streams.”), ¶33. This **rotates new advertising content into the content stream in response to the user input.**

163. The advertisement insertion module inserts advertisements in the media stream and provide it for display (after decoding) at a display device. Ex-1004, ¶47 (“The advertisement insertion module 304 inserts or splices the received advertisement into the avail of the programming stream channel. The resulting program stream channel 305 with the inserted advertisement is decoded by the decoder 306 and sent to the display device 24 for display to the viewer of the display device 24.”). A POSITA would have understood that display devices, which Eldering-I explains can be “a TV or computer monitor” (Ex-1004, ¶33), include limited storage space (e.g., in a buffer). These devices were not designed to store streams of content in their entirety. Instead, they temporarily store portions of the incoming data in a buffer for display. Once a portion of content is rendered for display, it is removed from the buffer to allow space for the next portion of the content. By providing the media stream with advertisements to the display device, the advertisement insertion module **replaces ad files** (e.g., advertisements that have been displayed) **with new ad files** (e.g., advertisements to be displayed) **after the ad files have been presented.**

164. Because Eldering-I's advertisement insertion module includes software that performs the recited functionalities of the ad manager and the ad rotator, Eldering-I teaches **an ad manager and an ad rotator**. A POSITA would have understood that software programs were routinely grouped or divided into functional modules or components. It would have been obvious for Eldering-I's advertisement insertion module to include components corresponding to an ad manager and an ad rotator, respectively.

165. While Eldering-I's advertisement insertion module includes the recited functionalities of the ad manager and ad rotator, Eldering-II includes additional relevant teachings applicable to Eldering-I that further satisfy the limitations of claim 10.

166. First, Eldering-II teaches a set-top box selecting advertisements based on subscriber profiling and requesting the selected advertisements from a server. Ex-1005, ¶¶54-55 ("According to one embodiment in which the CoD system is a VoD system, the advertisement profiles will be downloaded to the STB (or personal video recorder (PVR)) and the STB will make a determination as to which advertisements should be presented to the subscriber along with the video that the subscriber selected. ... The ads are then selected and the selections are transmitted upstream to the VoD system for delivery to the subscriber with the video. According to one embodiment in which the CoD system is a VoD system, the ads

are stored in the PVR and are inserted locally.”), ¶¶119-122 (“According to one embodiment, the STB 510 may select the ads itself by comparing ad metadata 572 to the subscriber profile. ... According to one embodiment, the STB 510 ranks the ads based on the amount of correlation between the ad and the subscriber. Whether the STB 510 simply determines matching ads or ranks the ads, the results (suggested ads) 516 are sent to the server side 520 for further processing.”), Abstract, ¶52, ¶¶99-100, ¶112.

167. The set-top box receives the requested advertisements from an ad database of the server. Ex-1005, ¶99 (“The ad database 570 stores ad metadata (in simple terms descriptions of the ads) 572 and ad media files (ads) 574. ... As one skilled in the art would recognize, the download carousel 525 transmits the files that need to be updated to the subscriber at appropriate times (i.e., every night, every 8 hours) or when the content is required. It should be noted that the ad metadata 572 need not be sent to the STB 510, and in fact, would probably only be sent to the STB 510 if the STB 510 did some type of profiling on the subscribers and could use this profiling to select potential ads based on the ad metadata 572 (discussed in more detail later).”), ¶100 (“According to one embodiment in which the STB 510 has some profiling capabilities, the STB 510 may forward suggested ads to the VoD server 550. The suggested ads 516 may be transmitted at the same time as the VoD request 512 or at different times.”), ¶161 (“Once, the VoD server

generates the playlist 552, the media server 530 selects the appropriate content 710-740 and the appropriate ads 750 from the ad database 570 so that the content can be delivered to the subscriber with ads.”). Eldering-II thus teaches **receiving ad files** (e.g., ad media files) **and selecting ad files for presentation from a database of ad files** (e.g., ad database).

168. Eldering-II further teaches deleting advertisements that have been shown to a user and receiving updated advertisements from the server. Ex-1005, ¶138 (“[I]f the ad selection is based on the viewer profiles, the STB will delete ads from consideration that have been displayed to the subscriber more than a predetermined number of times.”), ¶99 (“[T]he download carousel 525 transmits the files that need to be updated to the subscriber at appropriate times (i.e., every night, every 8 hours) or when the content is required.”). This teaches **replacing ad files** (e.g., ad media files that have been displayed to the subscriber more than a predetermined number of times) **with new ad files** (e.g., ad media files sent as an update) **after the ad files have been presented**.

169. It would have been obvious to apply the aforementioned teachings of Eldering-II to Eldering-I. First, Eldering-I teaches selecting advertisements to insert in media stream based on viewer identity. *Supra* §§V.A.3[1e-f]; Ex-1004, Abstract, ¶16, ¶30, ¶¶51-52, ¶75. This ensures that “ads that are most appropriate to the current viewer are inserted and displayed to the current viewer.” Ex-1004,

¶32. Because Eldering-I's advertisements are obtained from the server side (e.g., head end system) (*supra* §V.A.3[1b]; Ex-1004, ¶36), a POSITA would have found it desirable to select advertisements that match viewers for Eldering-I's subscriber system and receive the selected advertisements from the server side. Doing so would have ensured that the transmitted advertisements are appropriate for the viewers and prevent the unnecessary transmission of advertisements that would not be scheduled into the media stream. Eldering-I teaches performing viewer profiling using a profiling module at the subscriber system and transmitting advertisement metadata to the subscriber system. Ex-1004, ¶61, ¶74, Fig. 2. A POSITA would have understood that Eldering-I's subscriber system is in a position to select advertisements by comparing advertisement metadata with viewer profiling information. Applying Eldering-II's teachings to Eldering-I would have involved no more than using a known technique (e.g., client device selecting and requesting advertisements from server) to improve a similar system (e.g., Eldering-I's subscriber system) in the same way.

170. Second, Eldering-I teaches receiving advertisements and storing them at the subscriber system. *E.g.*, Ex-1004, ¶¶35-36 ("The ads that are pointed to by the ARLs preferably are stored in a memory local to the set top box."), ¶8. A POSITA would have understood that repetitively showing an advertisement that a viewer has watched multiple times results in diminished benefits because the

viewer is likely already familiar with the advertised product and bored with the advertisement. A POSITA would have been motivated to apply Eldering-II's approach of removing advertisements that have been viewed multiple times to avoid diminishing the effectiveness of advertisements and make space for new advertisements to be stored at the subscriber system. The combination applies a known technique (e.g., removing advertisements that have been viewed multiple times) to a known system (e.g., Eldering-I's subscriber system) ready for improvement to yield predictable results (e.g., fresh advertisements available to be played).

171. A POSITA would have found it obvious to apply these features of Eldering-II to Eldering-I's advertisement insertion module or group them with the functionalities of the advertisement insertion module because these features are logically related to the advertisement insertion module's functionalities. For example, the advertisement insertion module selects and requests advertisements from local storage. Ex-1004, ¶¶46-47. It would have been obvious to configure the advertisement insertion module to perform the closely related functionalities of selecting and requesting advertisements from server-side storage. As another example, the advertisement insertion module generates and stores an advertisement insertion log, which indicates which advertisements have been displayed. Ex-1004, ¶48 ("The advertisement insertion module 304 generates and stores the

advertisement insertion log of all insertion events in the log module 316. This is essentially the schedule of the ads inserted and whether or not they were inserted successfully and/or displayed.”). The recording of the advertisement insertion log provides a natural approach for advertisement insertion module to track the number of times an advertisement has been played and remove those that have been played multiple times. Applying Eldering-II’s teachings to Eldering-I would have involved modification to software that a POSITA would have had a reasonable expectation of success in implementing. The modifications enhances Eldering-I’s functionalities and does not change the principle of operation of either reference. The combination therefore teaches claim 10.

10. Dependent Claim 11

11. The digital media player device as in claim 1, wherein the adaptively modifying uses two or more of the adaptive preference rules for determining the one or more alternatively sequenced insertion points of at least a part of the digital advertising content.

172. The combination teaches the digital media player device of claim 1 (*supra* §V.A.3). As explained with respect to limitations [1e] and [1f], the combination teaches adaptively modifying a presentation position of the digital advertising content to one or more alternatively sequenced insertion points that are selected based on adaptive preference rules. *Supra* §§V.A.3[1e-f]. The adaptive preference rules are taught by rules of the hybrid orthogonal-linked sponsorship model. *Supra* §V.A.3[1f]; Ex-1004, ¶¶76-82. Eldering-I teaches scheduling

advertising content based on multiple rules of the hybrid orthogonal-linked sponsorship model. Ex-1004, ¶80 (“By providing the advertiser the ability to add linked sponsorship parameters to the queue, the present invention allows the use of combination of linked and orthogonal sponsorship parameters[.]”). For example, in Figure 6, the advertisements “KRAFT” and “SEARS” both have multiple linked sponsorship parameters corresponding to multiple rules for scheduling them. Ex-1004, Fig. 6:

AD QUEUE	TIME OF DAY	PROGRAMS	VIEWER
FORD	6-9PM		
MACY'S			A
KRAFT	9-12AM	SOAPS	
WALMART			
⋮			
SEARS	6-9PM	BUFFY	B

FIG. 6

The combination thus teaches the additional limitations of claim 11.

11. Dependent Claim 13

13. The device as in claim 1, the digital media player device further comprising a media file decryptor configured to receive and decrypt the digital media content during play, the media file decryptor configured to limit access to a non-volatile memory following the decryption of the digital media content.

173. This claim is directed to the idea of protecting data using encryption/decryption and memory access control, which are fundamental and well-known in the context of transmission and storage of media content. The combination of Eldering-I and Eldering-II teaches the digital media player device of claim 1 (*supra* §V.A.3), and further teaches or suggests the additional limitations of claim 13.

174. Eldering-I teaches receiving copyrighted content (e.g., television program) from a head end system and providing such content to a user and allowing the capabilities of recording and playing back such content. *E.g.*, Ex-1004, ¶36, ¶¶44-47; *supra* §§V.A.3[1b], [1d]. A POSITA would have found it obvious to protect the copyrighted content from interception during transmission and to limit unauthorized individuals' access to the recorded content. *See, e.g.*, Ex-1017, ¶6 (“Often the content offered to users over the Internet or other networks is restricted or secured for any number of reasons. ... [T]he content may be available only on a pay-per view or membership basis ... Further, the content may be restricted since it is copyright protected.”), ¶40. It would have been obvious for Eldering's device to include digital rights management functionalities that provide

these protections, which were conventional and commonplace in the 2002 timeframe. *Supra* §V.A.3[1d]; e.g., Ex-1017, ¶9; Ex-1018, ¶25.

175. Encryption and decryption of media content was a well-known and widely used method to protect the media content during transmission. *See, e.g.*, Ex-1017, ¶37 (“decrypting the content with the encryption key”); Ex-1018, ¶66, ¶70, ¶94. Eldering-I and Eldering-II teach encoding and decoding media content according to standards such as MPEG. Ex-1004, ¶26, ¶42, ¶47, ¶74; Ex-1005, ¶82, ¶161. Encryption and decryption were conventionally carried out in conjunction with encoding and decoding. For example, the MPEG-4 standard as released in 2001 includes an intellectual property management and protection (IPMP) framework for content management and protection, which “must at a minimum ... [a]ppropriately manage (e.g. *decrypt* and release) protected elementary streams.” Ex-1024, 000069, 000011, 000029-31; Ex-1018, ¶70.

176. Therefore, it would have obvious for the content from the head end system to be encrypted, and for the software on Eldering-I’s device to receive and decrypt such content during play. The combination thus teaches or suggests that **the digital media player device comprises a media file decryptor configured to receive and decrypt the digital media content during play.**

177. Furthermore, Eldering-I’s device includes non-volatile memory for storing media content, such as a hard drive. Ex-1004, ¶8, ¶27 (“It is equally

applicable to inserting advertisements into recorded data, for example, from a VCR or PVR.”), ¶¶42-43 (The APU 22 can be realized as a combination of both hardware and software and includes components which are typically used as part of a television set-top including a microprocessor, Random Access Memory (RAM), and in the case of a Personal Video Recorder, *a hard drive.*), ¶¶70-71. A POSITA would have found it obvious to limit access to the memory to prevent unauthorized copying or redistribution of the media content after decryption, which was a widespread concern among content providers. *See, e.g.*, Ex-1013, ¶5 (“The ease of copying downloaded video makes it easy to illicitly reproduce and forward copyrighted materials without detection of this activity by the copyright owner.”); Ex-1018. Software functionalities that limit access to memory was well-known in the art. *E.g.*, Ex-1013, ¶38 (“[I]t is often necessary to restrict access to memory buffers containing the video content once it has been decrypted for playback, at least until a video decoder has accessed the content.”); Ex-1018, ¶71 (“The storage device (SD) is capable of storing the digital content. It can either be realized by an optical device, such as a CD or DVD, or by a flash erasable programmable read-only memory. The storage device is configured to hold protected content. Therefore, it is able to store different tables provided for controlling the access to the protected content by the rendering device.”), ¶79 (“The secure player 246 is adapted to render the encrypted digital content by using the respective keys

provided by the rights wallet or the storage device itself without enabling the user to copy decrypted digital content.”).

178. A POSITA would have found it obvious for Eldering-I’s device to have conventional software that limits access to its non-volatile memory and for the software to be implemented with the media file decryptor. Thus, the combination further teaches or suggests that **the media file decryptor is configured to limit access to a non-volatile memory following the decryption of the digital media content.**

12. Dependent Claim 14

14. The device as in claim 1, wherein the digital media player device is configured to read a data structure of the one or more data blocks of the digital media content, the data structure including a first field containing data identifying a media file associated with the digital media content, a second field containing data indicative of an ad requirement associated with the digital media content, and a third field containing data representing an ad file associated with the digital advertising content to be displayed with the media file.

179. The combination teaches the digital media player device of claim 1 (*supra* §V.A.3), and further teaches or suggests the additional limitations of claim 14.

