

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. IPR2024-01253

U.S. Patent No. 11,463,768

Declaration of Henry Houh, Ph.D.

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I, Henry 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. 11,463,768 (“the ’768 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-1007, ¶33; Ex-1008, ¶41, ¶61; Ex-1009, ¶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-1009, ¶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-1010, ¶¶10-11.

II. THE '768 PATENT

A. Overview

7. The '768 patent “relates generally to the distribution of audio, video, and print media content via digital replication and delivery channels.” Ex-1001, 1:27-29. The '768 patent discusses inserting and displaying advertisements within media content. Ex-1001, 7:45-55.

8. The '768 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, 7:4-18 (“[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 ’768 patent is to adaptively select and re-sequence ads in response to user playback controls. *See* Ex-1001, 7:45-55, 15:4-18, 28:62-29:7. By doing so, the ’768 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, 6:63-7:3, 8:46-58, 14:37-59, 15:4-18.

10. However, the idea of selecting and re-sequencing ads for display was known and applied in media streaming well before the ’768 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, 8:32-45, 42:51-67.

B. Prosecution History

11. The ’768 patent was allowed after two Office Actions. Ex-1002, 000345. In the first Office Action, the Examiner rejected the claims as being anticipated over U.S. Patent Application Publication No. 2007/0204310. Ex-1002,

000125-130. In response, the Applicant argued that the cited reference is not prior art. Ex-1002, 000153-154. In the second Office Action, the Examiner rejected the claims under non-statutory double patenting and did not raise any prior-art rejection. Ex-1002, 000297-301.

12. The application for U.S. Patent No. 10,986,403 (the '403 patent), a parent of the '768 patent, received Office Actions with substantive prior-art rejections. The '403 patent has a prosecution history spanning 18 years, including multiple Office Actions under §§ 101, 102, 103 and 112. Ex-1006, 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-1006, 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-1006, 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-1006, 000895-96. As explained below, Ground 1 provides the teachings that the PTAB found to be lacking in Knepper.

C. Priority Date

13. The '768 patent was filed April 19, 2021. The '768 patent is a continuation of U.S. Patent No. 10,986,403 (the '403 patent), which 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 '768 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

14. I understand that Petitioner is challenging the validity of claims 1-3, 5-12, 14-21, 23-25, 27-29, and 31-33 of the '768 patent in the Petition for Inter Partes Review to which this declaration will be attached. Those claims are reproduced in Appendix 3. While this Petition and declaration are directed to the challenged claims, I have considered all claims 1-34 of the '768 patent, as well as

portions of the prosecution history of the '768 and '403 patents in forming my opinions.

III. LEVEL OF ORDINARY SKILL IN THE ART

15. I have analyzed the '768 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.”), 1:27-29 (“This invention relates generally to the distribution of audio, video, and print media content via digital replication and delivery channels.”).

16. In determining the characteristics of a hypothetical person of ordinary skill in the art (“POSITA”) of the '768 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 '768 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.

17. I came to the conclusion that a person of ordinary skill in the field of art of the '768 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.

18. 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

19. 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.

20. 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”

21. Based on my review of the claims and specification of the ’768 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.”

22. Claims of the ’768 patent recite multiple ways that the intersplicer controls the insertion and conveyance of advertising content in media content, including, for example, “chang[ing] a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point” (Ex-1001,

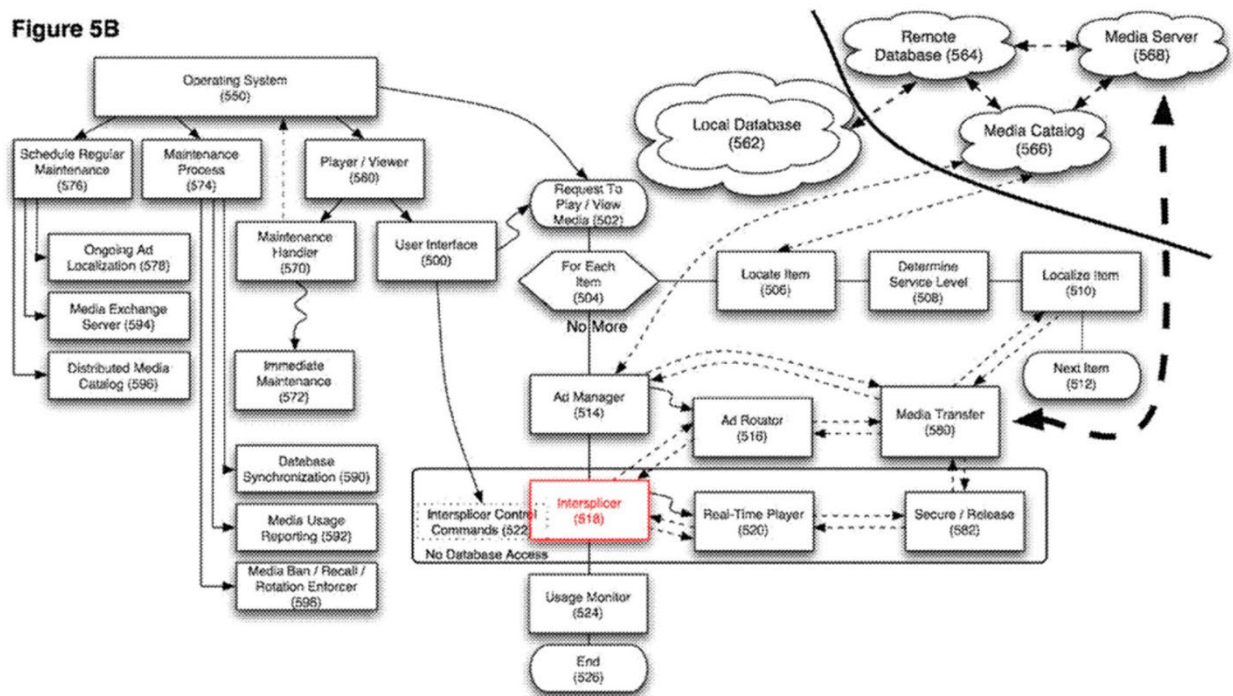
cl. 1), “modifying a presentation position of a predetermined advertisement,” (*id.*, cl. 3), and “generat[ing] a control signal configured to interrupt a course of presentation of the digital media content with a presentation of the digital advertising content” (*id.*, cl. 6). The claims further specify the intersplicer’s functionality to select advertising content by requiring it to “request, from the advertisement rotator, digital advertising content to be played at the adapted advertisement insertion point” (*id.*, cl. 1), where the requested digital advertising content may be different from originally inserted content (*id.*, cl. 2).

23. This interpretation is confirmed by the specification of the ’768 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, 7:45-55; *see also*, *e.g.*, Abstract (“The intersplicer combines the media files with the ad files by providing control signals to the media player[.]”), 15:4-18 (“The intersplicer also has the ability to adaptively re-group 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.”).

24. 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-1011, 000006, 12. 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, 44:17-48:20.

25. 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, 6:53-62 (“The player/viewer software applies digital rights management techniques to control consumer use of media in a novel way.”), 14:37-49 (“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, 22:24-38, 23:46-57, Fig. 5A (showing “the logic by which the player/viewer software processes a user request,” where the intersplicer corresponds to step 518), 24:31-36, 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, 14:61-15:3 (“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.”).

26. 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, 27:11-26 ("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.").

27. Patent Owner's proposed construction is also inconsistent with its Infringement Contentions for the '768 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-1022, 000021) and that "the 'Manifest Generation' ... is an intersplicer that controls the insertion points of digital advertising content[.]" (*id.*, 000025). 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-1022, 000021-30.

V. INVALIDITY GROUND

28. There are a number of patents and publications that constitute prior art to the ’768 patent. I have reviewed and considered the prior art discussed in this section, along with the materials listed in Appendix 2.

29. 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 ’768 patent are invalid in view of the following ground:

Ground	Claims	Statutory Basis	Prior Art
1	1-3, 5-12, 14-21, 23-25, 27-29, 31-33	§ 103	Eldering-I in view of Eldering-II

A. Ground 1: Claims 1-3, 5-12, 14-21, 23-25, 27-29, 31-33 Are Rendered Obvious by Eldering-I in View of Eldering-II

30. It is my opinion that a POSITA would have found Claims 1-3, 5-12, 14-21, 23-25, 27-29, 31-33 obvious based on the teachings of Eldering-I and Eldering-II.

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

31. I have reviewed the Eldering-I reference. I understand that Eldering-I was not cited or considered during prosecution of the '768 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.

32. 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.

33. 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) to users and teaches "[a] system for inserting advertisement into channels of media programming[.]" Ex-1004, Abstract, ¶¶25-27, Fig. 1, Fig. 2:

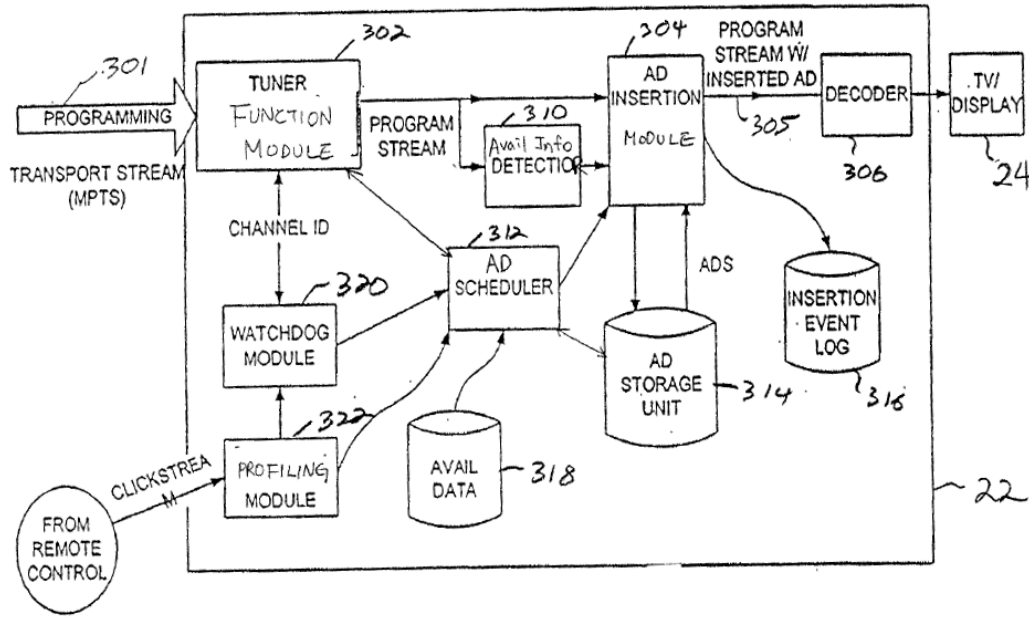


Figure 2

Eldering-I applies its teachings to streaming and recorded programming. *E.g.*, Ex-1004, ¶¶70-71, ¶27.

34. 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.

35. 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.

36. Eldering-I is in the same field of endeavor as the ’768 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)

37. I have reviewed the Eldering-II reference. I understand that Eldering-II was not cited or considered during prosecution of the ’768 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.

38. 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.

39. 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.

40. 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:

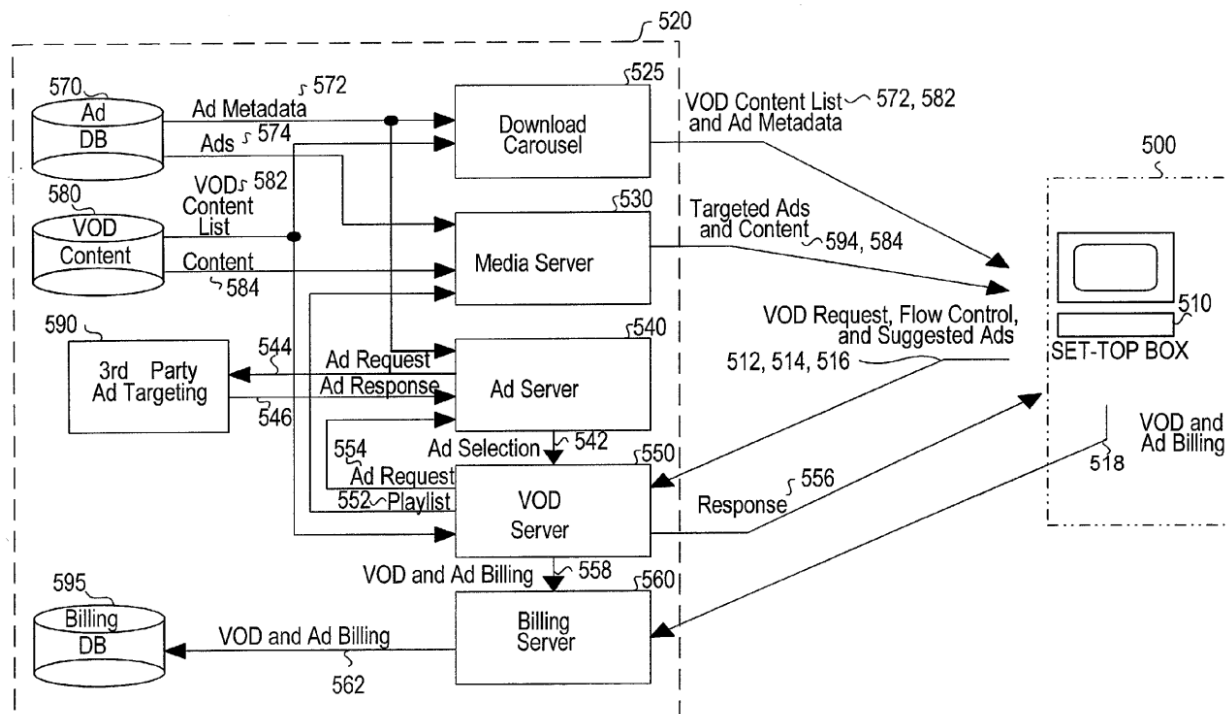


FIG. 5

41. Eldering-II displays an alternative advertisement when a user fast forwards or skips advertisements. *E.g.*, 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, ¶138, ¶¶165-179, ¶¶69-70, Figs. 9-10.

42. Eldering-II is in the same field of endeavor as the ’768 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 Claim 1

[1a] A digital media system comprising:
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43. 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 Eldering-I teaches the preamble.

44. Eldering-I teaches **a digital media system** (e.g., subscriber system). 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.”), ¶¶29-30, ¶33, ¶34, ¶¶36-37, Fig.1:

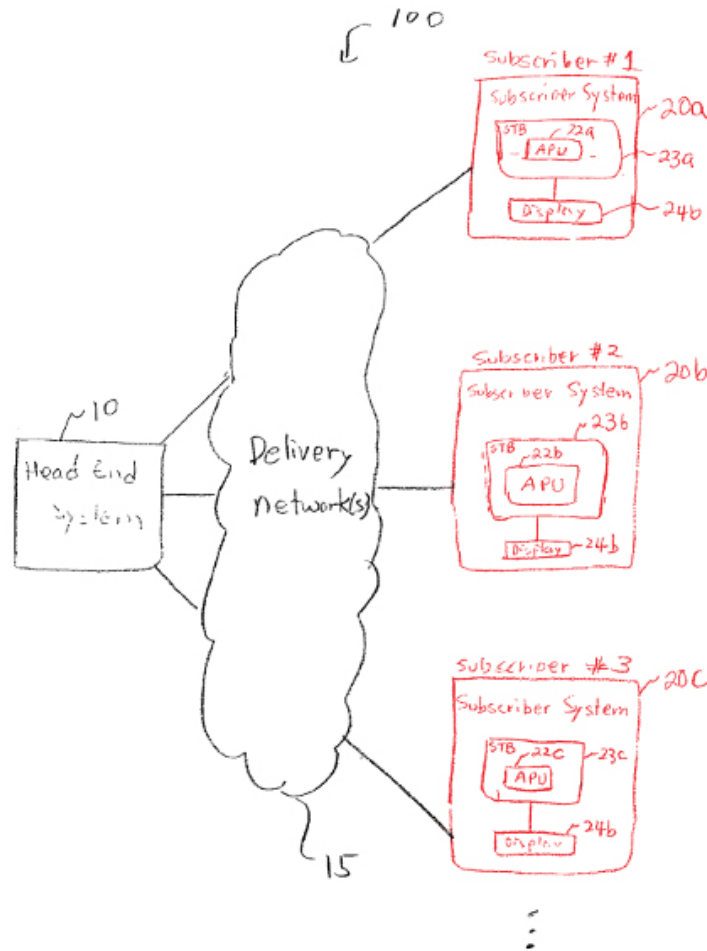


FIGURE 1

Eldering-I teaches that its subscriber system provides **digital** media for presentation. Ex-1004, ¶26, ¶5-8, ¶35, ¶39, ¶47.

45. The combination of Eldering-I and Eldering-II teaches a digital media system that comprises the components and operations explained below for limitations [1b]-[1h]. *Infra* §§V.A.3[1b]-[1h].

[1b] a user interface for receiving user input for controlling a course of presentation of digital media content;
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46. Eldering-I teaches a digital media system (e.g., subscriber system) that includes **a user interface**, such as one 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.”), ¹ ¶25, ¶34, Fig. 1.

47. Eldering-I’s user interface is **for receiving user input for controlling a course of presentation of digital media content** because Eldering-I teaches user input causing the digital media system to perform operations such as channel change. *E.g.*, Ex-1004, ¶32, ¶36, ¶38, ¶59, ¶61, Fig. 1.

48. Eldering-II also teaches a user interface implemented through 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.

49. This user interface is **for receiving user input for controlling a course of presentation of digital media content** because Eldering-II teaches user

¹ All annotations/emphasis added unless otherwise noted.

input causing the digital media system to perform operations such as skipping, fast forwarding, rewinding, pausing, 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 control functionalities allow the user to fast forward through or skip over advertisements, which is an issue that Eldering-II seeks to address. 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.”), ¶112, ¶124, ¶165. As a POSITA would have understood, a user may skip over an advertisement by inputting a skipping command when the advertisement is being displayed or by skipping over a portion of the digital media content in which an advertisement is inserted.

50. Eldering-II’s control functionalities (e.g., skip, fast forward, rewind, pause, stop) controls 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.”).

51. A POSITA would have realized that control functionalities such as skipping and fast forwarding were commonplace and readily applicable to Eldering-I's subscriber system. Eldering-I contemplates its subscriber system being implemented in a variety of devices (e.g., PVRs, video on demand) for handling various media playback scenarios. 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.”), ¶¶25-27, ¶¶70-72.

52. Well-known control functionalities such as skipping and fast forwarding were commonly implemented on devices such as TV set top boxes and personal video recorders (PVRs). 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.”). A POSITA would have understood that Eldering-I contemplates that its set top box

and/or PVR includes these common 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 teaches the same types of devices (e.g., set top box, PVR), 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.

53. Therefore, Eldering-I by itself, as well as the combination of Eldering-I and Eldering-II, teaches limitation [1b].²

[1c] an advertisement rotator for managing one or more requests for advertising content to be presented during the course of presentation of the digital media content either visually or audibly; and
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54. Eldering-I teaches **an advertisement rotator** (e.g., advertisement insertion module) **for managing one or more requests for advertising content**

² The '768 patent admits that limitation [1b] was known in the art. The '768 patent includes a "graphical user interface" shown in Fig. 3A that "provides *the ordinary functionality commonly found in typical media player software applications.*" '768 patent, 13:42-51, Fig. 3A. In addition, the '768 patent admits that user playback controls such as "play, stop, pause/continue" were "common." '768 patent, 36:21-28.

(e.g., notice from an ad scheduler about advertisement to be inserted). 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:

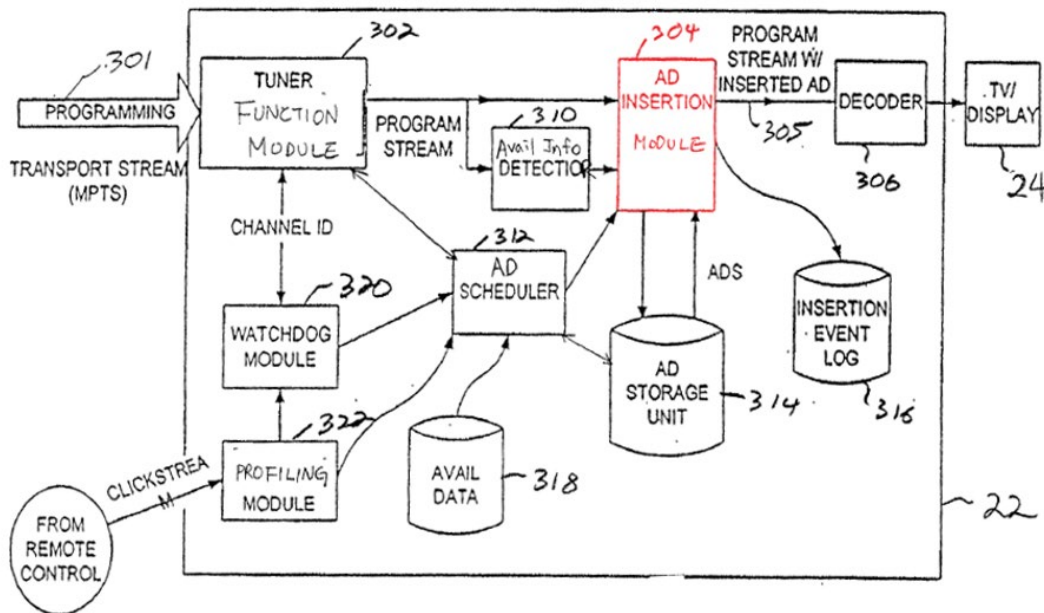


Figure 2

55. The advertisement insertion module receives an ad insertion schedule or information about the next advertisement from an ad scheduler³, 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. Here, the advertisement insertion module selects from the advertisements stored in local storage advertisements that match the ad insertion schedule.

56. Here, the notification from the ad scheduler regarding ad insertion schedule or the next advertisement is a request for advertising content because it is sent from the ad scheduler to the advertisement insertion module, requesting advertising content to be retrieved from local storage and inserted into the media

³ The ad scheduler is further discussed below with respect to limitations [1d]-[1h]. *Infra* §§V.A.3[1d]-[1h].

stream. *See* Ex-1004, ¶¶46-49. The advertisement insertion module manages such requests for advertising content by selecting an advertisement that matches the ad insertion schedule and obtaining the requested advertisement from local storage and inserting it for presentation. *Id.*

57. Eldering-I’s teachings regarding the advertisement insertion module satisfy “advertisement rotator” as the term is used in the ’768 patent. The ’768 patent uses “advertisement rotator” to refer to software that provides advertisements in response to requests for advertisements. *See, e.g.,* ’768 patent, 28:37-29:31 (“Ad rotator 516 handles requests for new ads from an intersplicer 518 by selecting and localizing appropriate ads, grouping them into blocks if so requested, and sending the result back to requesting intersplicer 518.”), 32:52-33:40 (“After ad rotator 516 has modified local database 562, it waits for new ad requests from the intersplicer 518, handling them accordingly.”), Fig. 5B. As explained above, the advertisement insertion module provides advertisements in response to requests. Ex-1004, Abstract, ¶¶46-49.