180. Eldering-I teaches implementing its ad insertion schedule as a queue. *E.g.*, Ex-1004, ¶49 (“The ad scheduler 312 provides a schedule of ads to be inserted in the form of a queue or other forms”), ¶56 (“The rescheduling of advertisements (i.e., changing the ad insertion schedule) in the queue may

encompass reordering the entire list of ARLs, or selectively changing the first or few items on the queue list, which may vary depending on the application.”). The ad queue includes information about linked sponsorship parameters. Ex-1004, ¶77 (“In hybrid orthogonal-linked sponsorship models, the orthogonal sponsorship based queue can be provided with one or more linked sponsorship parameters”), ¶81 (“As shown in FIG. 6, the ad queue can contain additional columns which indicate linked sponsorship parameters such as the time of day, programs in which the advertisement should be shown, and the viewer to which the advertisement should be shown.”), Fig. 6:

AD QUEUE	TIME OF DAY	PROGRAMS	VIEWER
FORD	6-9PM		
MACY'S			A
KRAFT	9-12AM	SOAPS	
WALMART			
⋮			
SEARS	6-9PM	BUFFY	B

FIG. 6

The ad queue **includes a first field containing data identifying a media file associated with the digital media content (e.g., “BUFFY”), a second field containing data indicative of an ad requirement associated with the digital media content (e.g., a requirement for the “SEARS” advertisement to be played 6-9pm)**⁹, **and a third field containing data representing an ad file associated with the digital advertising content to be displayed with the media file (e.g., “SEARS”).**

181. The ad queue/ad insertion schedule is constructed based on scheduling instructions received from the head end system. Ex-1004, ¶29 (“An ad processing unit of the subscriber system can determine in advance which ads are to be inserted and in what order based on scheduling instructions from the head end system, or predetermined ad ordering and selection algorithms. This ad insertion schedule can be received from the head end (e.g., from the head end over a control channel) and stored in a memory associated with a set top box.”), ¶50, ¶80. The scheduling instructions thus include data in the first, second, and third fields, which the subscriber system reads and utilizes to construct the ad queue.

182. The head end system transmits a media stream including digital media content and digital advertising content to the subscriber system. *Supra* §V.A.3[1b].

⁹ The ’403 patent uses the term “ad requirement” broadly, describing that it is “an arbitrary function that can depend on ... [an] item’s running time.” Ex-1001, 30:3-18, 27:36-45, 32:3-17.

A POSITA would have found it obvious to include scheduling instructions such as linked sponsorship parameters as part of the media stream's data structure. It was well-understood that media content was typically transmitted with accompanying metadata, which provides descriptive information about the properties of the content and aids in the processing and presentation of the content. Ex-1025, 1:41-55 ("The media is annotated with metadata that facilitates non-linear retrieval and viewing of the media."), 4:19-34, 4:54-5:42; Ex-1026, ¶39 ("The metadata may be attached to and/or associated with media or a selectable object imbedded within the media."). Using metadata to associate advertisements with media content was well known in the art. For example, Moore teaches attaching metadata that includes "descriptive information about the program," "whether commercials may be skipped during playback," and "a source address (e.g., a URL) to download an advertisement" to media content. Ex-1026, ¶20 ("These systems and methods may associate advertisements with other media by using an enhanced data set herein referred to as 'metadata'. Metadata may be used to describe programming and may include any information that may be associated with a program and/or that may describe a program, its content, or services related to a program. Metadata may describe, for example, the content of a program, whether commercials may be skipped during playback of a recorded program, or the clothes that an actor is wearing."), ¶23 ("The metadata for a program listing may include any descriptive

information about the program itself, the channel the program is being displayed on, and/or any other information attached to or associated with the program listing.”), ¶¶39-40 (“In addition, the metadata may contain a source address (e.g., a URL) to download an advertisement from a remote location, as also described below.”), ¶35. Because Eldering-I’s scheduling instructions include data identifying media files, ad files, and advertisement requirements, it would have been obvious to include such data as metadata embedded in the data structure of media data blocks. To allow the subscriber system to determine the ad insertion schedule in advance, it would have been obvious to transmit scheduling instructions for a portion of the media content with a preceding portion. Eldering-I thus teaches or suggests that **the digital media player device is configured to read a data structure of the one or more data blocks of the digital media content** including the first, second, and third fields.

183. Eldering-II further teaches the limitations of claim 14. Eldering-II teaches a VOD content list that includes **a first field containing data identifying a media file associated with the digital media content** (e.g., program title), **a second field containing data indicative of an ad requirement associated with the digital media content** (e.g., a requirement to play certain advertisements), **and a third field containing data representing an ad file associated with the digital advertising content to be displayed with the media file** (e.g., ads associated with

the content). Ex-1005, ¶¶154-155 (“The VOD content list 582 contains one record for each item that can be purchased by the subscriber. ... Information important to the subscriber may include, but is not limited to, the program title, episode title, release date, description, cost, MPAA rating, and duration. Information important to managing the VoD selection process may include, but is not limited to, the content ID, ads that may be associated with the content, cost models, and access privileges. ... The associated ads portion of the VoD content list 582 may indicate ads that can, are preferred, or are required to be played, or ads that cannot, are disfavored, or are banned from being played in conjunction with the VoD content.”).

184. Eldering-II teaches that the VOD content list is sent with media content from servers to subscriber devices. Ex-1005, ¶99 (“The download carousel 525 can retrieve the ad metadata 572 and the VOD content list 582 from the respective databases 570, 580 and transmit the data 572, 582 to the STB 510. As one skilled in the art would recognize, the download carousel 525 transmits the files that need to be updated to the subscriber at appropriate times (i.e., every night, every 8 hours) or when the content is required.”). A POSITA would have found it obvious for the VOD content list to be transmitted as part of the media content’s data structure. This teaches or suggests that **the digital media player device is configured to read a data structure of the one or more data blocks of the**

digital media content (e.g., a data structure that includes the media content and VOD content list) including the first, second, and third fields.

185. A POSITA would have found Eldering-II's VOD content list to provide a suitable format for providing scheduling instructions and would have found it obvious to apply this format to Eldering-I. This merely applies a known technique to improve a similar device. The combination of Eldering-I and Eldering-II thus renders obvious the limitations of claim 14.

13. Dependent Claims 18, 19

18. The system as in claim 17, wherein the at least first memory is part of the computer-implemented system.

19. The system as in claim 17, wherein the at least first memory is part of at least one remote system.

186. As explained above, the combination teaches the computer-implemented system of claim 17 (*supra* §V.A.3) and a first memory (*supra* §V.A.3[17i]). As a POSITA would have understood, a memory used by a system for storing data can either be local or remote. Eldering-I teaches both options – storing data related to advertisements locally or remotely. *E.g.*, Ex-1004, ¶35 (“The ads that are pointed to by the ARLs preferably are stored in a memory local to the set top box. ... The local memory may be integral to the STB or separately located at a node on a communications network, such as on a remote server.”), ¶69 (“In accordance with alternative embodiments of the invention, the queue itself need

not be stored at the set top box but can be stored at a separate server on the network which communicates with the set top box via the network.”). In light of Eldering-I’s teachings, a POSITA would have found it obvious for **the at least first memory to be part of the computer-implemented system or at least one remote system**. The combination thus teaches claims 18 and 19.

14. Dependent Claim 23

23. The method as in claim 22, wherein presentation data comprising an indication of the digital advertising content that has been presented is stored in a second memory of the digital media player system.

187. The combination teaches the computer-implemented method of claim 22 (*supra* §V.A.3), and further teaches the additional limitations of claim 23.

188. As explained above, Eldering-I teaches generating and storing an advertisement insertion log, which indicates “the schedule of the ads inserted and whether or not they were inserted successfully and/or displayed.” *Supra* §V.A.3[22k]; Ex-1004, ¶48 (“The advertisement insertion module 304 generates and stores the advertisement insertion log of all insertion events in the log module 316.”), Fig. 2:

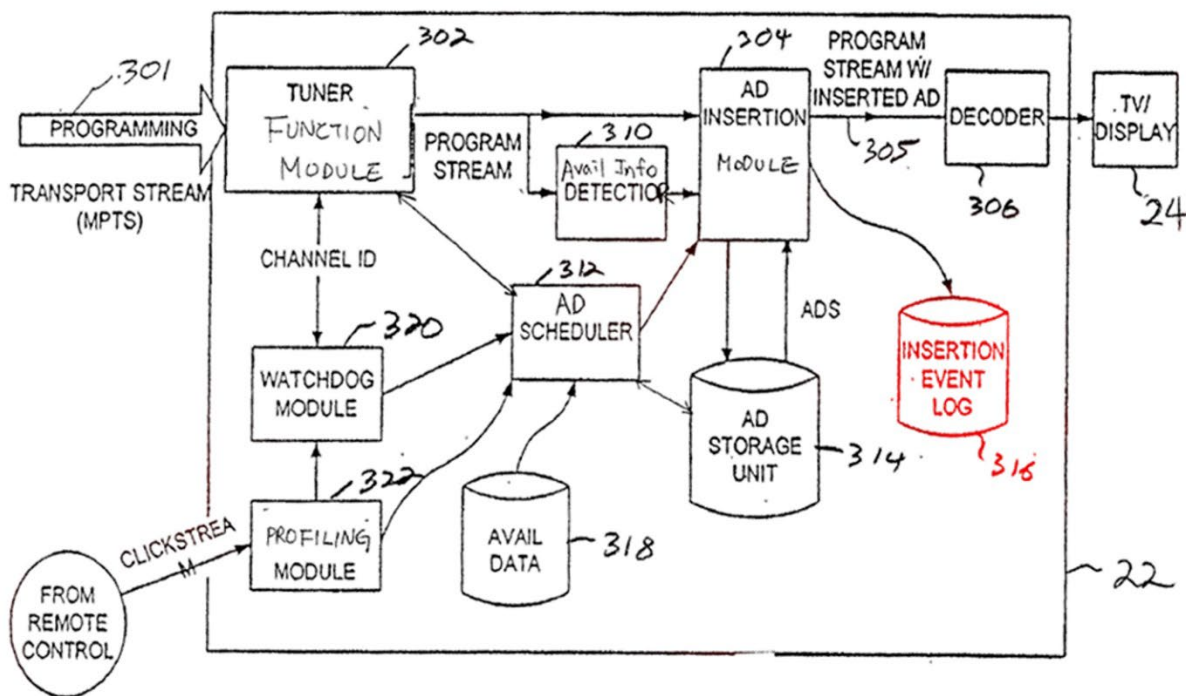


Figure 2

The advertisement insertion log includes data that indicates digital advertising content that has been presented. The data is stored in memory. Eldering-I thus teaches **presentation data comprising an indication of the digital advertising content that has been presented stored in a second memory of the digital media player system.**

189. To the extent Patent Owner argues that the second memory is required to be different from the first memory, it would have been obvious for information about the advertisement that is in progress to be stored temporarily in memory and transferred to the advertisement insertion log after the content is displayed, as explained above. *Supra* §V.A.3[22k]. For example, a POSITA would have found it

obvious to store information about advertisement in progress in a RAM and the advertisement insertion log in a hard drive. Ex-1004, ¶35 (“The local memory for storing the ads may comprise any high volume memory, including, but not limited to, RAM, magnetic hard drive, or optical storage media, such as optical disks.”), ¶43 (“The APU 22 can be realized as a combination of both hardware and software and includes components which are typically used as part of a television set-top including a microprocessor, Random Access Memory (RAM), and in the case of a Personal Video Recorder, a hard drive.”), ¶37. A POSITA would also have found it obvious to store information about advertisement in progress and advertisement insertion log in different memory partitions or locations.

B. Ground 2: Claims 2 and 15 Are Rendered Obvious by Eldering-I, Eldering-II, and Crow

1. U.S. Patent No. 6,262,724 (“Crow”) (Ex-1006)

190. I have reviewed the Crow reference. I understand that Crow was not cited or considered during prosecution of the ’403 Patent, based primarily on the fact that Crow is not cited on the face of the patent, nor have I seen the reference discussed in the prosecution history.

191. Crow was filed April 15, 2000 and patented July 17, 2001. I understand that Crow is prior art under at least pre-AIA §§102 (a), (e) because it was filed and patented before June 27, 2002.

192. Crow “relates to user interfaces for processing (e.g., generating, storing, transmitting and/or receiving, playing back/displaying, editing, referencing, etc.) media information, such as time-based media data representing video and/or audio.” Ex-1006, 1:12-20. Crow “provides an interactive digital processing system controlled graphical user interface that provides functionality for play back or other processing of time-based and still media data.” *Id.*

193. Crow discusses a graphical user interface that includes a time bar. *E.g.*, Ex-1006, 15:30-49, 17:51-18:8, 18:44-19:20, Figs. 6A–6B, Figs. 8A–8C. Crow allows users to perform operations such as skipping over content from one point to another specific point by dragging the time bar. *E.g.*, Ex-1006, 17:51-18:8, 18:44-19:20, Figs. 8A–8C.

194. Crow is in the same field of endeavor as the '403 patent (media display). *See supra* §III; *e.g.*, Ex-1006, 1:12-20.