58. Eldering-I further teaches that the advertising content is **presented during the course of presentation of the digital media content** (e.g., TV programming, recorded programming). *E.g.,* Ex-1004, Abstract (“A system for inserting advertisement into channels of media programming are disclosed for improving effectiveness in targeted advertising.”), ¶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.”), ¶71 (“The present invention can readily be applied to PVRs, which may use a variety of ad insertion opportunities including prepended ads, ads inserted into live programming, ads inserted into recorded programming, ads inserted into content, or ads placed at the end of the programming.”), ¶¶25-27, ¶¶34-37, ¶70.

59. Elderling-I further teaches presenting advertisements and digital media content **either visually or audibly**. *E.g.*, Ex-1004, ¶¶25-26 (“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.).”), ¶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.”).

[1d] an intersplicer in communication with the advertisement rotator, the intersplicer configured to:

60. Elderling-I teaches **an intersplicer** (e.g., ad scheduler) **in communication with the advertisement rotator** (e.g., advertisement insertion module). 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. The ad scheduler stores an ordered list corresponding to the identified order and modifies the stored ordered list whenever a modification requiring event occurs.”), ¶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:

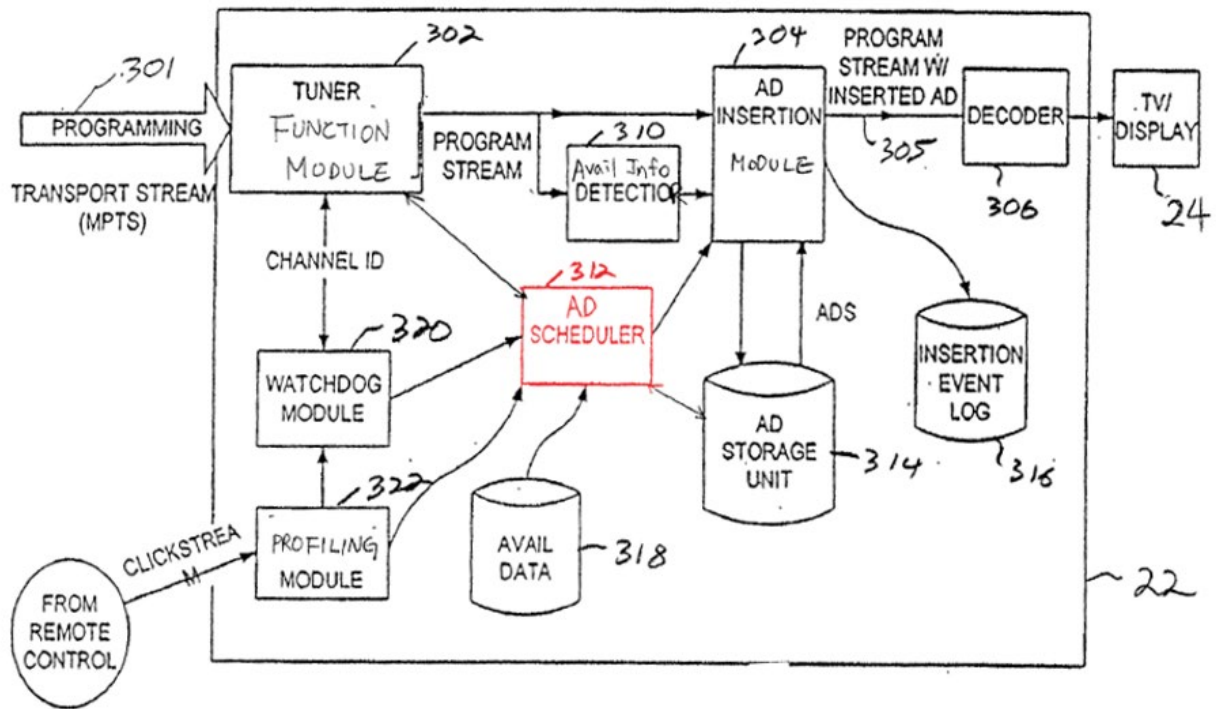


Figure 2

61. The ad scheduler selects advertisements and schedules insertion of advertisements. Ex-1004, ¶44 (“The ad scheduler 312 may schedule or reschedule the ad insertion based on the outputs from the avail data storage unit 318, the watchdog module 320 and/or the profiling module 322.”), ¶49 (“The ad scheduler 312 provides a schedule of ads to be inserted in the form of a queue or other forms. 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.”), ¶50 (“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.”).

62. The ad scheduler re-selects and reschedules advertisements in real time when there are changes to viewing parameters. Ex-1004, ¶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. Such viewing parameters may include, but are not limited to, channel selection, viewer identity, and the type of program being watched.”), ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶¶63-64, ¶75. As explained below with respect to limitation [1e], a POSITA would have understood that a user input updating a play position of the digital media content (e.g., skipping or fast forwarding) changes viewing parameters contemplated by Eldering-I and that it would have been obvious to reschedule advertisements in response to such a user input. *Infra* §V.A.3[1e].

63. The ad scheduler is in communication with the advertisement insertion module by notifying the advertisement insertion module of the advertisement insertion schedule or the next advertisement to insert. *Supra* §V.A.3[1c]; Ex-1004, ¶42 (“As shown in FIG. 2, the APU 22 may include ... an ad

insertion module 304, ... an ad scheduler 312, ... *all operatively connected.*”); ¶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.”), ¶33, Fig. 2:

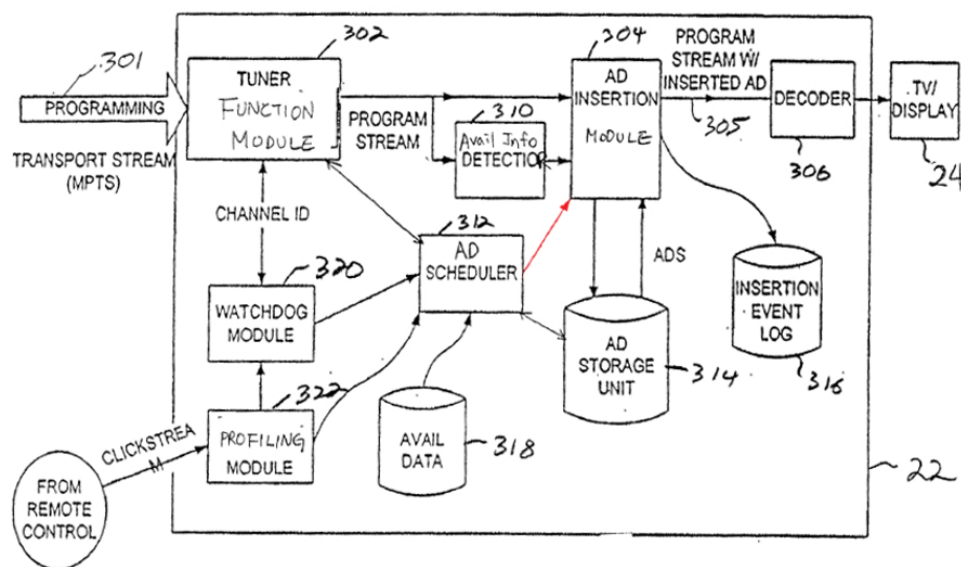


Figure 2

64. Eldering-I’s ad scheduler teaches an intersplicer because it selects advertising content and controls insertion and conveyance of advertising content in media content and is configured to perform the operations recited in limitations [1e]-[1h], as explained below. *Supra* §IV.A; *infra* §§V.A.3[1e]-[1h]. As explained

above, Eldering-I's ad scheduler selects, schedules, and reschedules advertisements. By scheduling and rescheduling advertisements, the ad scheduler controls how advertisements are inserted in media content and conveyed to the user. *E.g.*, Ex-1004, ¶33 (“[T]he 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.”), ¶44 (“The ad scheduler 312 may schedule or reschedule the ad insertion based on the outputs from the avail data storage unit 318, the watchdog module 320 and/or the profiling module 322.”), ¶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. 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.”).

65. The combination of Eldering-I and Eldering-II teaches an intersplicer configured to perform the operations recited in limitations [1e]-[1h], as explained below. *Infra* §§V.A.3[1e]-[1h].

66. It is my opinion that the combination of Eldering-I and Eldering-II teaches “intersplicer” even under Patent Owner’s proposed claim construction. *Supra* §IV.A; Ex-1011, 000006, 12. First, as explained above, Eldering-I’s ad scheduler selects, schedules and reschedules advertisements. *E.g.*, Ex-1004, ¶16, ¶30, ¶32, ¶44, ¶¶49-52, ¶¶56-61, ¶¶63-64, ¶75. Therefore, Eldering-I teaches an intersplicer that **enforces the conveyance of advertisements** by scheduling their insertion into a digital media stream.

67. Second, as explained with respect to limitation [1f], 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]; Ex-1004, ¶¶76-82. By scheduling advertisements based on rules, Eldering-I teaches **enforcing the conveyance of advertisements**.

68. 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. 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 because doing so would have provided the benefit of ensuring exposure to advertising content and protecting the interest of advertisers in sponsoring media content. A POSITA would have understood that there are various options to disable user control. For example, selected control functions may be disabled anytime when an advertisement is presented. As another example, selected control functions may be disabled after a user has attempted to skip advertisements for a threshold number of times. As explained above, it would have been obvious to implement control functionalities such as fast forwarding and skipping on Eldering-I's subscriber system. *Supra* §V.A.3[1b]. Because disabling user control merely involves suspending these functionalities using software configurations, a POSITA would have been more than capable of doing so and would have had a reasonable expectation of success in implementing Eldering-II's teachings to Eldering-I. The combination of Eldering-I and Eldering-II thus teaches **enforcing the conveyance of advertisements**.

69. Third, 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**.

70. 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-1012, Ex-1013. Eldering-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 systems 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 Elderling-I's digital media system.

71. 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." Ex-1011, 000006. I observe that this requirement is directed more to the intended use of a digital media 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-1014, ¶¶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-1015, 1:57-65 ("[I]t is a general object of the present invention to provide programmed music via the Internet to numerous subscribers without any charge to the subscribers. It is a further object of the invention to provide programmed music to the general public in a manner which facilitates the bundling of such programmed music with advertisement copy tailored to the individual, to thereby underwrite the cost of supplying to members of the public valuable music and other data containing information."); Ex-1016,

¶11 (“To achieve the above aspects, according to the present invention, an advertising or other content distribution system employs a so-called P2P system for the distribution of free content, and provides a service for the distribution of advertisement and/or other content to users who desire to acquire the free content.”). This is confirmed by the ’768 patent’s “Description of Background Art” section. *See* Ex-1001, 1:66-2:16 (“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.”).

72. Because Elderling-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]), 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, Elderling-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[1b].

Conventional user control functionalities such as play, stop, pause, rewind, fast forward, and skip were readily available in the 2002 timeframe. Elderling-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] change a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point in the digital media content, in response to receiving a user input to update a current play position in the digital media content to a new play position in the digital media content,
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73. Eldering-I teaches **changing a predetermined advertisement insertion point** (e.g., avail corresponding to an advertisement's original position in the ad insertion schedule) **in the digital media content to an adapted advertisement insertion point** (e.g., avail corresponding to the advertisement's new position in the ad insertion schedule) **in the digital media content** in response to changes to viewing parameters.

74. Eldering-I teaches inserting advertisements into digital media content based on an ad insertion schedule. *E.g.*, Ex-1004, ¶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.”), Abstract, ¶11, ¶17; *supra* §V.A.3[1c]-[1d].

75. Eldering-I teaches the scheduler predetermining the ad insertion schedule in the form of a queue. *E.g.*, 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.”), ¶50 (“[T]he 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. ... [T]he scheduler 312 may prepare in advance the ad schedule in the form of a queue discussed above.”). The ad insertion schedule includes an ordered list of advertisement resource locators (ARLs) respectively corresponding to the scheduled advertisements. Ex-1004, ¶29 (“[T]he ad insertion schedule includes an ordered list of ARLs (advertisement resource locators) each of which indicates the location of a particular advertisement at the head end system”), ¶¶34-35, ¶49, ¶66, Fig. 3:

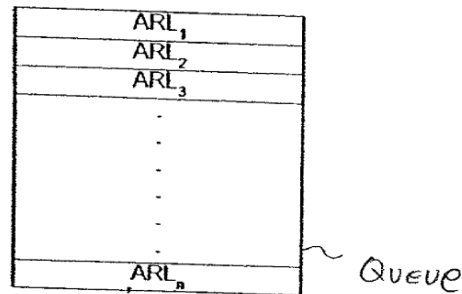


Figure 3

76. The advertisements are inserted into avails in the digital media content based on the ad insertion schedule. *Supra* §V.A.3[1c]; e.g., Ex-1004, ¶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.”), ¶28 (“In accordance with the preferred embodiment of the invention, various 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 (“The subscriber system receives from the head end system or other external source a plurality of programming channels having avails,

and inserts selected advertisements into the avails of the programming channels.”), ¶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.”), ¶63, Fig. 4.

77. Each avail corresponds to a position in the digital media content that is appropriate for inserting an advertisement. Ex-1004, ¶28 (“In accordance with the preferred embodiment of the invention, various 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.”), ¶44 (“[T]he 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.”), ¶50 (“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.”). By predetermining a schedule of advertisements to be inserted in the avails, Eldering-I teaches a predetermined advertisement insertion point in the digital media content for each advertisement in the ad insertion schedule, i.e., the avail corresponding to the advertisement’s position in the queue.

78. Eldering-I teaches that this predetermined advertisement insertion point is changed by the ad scheduler, as it reschedules advertisements in response to changes to viewing parameters. *Supra* §V.A.3[1d]; 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 (“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.”), ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶¶63-64, ¶75, ¶82.

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 changes 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 a predetermined advertisement insertion point. 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 changes the advertisement insertion point. Eldering-I teaches performing rescheduling on a continuous, on-going, and real-time basis. Ex-1004, ¶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.”), ¶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.”), ¶52, ¶55, ¶58, ¶75. In this way, the ad scheduler continuously adapts advertisement insertion points based on changes to viewing parameters, making the new advertisement insertion point an *adapted* advertisement insertion point. This teaches that the ad scheduler changes a predetermined advertisement insertion point (e.g., avail corresponding to an advertisement’s original position in the ad insertion schedule) in the digital media content to an adapted advertisement insertion point (i.e., avail corresponding to the advertisement’s new position in the ad insertion schedule) in the digital media content.

82. Eldering-II teaches **receiving a user input** (e.g., skipping, fast forwarding) **to update a current play position in the digital media content to a new play position in the 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...”); *supra* §V.A.3[1b]. 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.

83. The user input for skipping or fast forwarding **updates a current play position in the digital media content to a new play position in the digital media content**. As a POSITA would have understood, skipping over digital media 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-1010, ¶21; Ex-1017, ¶34, ¶36, Fig. 5; Ex-1018, ¶¶10-15, Fig. 1. This is the case when the user input causes at least part of an advertisement to be skipped. *See, e.g.*, Ex-1010, ¶21 (“[T]he user sends the skip command while the device plays out content. The command configures the device to bypass the original advertisement in its entirety if the device recognizes bookmarks in content that indicate the beginning and end of the original advertisement in content. 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-1017, ¶34 (“Whether the technique is a visual fast-forward (TiVo) or fixed-time (e.g., 30 seconds) skip function (ReplayTV), there is a delay from when the viewer realizes 502 that the program

material has ended and advertising has begun 501, and when the viewer starts skipping the commercial using the remote input device 503.”), ¶36 (“Similarly, when 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.”), Fig. 5. For example, a user may skip from a current play position in the digital media content before an advertisement to a new play position in the digital media content after an advertisement. As another example, the user may skip from a current play position in the digital media content to a play position in the middle of an advertisement. Normally, after the remaining portion of the advertisement is played, the digital media content will resume playing at the play position where advertisement is inserted. The user input updates the current play position to a new play position corresponding to the digital media content right after the advertisement. As yet another example, the user may initiate a skipping operation when an advertisement is in progress to bypass the remaining portion of the advertisement and move to a selected position in the digital media content. In this case, the user input updates a current play position corresponding to where the advertisement is inserted in the digital media content to a selected new play position.

84. As was well known to those skilled in the art, fast forwarding increases the playback speed of digital media content for a period of time, during which media content may or may not be viewable. *See, e.g.*, Ex-1010, ¶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.”). Normal playback resumes after the fast forwarding operation. Similar to the case of skipping, as explained above, fast forwarding through a portion of digital media content that includes at least part of an advertisement updates the play position.

85. As explained above, a POSITA would have found it obvious to implement user control functionalities such as skipping and fast forwarding on Eldering-I’s digital media system. *Supra* §V.A.3[1b]. The combination of Eldering-I and Eldering-II teaches or suggests changing a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point in the digital media content, **in response to** receiving a user input to update a current play position in the digital media content to a new play position in the digital media content because, as explained below, such a user input changes viewing parameters.

86. First, 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 of a TV channel 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.

87. Second, Eldering-II teaches the skipping or fast forwarding operation bypassing advertisements. *Supra* §V.A.3[1b]. Because the advertisements are inserted in avails, this teaches bypassing one or multiple avails, causing a different avail to be available after 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, such as its size, which may be different from the previously available avails. E.g., Ex-1004, ¶30.

88. Third, 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 pertain to viewers’ viewing habits. For example, such inputs can demonstrate a viewer’s lack of interest in certain types of content. As another example, such inputs can show a viewer’s habits of patiently viewing through entire programs or, alternatively, picking only portions of interest and skipping the rest. These habits can be used to determine the viewer’s identity. When inputs of skipping or fast forwarding suggests a change in viewer identity, Eldering-I teaches rescheduling advertisements.

89. 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 make 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; *supra* §V.A.3[1d]. 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 digital media content, including or not including advertisements, may lead to the change in the type of program being watched, change the characteristics of the upcoming avails, and indicate that the viewer has changed.

90. These factors all suggest that the currently scheduled advertisements may not be appropriate any more and rescheduling is needed to make sure appropriate advertisements are displayed for 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.

This warrants bringing a shorter advertisement to the top of the queue. As yet another example, based on inputs of skipping and fast forwarding, it may be determined that the viewer has changed. This change warrants prioritizing an advertisement of interest to the new viewer.

91. 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 based on such inputs. A POSITA would have been motivated to do so because doing so would have advanced Eldering-I’s goal of ensuring that appropriate advertisements are scheduled and displayed.

92. 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 teaching of Elderling-II.

93. 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., Elderling-I’s rescheduling advertisements, Elderling-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 Elderling-I teaches rescheduling advertisements based on certain inputs (e.g., channel change), implementing the system according to the combination of Elderling-I and Elderling-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.

94. 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. 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 suitable 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.

95. Because Eldering-I's ad scheduler teaches "intersplicer" (*supra* §V.A.3[1d]), the combination of Eldering-I and Eldering-II teaches the intersplicer being configured to preform of the operation of limitation [1e].

[1f] the adapted advertisement insertion point determined by an adaptive preference rule based on an advertisement requirement that applies to the digital media system;
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96. Eldering-I further teaches that **the adapted advertisement insertion point is determined by an adaptive preference rule** (e.g., rules of the hybrid orthogonal-linked sponsorship model) **based on an advertisement requirement** (e.g., a requirement that a linked sponsorship parameter is satisfied) **that applies to the digital media system.**

97. As explained above, Eldering-I teaches 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. Ex-1004, Abstract, ¶16, ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶¶63-64, ¶75; *supra* §V.A.3[1e].

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

99. 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. In one embodiment, when all the linked sponsorship columns are left blank, it indicates that the associated ad may be inserted according to the purely orthogonal sponsorship model, i.e., non-linked advertising. In another embodiment, if 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 digital media system.

100. Changes to viewing parameters may affect whether one or more of the linked sponsorship parameters is satisfied, commanding rescheduling of advertisements according to the rules of the hybrid orthogonal-linked sponsorship model. As an 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]. 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 queue⁴ 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 adapted advertisement insertion point to be the upcoming

⁴ Moving the “KRAFT” advertisement to the top of the queue also depends on the linked sponsorship parameter “9-12 am.” For simplicity of explanation, this parameter is assumed to be satisfied here.

avail. This adapted advertisement insertion point is determined by rules of the hybrid orthogonal-linked sponsorship model based on the requirement that the linked sponsorship parameter “SOAPS” is satisfied.

101. As another example, based on a user input of skipping or fast forwarding, Eldering-I’s profiling model may determine that the viewer has changed and that the new viewer is viewer A. *Supra* §V.A.3[1e]. 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 is A). Ex-1004, Fig. 6. Moving this advertisement to the top of the queue determines its adapted advertisement insertion point to be the upcoming avail. This adapted advertisement 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.

102. As yet another example, Eldering-I further explains the scheduling and rescheduling of advertisements being based on “time dependence (signifying a specific time) [and] time-of-day dependence (e.g. morning, afternoon, prime time)[.]” Ex-1004, ¶77. The “time dependence” linked sponsorship parameter indicates a particular time 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 adapted advertisement insertion point corresponding to the avail.

103. Therefore, Eldering-I teaches that the adapted advertisement insertion point is determined by an adaptive preference rule (e.g., rules of the hybrid orthogonal-linked sponsorship model) based on an advertisement requirement (e.g., a requirement that a linked sponsorship parameter is satisfied) that applies to the digital media system.

104. Eldering-I’s teachings regarding scheduling and rescheduling advertisements into avails by rules of the hybrid orthogonal-linked sponsorship model based on linked sponsorship parameters and viewing parameters fall within the scope of the plain and ordinary meaning of “an adaptive preference rule” and “an advertisement requirement” as these terms are used in the ’768 patent.

105. First, the '768 patent uses the term “advertisement requirement” broadly, stating that it is “an arbitrary function” and describing that it is related to parameters used for advertisement selection or scheduling. Ex-1001, 30:16-30 (“The resulting ad requirement is an arbitrary function that can depend on, without limitation, one or more of the following: the item’s running time; the number of segments it contains; and/or its advertising requirement parameters, determined with its service level in step 508.”), 27:50-59 (“Aside from either calling for ads or not, the service level may include one or more advertising requirement parameters, such as the relative ratio of content material to promotional material, the frequency of interruptions, or some other metric.”), 32:16-30.