2. Dependent Claims 2, 15

- 2. The digital media player device as in claim 1, wherein the user interface input comprises a graphical user interface that includes a time bar to allow the user to control the course of presentation of the digital media content received to a specific point in the presentation past at least one of the one or more initially sequenced insertion points.**
- 15. The device as in claim 1, wherein the user interface input includes a time bar configured to control the intersplicer to alter a course of presentation of the content stream in response to the user dragging the time bar, the dragging of the time bar enabling at least one of fast-forward play, skipping forward, backward skipping to a fixed point, slow motion play, and frame advance play.**

195. As explained above, the combination of Eldering-I and Eldering-II (Ground 1) renders claims 2 and 15 obvious. *Supra* §V.A.4. To the extent Ground 1 does not explicitly disclose “a time bar,” Crow teaches a graphical user interface that includes a time bar. *E.g.*, Ex-1006, 17:51-18:8 (“As shown in FIGS. 8A and 8B, in addition to the time display 262 and the adaptive chapter display/control 260, the time/chapter display/control 204 includes *a time bar* 271. The time bar 271 represents a time line of the current time-based media file. ... [W]hen a time-based media file is being played back, the current time marker 274 moves from the left to the right to indicate how much of the time-based media file (depicted by the entire length of the time bar 271) has elapsed or remains.”), 8:25-10:57, Fig. 3A, Figs. 8A–8B:

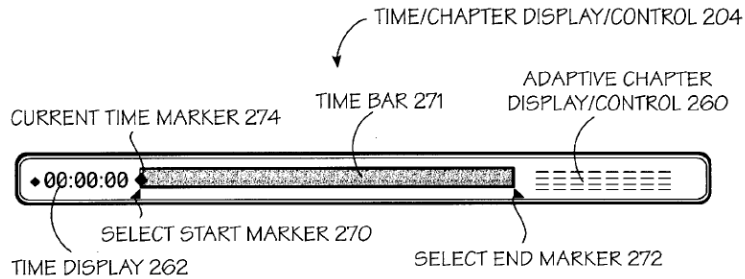


Fig. 8A

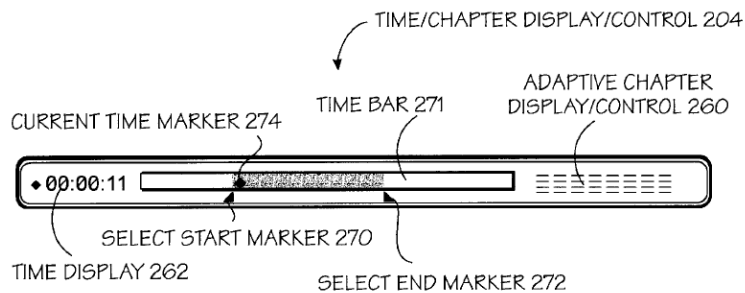


Fig. 8B

196. Dragging the time bar allows the user to control the course of presentation of digital media content to a specific point in the presentation. *E.g.*, Ex-1006, 17:51-18:8 (“The position of a current time marker 274 on the time bar 271 indicates the current time (e.g., time currently being played back, such as an approximation of the time of the currently displayed frame in window 202) of the currently selected media file. *A user may drag the position of the current time marker 274 along the time bar 271 to change the time-based media file’s current time to a currently selected time.* In one embodiment, the time display 262 and the adaptive chapter display/control 260 are updated (to show the current time and

current chapter, respectively) as the current time marker 274 is moved and a frame at the currently selected time is also displayed in window 202 to update that window.”), 18:23-19:20, 19:42-45, Figs. 8A-8C. Crow at least teaches that dragging its time bar triggers a forward or backward skipping operation from the current time marker’s original position to the selected position.

197. A POSITA would have been motivated to apply Crow’s time bar teachings with the combination of Eldering-I and Eldering-II because the combination teaches an electronic digital recording/play back device that supports user interface operations such as skipping and fast forwarding. *Supra* §V.A.3[1c]. It was customary for the graphical user interfaces of digital recording and playback devices such as that of Eldering-I to include a time bar so that the user could perform navigation operations (e.g., skipping, fast forwarding) by dragging the time bar. *See, e.g.*, Ex-1023, ¶31 (teaching that “[t]he viewer can fast forward and rewind at multiple speeds, pause, single step, slow play, etc. through the program material” in a graphical user interface with a time bar), ¶45, Figs.1, 2, 4, 9.

Allowing a user to skip over or fast forward through digital content using a time bar would not have changed the principle of operation of any reference of the combination. A POSITA would have been motivated to apply Crow’s teachings because a time bar would have improved Eldering-I’s device by offering an intuitive way for users to navigate through media content with a clear visual

representation of progress and control. This makes media viewing more efficient and engaging. A POSITA would have had a reasonable expectation of success in combining Crow with Eldering-I and Eldering-II's teachings because the combination simply applies a conventional media player feature to a media play back device.

C. Ground 3: Claim 13 Is Rendered Obvious by Eldering-I, Eldering-II, and Kocher

1. U.S. Patent Application Publication No. 2002/0141582 (“Kocher”) (Ex-1007)

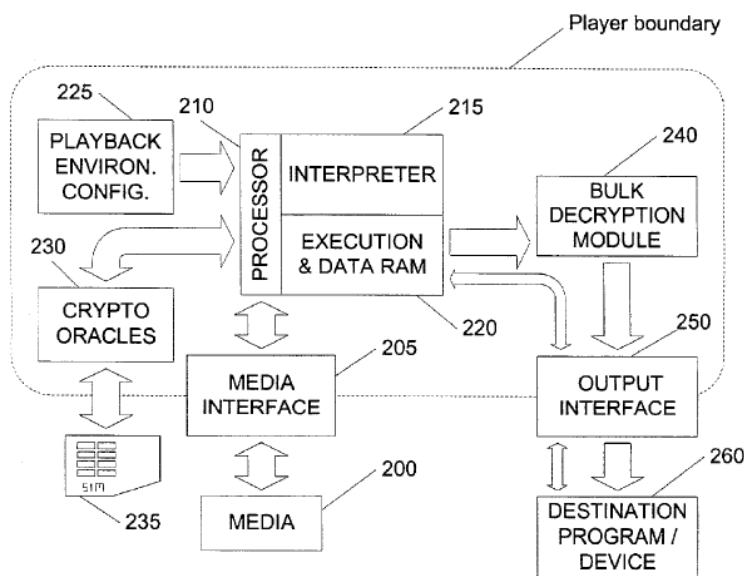
198. I have reviewed the Kocher reference. I understand that Kocher was not cited or considered during prosecution of the '403 Patent, based primarily on the fact that Kocher is not cited on the face of the patent, nor have I seen the reference discussed in the prosecution history.

199. Kocher was filed March 27, 2002 as application 10/113,363, and published October 3, 2002. I understand that Kocher is prior art under at least pre-AIA §102 (e) because it was filed before June 27, 2002.

200. Kocher “relates generally to securing the distribution of digital content against piracy and other unauthorized use or redistribution.” Ex-1007, ¶2. Kocher teaches a “content protection system that can be implemented in a manner providing flexible and renewable content protection across a wide variety of interoperable platforms.” Ex-1007, ¶36. It teaches a media player implementing the

system, which “decrypt[s] or otherwise gain[s] access to protected content.” Ex-1007, ¶¶37, ¶41, ¶43, Fig. 2:

FIG. 2



201. Kocher’s media player includes a bulk decryption module that retrieves encrypted content and decrypts it. Ex-1007, ¶50. Kocher teaches that its decryption module includes DRM functionalities. *E.g.*, Ex-1007, ¶2, ¶¶112-113.

202. Kocher further teaches that the “player[] can provide content with secure, nonvolatile storage for maintaining state between playings,” where, for example, the player employs authentication mechanism (e.g., digital signature) to unlock the non-volatile memory. Ex-1007, ¶¶92-93.

203. Kocher is in the same field of endeavor as the '403 patent (media display). *See supra* §III; *e.g.*, Ex-1007, Abstract (“Player devices having a processing environment compatible with the content’s data processing operations are able to decrypt and play the content.”), ¶37, ¶43.

2. Dependent Claim 13

13. The device as in claim 1, the digital media player device further comprising a media file decryptor configured to receive and decrypt the digital media content during play, the media file decryptor configured to limit access to a non-volatile memory following the decryption of the digital media content.

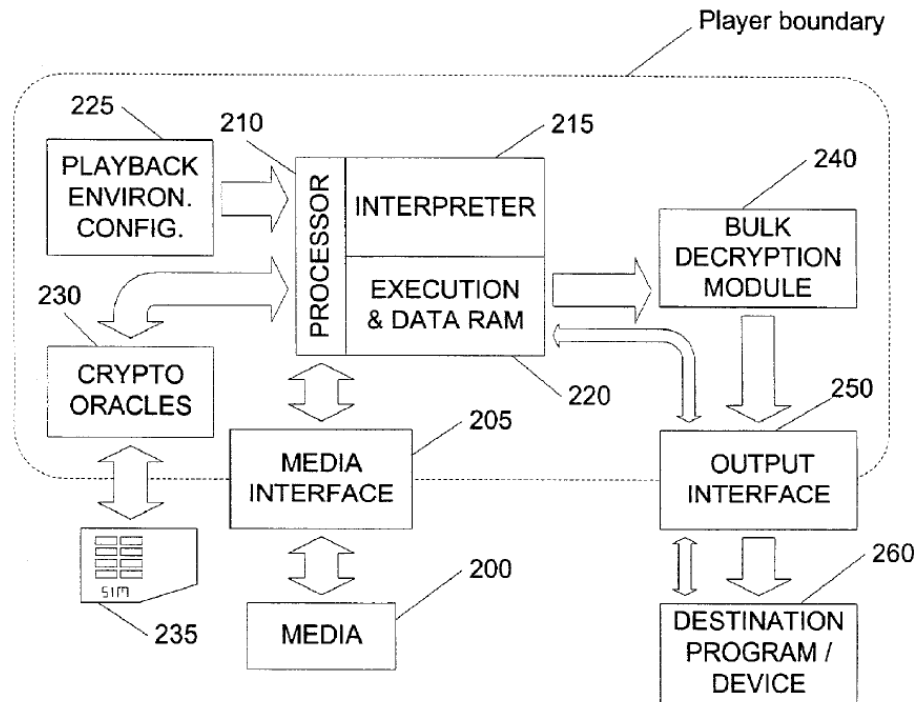
204. As explained above, the combination of Eldering-I and Eldering-II renders claim 13 obvious. *Supra* §V.A.11. To the extent Eldering-I and Eldering-II do not explicitly disclose a component with functionalities corresponding to the claimed “media file decryptor,” Kocher discloses **a media file decryptor**.

205. First, Kocher teaches a bulk decryption module that retrieves encrypted content and decrypts the received content as playback continues. Ex-1007, ¶50:

If the content decides that playback should proceed, it uses procedure calls to direct media interface 205 to begin loading encrypted content from the appropriate location on media 200. The content specifies valid decryption keys and parameters to *bulk decryption module 240, which retrieves the encrypted content from RAM 220 (or, alternatively, directly from media interface 205) and decrypts it*. The decrypted content is then supplied to output interface 250, which converts it to the

appropriate analog or digital format for destination program or device 260. As playback continues, the data processing instructions being processed by interpreter 215 can load new decryption parameters, specify new blocks of data to read from media 200, etc. When playback completes, the content can re-initialize the RAM 220.

Fig.2:



Here, the bulk decryption module is **configured to receive content** (e.g., from memory or media interface) **and decrypt the received digital media content during play**.

206. Second, Kocher teaches using secure, nonvolatile storage for storing state information between playback of different portions of media content. Ex-1007, ¶92 (“For some features, however, it is useful for content to be able to store

data between playings and between titles. To satisfy this need, players can provide content with secure, nonvolatile storage for maintaining state between playings.”). For example, the secure, nonvolatile storage is used for “track[ing] offline pay-per-view viewing histories for later billing.” *Id.*

207. The non-volatile memory is locked by default and unlocked when data reading or writing by authorized programs is needed. Ex-1007, ¶92 (“Such storage can require additional security protections to ensure that only authorized interpreted code is able to read or modify the nonvolatile memory contents.”), ¶93 (“In this embodiment, players contain several blocks of nonvolatile memory, which are locked (i.e., read and write permissions are denied) by default. The player also contains a public key used to authenticate requests to unlock memory blocks. To gain access to this memory block, the content calls a function that takes as input a digital signature over the block of code that is authorized to access the memory. This signature is verifiable using the public key embedded in the player and specifies the memory block to unlock and the access privileges authorized (arbitrary read, arbitrary write, increment, decrement, zeroize, etc.) within each portion of the block.”).

208. Under Kocher’s disclosure, after a portion of the media content (e.g., a playing, a title) is displayed to the user, the secured nonvolatile memory is unlocked for the viewing history to be updated and relocked to limit access to the

memory. Ex-1007, ¶¶92-93. Because the media content is decrypted for display to the user, this teaches **limiting access to a non-volatile memory following the decryption of the digital media content**.

209. Kocher's memory access management includes functionalities such as using decryption keys to authenticate requests and verify digital signatures. *Id.* A POSITA would have found these functionalities to be well-suited for a decryptor to perform and would have found it obvious to implement the functions using a software component like the bulk decryption module. Alternatively, a POSITA would have found it obvious to group data security functionalities together and use a software module to perform decryption and memory access management. Kocher thus teaches or suggests **a media file decryptor** configured to perform the operations recited by claim 13.

210. A POSITA would have found it obvious and been motivated to apply Kocher's teachings regarding decryption and memory access management to Eldering-I's subscriber system. As explained above, a POSITA would have found it obvious to protect Eldering-I's copyrighted content from interception during transmission and for Eldering-I's device to have conventional digital rights management functionalities such as data encryption and decryption. *Supra* §V.A.11. A POSITA would have found it obvious to implement Kocher's

decryptor with Eldering-I for decrypting encrypted media data received from Eldering-I's head end system.

211. Furthermore, both Eldering-I and Eldering-II teach tracking and managing users' viewing activities. *Supra* §V.A.3[1i]; e.g., Ex-1004, ¶48, Fig. 2; Ex-1005, ¶111. A POSITA would have found it obvious to protect such information from tampering by the user or other applications because the information is critical for billing management. E.g., Ex-1004, ¶48 ("The insertion logs will eventually be sent upstream to the head end system to be used for billing advertisers based on the ads that have been played at each subscriber's location."); Ex-1005, ¶111 ("This information is transmitted back to the headend for billing purposes."). Allowing such information to be accessed and modified by unauthorized programs may result in inaccurate billing of advertisers. A POSITA would have been motivated to apply Kocher's teaching of limiting access to nonvolatile memory for storing critical information for media display to ensure such data is not improperly tampered with. Eldering-I teaches storing data in non-volatile memory. Ex-1004, ¶¶42-43. A POSITA would have realized that Kocher's teachings of providing secure memory blocks based on authentication mechanisms are readily applicable to Eldering-I's device.

212. Applying Kocher's teachings to Eldering-I would have been simply applying a known technique (e.g., Kocher's decryption and memory access

management functionalities) to a known device (Eldering-I's subscriber system) to yield predictable results. Incorporating Kocher's decryptor in Eldering-I's device would not have changed the principle of operation of either reference, because Kocher's decryptor is implemented as taught to enhance the security of Eldering-I's media display operations. In fact, it would have advanced Eldering-I's objective of securing content providers' advertisement revenues by adding extra protection to the media content and viewing activity data. A POSITA would have had a reasonable expectation of success in combining Kocher with Eldering-I and Eldering-II because the combination would have involved implementing conventional and well-known software operations.