106. As explained above, Eldering-I’s requirements for its linked sponsorship parameters to be satisfied are functions of time, program type, and user identity that are related to advertisement selection and scheduling. Ex-1004, ¶¶76-82. Therefore, “advertisement requirement” is satisfied by a requirement that a linked sponsorship parameter is satisfied.⁵

107. Second, the '768 patent indicates that “adaptive preference rules” “include ad preference tables [] and ad preference parameters” (Ex-1001, 33:6-13)

⁵ This is further confirmed by Patent Owner’s Infringement Contentions that allege the advertisement requirement is satisfied by “Ad Decision Parameters,” which are parameters used for selecting ads. Ex-1022, 000079-83. Eldering-I’s linked sponsorship parameter is used for advertisement selection and scheduling. Ex-1004, ¶¶76-82.

and are “rules by which the intersplicer can perform adaptive ad selection and sequencing extemporaneously” (Ex-1001, 33:26-34:40). 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; *supra* §V.A.3[1e]. Based on this mechanism, a table can be created to include parameters related to whether an advertisement is preferred to be played at a certain avail. Ex-1004, Fig. 6, ¶¶81-82. The ’768 patent’s description of adaptive preference rules is consistent with Eldering-I’s rules of the hybrid orthogonal-linked sponsorship model.

[1g] modify the adapted insertion point of digital advertising content based on the advertisement requirement; and
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108. As explained with respect to limitations [1e] and [1f], Eldering-I’s ad scheduler reschedules advertisements based on the advertisement requirement (e.g., a requirement that a linked sponsorship parameter is satisfied). *Supra* §§V.A.3[1e]-[1f]. Eldering-I teaches that the ad insertion schedule is modified on an on-going, real-time basis so that the most appropriate advertisements are inserted into the incoming programming stream. 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.”), ¶52, ¶55, ¶58, ¶75. “[T]he rescheduling of ads may occur continuously so that ads that are most appropriate for the current viewer are inserted and played.” Ex-1004, ¶63.

109. As explained above, Eldering-I’s rescheduling process changes a predetermined advertisement insertion point of an advertisement in the digital media content to an adapted advertisement insertion point in the digital media content in response to changes to viewing parameters. *Supra* §V.A.3[1e]. Because the rescheduling occurs continuously and the ad insertion schedule is modified on an on-going, real-time basis, when there is a further change to the viewing parameters, the ad scheduler reschedules the advertisements. This contemplates changing the advertisement insertion point of the advertisement, which **modifies the adapted insertion point of digital advertising content** corresponding to the advertisement. Eldering-I contemplates that the advertising content is in a digital format. 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 modification is **based on the advertisement requirement** because Eldering-I reschedules advertisements based on whether viewing parameters satisfy the linked sponsorship parameters of advertisements. *Supra* §V.A.3[1f].

[1h] request, from the advertisement rotator, digital advertising content to be played at the adapted advertisement insertion point.

110. Eldering-I teaches an advertisement rotator (e.g., advertisement insertion module) that manages requests from the intersplicer (e.g., ad scheduler) for advertisements to be displayed. *Supra* §V.A.3[1c]; Ex-1004, Abstract, ¶42, ¶¶46-49, Fig. 2. For example, Eldering-I teaches that the ad scheduler notifies the advertisement insertion module of an ad insertion schedule or information about the next advertisement, based on which the advertisement insertion module requests an advertisement from the advertisement storage unit and inserts the received advertisement for presentation. 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.”), Fig. 2; *supra* §V.A.3[1c]. By notifying the advertisement insertion module of the ad insertion schedule, the ad scheduler requests from the advertisement insertion module digital advertising

content to be played. *Supra* §V.A.3[1c]; Ex-1004, ¶¶46-47, ¶49, Fig. 2. Moreover, the combination teaches that the advertisement is scheduled to be played at the adapted advertisement insertion point. *Supra* §V.A.3[1e].

111. Therefore, Eldering-I teaches that the intersplicer (e.g., ad scheduler) **requests, from the advertisement rotator** (e.g., advertisement insertion module) **digital advertising content to be played at the adapted advertisement insertion point.**

4. Dependent Claim 2

2. The digital media system of claim 1, wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.

112. The combination teaches the digital media system of claim 1. *Supra* §V.A.3. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 2.

113. As explained with respect to limitation [1e], Eldering-I teaches scheduling an advertisement to be inserted at a predetermined advertisement insertion point in digital media content. *Supra* §V.A.3[1e]; Ex-1004, ¶11, ¶15, ¶17, ¶¶28-29, ¶¶33-35, ¶44, ¶¶46-50, ¶63, ¶66, ¶82, Figs. 3-4. This teaches a **predetermined advertisement selected to be played at the predetermined advertisement insertion point.**

114. Eldering-I teaches rescheduling the advertisement to the adapted advertisement insertion point. *Supra* §V.A.3[1e]; Ex-1004, ¶16, ¶30, ¶32, ¶¶51-61, ¶¶63-64, ¶75, Fig.4. The requested digital advertising content corresponds to the advertisement for the adapted advertisement insertion point. *Supra* §§V.A.3[1e], [1h]; Ex-1004, ¶16, ¶30, ¶32, ¶42, ¶¶46-61, ¶¶63-64, ¶75, Fig.4.

115. Eldering-II teaches, when a user fast forwards through or skips advertisements, replacing the skipped advertisement with an alternative advertisement. *E.g.*, 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 (“[T]he fast-forward and skip functions ... 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).”), Abstract. Eldering-II teaches the alternative advertisement being a shorter version created from the original advertisement. Ex-1005, ¶165 (“[T]he subscriber may be presented with a short alternative ad when the subscriber attempts to fast forward or skip the advertisement (targeted or default) so that the advertiser maintains same value for their advertising dollar and the subscriber does not get offended by the lose [sic] of control. The alternative ad may be a section of the original ad, may be created from the original ad in some manner, or may be a separate ad altogether.”), ¶110, ¶¶166-179, 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

116. A POSITA would have found it obvious and been motivated to apply the teachings of Eldering-II to Eldering-I such that the advertisement is replaced with a shorter alternative advertisement to be inserted at the adapted advertisement insertion point. In this case, **the digital advertising content is different from a predetermined advertisement** because the digital advertising content corresponds to a modified version of the predetermined advertisement. Eldering-II explains that displaying a shorter advertisement provides a way to balance the interests of the advertiser and the viewer, such that “the advertiser maintains same value for their advertising dollar and the subscriber does not get offended by the lose [sic] of control.” Ex-1005, ¶165. As explained above, user input of skipping or fast forwarding may be used to skip an advertisement. *Supra* §V.A.3[1e]; Ex-1005,

¶58, ¶110, ¶112, ¶124. This input from the user may indicate a willingness at the moment not to watch an advertisement. In this case, displaying a shorter alternative advertisement instead of a full-sized advertisement may provide the viewer a sense of control, thereby improving the viewer's experience consuming digital media content. At the same time, the alternative advertisement provides the advertiser the purchased advertisement exposure.

117. A POSITA would have been motivated to replace an original advertisement with a shorter alternative advertisement further because doing so would have improved the flexibility of inserting advertisements in avails. *Eldering-I* teaches that each avail is associated with a length. Ex-1004, ¶35, ¶¶49-51. *Eldering-I* thus contemplates the scenario where the user's input of skipping or fast forwarding changes the play position such that one or more upcoming avails are shorter than one or more previous avails. If an advertisement is determined appropriate based on viewing parameters and linked sponsorship parameters, except that its length is longer than that of an upcoming avail, replacing the advertisement with a shorter alternative advertisement would have allowed fitting the content of the advertisement in the upcoming avail. This provides the benefit of improving the flexibility of scheduling appropriate advertisements for a viewer.

118. *Eldering-II* includes explicit teachings about how to create the alternative advertisement. For example, *Eldering-II* teaches multiple methods for

modifying an original advertisement to create an alternative advertisement, including creating the alternative advertisement based on I-frames of the original advertisement in MPEG format, based on segments of video from the original advertisement, or a combination of I-frames and segments. Ex-1005, ¶¶167-172, Figs. 11A-11C. Implementing these teachings of Eldering-II would have been well within the skills of a POSITA. *Supra* §III. Applying Eldering-II's teachings to Eldering-I would have been simply using a known technique (e.g., replacing an original advertisement with a shorter alternative advertisement) to improve similar devices (e.g., Eldering-I's digital media system) in the same way. A POSITA would have had a reasonable expectation of success in applying the teachings of Eldering-II to Eldering-I because it simply involves creating the alternative advertisement in the manner disclosed by Eldering-II and scheduling the alternative advertisement in the manner disclosed by Eldering-I. Doing so does not change the principle of operation of either reference.

5. Dependent Claim 3

3. **The digital media system of claim 1, wherein the intersplicer is further configured to change the predetermined advertisement insertion point to the adapted advertisement insertion point by adaptively modifying a presentation position of a predetermined advertisement from the predetermined advertisement insertion point to the adapted advertisement insertion point in the digital media content, the adapted advertisement insertion point being different than the predetermined advertisement insertion point.**

119. The combination teaches the digital media system of claim 1. *Supra* §V.A.3. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 3.

120. As explained above with respect to limitation [1d] and [1e], the combination of Eldering-I and Eldering-II teaches **an intersplicer configured to change the predetermined advertisement insertion point to the adapted advertisement insertion point**. *Supra* §§V.A.3[1d]-[1e].

121. Eldering-I teaches rescheduling an advertisement from the predetermined advertisement insertion point to the adapted advertisement insertion point. *Supra* §V.A.3[1e]; Ex-1004, Abstract, ¶16, ¶30, ¶32, ¶¶51-54, ¶¶56-61, ¶¶63-64, ¶75. Because the advertisement was originally scheduled for insertion at the predetermined advertisement insertion point, it is a predetermined advertisement. Eldering-I teaches changing advertisement insertion points by adaptively and extemporaneously rescheduling advertisements based on changes to viewing parameters. *Supra* §V.A.3[1e]; Ex-1004, ¶32, ¶52, ¶55, ¶58, ¶63, ¶75.

Thus, the combination of Eldering-I and Eldering-II teaches **adaptively modifying a presentation position of a predetermined advertisement from the predetermined advertisement insertion point to the adapted advertisement insertion point in the digital media content, the adapted advertisement insertion point being different than the predetermined advertisement insertion point.**

6. Dependent Claim 5

5. The digital media system of claim 1, wherein the adaptive preference rule is based on at least one of a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

122. The combination teaches the digital media system of claim 1. *Supra* §V.A.3. I understand that claim 5 recites three alternatives and is satisfied by any one of the three alternatives. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 5.

123. As explained with respect to limitation [1f], Eldering-I teaches that the adapted advertisement insertion point is determined by an adaptive preference rule (e.g., rules of the hybrid orthogonal-linked sponsorship model), which selects advertisements for insertion into avails based on linked sponsorship parameters and viewing parameters. *Supra* §V.A.3[1f]; Ex-1004, ¶¶76-82, Fig. 6. 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). Ex-1004, ¶77 (“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) ...”), ¶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.”); *supra* §V.A.3[1f].

124. 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; *supra* §V.A.3[1f]. Therefore, Eldering-I teaches that the adaptive preference rule (e.g., hybrid orthogonal-linked sponsorship model) is 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.**

125. Eldering-I teaches that digital media content includes avails with predetermined time or location in the media content. Ex-1004, ¶27 (“Preferably, the information stream includes particular time intervals which are dedicated for insertion of such external data. However, the invention also can be utilized to replace existing data in the data stream, if desired. In the nomenclature of this specification, such designated intervals are termed avails.”), ¶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.”), ¶50 (“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.”), ¶13, ¶29.

126. Because the timing or location of the avails are predetermined, there is a predetermined portion of digital media content between two consecutive avails.

Ex-1004, ¶13, ¶27, ¶29, ¶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 using commonly used units such as macroblocks, frames, groups of pictures, segments, or tracks. *See, e.g.*, Ex-1020, 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. The blocks[] may be bits, bytes, or other appropriate block sizes. Each of the blocks[] is marked either with a P or a C, indicating whether the actual content of the data stream is a program (P) or a communication (C).”); 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:

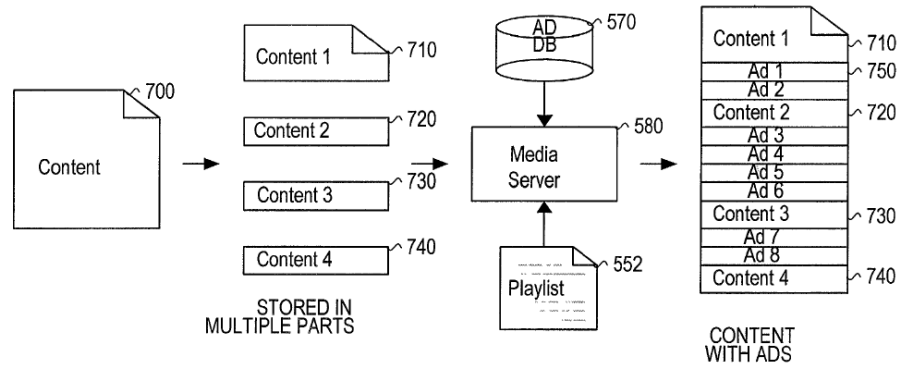


FIG. 7

127. When it is determined that a time signified by the time dependence parameter matches the timing of an avail, this time is separated from the preceding avail by the portion of the media content. The advertisement inserted at this time is played right after **a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, or a number of digital media data blocks played since the previous digital advertisement.**

128. Eldering-I thus teaches that the adaptive preference rule (e.g., rules of the hybrid orthogonal-linked sponsorship model) is based on at least one of a

number of tracks played since a previous digital advertisement (e.g., a number of tracks played between an avail matching the time dependence parameter and its preceding avail), a length of time associated with playing the digital media content (e.g., time signified by the time dependence parameter), and a number of digital media data blocks played since the previous digital advertisement (e.g., a number of digital media data blocks played between an avail matching the time dependence parameter and its preceding avail).

7. Dependent Claim 6

6. The digital media system of claim 1, wherein the intersplicer is configured to generate a control signal configured to interrupt a course of presentation of the digital media content with a presentation of the digital advertising content at the adapted advertisement insertion point.

129. The combination teaches the digital media system of claim 1. *Supra* §V.A.4. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 6.

130. As explained above, Eldering-I teaches the intersplicer (e.g., ad scheduler) generates an ad insertion schedule or information about an individual advertisement, which is sent to an advertisement rotator (e.g., advertisement insertion module) to cause the retrieval and insertion of the advertisement in a media stream. *Supra* §V.A.3[1c]. Here, the ad insertion schedule or individual advertisement information **is generated by the intersplicer as a control signal**

that causes the presentation of the advertisement. To the extent Patent Owner argues that the word “signal” is not used in the prior art to describe the ad insertion schedule or advertisement information, a POSITA would have understood that control signals were conventionally used to communicate between different software and hardware components and that it would have been obvious to use control signals to communicate the identifications and schedule of advertisements between the intersplicer and the advertisement rotator.

131. The ad insertion schedule or advertisement information communicated between the ad scheduler and the advertisement insertion module satisfies “control signal” as the term is used in the ’768 patent. The ’768 patent uses “control signal” only in its abstract: “[t]he intersplicer combines the media files with the ad files by providing control signals to the media player, causing the media player to present the ad files with the selected media files.” Ex-1001, Abstract. This sentence explains that the control signal causes the presentation of ad files with media files. This is consistent with Eldering-I’s disclosure because Eldering-I’s ad insertion schedule causes presentation of the advertisement with media files.

132. Furthermore, Eldering-I teaches that the intersplicer (e.g., ad scheduler) is configured to change a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point, where the

digital advertising content is presented. *Supra* §§V.A.3[1e]-[1h]. Elderling-I teaches the adapted advertisement insertion point as an avail in which the digital advertising content is inserted. *Supra* §V.A.3[1e]. Avails correspond to commercial breaks that interrupt the course of presentation of the digital media content (e.g., TV program content). *See, e.g.*, Ex-1004, ¶13 (“The set top box for each subscriber is capable of receiving television programming streams or channels carrying programs and openings (or avails).”), ¶27 (“It is equally applicable to inserting advertisements into recorded data, for example, from a VCR or PVR. Preferably, the information stream includes particular time intervals which are dedicated for insertion of such external data. However, the invention also can be utilized to replace existing data in the data stream, if desired. In the nomenclature of this specification, such designated intervals are termed avails.”), ¶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.”), ¶29, ¶46, ¶50. Elderling-I teaches inserting digital advertising content in between digital media content or using digital advertising content to replace original advertisement in a data stream. Ex-1004, ¶13 (“Although the avails may contain default ads, other ads, more suitable to the user, can be inserted.”), ¶28 (“In

accordance with the preferred embodiment of the invention, various 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.”). Either way, the digital advertising content interrupts a course of presentation of the digital media content. Thus, the combination teaches that the intersplicer is configured to generate a control signal configured to **interrupt a course of presentation of the digital media content with a presentation of the digital advertising content at the adapted advertisement insertion point.**

133. The teachings of the combination falls within the scope of “interrupt,” as the term is used in the ’768 patent. The ’768 patent explains that insertion of an advertisement between portions of digital media content interrupts the course of presentation of the digital media content. Ex-1001, 23:31-45 (“In step 514, the program selects appropriate ads to go with the media request list and prepares them for insertion into the content play/view sequence. It selects which ads, if any, are to interrupt the requested content during the course of play, and then it localizes them.”), 32:1-15 (“The main purpose of segments in a media track or title is to

indicate appropriate points for commercial interruptions, and the ad manager has the power to decide which segments are run back-to-back, and which ones are to have ad blocks inserted after them.”). This is consistent with Eldering-I’s teachings.

8. Dependent Claim 7

7. The digital media system of claim 1, wherein the advertisement rotator selects the digital advertising content based on the advertisement requirement that applies to the digital media system.

134. The combination teaches the digital media system of claim 1. *Supra* §V.A.3. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 7.

135. As explained above with respect to limitation [1f], Eldering-I teaches determining the adapted insertion point based on an advertisement requirement that applies to the digital media system, where the advertisement requirement is taught by Eldering-I’s requirement that a linked sponsorship parameter is satisfied. *Supra* §V.A.3[1f]. Satisfaction of linked sponsorship parameters causes an advertisement to be selected for insertion into the digital media stream. *Supra* §V.A.3[1f]; Ex-1004, ¶¶80-81, Fig. 6. For example, information of the advertisement (e.g., ARL) is moved to the top of an ad insertion schedule. *Supra* §§V.A.3[1e]-[1f]; Ex-1004, ¶32, ¶¶52-54, ¶56, ¶63, ¶77.

136. As explained above with respect to limitation [1c], Eldering-I teaches an advertisement rotator (e.g., advertisement insertion module) that retrieves and inserts advertisements based on the ad insertion schedule or information about the next advertisement from the intersplicer (e.g., ad scheduler). *Supra* §V.A.3[1c]; *see, e.g.*, Ex-1004, ¶¶46-49. Here, the advertisement rotator selects an advertisement to retrieve from local storage according to information of the advertisement in the ad insertion schedule, which in turn is determined based on advertisement requirements. Thus, Eldering-I teaches that **the advertisement rotator** (e.g., advertisement insertion module) **selects the digital advertising content based on the advertisement requirement** (e.g., a requirement that a linked sponsorship parameter is satisfied) **that applies to the digital media system**.

9. Dependent Claim 8

8. The digital media system of claim 1, wherein the intersplicer eliminates the advertisement requirement, in response to presenting the digital advertising content at the adapted insertion point of digital advertising content.

137. The combination teaches the digital media system of claim 1. *Supra* §V.A.3. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 8.

138. Eldering-I's display device displays the digital media content with advertisements inserted according to the most current ad insertion schedule, which

as explained above may include an advertisement for insertion at the adapted advertisement insertion point. *Supra* §V.A.3[1e]; Ex-1004, ¶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. This ensures that the advertisements that will most likely interest the current viewer of the programming channel are actually inserted and displayed to the current viewer.”), ¶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.”), ¶32, ¶82. Eldering-I thus teaches **presenting the digital advertisement content at the adapted insertion point of digital advertising content.**

139. Eldering-I teaches an advertisement requirement that applies to the digital media system through its disclosure of a requirement that a linked sponsorship parameter is satisfied. *Supra* §V.A.3[1f]. Eldering-I teaches time dependence as a linked sponsorship parameter, which signifies a specific time in the digital media content when an advertisement should be presented. Ex-1004, ¶77, ¶5. When an upcoming avail matches the signified time, this requirement

suggests inserting the advertisement in the avail as its adapted advertisement insertion point. Ex-1004, ¶¶50-51. After the advertisement has been presented, the requirement for satisfying this time dependence parameter is eliminated because the signified time in the digital media content has elapsed. Since the requirement that the advertisement be presented at the signified time has been satisfied and cannot be satisfied again, this requirement is no longer considered by the intersplicer (e.g., ad scheduler) in scheduling advertisements for subsequent avails.

140. As another example, Eldering-I teaches viewer dependence as a linked sponsorship parameter, which signifies that an advertisement should be presented when a specific viewer is watching the program. Ex-1004, ¶77, ¶81, Fig. 6. For example, as illustrated in Fig.6, the Macy's advertisement will be moved to the top of the queue and be played at the next available avail when A becomes the viewer. Ex-1004, ¶81, Fig. 6. After the viewer A has watched the Macy's advertisement, showing the same advertisement to viewer A would have significantly diminished benefit for the advertiser and would have damaged the viewer experience by showing repeated information. It would have been obvious to remove the requirement for viewer A to watch the Macy's advertisement once the advertisement has been shown to viewer A.

141. To the extent Patent Owner argues that this claim requires deleting data associated with the linked sponsorship parameter, it would have been obvious

to remove such data about a moot requirement from Eldering-I's subscriber system, and a POSITA would have been motivated to do so for reasons such as saving local storage space. Therefore, Eldering-I teaches or suggests the intersplicer **eliminating the advertisement requirement in response to** presenting an advertisement.

10. Dependent Claim 9

9. **The digital media system of claim 2, wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point, and wherein the advertisement rotator is configured to manage one or more requests to replace the predetermined advertisement.**

142. The combination teaches the digital media system of claim 2. *Supra* §§V.A.3-4. As explained below, it is my opinion that the combination further teaches the additional limitations of claim 9.