213. For reasons explained above, the combination of Eldering-I, Eldering-II, and Kocher renders obvious claim 13.

VI. BACKGROUND AND QUALIFICATIONS

214. This section contains a summary of my educational background, career history, publications, and other relevant qualifications. My full curriculum vitae is attached as Appendix 1 to this declaration.

215. I received a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology ("MIT") in 1998. Beforehand, I received a Master of Science degree in Electrical Engineering and Computer Science in 1991, a Bachelor of Science degree in Electrical Engineering and

Computer Science in 1989, and a Bachelor of Science degree in Physics in 1990, all from MIT.

216. I am currently self-employed as an independent technical consultant. From its founding in 2012 until October 2022, I was also president of a company that provides supplemental science, technology, engineering, and mathematics (“STEM”) education to children of all ages.

217. I first entered telecommunications in 1987 when I worked as a summer intern at AT&T Bell Laboratories as part of a five-year dual degree program at MIT. I continued to work at AT&T Bell Laboratories as part of this MIT program. While at MIT, I was a teaching assistant (“TA”) in the Electrical Engineering and Computer Science Department’s core Computer Architectures course. I first was a TA as a senior for a role typically reserved for graduate students. I later became head TA. The course covered various topics in computer architectures. As a TA, I helped write homework assignments, lab assignments, and exams. I also taught in the recitation sections.

218. Later, as part of my doctoral research at MIT from 1991-1998, I was a research assistant in the Telemedia Network Systems (“TNS”) group at the Laboratory for Computer Science. The TNS group built a high-speed gigabit network and created applications that ran over the network. Example applications included ones for remote video capture, processing, and display of video on

computer terminals. In addition to working on the design of core network components (which was based on FPGAs), designing and building the high-speed links (which included programmable logic devices), and designing and writing the device drivers for the interface cards (which included programmable logic devices), I also set up the group's web server. Also, I helped to maintain, install, and upgrade the networking devices used within the group, along with other graduate students.

219. I also helped to build the web pages that initiated the above-mentioned video sessions via a web interface. Vice President Al Gore visited our group in 1996 and received a demonstration of—and remotely drove—a radio-controlled toy car with a wireless video camera mounted on it that was built by our group. This toy car device received commands transmitted over a network from a remote computer, and video data from the toy car was transmitted wirelessly then over a computer network back to the user controller. On occasion, we allowed users visiting our web site to drive the toy car from their remote computer while they watched the video on their computer. The video stream was encoded by TNS-designed hardware, streamed over the TNS-designed network, and displayed using TNS-designed software.

220. I defended and submitted my Ph.D. thesis, titled “Designing Networks for Tomorrow’s Traffic,” in January 1998. As part of my thesis research, I

analyzed local area and wide area flows to show a more efficient method for routing packets in a network, based on traffic patterns at the time. The traffic flow data included Ethernet, IP, TCP or UDP, and RTP header information, which I analyzed to come to the conclusions in my thesis.

221. While I was in graduate school, I started a company that provided web site design services and targeted advertising opportunities. We also sold targeted advertising placements. As the web became popular first at colleges and universities, we focused initially on building college recruiting web sites and sold advertisements to companies wishing to target students to recruit at specific colleges. We developed technology that utilized the web user's college affiliation to customize advertisements targeted to students at that college.

222. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems for streaming packetized audio over data networks instead of using traditional telephone lines. NBX was later acquired by 3Com Corporation and the phone system is still used today by numerous businesses.

223. As part of my work at NBX, I designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system. The protocol was used for all signaling in the phone system, including for

the setup of conference calls. The NBX system also featured a computer interface for initiating phone calls, which could also initiate conference calls. The NBX system also supported the Telephony Application Programming Interface (“TAPI”) that allowed other computer programs to integrate with our system telephony features. We obtained U.S. Patent No. 6,967,963, entitled “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” as part of this work. The first release of the phones had integrated Ethernet repeater hubs embedded in them, and I worked with the documentation and field support people to develop sets of guidelines so that customers would not build their networks to violate the Ethernet specifications, typically by chaining too many hub repeaters and NBX phones together. The first release of the phones also worked using Ethernet-layer packets (without the use of IP). I also programmed the first prototype of our phone which communicated using IP, and I demonstrated our IP phones working over the Internet when we attended a trade show in California. The phone connected over the Internet to our headquarters in Andover, MA.

224. From 1999-2004, I was employed by Empirix or its predecessor company, Teradyne. Teradyne had traditionally made products to test chips and hardware, but the founder and board chairman, Alex d’Arbeloff wanted to expand the company’s products to include software systems testing. Teradyne made a number of acquisitions to achieve this goal, and I was hired to work for Mr.

d'Arbeloff to work with all the acquired software test divisions. These divisions were later spun-out of Teradyne into a separate company, Empirix. Empirix was a leader in test tools for software systems including telecommunications protocols and systems, providing functional testing tools as well as load testing tools. From 2000-2001, I conceived and built a test platform for testing Voice-over-IP (VoIP). The first application on this new test platform was a cloud emulator for simulating the effects of transmitting VoIP over a busy network. The test platform was based on a network processor chip, which could be programmed to cut-through packets while processing packet data such as various protocol layer headers including addresses included therein and even packet data contents. I also designed a protocol analyzer built on the same platform. The application captured and performed protocol decoding at various layers in the protocol stacks of captured packets, including detailed Ethernet header decoding, IP header decoding, TCP header decoding, UDP header decoding, RTP header decoding, and many other specified protocols. The application was also designed to reconstruct entire conversations that spanned multiple packets.

225. In 2006, as part of my role at BBN Technologies, I helped found PodZinger Inc., now known as RAMP Inc. PodZinger utilized BBN's speech recognition algorithms to search through the spoken words in audio and video segments. While I was Vice President of Operations and Technology, PodZinger

followed its initial prototype with a full streaming audio and video search solution. I also created a social networking web site, which BBN sold to a venture-funded startup company. In the process of creating the web site, I designed and specified the authentication and authorization protocols.

226. During my time working at BBN, I applied for several patents in the areas of dynamic presentation of advertising content, and using rules for obtaining media content, including advertising, for assembly into a channel of information.

227. I was a co-inventor on U.S. Patent No. 9,697,230 titled “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-drive media applications,” which discloses using a data map that maps timed content segments with corresponding advertising content, and an advertising engine that tracks the playback status of a media file or stream, detects transitions between segments of the media, and determines the next set of advertising content to present.

228. I was also a co-inventor on U.S. Patent No. 9,697,231 titled “Methods and apparatus for providing virtual media channels based on media search,” which discloses rules, such as derived from a search, to identify candidate media content that can include informational or advertising content, that are sequenced and merged for playback.

229. I am co-inventor on eight U.S. Patents, some with foreign counterparts, have filed a number of other patents, and have roughly 25 papers in peer-reviewed journals, conferences, and magazines.

A. Compensation

230. For my efforts in connection with the preparation of this declaration I have been compensated at my standard rate for this type of consulting activity. My compensation is in no way contingent on the results of these or any other proceedings relating to the above-captioned patent.

B. Materials and Other Information Considered

231. I have considered information from various sources in forming my opinions. I have reviewed and considered each of the exhibits listed in the attached Appendix 2 (Materials Considered in the Preparation of This Declaration) in forming my opinions.

VII. UNDERSTANDING OF THE LAW

232. I am not an attorney. In forming my opinions in this Declaration, I applied the relevant legal principles provided to me by counsel, which are summarized in Appendix 4.

VIII. RESERVATION OF RIGHTS

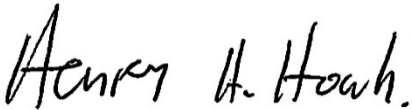
233. My opinions are based upon the information that I have considered to date. I am unaware of any evidence of secondary considerations with respect to the '403 Patent that would render any of the challenged claims non-obvious. I reserve

the right, however, to supplement my opinions in the future to respond to any arguments raised by the owner of the '046 Patent and to take into account new information that becomes available to me.

234. I declare that all statements made herein of my knowledge are true, and 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.

Executed on October 31, 2024.

By:

A handwritten signature in black ink that reads "Henry H. Houh." The signature is written in a cursive, slightly slanted style.

Henry Houh, Ph.D.

APPENDIX 1: CURRICULUM VITAE OF HENRY HOUH, PH.D.

Henry H. Houh

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Lexington, MA 02420
henry.houh@gmail.com
cell: 781-325-8273

Education

Massachusetts Institute of Technology, Cambridge, MA

- PhD in Electrical Engineering and Computer Science, February 1998. “Designing Networks for Tomorrow's Traffic,” thesis supervised by Professor David Tennenhouse and Professor John Guttag. GPA 4.7/5.0
- Master of Science in Electrical Engineering and Computer Science, February 1991. “Demonstration of a laser repetition rate multiplier,” thesis. GPA 4.5/5.0
- Bachelor of Science in Electrical Engineering and Computer Science, June 1989. “Boundary element analysis of arbitrarily shaped dielectric structures,” thesis. GPA 4.7/5.0
- Bachelor of Science in Physics, February 1990. GPA 4.7/5.0

MITx, Cambridge, MA

- September 2020 – present: Enrolled in Statistics and Data Science MicroMasters program, a sequence of five MIT-offered graduate-level courses in statistics and machine learning, culminating in a MicroMasters certificate. Have completed four of five required courses.

Experience

Houh Consulting Inc. / Independent Consultant

- 2009 - present: Technical consultant specializing in Social Networking, Web 2.0, Web Site Development, Data Networking, Optical Networking, Telecommunications, Media Streaming and Voice Over IP. Clients include: Akin Gump Strauss Hauer & Feld LLP, Arnold & Porter Kaye Scholer LLP, BBN, Baker Botts LLP, Barnes & Thornburg LLP, BBN Technologies, Beus Gilbert McGroder PLLC, Bracewell LLP, Christensen O'Connor Johnson Kindness PLLC, Cooley LLP, Covington & Burling LLP, Cozen O'Connor P.C., DLA Piper, Davis Polk & Wardwell LLP, Desmarais LLP, Duane Morris LLP, Erise IP, P.A., Faegre Baker Daniels LLP, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Fish & Richardson P.C., Goldman Ismail Tomaselli Brennan & Baum LLP, Haynes and Boone, LLP, Kaye Scholer, Kellogg Huber Hanson Todd Evans & Figel PLLC, Kirkland & Ellis LLP, Klarquist Sparkman, LLP, McCarthy Tetrault LLP, McGuireWoods LLP, Morgan, Lewis & Bockius LLP, Munger Tolles & Olson LLP, Orrick, Herrington & Sutcliffe LLP, O'Melveny & Myers LLP, Orrick, Herrington & Sutcliffe LLP, Paul Hastings LLP, Paul, Weiss, Rifkind, Wharton & Garrison LLP, Perkins Coie LLP, Quinn Emanuel Urquhart & Sullivan, LLP, Sidley Austin LLP, Smith Baluch LLP, Sterne, Kessler, Goldstein & Fox PLLC, Troutman Sanders LLP, Venable LLP, Weil, Gotshal &

Manges LLP, Wiley Rein LLP, Wilmer Cutler Pickering Hale and Dorr LLP, and Winston & Strawn LLP.

BlocksCAD Inc. (H3XL spin-out)

- 2014 - present: Founder and member of Board of Directors. BlocksCAD is a visual Computer-Aided Design (CAD) program, designed to teach children mathematics and geometric visualization. BlocksCAD is being used in U.S. schools and worldwide in maker spaces, with 350,000+ users. BlocksCAD was selected to be part of the LearnLaunch 2017 Boost Accelerator, the MIT Play Labs 2018 Summer Accelerator, and the MassChallenge 2018 Boston Cohort. Recipient of DARPA DSO grant in 2014, and SBIR grant from the USDA in 2019.

H3XL Inc. d/b/a Einstein's Workshop (formerly Lexington Robotics)

- 2009 - 2022: Founder and President. Started a science, technology, engineering and math enrichment program and creative/maker space, in 7,000 square feet of space. Serve 2,000+ kids and families annually. As of end of 2022, have delivered an estimated 250,000 student-instruction-hours of STEM courses. Principle Investigator for 2-year DARPA grant to improve 3D Computer Aided Design tool developed in-house for the purposes of teaching 8 year olds and up 3D CAD.

Eons

- 2008 - 2009: Chief Technology Officer. Created product that Eons acquired from BBN Technologies. Integrated BBN product with Eons social networking platform and significantly increased the Eons group creation rate. Helped evaluate advertisement platform offerings and rolled out the "Boom Network" advertising network. Eons raised \$32 million from General Catalyst Partners, Charles River Ventures, Sequoia Capital, and Intel Capital.

BBN Technologies

- 2007 - 2008: Delta Division, Vice President of Technology. Grew "Boomerang" counter-sniper project engineering team and significantly de-risked \$10 million worth of product deliveries. Identified sales team leading to \$10 million dollars of new sales within 6 months and \$100+ million in additional orders in the following two years. Boomerang was a significant asset leading to the acquisition of BBN by Raytheon in 2009. Created new business plan and grew team; launched new fully-featured social networking web site in 5 months. Served as lead expert witness in patent infringement lawsuit, resulting in \$58 million jury award to client; verdict for patents I testified on were upheld on appeal which resulted in a \$120 million settlement.
- 2004 - 2007: Delta Division, Director of Technology, responsible for commercializing IP and creating new businesses. Hired and grew division's initial engineering team. Wrote three business plans, two of which were funded. For call center business plan, acted as general manager, hiring and managing engineering team, inside sales team, and identifying and recruiting a new general manager. Identified and recruited other key employees to Delta Division, including senior members of team leading to successful internal sales growth and spin-outs of projects. Contracted by BBN to BBN spin-out PodZinger as VP of Operations and Technology. Additional areas studied include mesh networking, network security, satellite communications, and semantic web.

PodZinger Inc. (BBN spin-out, also known as EveryZing and now RAMP)

- 2006: Vice President of Operations and Technology. Significantly upgraded capability of consumer-facing search site and redeployed web site from company to co-location facility. Identified key portions of infrastructure for upgrading and cost reduction. Helped write business plan, evaluating advertisement models of revenue. Hired in operations replacement and phased back to BBN.

Commonwealth Capital

- 2004: Entrepreneur-in-residence (informally), performed technical due diligence on business plans, brainstormed ideas for new businesses with venture partner. With venture partner, left for portfolio company BBN to form core of commercialization team.

Empirix, Inc./Teradyne, Inc.

- 2001 - 2004: Chief Technologist, Engineering Manager, Web Application Test Group. Researched potential new product areas; developed product plan and prototype. Responsible for three new and existing products. Managed off-shore development team. Chief architect for all web testing products. Re-architected core testing product, helped write javascript interpreter. Provided technical vision for core product.
- 2000 - 2001: Chief Technologist, Communication Infrastructure Test Group. Responsible for incorporating new technology internally, tracking new technologies, technical evaluation of partnerships and potential acquisitions. Helped develop division strategy. Developed plans which formed core capabilities for successful new products introduced in 2004-5.
- 2000 - 2001: Engineering Manager, Communications Infrastructure Test Group. Execution of new product plan developed in prior role. Grew team from four existing engineers to team of over 30 on immediate team and over 40 on project. Delivered new platform in one year. Platform and derivatives accounted for large portion of booked products for the division within 2 years and is currently (2008) a key portion of new product offerings.
- 2000: Empirix was formed as a spin-out of Teradyne in January 2000. Reported to CEO in carve-out of Empirix from Teradyne.
- 1999: (Teradyne) Director of Business Development, Software Test Units. Reported directly to Chairman of the Board/Founder and then to general manager of software test unit (6 divisions of Teradyne). Evaluated and researched acquisition and partnership candidates. Internally assessed technology position in market and gaps in product lines. Worked with senior division staff to develop new product strategies. Attended internal Teradyne divisional board meetings. Chairman served as my mentor.

3Com Corporation/NBX Corporation

- 1999: Software Engineer 5. Continued work after 3Com acquisition of NBX. Built cross-division relationships for new products and research directions. NBX was acquired by 3Com in March 1999.
- 1997 - 1999: (NBX) Senior Scientist and Engineer. Work in IP Telephony. Architected next-generation product. Protocol design and validation for core protocol now used tens of millions of times daily. Led team in integration of IP protocols into current product. Designed audio reconstruction algorithms. Developed applications for bug analysis and diagnosis of system

problems. Implementation of network simulator. Work on collaborative projects with external partners. Worked to identify gaps in product. Representative at numerous trade shows. Innovated novel methods of using product.

MIT Department of Electrical Engineering and Computer Science, Cambridge, MA

- 1991 - 1998: Research assistant, Telemedia Network Systems Group. Design, development, and implementation of Gigabit ATM network for distributed multimedia system. Studied host interface design issues. ATM network simulation.
- Spring 1989, Fall 1990, Spring 1995: Teaching assistant, Computation Structures digital systems course. (Spring 1995 Head TA)
- 1988 - 1989: Head laboratory teaching assistant for Computation Structures. Responsibilities included writing and revising lab assignments, and maintaining the lab.
- 1987: Laboratory teaching assistant for Computation Structures.
- 1987: Design, construction, and programming of 16-bit computer.

Agora Technology Group, Incorporated

- 1994 - 1996: Founder and CEO. Conceived and oversaw development of targeted advertising-supported Web sites. Responsible for company's vision and direction. Attended the first two WWW Conferences, presenting a workshop and paper at the first, and appearing on the "Commercialization and Economics of the Web" panel and chairing the "Where Commercial Services and the Web Are Headed" panel at the second. Sold company intact; is currently an operating stand-alone company.

AT&T Bell Laboratories, Holmdel, NJ

- 1989 - 1990: Implementation of cascadable all-optical fiber logic gate. Modelocking of all-fiber erbium laser. Construction of modelocked laser repetition rate booster. Strong optics laboratory and fiber optic experience.
- Summer 1988, 1987: Research in integrated optics. Analysis of rectangular waveguides using microwave modeling. Fabrication of integrated optical components.

Honors

- MIT Alumni Association Great Dome Award, 2010, Baker 60th Anniversary Reunion Co-Chair (highest group award given by MIT Alumni Association)
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 2008, Member of MIT Chairman's Salon committee
- MIT Alumni Association Bronze Beaver Award, 2007 (highest individual award given by MIT Alumni Association)
- MIT Alumni Association Volunteer Honor Roll, February 2004
- MIT Alumni Association Lobdell Award, 1999
- Boston Museum of Science Gold Pin for 1000 hours of Volunteer Service, April 1999
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 1997, Member of Alumni Online Communications Committee

Patents and Patent Publications

- U.S. Patent #9,697,231, H. Houh, J. Stern, R. Spina, M. Meteer, “Methods and apparatus for providing virtual media channels based on media search,” July 4, 2017.
- U.S. Patent #9,697,230, H. Houh, J. Stern, “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications,” July 4, 2017. See also WO2007056485.
- U.S. Patent #7,975,296, L. Apfelbaum, H. Houh, T. Mayberry and G. Friedman, “Automated security threat testing of web pages,” July 5, 2011. See also US20030159063, WO2003067405.
- U.S. Patent #7,877,736, H. Houh and J. N. Stern, “Computer language interpretation and optimization for server testing,” January 25, 2011. See also US20050138104, WO2005043300.
- U.S. Patent #7,801,910, H. Houh and J. N. Stern, “Method and apparatus for timed tagging of media content,” September 21, 2010. See also US20070112837, US20090222442, WO2007056535.
- U.S. Patent #7,590,542, D. C. Williams, W. C. Hand, H. Houh, A. R. Seeley, “Method of Generating Test Scripts Using a Voice-Capable Markup Language,” September 15, 2009. See also EP1530869, US20030212561, WO2003096663.
- U.S. Patent #6,967,963, H. H. Houh, P. Anderson, C. Gadda, “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” November 22, 2005. See also EP1060400, WO2000033092, CA2318774.
- U.S. Patent #5,144,375, M. C. Gabriel, H. H. Houh, N. A. Whitaker, “Sagnac Optical Logic Gate,” September 1, 1992. Also issued as European Patent # EP0456422, July 23, 1997, German Patent #DE69126913, August 28, 1997
- U.S. Patent Application Publication No. 20020015387, “Voice Traffic Packet Capture and Analysis Tool for a Data Network” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016708, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016937, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System.” (Abandoned in 2007) See also WO2002011413.
- U.S. Patent Application Publication No. 20070106646, “User-directed navigation of multimedia search results” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106660, “Method and apparatus for using confidence scores of enhanced metadata in search-driven media applications” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106685, “Method and apparatus for updating speech recognition databases and reindexing audio and video content using the same” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20070118873, “Methods and apparatus for merging media content” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20090222442, “User-directed navigation of multimedia search results” (Abandoned in 2016)
- U.S. Patent Application 11/395,732, “Search snippet creation for audio and video data” (Abandoned in 2009)
- U.S. Patent Application 11/774,931, “Methods and apparatus for managing a social networking web site”
- U.S. Patent Application 11/774,947, “Methods and apparatus for organizing media files”
- U.S. Patent Application 11/774,956, “Methods and apparatus for managing an online event”

- U.S. Provisional Patent Application 61/086,909, “Measuring and ranking relationship activity”
- U.S. Provisional Patent Application 61/086,914, “Detecting media object commonality”
- U.S. Provisional Patent Application 61/086,904, “Message categorization based on message characteristics”
- U.S. Provisional Patent Application 61/086,905, “Photo tagging to request action”

Trials, Testimony and Depositions

- Case No. 1:06CV682 (CMH/BRP), Verizon vs. Vonage, U.S. District Court for the Eastern District of Virginia, filed expert report, was deposed and testified at trial.
- Case No. 1:08CV157 (CMH/TRJ), Verizon vs. Cox, U.S. District Court for the Eastern District of Virginia, was deposed and testified at trial.
- Case No. 5:09-cv-476, Two-Way Media vs. AT&T, U.S. District Court for the Western District of Texas, filed expert report, testified at trial.
- Case No. 2:10-cv-248 (RAJ/FBS), ActiveVideo Networks vs. Verizon, U.S. District Court for the Eastern District of Virginia, filed expert report and was deposed as an expert witness.
- Case No. 1:11-cv-00880-TSE-JFA, Bear Creek Technologies, Inc. vs. Verizon Services Corp., et al, U.S. District Court for the Eastern District of Virginia, was deposed as an expert witness.
- Case No. 3:10-CV-298-BBC, AlmondNet, Inc. vs. Microsoft Corp., U.S. District Court for the Western District of Wisconsin, filed expert report.
- Case No. 6:10-cv-00597, Guardian Media Technologies, Ltd. Vs. AT&T Operations, Inc. et al., U.S. District Court for the Eastern District of Texas, Tyler Division, filed expert report.
- Case No. ESCV2010-02282C, The Octopus Solution LLC v. Gary Brown et al., Essex, MA Superior Court, testified at trial.
- Investigation No. 337-TA-882, In the matter of Certain digital media devices, including televisions, Blu-ray disc players, home theater systems, tablets and mobile phones, components thereof and associated software, U.S. International Trade Commission, filed expert reports, was deposed and testified at hearing.
- Investigation No. 337-TA-995, In the matter of Certain communications or computing devices, and components thereof, U.S. International Trade Commission, filed expert reports, and was deposed.
- Case No. 8:12-cv-122-LES-TDT, Prism Technologies LLC v. AT&T Mobility LLC, U.S. District Court for the District of Nebraska, filed expert report, was deposed and testified at trial.
- Case No. 11-2684 (JWL), Sprint Communications Co., L.P., v. Comcast Cable Communications, LLC, et al., U.S. District Court for the District of Kansas, filed expert report and was deposed.
- Case No. 11-2686 (JWL), Sprint Communications Co., L.P., v. Time Warner Cable, Inc., et al., LLC, et al., U.S. District Court for the District of Kansas, filed expert report, was deposed, and testified at trial.
- Case No. 12-487 (SLR), Cox Communications, Inc., et al., v. Sprint Communications Company L.P., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.
- Case IPR 2014-00039, Microsoft Corporation v. B.E. Technology LLC, U.S. Patent No. 6,628,314. Submitted declaration and cross-examined in deposition.
- Case IPR 2014-00086, Apple, Inc. v. Evolutionary Intelligence, LLC, U.S. Patent No. 7,010,536. Submitted declaration and cross-examined in deposition.
- Case No. 6:11-CV-421, Stragent, LLC v. Intel Corporation, U.S. District Court for the Eastern District of Texas, Tyler Division, deposed and testified at trial as a fact witness.

- IPR2014-01366, IPR2014-01367, IPR2014-01368, Samsung et al. v. Straight Path, submitted IPR declarations and was deposed.
- IPR2015-1006, IPR2015-1007, Cisco v. Straight Path, submitted IPR declarations.
- IPR2014-01457, IPR2014-01459, Microsoft v. Biscotti, submitted IPR declaration and was deposed.
- IPR2016-00302, Apple v. Nonend, submitted IPR declaration.
- IPR2014-00812, Yelp and Twitter v. Evolutionary Intelligence, submitted IPR declaration.
- IPR2015-00307, Cisco v. AIP, submitted IPR declaration.
- Microsoft v. Acacia, submitted IPR declaration.
- IPR2015-00342, AT&T Mobility LLC and Cellco Partnership d/b/a Verizon Wireless v. Solocron, submitted IPR declaration.
- Mediatube v. Bell Canada, Canadian Federal Court, submitted expert report and testified at trial.
- CBM2016-00036, Google v. At Home Bondholder's Liquidating Trust, submitted CBM declaration.
- IPR2016-01198, IPR2016-01201, Apple, Inc. v. VoIP-Pal.com, Inc., submitted IPR declaration and was deposed.
- Case No. 3:14-cv-2824-VC, Trend Micro Incorporated v. Rpost Holdings, Inc., et al, submitted expert report and was deposed
- Akamai v. Limelight Networks, IPR2016-01631, IPR2016-01711, IPR2017-00249, IPR2017-00349, submitted IPR declarations and was deposed
- Hyperlync Technologies v. Verizon Sourcing, No. 650151/2015 New York Supreme Court, submitted declaration and was deposed
- Cascades Streaming Technologies v. Big Ten Networks, submitted expert reports and was deposed
- Klaustech, Inc. v. Google LLC., Case No. 4:10-CV-05899-JSW (N.D. Cal.), submitted expert report and was deposed
- Cisco v. Uniloc, IPR2017-00198, IPR2017-00058, submitted IPR declarations and was deposed.
- Cisco v. Uniloc, IPR2017-00597, submitted IPR declaration and was deposed
- Twitter v. Youtoo Technologies, LLC, IPR2017-01133, IPR2017-01131, submitted IPR declarations and was deposed
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00375, submitted IPR declaration and was deposed
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00376, IPR2017-00515, IPR2017-00775, submitted IPR declarations
- HTC Corporation v. IPA Technologies, IPR2018-00306, IPR2018-00307, submitted IPR declaration
- Hulu v. Soundview, IPR2018-00864, IPR2018-01023, submitted IPR declarations and was deposed
- XpertUniverse v. Cisco, 3:17-cv-3848, U.S. District Court for Northern District of California, submitted declaration in support of claim construction and was deposed
- Improved Search v. Microsoft, C.A. No. 16-cv-650-JFB-SRF (Del.), submitted declaration in support of claim construction
- Apple v. Uniloc, IPR2018-00361, IPR2018-00394, IPR2018-00395, IPR2019-00700, IPR2019-00701, IPR2019-01667, submitted IPR declarations
- LG Electronics v. Uniloc, submitted IPR declaration
- SRC Labs and Saint Regis Mohawk Tribe v. Microsoft, 2:18-cv-00321-JLR, U.S. District Court for Western District of Washington at Seattle, submitted declaration in support of claim construction and was deposed