143. As explained above with respect to limitation [1e] and claim 2, the combination of Eldering-I and Eldering-II teaches that advertisements are scheduled to be inserted at predetermined points in digital media content. *Supra* §V.A.3[1e], §V.A.4; Ex-1004, ¶11, ¶15, ¶17, ¶¶28-29, ¶¶33-35, ¶44, ¶¶46-50, ¶63, ¶66, ¶82, Figs. 3-4. This teaches that **the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point.**

144. Furthermore, the combination of Eldering-I and Eldering-II teaches the advertisement scheduled at the adapted advertisement insertion point (e.g., a

shorter alternative advertisement) being different from the predetermined advertisement scheduled at the adapted advertisement insertion point. *Supra* §V.A.3[1e], §V.A.4; Ex-1005, Abstract, ¶58, ¶110, ¶¶165-179, Fig. 9. In this scenario, the predetermined advertisement is replaced with a newly scheduled advertisement. The combination further teaches the advertisement rotator manages requests from the intersplicer by retrieving and inserting requested advertisements. *Supra* §V.A.3[1c]; Ex-1004, ¶¶46-49. When the newly scheduled advertisement is different from the predetermined advertisement, the advertisement rotator **manages one or more requests to replace the predetermined advertisement.**

11. Independent Claims 10, 19, and 27

[10a]. A digital media advertisement presentation control system comprising: at least one processor; a non-transitory computer-readable storage medium storing instructions that, when executed by the processor, cause the processor to perform operations comprising:

145. 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 preamble and any additional limitations of element [10a].

146. As explained above with respect to limitation [1a], Elderling-I teaches a subscriber system. *Supra* §V.A.3[1a]; Ex-1004, ¶¶25-26, ¶¶29-30, ¶¶33-34, ¶¶36-37, Fig.1. Elderling-I's subscriber system is **a digital media advertisement**

control system because it controls the presentation of digital media and advertisements. *Supra* §V.A.3[1b] (explaining that Eldering-I’s system controls a course of presentation of digital media content) (citing Ex-1004, ¶¶32, ¶36, ¶38, ¶59, ¶61, Fig.1); §V.A.3[1e] (explaining that Eldering-I’s system controls the presentation of advertisements, such as their insertion into the digital media content) (citing Ex-1004, ¶15, ¶29, ¶¶46-47, ¶63, Fig. 4).

147. Eldering-I teaches that its system comprises **at least one processor and a non-transitory computer-readable storage media storing instructions** and that **the processor executes the instructions to perform operations** of the system. 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. The *software* of APU 22 can be realized in a number of programming languages including C, C++, Java, JavaScript as well as other languages known to those skilled in the art. Many of the elements and modules of the APU 22 can be realized as software running directly on the operating system of the set-top box or on middleware running on the operating system.”), ¶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*.”). Eldering-I teaches implementing its memory units using, for example, RAM and hard drive, which are forms of non-transitory computer readable storage medium, as opposed to transitory signals. 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.

148. The combination of Eldering-I and Eldering-II teaches performing operations explained below for [10b]-[10e]. *Infra* §§V.A.11[10b]-[10e].

[19a] A method embedded in a machine-readable medium in form of executable instructions to cause at least one programmable processor to perform operations comprising:
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149. 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 preamble.

150. Eldering-I teaches using instructions stored on a computer-readable medium (i.e., machine-readable medium) and executable by a processor to cause the processor to perform operations of Eldering-I’s system. *Supra* §V.A.11[10a]. Because Eldering-I’s processor executes instructions that form software programs,

it teaches a programmable processor. Ex-1004, ¶¶42-43, ¶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 ... and *programmed general purpose processors*.”). Eldering-I further teaches a **method** comprising the operations performed by its system. Ex-1004, ¶¶9-12 (“[I]t is an object of the present invention to provide an improved *method* and system for delivering targeted advertising via a network, such as a television service network. It is another object of the present invention to provide *a method* and system for inserting targeted advertisements into media program channels at the subscriber’s side.”). Therefore, Eldering-I teaches a method embedded in the machine-readable medium in form of the executable instructions stored thereon.

151. The combination of Eldering-I and Eldering-II teaches performing operations explained below for [19b]-[19e]. *Infra* §§V.A.11[19b]-[19e].

[27a] A computer program product comprising a non-transitory machine-readable medium storing instructions that, when executed by at least one programmable processor, cause the at least one programmable processor to perform operations comprising:

152. 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 preamble.

153. As explained above, Eldering-I teaches a non-transitory machine-readable medium storing instructions that, when executed by at least one programmable processor, cause the at least one programmable processor to perform operations of Eldering-I's system. *Supra* §§V.A.11[10a], [19a]. Eldering-I teaches embedding operations of its system in executable software program stored on a non-transitory medium. 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. The software of APU 22 can be realized in a number of programming languages including C, C++, Java, JavaScript as well as other languages known to those skilled in the art. Many of the elements and modules of the APU 22 can be realized as software running directly on the operating system of the set-top box or on middleware running on the operating system."). Eldering-I therefore applies its teachings to a computer-program product. A POSITA would have found it obvious to have a computer program product that includes a storage medium storing the software program, since computer program products have almost universally stored their software program code in non-transitory mediums (e.g., memory, ROM) for decades. Ex-1004, ¶43; Ex-1005, ¶183. For example, software program

code instructions saved on a CD-ROM had been a very common form of computer program product since the 1990s.

154. The combination of Eldering-I and Eldering-II teaches performing operations explained below for [27b]-[27e]. *Infra* §§V.A.11[27b]-[27e].

[10b]/[19b]/[27b] replacing a predetermined advertisement insertion point in digital media content with an adapted insertion point for digital advertising content, in response to receiving a request to update a current play position in the digital media content to a new play position in the digital media content,
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155. The combination of Eldering-I and Eldering-II teaches limitations [10b]/[19b]/[27b]. As explained above with respect to claim 1, the combination of Eldering-I and Eldering-II teaches changing a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point in the digital media content, in response to receiving a user input to update a current play position in the digital media content to a new play position in the digital media content. *Supra* §V.A.3[1e].

156. Eldering-II teaches the user input to update a current play position via its disclosure of a user's request to skip over or fast forward through digital media content. *Supra* §§V.A.3[1b], [1e]; Ex-1005, ¶¶109-110, ¶165, ¶112, ¶124. Eldering-II thus teaches receiving **a request** to update a current play position.

157. Changing a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point **replaces** the predetermined advertisement insertion point **with** an adapted insertion point **for digital advertising content** (e.g., advertisement). *Supra* §V.A.3 [1e]; Ex-1004, ¶16, ¶30, ¶32, ¶¶51-52, ¶¶56-61, ¶¶63-64, ¶75, ¶77; Ex-1005, ¶58, ¶¶109-112, ¶124, ¶165.

158. The combination of Eldering-I and Eldering-II therefore teaches limitations [10b]/[19b]/[27b].

[10c]/[19c]/[27c] the adapted insertion point determined by an adaptive preference rule based on one or more advertisement requirements;

159. The combination of Eldering-I and Eldering-II teaches limitations [10c]/[19c]/[27c]. As explained above with respect to claim 1, the combination of Eldering-I and Eldering-II teaches that the adapted advertisement insertion point is determined by an adaptive preference rule (e.g., rules of the hybrid orthogonal-linked sponsorship model) based on an advertisement requirement (e.g., a requirement that a linked sponsorship parameter is satisfied) that applies to the digital media system. *Supra* §V.A.3[1f].

[10d]/[19d]/[27d] requesting digital advertising content to be played at the adapted insertion point of digital advertising content; and

160. The combination of Eldering-I and Eldering-II teaches limitations [10d]/[19d]/[27d]. As explained above with respect to claim 1, the combination of

Eldering-I and Eldering-II teaches requesting digital advertising content (e.g., advertisement(s)) to be played at the adapted advertisement insertion point, which is an adapted insertion point of digital advertising content. *Supra* §V.A.3[1h]; Ex-1004, ¶¶46-49, Fig.2.

[10e]/[19e]/[27e] presenting the digital advertising content at the adapted insertion point of digital advertising content.

161. The combination of Eldering-I and Eldering-II teaches limitations [10e]/[19e]/[27e]. As explained above with respect to claim 1, the combination teaches that advertisements are scheduled to be played at the adapted advertisement insertion point. *Supra* §§V.A.3[1e], [1h]. Eldering-I teaches that the intersplicer (e.g., ad scheduler) requests digital advertising content (e.g., advertisement(s)) to be played at the adapted advertisement insertion point, which is the adapted insertion point of digital advertising content. *Supra* §V.A.3[1h]; Ex-1004, ¶¶46-49, Fig.2. Next, the digital advertising content is presented (e.g., displayed) at this adapted insertion point. 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.”), ¶54, ¶60. Eldering-II similarly teaches presenting an advertisement. Ex-1005, ¶97 (“According to one embodiment, the ads that are targeted to the

subscribers in the VoD content can be coordinated with ads that were displayed to the subscriber while they were interacting with the television prior to requesting the video (i.e., ads displayed in television programming, ads displayed in the EPG), whether those ads were targeted or not (default ads).”), ¶166 (“When the fast forward command is detected during playing of the ad, the playlist switches to displaying the alternative ad.”), Abstract (“Selecting targeted advertisements to be presented to subscribers along with selected video in a video on demand (VoD) system.”), ¶127. ¶162. The combination therefore teaches limitations [10e]/[19e]/[27e].

12. Dependent Claims 11, 20, and 28

- 11. The system of claim 10,**
- 20. The method of claim 19,**
- 28. The computer program product of claim 27,**
- wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.**

162. The combination of Eldering-I and Eldering-II teaches the system of claim 10, the method of claim 19, and the computer program product of claim 27. *Supra* §V.A.11. As explained with respect to claim 2, the combination further teaches the additional limitations of claims 11, 20, and 28. *Supra* §V.A.4.

13. Dependent Claims 12, 21, and 29

12. The system of claim 10,
21. The method of claim 19,
29. The computer program product of claim 27,

wherein the replacing the predetermined advertisement insertion point with the adapted insertion point includes adaptively modifying a presentation position of the predetermined advertisement from the predetermined advertisement insertion point to the adapted insertion point in the digital media content.

163. The combination of Eldering-I and Eldering-II teaches the system of claim 10, the method of claim 19, and the computer program product of claim 27. *Supra* §V.A.11. It is my opinion that the combination further teaches the additional limitations of claims 12, 21, and 29.

164. As explained above with respect to limitations [10b], [19b], and [27b], the combination of Eldering-I and Eldering-II teaches **replacing the predetermined advertisement insertion point with the adapted insertion point.** *Supra* §V.A.11[10b]/[19b]/[27b].

165. As explained with respect to claim 3, the combination further teaches that this includes **adaptively modifying a presentation position of the predetermined advertisement from the predetermined advertisement insertion point to the adapted insertion point in the digital media content.** *Supra* §V.A.5.

14. Dependent Claims 14, 23, and 31

14. The system of claim 10,
23. The method of claim 19,
31. The computer program product of claim 27,

wherein the adaptive preference rule is based on at least one of: a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

166. The combination of Eldering-I and Eldering-II teaches the system of claim 10, the method of claim 19, and the computer program product of claim 27.

Supra §V.A.11. As explained with respect to claim 5, the combination further teaches the additional limitations of claims 14, 23, and 31. *Supra* §V.A.6.

15. Dependent Claims 15, 24, and 32

15. The system of claim 10,
24. The method of claim 19,
32. The computer program product of claim 27,

wherein the course of presentation of the digital media content is interrupted with a presentation of the digital advertising content at the adapted insertion point.

167. The combination of Eldering-I and Eldering-II teaches the digital media advertisement presentation control system according to claim 10, the method according to claim 19, and the computer program product according to

claim 27. *Supra* §V.A.11. It is my opinion that the combination further teaches the additional limitations of claims 14, 23, and 31.