- Verizon Wireless v. Barkan Wireless IP Holdings LP, submitted IPR declarations
- Verizon Wireless and Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-199, IPR2019-200, IPR2019-234, IPR2019-631, IPR2019-632, submitted IPR declarations
- Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-100, submitted IPR declaration
- Cisco Systems Inc. v. Meetrix IP LLC, IPR2019-539, IPR2019-540, IPR2019-541, IPR2019-542, IPR2019-543, IPR2019-544, submitted IPR declarations
- GMG Products LLC v. Traeger Pellet Grills LLC, PGR2019-24, PGR2019-34, PGR2019-35, PGR2019-36, submitted PGR declaration and was deposed
- Uniloc 2017 LLC v. Google LLC, 2:18-cv-00502-JRG-RSP, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Microsoft Corporation v. Uniloc 2017 LLC, IPR2020-00102, IPR2020-00103, submitted IPR declarations
- Microsoft Corporation and HP Inc. v. Syncloud Technologies, LLC, IPR2020-00316, IPR2020-01031, IPR2020-01032, IPR2020-01269, IPR2020-01270, IPR2020-01271, submitted IPR declarations
- Seven Networks, LLC v. Apple Inc, 2:19-cv-115-JRG, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Unified Patents Inc. v. Ortiz & Associates Consulting, LLC, IPR2019-00743, submitted IPR declaration
- Uniloc 2017 LLC v. Apple Inc., 3:19-cv-01905-JD, U.S. District Court for the Northern District of California, San Francisco Division, submitted declaration in support of claim construction and was deposed
- ClearPlay Inc. v. Dish Network LLC et al.; 2:14-cv-00191, U.S. District Court for the District of Utah, Central Division, submitted expert report and re-examination declarations, was deposed, and testified at trial
- AMC Networks, Inc. et al v. Sound View Innovations, LLC, IPR2020-00482, submitted IPR declaration
- Case No. 1:17-cv-01734-RGA, Sprint Communications Co., L.P., v. Charter Communications, Inc., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.
- CommScope Technologies LLC et al. v. Barkan Wireless IP Holdings LP et al., IPR2020-00827, IPR2020-00829, IPR2020-00831, IPR2020-00833, IPR2020-00835, IPR2020-00838, submitted IPR declarations
- Cisco Systems Inc. v. Monarch Networking Solutions LLC, IPR2020-01226, submitted IPR declaration
- CoolTV Network.com v. Blackboard, Inc., Facebook, Inc., International Business Machines Corporation, Kaltura, Inc., Limelight Networks, Inc., Microsoft Corporation, Ooyala, Inc., Snap, Inc., and Trapelo Corp., submitted declaration in support of claim construction and was deposed
- Facebook, Inc. v. Onstream Media Corporation, IPR2020-01507, IPR2020-01508, IPR2020-01525, IPR2020-01527, IPR2020-01528, submitted IPR declarations
- Hisense Co LTD. v. Maxell, LTD, IPR2020-01598, IPR2020-01600, submitted IPR declarations
- Microsoft Corp. v. O'Brien, IPR2021-00015, submitted IPR declaration and was deposed
- Sable Networks Inc. v. Cisco Systems, Inc., WA:20-CV-00288-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted declaration in support of claim construction
- Peloton Interactive, Inc. v. Icon Health and Fitness Inc et al., IPR2021-00342, submitted IPR declaration

- Hulu, LLC v. SITO Mobile R&D IP, LLC et al., CBM2020-00028, IPR2020-00158, IPR2020-00206 , IPR2020-00219 , IPR2020-00265 , IPR2020-00298 , IPR2020-00304 , IPR2020-00308 , submitted CMB and IPR declarations and was deposed
- Twitter, Inc. and Google LLC v. B.E. Technology, LLC, IPR2021-00482, IPR2021-00483, IPR2021-00484, IPR2021-00485, submitted IPR declarations
- MG Freesites LTD v. ScorpCast, LLC, IPR2021-00511, submitted IPR declaration
- Avionte, LLC v. Sandeep Acharya, Samar Basnet, and Aqore LLC, Arbitration, Hon. Jeffrey Keyes (Ret.)
- Microsoft Corporation v. WSOU Investments, LLC d/b/a Brazos Licensing and Development, IPR2021-00751, submitted IPR declaration
- SAP America, Inc. v. Express Mobile, Inc., IPR2021-01144, IPR2021-01145, IPR2021-01146, submitted IPR declarations
- StratosAudio Inc. v. Hyundai Motor America, 6:20-cv-01125-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted claim construction declaration and was deposed
- Peloton Interactive, Inc. v. Ifit Health and Fitness Inc, IPR2022-00029, IPR2022-00030, submitted IPR declarations and was deposed
- Investigation No. 337-TA-1263, In the matter of Certain televisions, remote controls, and components thereof, U.S. International Trade Commission, filed expert reports, was deposed, and testified at hearing
- Alexander Stross v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00861-AB(JC), filed expert reports, and was deposed
- Ralph Ledergerber v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00862-AB(JC), filed expert reports and was deposed
- John Walmsley v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00863-AB(JC), filed expert reports and was deposed
- Bernhard Kuhmstedt v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-02044-AB(JC), filed expert reports and was deposed
- Netflix, Inc. v. CA, Inc., IPR2021-01319, submitted IPR declaration and was deposed
- F45 Training Pty Ltd. v. Body Fit Training USA Inc., C.A. No. 20-1194 (LPS) (D. Del.), filed expert report
- Apple v. Fintiv, IPR2022-00976, IPR2022-01149, IPR2022-01150, IPR2023-00399, submitted IPR declarations and was deposed
- Estech Systems, Inc. v. Howard Midstream Energy Partners d/b/a Howard Energy Partners, C.A. No. 6:20-cv-777-ADA (Western District of Texas, Waco Division), filed expert reports and was deposed
- Echelon Fitness Multimedia, LLC. v. Peloton Interactive, Inc., IPR2020-01187, submitted IPR declaration and was deposed
- VIZIO. V. Maxell Ltd., IPR2022-01458, submitted IPR declaration
- Maxell, Ltd. et el. v. VIZIO, Inc., Case No. 2-21-cv-06758 (C.D. Cal.). filed declaration and was deposed
- Microsoft Corporation v. SurfCast, Inc., submitted IPR declarations
- The Walt Disney Company et al. v. WAG Acquisition LLC, IPR2022-01227, IPR2022-01228, IPR2022-01346, submitted IPR declarations and was deposed
- Rakuten Rewards et al. v. IBM, submitted IPR declarations and was deposed
- Fubotv Media Inc. v. SITO Mobile R&D IP, LLC et al., submitted IPR declarations
- Unified Patents, LLC v. Noblewood IP LLC, IPR2022-01111, submitted IPR declaration
- Unified Patents, LLC. v. Pedersen, Peter Henrik, IPR2023-00029, submitted IPR declaration
- Ericsson Inc v. Dali Wireless Inc., submitted IPR declarations

- Universal Electronics, Inc. et al. v. Roku, Inc., IPR2022-00818, submitted declarations and was deposed
- Google LLC v. Wildseed Mobile LLC et al., IPR2023-00244, IPR2023-00245, IPR2023-00246, IPR2023-00247, IPR2023-00248, submitted declarations
- Lululemon Athletica Canada Inc. et al. v. Nike, Inc., IPR2023-00180, IPR2023-00424, submitted declarations
- Zoho Corporation, et al. v. Meetrix IP, LLC, IPR2023-00371, IPR2023-00377, IPR2023-00379, IPR2023-00380, IPR2023-00382, submitted declarations
- WSOU Investments, LLC d/b/a/ Brazos Licensing and Development v. Google LLC, 6:20-cv-572, U.S. District Court for the Western District of Texas, Waco Division, submitted reports and was deposed
- Google LLC v. Safecast Limited LLC, IPR2023-00652, submitted declaration
- Investigation No. 337-TA-1338, In the matter of Certain smart televisions, U.S. International Trade Commission, filed reports and was deposed
- Cisco Systems, Inc. v. Orckit IP LLC, IPR2023-00714, submitted declaration
- SupplyPro, Inc. v. Sandvik Machining Solutions AB, et al., AAA Case No. 01-22-000-7897. submitted declaration
- TrackThings LLC v. NETGEAR, Inc., Case No. 22-00981-RGA-JLH, U.S. District Court for the District of Delaware, submitted declaration
- Walt Disney Parks & Resorts US Inc. v. Agile Journeys LLC; IPR2024-00029, submitted declaration
- Aylo Freesites Ltd v. Dish Technologies LLC; IPR2024-00043, IPR2024-00044, IPR2024-00045, IPR2024-00046, IPR2024-00047, IPR2024-00048, IPR2024-00146, IPR2024-00147; submitted declarations
- Arm Inc. et al. v. Icpillar LLC; IPR2024-00476, IPR2024-00566; Retained by Arm; submitted declarations
- Microsoft Corp et al. v. Litl LLC, IPR2024-00454, IPR2024-00455, IPR2024-00456, IPR2024-00457, IPR2024-00458; submitted declarations
- Cisco Systems Inc et al. v. InfoExpress Inc, IPR2024-00539, IPR2024-00540, IPR2024-00677, IPR2024-00678; submitted declarations
- Vizio Inc v. Multimedia Technologies Pte Ltd; IPR2024-00722, IPR2024-00723; Retained by Vizio; submitted declarations
- Sap America Inc v. Isix IP LLC; IPR2024-00615; Retained by SAP; submitted declarations
- Cisco Systems Inc et al. v. Portsmouth Network Corp; IPR2024-00505, IPR2024-00506; submitted declarations
- Verizon Corporate Service Group et al. v. Headwater Partners I LLC; IPR2024-00809, IPR2024-00945; Retained by Verizon; Technology: Mobile device management; Submitted declarations, 2024
- Microchip Technology Inc v. Aptiv Technologies Ltd et al.; IPR2024-00228; Retained by Aptiv; Technology: Universal Serial Bus; Submitted declaration, 2024
- Vusion Group SA v. Hanshow Technology Co Ltd; IPR2024-00963; Retained by VusionGroup; Technology: Video analysis; Submitted declaration, 2024

Publications

- “IP switching: server driven flow classification,” H. H. Houh, *Proceedings of the Washington University Workshop on Integration of IP and ATM*, November 1996.
- “Aurora at MIT,” D. D. Clark, H. H. Houh, and D. L. Tennenhouse, Editors, *MIT Laboratory for Computer Science Technical Report 673*, December 1995.
- “ViewStation Applications: Implications for Network Traffic,” C. J. Lindblad, D. Wetherall, W. Stasior, J. F. Adam, H. H. Houh, M. Ismert, D. Bacher, B. Phillips, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 1995.
- “The VuNet Desk Area Network: Architecture, Implementation, and Experience,” H. H. Houh, J. F. Adam, M. Ismert, C. J. Lindblad, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 13 (4), May, 1995.
- “Reducing the Complexity of ATM Host Interfaces,” H. H. Houh and D. L. Tennenhouse, Hot Interconnects II Symposium Proceedings, Stanford, August 11-12, 1994.
- “Media-intensive data communications in a ‘desk-area’ network,” J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, *IEEE Communications*, August 1994.
- “ViewStation Applications: Intelligent Video Processing Over A Broadband Local Area Network,” C. J. Lindblad, D. J. Wetherall, W. Stasior, B. Phillips, D. Bacher, J. Adam, H. Houh, M. Ismert, and D. L. Tennenhouse, Proceedings of the 1994 USENIX Symposium on High-Speed Networking, Oakland, CA, August 1994.
- “The Media Gateway: Live Video on the World Wide Web,” H. H. Houh, C. J. Lindblad, J. Soo, D. L. Tennenhouse, and D. J. Wetherall, Workshop at the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- “Active Pages: Intelligent Nodes on the World Wide Web,” H. H. Houh, C. J. Lindblad, and D. J. Wetherall, Proceedings of the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- “Wavelength Division vs. Code Division Access Methods for Optical Networks,” H. H. Houh, Area Exam Paper, May 1993.
- “Experience with the VuNet: A Network Architecture for a Distributed Multimedia System,” J. F. Adam, H. H. Houh, D. L. Tennenhouse, Proceedings of the 18th Conference on Local Computer Networks, pp. 70-76, September 1993
- “The VudBoard: A Simple DMA Interface,” H. H. Houh, Proceedings of the 4th Gigabit Minijam, January 1994.
- “A Software-Oriented Approach to the Design of Media Processing Environments,” D. L. Tennenhouse, J. Adam, D. Carver, H. Houh, M. Ismert, C. Lindblad, W. Stasior, D. Weatherall, D. Bacher, and T. Chang., submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- “A Network Architecture for Distributed Multimedia Systems,” J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- “The Viewstation Collected Papers,” D. L. Tennenhouse, J. Adam, C. Compton, A. Duda, D. Gifford, H. Houh, M. Ismert, C. Lindblad, W. Stasior, R. Weiss, D. Wetherall, D. Bacher, D. Carver, and T. Chang, MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-590, November 1993.
- “The Viewstation Collected Papers II,” W. F. Stasior, D. L. Tennenhouse, J. F. Adam, D. R. Bacher, H. H. Houh, M. Ismert, C. J. Lindblad, B. M. Phillips, D. J. Wetherall, MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-696, April 1996.

- “A System's Perspective of the Sagnac Fiber Logic Gates and Their Possible Applications,” A. Huang, N. Whitaker, C. Gabriel, H. Avramopoulos, P. M. W. French, H. H. Houh, and I. Chuang, Applied Optics, September 10, 1994
- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, T. Morse, IEEE Phot. Tech. Lett. **3** (3), 235
- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, IEEE/LEOS Annual Meeting, Paper PDP-13, November 1990
- “All-optical phase-locked oscillator,” N. A. Whitaker, Jr., H. H. Houh, H. Avramopoulos, T. F. Morse, IEEE/LEOS Annual Meeting, Paper ELT2.4/MOO3, November 1990
- “Passive modelocking of an all-fiber erbium laser,” H. Avramopoulos, H. H. Houh, N. A. Whitaker, M. C. Gabriel, T. F. Morse, IEEE/LEOS Conference on Optical Amplifiers and their Applications, Paper PDP-8, August 1990
- “Transverse modes, waveguide dispersion, and 30ps recovery in submicron GaAs/AlAs microresonators,” J. L. Jewell, S. L. McCall, A. Scherer, H. H. Houh, N. A. Whitaker, A. C. Gossard, and J. H. English, Appl. Phys. Lett. **55** (1), July 3, 1989

Leadership, Activities and Interests

- Leadership
 - Reading Symphony Orchestra
 - Board of Directors (Treasurer), 2022 – present
 - Discovery Museum (Acton, MA)
 - Board of Directors, 2023 – present
 - Board of Directors, Development Committee, 2023 – present
 - Science and Technology Advisory Council, 2012 – present
 - The Discover Museum received the 2024 National Medal for Museum and Library Service, the nation’s highest honor given to museums and libraries that make significant and exceptional contributions to their communities.
 - Tau Beta Pi National Engineering Honor Society
 - Executive Councilor, 2024 – 2026
 - Advisor, MA B Chapter at MIT, 2003 – present
 - District Director (National Officer), Tau Beta Pi, New England Area, 1991 – 2003
 - President, MA B Chapter at MIT, Fall 1988 – Spring 1989
 - Laureate award, 1989
 - MIT Alumni Association Board of Directors
 - MIT Annual Giving Board, 3 year term, 2024 – 2027
 - National Selection Committee, 3 year term, 2020 – 2023
 - K-12 STEM Initiatives Co-chair, 2013 – 2017
 - Awards Committee Chair, 2012 – 2014
 - Awards Committee, 3 year term, 2011 – 2014
 - Vice President, 2 year term, 2004 – 2006
 - Alumni Ad-Hoc Committee, Chair, 2005-2006
 - Board Member, 2 year term, 1997 – 1999
 - MIT Club of Boston
 - Board of Directors, 2006 – 2011
 - K-12 Initiatives Chair, 2009 – 2012

- VP of Communications, MIT Club of Boston, 2003 – 2006
 - Past-President, MIT Club of Boston, 2002 – 2003
 - President, MIT Club of Boston, 2001 – 2002
 - President-Elect, MIT Club of Boston, 2000 – 2001
 - VP of Programs, MIT Club of Boston, 1999 – 2000
 - Activities Super-Chair, MIT Club of Boston, 1998 – 1999
- MIT Enterprise Forum of Cambridge, Inc.
 - Past Chair, 2009 – 2011
 - In-NOW-vation Co-chair, 2010
 - Chair, 2007 – 2009
 - Vice Chair, 2005 – 2007
 - Executive Board Member, 2002 – 2011
 - Winter Workshop Co-Chair, February 2007 – conceived idea for conference, which sold-out and produced largest attendance numbers in recent memory
 - Spring Workshop Co-Chair, Spring 2004
 - Membership Committee Chair, Fall 2003 - 2006
 - 25th Anniversary Dinner Chair, Fall 2003
 - As Membership Chair and Board Member, started Special Interest Groups in 2004; a SIG won the MIT Presidential Citation award, the MIT Alumni Association's highest award for organizations, in 2006
- Estabrook Elementary School PTA
 - Advisory committee to the superintendent on PCB issue, 2010-2011
 - 4th Grade after-school science program co-organizer, 2010-2012
 - 4th and 5th Grade before-school Math Olympiad co-organizer, 2009-2013
 - 5th Grade BBQ and Yearbook Committee, 2011, 2013
 - Family Math Night volunteer, 2008-2012
- MIT Class of 1989
 - Secretary, five consecutive 5 year terms, 1989 - 2014
 - 30-year Reunion Committee, 2019
 - 25-year Reunion Committee, 2014
 - 20-year Reunion Committee and Gift Committee, 2009
 - 15-year Reunion Committee and Gift Committee, 2004
 - 10-year Reunion Committee and Gift Committee, 1999
 - 5-year Reunion Committee, 1994
 - Interim Treasurer, 1993 - 1994
 - Instituted annual senior class career fair, now raising over \$100,000 annually for senior class activities, Fall 1988
- Strong, consistent record of leadership dating to high school
- Acting
 - ‘21’ (Sony Pictures), credited as “Chinatown Dealer,” 2007, Kevin Spacey's movie about the MIT Blackjack Team inspired by “Bringing Down the House” by Ben Mezrich, opened nationwide on March 28, 2008. 21 was the number one movie in US for two weeks and number one globally for one week. 21 also topped the DVD sales, Blu-ray sales and DVD rental charts.
 - Spring Lake Theater Company, first New York-area off-broadway production of “A Chorus Line,” played role of Mark, Summer 1990
- Former member of the MIT Blackjack team
- Producer for 10,000 Maniacs’ 2013 album “Music from the Motion Picture”

- Executive Producer for 10,000 Maniacs' 2015 album "Twice Told Tales"
- Violist, violist, harpist, guitarist, singer, actor: played in many amateur/semi-professional groups including Firebird Pops Orchestra, Reading Symphony Orchestra, MIT Summer Philharmonic Orchestra, Carlisle Chamber Orchestra, Rivers Symphony Orchestra, Opera51 Orchestra, Freisinger Chamber Orchestra, Merrimack Valley Philharmonic, Longwood Symphony, MIT Symphony, and Somerville Community Chorus
- Violist, "Coming Home" album by Karen Phillips, 2014
- Google Scholar citations: 2079, h-index: 21, i10-index: 26 (since 2017: 662/12/14)
- Erdos-Bacon number of 7
- Erdos-Bacon-Sabbath number of 11

APPENDIX 2: MATERIALS CONSIDERED IN THE PREPARATION OF THIS DECLARATION

Exhibit No.	Description
1001	U.S. Patent No. 10,986,403 to Donian <i>et al.</i> (the '403 patent)
1002	Prosecution History for the '403 patent
1004	U.S. Pat. App. Pub. No. 2002/0083439 ("Eldering-I")
1005	U.S. Pat. App. Pub. No. 2003/0149975 ("Eldering-II")
1006	U.S. Patent No. 6,262,724 ("Crow")
1007	U.S. Pat. App. Pub. No. 2002/0141582 ("Kocher")
1008	U.S. Patent No. 7,006,760 ("Takagi")
1009	U.S. Patent No. 7,302,160 ("Wells")
1010	U.S. Pat. App. Pub. 2002/0161739 ("Oh")
1011	U.S. Pat. App. Pub. 2001/0042249 ("Knepper")
1012	U.S. Pat. App. Pub. 2003/0154128 ("Liga")
1013	US 2003/0154295 ("Mangold")
1014	U.S. Pat. App. Pub. 2003/0149621 ("Shteyn")
1015	<i>Piranha Media Distribution, LLC v. Hulu, LLC</i> , CDCA-2-24-cv-00498, Dkt. No. 28 (Piranha's Opposition to Hulu's Motion to Dismiss)
1016	<i>Piranha Media Distribution, LLC v. Hulu, LLC</i> , CDCA-2-24-cv-00498, Piranha's Infringement Contentions for the '403 Patent
1017	U.S. Pat. App. Pub. 2002/0002674 ("Grimes")
1018	U.S. Pat. App. Pub. 2003/0079133 ("Breiter")
1019	U.S. Pat. App. Pub. 2001/0047338 ("Jones")
1020	U.S. Patent No. 6,161,142 ("Wolfe")
1021	U.S. Pat. App. Pub. 2002/0120515 ("Morimoto")
1022	U.S. Pat. App. Pub. 2003/0044162 ("Angel")
1023	U.S. Pat. App. Pub. 2001/0049820 ("Barton")
1024	International Standard ISO/IEC 14496-1
1025	U.S. Patent No. 7,739,601 ("Wong")
1026	U.S. Pat. App. Pub. 2001/0047298 ("Moore")

APPENDIX 3: CHALLENGED CLAIMS

[1a] A digital media player device for controlling digital media presentations, the digital media player device comprising:

[1b] one or more processors for receiving data comprising digital media content and digital advertising content;

[1c] a user interface input for allowing a user to control a course of presentation of the digital media content received;

[1d] an intersplicer for controlling one or more insertion points of the digital advertising content into the digital media content thereby sequencing the digital media content and the digital advertising content, the sequencing comprising ordering one or more data blocks of the digital media content and one or more data blocks of the digital advertising content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising one or more initially sequenced insertion points at which the digital advertising content is scheduled to be presented relative to the digital media content during play;

[1e] in response to user input updating a current play position in the content stream to a new play position in the content stream, the one or more processors using one or more adaptive preference rules to adaptively

modify a presentation position of the digital advertising content from at least one of the one or more initially sequenced insertion points to one or more alternatively sequenced insertion points in the digital media content, at least one of the one or more alternatively sequenced insertion points being different than the one or more initially sequenced insertion points relative to the digital media content within the content stream;

[1f] the one or more alternatively sequenced insertion points being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference rules taking into account the new play position and at least one of a length of time associated with playing the digital media content and a number of digital media data blocks of the digital media content to be played,

[1g] such that at least one of the alternatively sequenced insertion points is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position; and

[1h] a user interface output for causing presentation of the content stream during a play period associated with one or more states of play such that a part of the digital advertising content is adaptively played at the one or more alternatively sequenced insertion points, instead of at the one or more initially sequenced insertion points; and

[1i] at least a first memory for storing a setting to indicate a first state of play, the setting including a first value to indicate presentation of a required part of the digital advertising content is in progress during presentation of the content stream such that responsive to detecting the first value in the first memory, the user interface input is disabled to prevent commands comprising at least one of a user volume control or a user navigation control from altering a course of presentation of the content stream while presentation of the required part of the digital advertising content is in progress.

2. The digital media player device as in claim 1, wherein the user interface input comprises a graphical user interface that includes a time bar to allow the user to control the course of presentation of the digital media content received to a specific point in the presentation past at least one of the one or more initially sequenced insertion points.

4. The digital media player device as in claim 1, wherein the digital media content comprises at least one media file.

5. The digital media player device as in claim 1, wherein the digital advertising content comprises at least one advertisement file.

6. The digital media player device as in claim 5, wherein a sequence is generated by sub-dividing a media file into two or more segments, and wherein at least a part of the at least one of the advertising file is presented between two of the segments.

7. The digital media player device as in claim 4, wherein the user input results in a change of a sequence of two or more media files by at least one of subtracting an existing media file and re-arranging the sequence of two or more media files in a change of sequence by adding a new media file.

8. The digital media player device as in claim 1, wherein the user input further comprises one or more navigational choices for the content stream.

9. The digital media player device as in claim 8, wherein the one or more navigational choices are selected from a group consisting of: play, stop, pause/continue, reverse, rewind, fast-forward, slow-motion, track

advance, frame-by-frame advance, go direct to point or page in sequence, advance chapter, page turn, change track, change media selection, shuttle knob, and one or more sound controls.

10. The digital media player device as in claim 1, further comprising: rotating, using an ad manager and an ad rotator, new advertising content into the content stream in response to the user input, the ad manager operative to receive ad files and select ad files for presentation from a database of ad files and the ad rotator configured to replace ad files with new ad files after the ad files have been presented.

11. The digital media player device as in claim 1, wherein the adaptively modifying uses two or more of the adaptive preference rules for determining the one or more alternatively sequenced insertion points of at least a part of the digital advertising content.

13. The device as in claim 1, the digital media player device further comprising a media file decryptor configured to receive and decrypt the digital media content during play, the media file decryptor configured to limit access to a non-volatile memory following the decryption of the digital media content.

14. The device as in claim 1, wherein the digital media player device is configured to read a data structure of the one or more data blocks of the digital media content, the data structure including a first field containing data identifying a media file associated with the digital media content, a second field containing data indicative of an ad requirement associated with the digital media content, and a third field containing data representing an ad file associated with the digital advertising content to be displayed with the media file.

15. The device as in claim 1, wherein the user interface input includes a time bar configured to control the intersplicer to alter a course of presentation of the content stream in response to the user dragging the time bar, the dragging of the time bar enabling at least one of fast-forward play, skipping forward, backward skipping to a fixed point, slow motion play, and frame advance play.

[17a] A computer-implemented system for controlling digital media presentations, the system comprising:

[17b] one or more processors;

[17c] a user interface for allowing a user to control a course of presentation of digital media content;

[17d] an intersplicer for controlling one or more insertion points of digital advertising content into the digital media content thereby sequencing the digital media content and digital advertising content, the sequencing comprising ordering one or more data blocks of the digital media content and one or more data blocks of the digital advertising content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising one or more initially sequenced insertion points at which the digital advertising content is scheduled to be presented relative to the digital media content during play;

[17e] in response to user input updating a current play position in the content stream to a new play position in the content stream, the one or more processors using one or more adaptive preference rules to adaptively modify, a presentation position of the digital advertising content from at least one of the one or more initially sequenced insertion points to one or more alternatively sequenced insertion points;

[17f] the one or more alternatively sequenced insertion points being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of

the digital media content to be played, and a point in time the digital media content is to be played,

[17g] such that at least one of the alternatively sequenced insertion points is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;

[17h] a user interface output for causing presentation of the content stream during a play period associated with one or more states of play such that a part of the digital advertising content is adaptively played at the one or more alternatively sequenced insertion points, instead of the one or more initially sequenced insertion points; and

[17i] at least a first memory for storing a setting to indicate a first state of play, the setting including a first value to indicate presentation of a required part of the digital advertising content is in progress during presentation of the content stream such that responsive to detecting the first value in the first memory, the user interface is disabled to prevent

commands comprising a user navigation control from altering a course of presentation of the content stream.

18. The system as in claim 17, wherein the at least first memory is part of the computer-implemented system.

19. The system as in claim 17, wherein the at least first memory is part of at least one remote system.

[21a] A computer-implemented method for controlling digital media presentations using an improved digital media player system, the method comprising:

[21b] receiving, on a digital media player system, data comprising digital media content and digital advertising content,

[21c] the digital media player system having a user interface and an intersplicer, the user interface configured to allow a user to control a course of presentation of the digital media content received,

[21d] and the intersplicer configured to control one or more initially sequenced insertion points of the digital advertising content into the digital media content;

[21e] sequencing the digital media content, using the intersplicer, the sequencing comprising ordering one or more data blocks of the digital

media content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising a media section that comprises at least some of the digital media content, the content stream further comprising an advertising block within which at least some of the digital advertising content is scheduled to be presented, the advertising block being arranged within the content stream at an initially defined insertion position relative to the media section during play;

[21f] adaptively re-sequencing the content stream into a modified content stream to reflect a user input comprising updating a current play position to a new play position in the digital media content detected at the digital media player system, the modified content stream comprising an alternate insertion position of the advertising block relative to the media section, the adaptively re-sequencing comprising determining the alternate insertion position using one or more adaptive preference placement rules associated with the digital media content;

[21g] the alternate insertion position being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference placement rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital

media content to be played, and a point in time the digital media content is to be played,

[21h] such that the alternate insertion position is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;

[21i] causing presentation of the modified content stream at the digital media player system during a play period associated with one or more states of play;

[21j] causing adaptive presentation of a required part of the digital advertising content at the alternate insertion position, instead of at the one or more initially sequenced insertion points;

[21k] keeping a setting, in at least a first memory of the digital media player system, to indicate a first state of play, the setting including a first value to indicate presentation of the required part of the digital advertising content is in progress during presentation of the modified content stream; and

[211] responsive to detecting the first value in the first memory, disabling user interface commands comprising a user navigation control that enables the user to alter a course of presentation of the modified content stream.