168. As explained with respect to claim 6, the combination of Eldering-I and Eldering-II teaches generating a control signal configured to interrupt a course of presentation of the digital media content with a presentation of the digital advertising content at the adapted advertisement insertion point. *Supra* §V.A.7. This teaches that **the course of presentation of the digital media content is interrupted with a presentation of the digital advertising content at the adapted insertion point.**

16. Dependent Claim 16

16. The system of claim 10, wherein the digital advertising content is selected based on one or more advertisement requirements that apply to a user device.

169. The combination of Eldering-I and Eldering-II teaches the system of claim 10. *Supra* §V.A.11. It is my opinion that the combination further teaches the additional limitations of claim 16.

170. As explained with respect to claim 7, the combination of Eldering-I and Eldering-II teaches selecting the digital advertising content based on the advertisement requirement that applies to the digital media system. *Supra* §V.A.8. Eldering-I teaches that its digital media system (e.g., subscriber system) is a user device. Ex-1004, ¶13 (“In accordance with one embodiment of the present

invention, subscribers to a particular television service provider, such as a cable television network, have set top boxes for accessing television programming channels offered by the television service provider. The set top box for each subscriber is capable of receiving television programming streams or channels carrying programs and openings (or avails). Although the avails may contain default ads, other ads, more suitable to the user, can be inserted.”), ¶25 (“In this specification, a ‘subscriber’ includes a viewer, a household, *a user*, or any entity that has the capability of receiving the advertisements from advertisers according to the present invention. *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.”). Therefore, the combination teaches that **the digital advertising content is selected based on one or more advertisement requirements that apply to a user device.**

17. Dependent Claims 17, 25, and 33

- 17. The system of claim 11,**
25. The method of claim 20,
33. The computer program product of claim 28,
wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point.

171. The combination of Eldering-I and Eldering-II teaches the system of claim 11, the method of claim 20, and the computer program product of claim 28. *Supra* §V.A.12. As explained with respect to claim 9, the combination further teaches the additional limitations of claims 17, 25, and 33. *Supra* §V.A.10.

18. Dependent Claim 18

- 18. The system of claim 16, wherein the advertisement one or more requirements are eliminated in response to presenting the digital advertising content to the user device at the adapted insertion point of digital advertising content.**

172. The combination of Eldering-I and Eldering-II teaches the system of claim 16. *Supra* §V.A.16. It is my opinion that the combination further teaches the additional limitations of claim 18.⁶

173. As explained with respect to claim 8, the combination of Eldering-I and Eldering-II teaches that the intersplicer eliminates the advertisement

⁶ The phrase “the advertisement one or more requirements” in claim 18 appears to be erroneous. My opinion regarding claim 18 is based on the understanding that this phrase is intended to read as “the one or more advertisement requirements.”

requirement, in response to presenting the digital advertising content at the adapted insertion point of digital advertising content. *Supra* §V.A.9. As explained with respect to limitation [10e] and claim 16, the combination further teaches that the digital advertising content is presented to the digital media system that is a user device. *Supra* §§V.A.11[10e], V.A.16. Thus, the combination teaches that **the one or more advertisement requirements are eliminated in response to presenting the digital advertising content to the user device at the adapted insertion point of digital advertising content.**

VI. BACKGROUND AND QUALIFICATIONS

174. 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.

175. 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.

176. 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.

177. 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.

178. 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.

179. 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.

180. 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.

181. 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.

182. 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.

183. 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.

184. 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.

185. 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.

186. 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.

187. 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.

188. 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.

189. 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

190. 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

191. 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

192. 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.

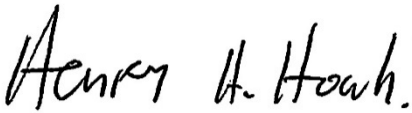
VIII. RESERVATION OF RIGHTS

193. 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 '768 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 '768 Patent and to take into account new information that becomes available to me.

194. 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 August 22, 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

15 Ballard Ter.
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. 11,463,768 to Donian <i>et al.</i> (the '768 patent)
1002	Prosecution History for the '768 patent
1004	U.S. Patent Application Publication No. 2002/0083439 ("Eldering-I")
1005	U.S. Patent Application Publication No. 2003/0149975 ("Eldering-II")
1006	Prosecution History for U.S. Patent No. 10,986,403 (the '403 patent)
1007	U.S. Pat. App. Pub. 2002/0161739 (Oh)
1008	U.S. Pat. App. Pub. 2001/0042249 (Knepper)
1009	U.S. Pat. App. Pub. 2003/0154128 (Liga)
1010	U.S. Pat. App. Pub. 2003/0149621 (Shteyn)
1011	<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)
1012	U.S. Pat. App. Pub. 2002/0002674 (Grimes)
1013	U.S. Pat. App. Pub. 2003/0079133 (Breiter)
1014	U.S. Pat. App. Pub. 2001/0047338 (Jones)
1015	U.S. Patent No. 6,161,142 (Wolfe)
1016	U.S. Pat. App. Pub. 2002/0120515 (Morimoto)
1017	U.S. Pat. App. Pub. 2001/0049820 (Barton)
1018	U.S. Pat. App. Pub. 2003/0044162 (Angel)
1019	U.S. Patent No. 7,006,760 (Takagi)
1020	U.S. Patent No. 7,302,160 (Wells)
1021	U.S. Pat. App. Pub. 2002/0056107 (Schlack)
1022	<i>Piranha Media Distribution, LLC v. Hulu, LLC</i> , CDCA-2-24-cv-00498, Piranha's Infringement Contentions for the '768 Patent

APPENDIX 3: CHALLENGED CLAIMS

[1a] A digital media system comprising:

[1b] a user interface for receiving user input for controlling a course of presentation of digital media content;

[1c] an advertisement rotator for managing one or more requests for advertising content to be presented during the course of presentation of the digital media content either visually or audibly; and

[1d] an intersplicer in communication with the advertisement rotator, the intersplicer configured to:

[1e] change a predetermined advertisement insertion point in the digital media content to an adapted advertisement insertion point in the digital media content, in response to receiving a user input to update a current play position in the digital media content to a new play position in the digital media content,

[1f] the adapted advertisement insertion point determined by an adaptive preference rule based on an advertisement requirement that applies to the digital media system;

[1g] modify the adapted insertion point of digital advertising content based on the advertisement requirement; and

[1h] request, from the advertisement rotator, digital advertising content to be played at the adapted advertisement insertion point.

2. The digital media system of claim 1, wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.

3. The digital media system of claim 1, wherein the intersplicer is further configured to change the predetermined advertisement insertion point to the adapted advertisement insertion point by adaptively modifying a presentation position of a predetermined advertisement from the predetermined advertisement insertion point to the adapted advertisement insertion point in the digital media content, the adapted advertisement insertion point being different than the predetermined advertisement insertion point.

5. The digital media system of claim 1, wherein the adaptive preference rule is based on at least one of a number of tracks played since a previous digital advertisement, a length of time associated with playing

the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

6. The digital media system of claim 1, wherein the intersplicer is configured to generate a control signal configured to interrupt a course of presentation of the digital media content with a presentation of the digital advertising content at the adapted advertisement insertion point.

7. The digital media system of claim 1, wherein the advertisement rotator selects the digital advertising content based on the advertisement requirement that applies to the digital media system.

8. The digital media system of claim 1, wherein the intersplicer eliminates the advertisement requirement, in response to presenting the digital advertising content at the adapted insertion point of digital advertising content.

9. The digital media system of claim 2, wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point, and wherein the advertisement rotator is configured to manage one or more requests to replace the predetermined advertisement.

[10a] A digital media advertisement presentation control system comprising:

at least one processor;

a non-transitory computer-readable storage medium storing instructions that, when executed by the processor, cause the processor to perform operations comprising:

[10b] replacing a predetermined advertisement insertion point in digital media content with an adapted insertion point for digital advertising content, in response to receiving a request to update a current play position in the digital media content to a new play position in the digital media content,

[10c] the adapted insertion point determined by an adaptive preference rule based on one or more advertisement requirements;

[10d] requesting digital advertising content to be played at the adapted insertion point of digital advertising content; and

[10e] presenting the digital advertising content at the adapted insertion point of digital advertising content.

11. The system of claim 10, wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.

12. The system of claim 10, wherein the replacing the predetermined advertisement insertion point with the adapted insertion point includes adaptively modifying a presentation position of the predetermined advertisement from the predetermined advertisement insertion point to the adapted insertion point in the digital media content.

14. The system of claim 10, wherein the adaptive preference rule is based on at least one of a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

15. The system of claim 10, wherein the course of presentation of the digital media content is interrupted with a presentation of the digital advertising content at the adapted insertion point.

16. The system of claim 10, wherein the digital advertising content is selected based on one or more advertisement requirements that apply to a user device.

17. The system of claim 11, wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point.

18. The system of claim 16, wherein the advertisement one or more requirements are eliminated in response to presenting the digital advertising content to the user device at the adapted insertion point of digital advertising content.

[19a] A method embedded in a machine-readable medium in form of executable instructions to cause at least one programmable processor to perform operations comprising:

[19b] replacing a predetermined advertisement insertion point in digital media content with an adapted insertion point for digital advertising content, in response to receiving a request to update a current play position in the digital media content to a new play position in the digital media content,

[19c] the adapted insertion point determined by an adaptive preference rule based on one or more advertisement requirements;

[19d] requesting digital advertising content to be played at the adapted insertion point of digital advertising content; and

[19e] presenting the digital advertising content at the adapted insertion point of digital advertising content.

20. The method of claim 19, wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.

21. The method of claim 19, wherein the replacing the predetermined advertisement insertion point with the adapted insertion point includes adaptively modifying a presentation position of the predetermined advertisement from the predetermined advertisement insertion point to the adapted insertion point in the digital media content.

23. The method of claim 19, wherein the adaptive preference rule is based on at least one of: a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

24. The method of claim 19, wherein the course of presentation of the digital media content is interrupted with a presentation of the digital advertising content at the adapted insertion point.

25. The method of claim 20, wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point.

[27a] A computer program product comprising a non-transitory machine-readable medium storing instructions that, when executed by at least one programmable processor, cause the at least one programmable processor to perform operations comprising:

[27b] replacing a predetermined advertisement insertion point in digital media content with an adapted insertion point for digital advertising content, in response to receiving a request to update a current play position in the digital media content to a new play position in the digital media content,

[27c] the adapted insertion point determined by an adaptive preference rule based on one or more advertisement requirements;

[27d] requesting digital advertising content to be played at the adapted insertion point of digital advertising content; and

[27e] presenting the digital advertising content at the adapted insertion point of digital advertising content.

28. The computer program product of claim 27, wherein the digital advertising content is different from a predetermined advertisement selected to be played at the predetermined advertisement insertion point.

29. The computer program product of claim 27, wherein the replacing the predetermined advertisement insertion point with the adapted insertion point includes adaptively modifying a presentation position of the predetermined advertisement from the predetermined advertisement insertion point to the adapted insertion point in the digital media content.

31. The computer program product of claim 27, wherein the adaptive preference rule is based on at least one of: a number of tracks played since a previous digital advertisement, a length of time associated with playing the digital media content, and a number of digital media data blocks played since the previous digital advertisement.

32. The computer program product of claim 27, wherein the course of presentation of the digital media content is interrupted with a presentation of the digital advertising content at the adapted insertion point.

33. The computer program product of claim 28, wherein the predetermined advertisement is scheduled to play at the predetermined advertisement insertion point.

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.