[22a] A computer-implemented method for controlling digital media presentations using an improved digital media player system, the method comprising:

[22b] transmitting, by at least one remote system to a digital media player system, data comprising digital media content and digital advertising content,

[22c] the digital media player system having a user interface and an intersplicer, the user interface configured to allow a user to control a course of presentation of the digital media content received,

[22d] and the intersplicer for controlling one or more insertion points of the digital advertising content into the digital media content;

[22e] sequencing the digital media content, using the intersplicer, the sequencing comprising ordering one or more data blocks of the digital media content into a content stream playable as audio or visual content perceivable by the user, the content stream comprising a media section that

comprises at least some of the digital media content, the content stream further comprising an advertising block within which at least some of the digital advertising content is scheduled to be presented during play, the advertising block being arranged within the content stream at an initially defined insertion position relative to the media section;

[22f] adaptively re-sequencing the content stream into a modified content stream to reflect a user input comprising updating a current play position to a new play position in the digital media content detected at the digital media player system, the modified content stream comprising an alternate insertion position of the advertising block relative to the media section, the adaptively re-sequencing comprising determining the alternate insertion position using one or more adaptive preference placement rules associated with the digital media content during play;

[22g] the alternate insertion position being adaptively selectable by the intersplicer according to selection criteria defined by the one or more adaptive preference placement rules taking into account the new play position and at least one of a length of time associated with playing the digital media content, a number of digital media data blocks of the digital media content to be played, and a point in time the digital media content is to be played

[22h] such that the alternate insertion position is positioned at a play position in the digital media content that satisfies a condition selected from: the play position being a predetermined length of time after the new play position, the play position being a predetermined number of digital media data blocks after the new play position, and the play position being at a predetermined time of the hour after the new play position;

[22i] causing presentation of the modified content stream at the digital media player system during a play period associated with one or more states of play;

[22j] causing adaptive presentation of a required part of the digital advertising content at the alternate insertion point, instead of the initially defined insertion position;

[22k] keeping a setting, in at least a first memory of the digital media player system, to indicate a first state of play, the setting including a first value to indicate presentation of the required part of the digital advertising content is in progress during presentation of the modified content stream; and

[221] responsive to detecting the first value in the first memory, disabling user interface commands comprising a user navigation control that enables the user to alter a course of presentation of the content stream.

23. The method as in claim 22, wherein presentation data comprising an indication of the digital advertising content that has been presented is stored in a second memory of the digital media player system.

APPENDIX 4: UNDERSTANDING OF THE LAW

I have applied the following legal principles provided to me by counsel in arriving at the opinions set forth in this report.

Legal Standard for Prior Art

I am not an attorney. I have been informed by attorneys of the relevant legal principles and have applied them to arrive at the opinions set forth in this declaration.

I understand that the petitioner for inter partes review may request the cancelation of one or more claims of a patent based on grounds available under 35 U.S.C. § 102 and 35 U.S.C. § 103 using prior art that consists of patents and printed publications.

Anticipation and Prior Art

I understand that § 102 specifies when a challenged claim is invalid for lacking novelty over the prior art, and that this concept is also known as “anticipation.” I understand that a prior art reference anticipates a challenged claim, and thus renders it invalid by anticipation, if all elements of the challenged claim are disclosed in the prior art reference. I understand the disclosure in the prior art reference can be either explicit or inherent, meaning it is necessarily present or implied. I understand that the prior art reference does not have to use the same words as the challenged claim, but all of the requirements of the claim must

be disclosed so that a person of ordinary skill in the art could make and use the claimed subject-matter.

In addition, I understand that § 102 also defines what is available for use as a prior art reference to a challenged claim.

Under § 102(a), a challenged claim is anticipated if it was patented or described in a printed publication in the United States or a foreign country before the challenged claim's date of invention.

Under § 102(b), a challenged claim is anticipated if it was patented or described in a printed publication in the United States or a foreign country more than one year prior to the challenged patent's filing date.

Under § 102(e), a challenged claim is anticipated if it was described in a published patent application that was filed by another in the United States before the challenged claim's date of invention, or was described in a patent granted to another that was filed in the United States before the challenged claim's date of invention.

I understand that a challenged claim's date of invention is presumed to be the challenged patent's filing date. I also understand that the patent owner may establish an earlier invention date and "swear behind" prior art defined by § 102(a) or § 102(e) by proving (with corroborated evidence) the actual date on which the

named inventors conceived of the subject matter of the challenged claim and proving that the inventors were diligent in reducing the subject matter to practice.

I understand that the filing date of a patent is generally the filing date of the application filed in the United States that issued as the patent. However, I understand that a patent may be granted an earlier effective filing date if the patent owner properly claimed priority to an earlier patent application.

I understand that when a challenged claim covers several structures, either generically or as alternatives, the claim is deemed anticipated if any of the structures within the scope of the claim is found in the prior art reference.

I understand that when a challenged claim requires selection of an element from a list of alternatives, the prior art teaches the element if one of the alternatives is taught by the prior art.

Legal Standard for Obviousness

I understand that even if a challenged claim is not anticipated, it is still invalid if the differences between the claimed subject matter and the prior art are such that the claimed subject matter would have been obvious to a person of ordinary skill in the pertinent art at the time the alleged invention.

I understand that obviousness must be determined with respect to the challenged claim as a whole.

I understand that one cannot rely on hindsight in deciding whether a claim is obvious.

I also understand that an obviousness analysis includes the consideration of factors such as (1) the scope and content of the prior art, (2) the differences between the prior art and the challenged claim, (3) the level of ordinary skill in the pertinent art, and (4) “secondary” or “objective” evidence of non-obviousness.

Secondary or objective evidence of non-obviousness includes evidence of: (1) a long felt but unmet need in the prior art that was satisfied by the claimed invention; (2) commercial success or the lack of commercial success of the claimed invention; (3) unexpected results achieved by the claimed invention; (4) praise of the claimed invention by others skilled in the art; (5) taking of licenses under the patent by others; (6) deliberate copying of the claimed invention; and (7) contemporaneous and independent invention by others. However, I understand that there must be a relationship between any secondary evidence of non-obviousness and the claimed invention.

I understand that a challenged claim can be invalid for obviousness over a combination of prior art references if a reason existed (at the time of the alleged invention) that would have prompted a person of ordinary skill in the art to combine elements of the prior art in the manner required by the challenged claim. I understand that this requirement is also referred to as a “motivation to combine,”

“suggestion to combine,” or “reason to combine,” and that there are several rationales that meet this requirement.

I understand that the prior art references themselves may provide a motivation to combine, but other times simple common sense can link two or more prior art references. I further understand that obviousness analysis recognizes that market demand, rather than scientific literature, often drives innovation, and that a motivation to combine references may come from market forces.

I understand obviousness to include, for instance, scenarios where known techniques are simply applied to other devices, systems, or processes to improve them in an expected or known way. I also understand that practical and common-sense considerations should be applied in a proper obviousness analysis. For instance, familiar items may have obvious uses beyond their primary purposes.

I understand that the combination of familiar elements according to known methods is obvious when it yields predictable results. For instance, obviousness bars patentability of a predictable variation of a technique even if the technique originated in another field of endeavor. This is because design incentives and other market forces can prompt variations of it, and predictable variations are not the product of innovation, but rather ordinary skill and common sense.

I understand that a particular combination may be obvious if it was obvious to try the combination. For example, when there is a design need or market

pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. This would result in something obvious because the result is the product not of innovation but of ordinary skill and common sense. However, I understand that it may not be obvious to try a combination when it involves unpredictable technologies.

It is further my understanding that a proper obviousness analysis focuses on what was known or obvious to a person of ordinary skill in the art, not just the patentee. Accordingly, I understand that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

It is my understanding that the Manual of Patent Examining Procedure §2143 sets forth the following as exemplary rationales that support a conclusion of obviousness:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known technique to improve similar devices (methods, or products) in the same way;

- Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- Choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

A person of ordinary skill in the art looking to overcome a problem will often use the teachings of multiple publications together like pieces of a puzzle, even though the prior art does not necessarily fit perfectly together. Therefore, I understand that references for obviousness need not fit perfectly together like puzzle pieces. Instead, I understand that obviousness analysis takes into account inferences, creative steps, common sense, and practical logic and applications that a person of ordinary skill in the art would employ under the circumstances.

I understand that a claim can be obvious in light of a single reference, if the elements of the challenged claim that are not explicitly or inherently disclosed in the reference can be supplied by the common sense of one of skill in the art.

I understand that obviousness also bars the patentability of applying known or obvious design choices to the prior art. One cannot patent merely substituting one prior art element for another if the substitution can be made with predictable results. Likewise, combining prior art techniques that are interoperable with respect to one another is generally obvious and not patentable.

In order for a claim to be found invalid based upon a modification or combination of the prior art, there must be reasonable expectation that a person of ordinary skill would have successfully modified or combined the prior art to arrive at the claimed arrangement. This does not mean that it must be certain that a person of ordinary skill would have been successful – the law only requires that the person of ordinary skill in the art would have perceived a reasonable expectation of success in modifying or combining the prior art to arrive at the claimed invention.

In sum, my understanding is that obviousness invalidates claims that merely recite combinations of, or obvious variations of, prior art teachings using understanding and knowledge of one of skill in the art at the time and motivated by the general problem facing the inventor at the time. Under this analysis, the prior art references themselves, or any need or problem known in the field of endeavor

at the time of the invention, can provide a reason for combining the elements of or attempting obvious variations on prior art references in the claimed manner.

Legal Standard for Claim Construction

I understand that before any invalidity analysis can be properly performed, the scope and meaning of the challenged claims must be determined by claim construction.

I understand that a patent may include two types of claims, independent claims and dependent claims. I understand that an independent claim stands alone and includes only the limitations it recites. I understand that a dependent claim depends from an independent claim or another dependent claim. I understand that a dependent claim includes all the limitations that it recites in addition to the limitations recited in the claim (or claims) from which it depends.

In comparing the challenged claims to the prior art, I have carefully considered the patent and its file history in light of the understanding of a person of skill at the time of the alleged invention.

I understand that to determine how a person of ordinary skill would have understood a claim term, one should look to sources available at the time of the alleged invention that show what a person of skill in the art would have understood disputed claim language to mean. It is my understanding that this may include what is called “intrinsic” evidence as well as “extrinsic” evidence.

I understand that, in construing a claim term, one should primarily rely on intrinsic patent evidence, which includes the words of the claims themselves, the remainder of the patent specification, and the prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient. I understand that extrinsic evidence may include principles, concepts, terms, and other resources available to those of skill in the art at the time of the invention.

I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else or something more specific. I understand that to determine whether a term has special meaning, the claims, the patent specification, and the prosecution history are particularly important, and may show that the inventor gave a term a particular definition or intentionally disclaimed, disavowed, or surrendered claim scope.

I understand that the claims of a patent define the scope of the rights conferred by the patent. I understand that because the claims point out and distinctly claim the subject matter which the inventors regard as their invention, claim construction analysis must begin with and is focused on the claim language itself. I understand that the context of the term within the claim as well as other claims of the patent can inform the meaning of a claim term. For example, because

claim terms are normally used consistently throughout the patent, how a term is used in one claim can often inform the meaning of the same term in other claims. Differences among claims or claim terms can also be a useful guide in understanding the meaning of particular claim terms.

I understand that a claim term should be construed not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the entire specification. I understand that because the specification is a primary basis for construing the claims, a correct construction must align with the specification.

I understand that the prosecution history of the patent as well as art incorporated by reference or otherwise cited during the prosecution history are also highly relevant in construing claim terms. For instance, art cited by or incorporated by reference may indicate how the inventor and others of skill in the art at the time of the invention understood certain terms and concepts. Additionally, the prosecution history may show that the inventors disclaimed or disavowed claim scope, or further explained the meaning of a claim term.

With regard to extrinsic evidence, I understand that all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises, can also be considered. For example, technical dictionaries may indicate how one of skill in the art used or understood the claim

terms. However, I understand that extrinsic evidence is considered to be less reliable than intrinsic evidence, and for that reason is generally given less weight than intrinsic evidence.

I understand that in general, a term or phrase found in the introductory words or preamble of the claim, should be construed as a limitation if it recites essential structure or steps, or is necessary to give meaning to the claim. For instance, I understand preamble language may limit claim scope: (i) if dependence on a preamble phrase for antecedent basis indicates a reliance on both the preamble and claim body to define the claimed invention; (ii) if reference to the preamble is necessary to understand limitations or terms in the claim body; or (iii) if the preamble recites additional structure or steps that the specification identifies as important.

On the other hand, I understand that a preamble term or phrase is not limiting where a challenged claim defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. I understand that to make this determination, one should review the entire patent to gain an understanding of what the inventors claim they invented and intended to encompass in the claims.

I understand that 35 U.S.C. § 112 ¶ 6 created an exception to the general rule of claim construction called a “means plus function” limitation. These types of

terms and limitations should be interpreted to cover only the corresponding structure described in the specification, and equivalents thereof. I also understand that a limitation is presumed to be a means plus function limitation if (a) the claim limitation uses the phrase “means for”; (b) the “means for” is modified by functional language; and (c) the phrase “means for” is not modified by sufficient structure for achieving the specified function.

I understand that a structure is considered structurally equivalent to the corresponding structure identified in the specification only if the differences between them are insubstantial. For instance, if the structure performs the same function in substantially the same way to achieve substantially the same result. I further understand that a structural equivalent must have been available at the time of the issuance of the claim.