

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TikTok Inc.
Petitioner

v.

NTECH Properties, Inc.
Patent Owner

IPR2024-01340
U.S. Patent No. 8,145,704

“Method and Apparatus for Efficient, Entertaining Information Delivery”

DECLARATION OF KEVIN ALMEROOTH, PH.D. IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 8,145,704

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LIST OF EXHIBITS

Exhibit	Description
EX1001	U.S. Patent No. 8,145,704 (“’704 patent”)
EX1002	Declaration of Kevin Almeroth, Ph.D.
EX1003	U.S. Pat. No. 8,555,318 (“Whitehead”)
EX1004	U.S. Pat. Pub. No. 2002/0152117 (“Cristofalo”)
EX1005	U.S. Pat. Pub. No. 2006/0015904 (“Marcus ’904”)
EX1006	U.S. Patent No. 6,177,931
EX1007	Int’l Publ. No. WO 00/40021
EX1008	U.S. Pat. No. 6,032,156 (“Marcus ’156”)
EX1009	Provisional Application for U.S. Pat. No. 8,145,704 (U.S. Prov. Appl. No. 60/934,456)
EX1010	D. Wilkerson, “ACTV hopes to steal print's thunder” (Dec. 8, 2000)
EX1011	Amended Complaint in <i>NTECH Properties, Inc. v. ByteDance Ltd. et al.</i> , No. 2:24-cv-00130 (E.D. Tex.)
EX1012	B. Hammersley, “Audible revolution” (Feb. 11, 2004)
EX1013	U.S. Pat. No. 6,388,714
EX1014	U.S. Pat. No. 7,467,398
EX1015	Verizon, “Verizon Unlocks Full Potential of Fiber-Based FiOS Internet and Video Services With Advanced 100-Mbps Broadband Home Router” (June 28, 2006)
EX1016	Prosecution History for U.S. Pat. No. 8,145,704
EX1017	Prosecution History for U.S. Pat. No. 8,886,753
EX1018	Prosecution History for U.S. Pat. No. 9,215,261
EX1019	Prosecution History for U.S. Pat. No. 9,923,947
EX1020	List of Recent Expert Witness Engagements of Dr. Kevin Almeroth

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Exhibit	Description
EX1021	Curriculum Vitae of Dr. Kevin Almeroth
EX1022	R. Gelles-Watnick, “Americans’ Use of Mobile Technology and Home Broadband,” Pew Research Center (Jan. 31, 2024)

I, Dr. Kevin Almeroth, declare as follows:

I. Introduction

1. I have been retained by Quinn Emanuel Urquhart & Sullivan, LLP on behalf of the Petitioner TikTok Inc. (“Petitioner”) as an independent expert in this *inter partes* review (this “Proceeding”) before the Patent Trial and Appeal Board of the United States Patent and Trademark Office (the “Board”) to review claims 1-24 (“the challenged claims”) of U.S. Patent No. 8,145,704 (“the ’704 patent”). I have been asked by the Petitioner to assist in evaluating the claims and the disclosure of the ’704 patent.

A. Qualifications

2. EX1021 is a true and correct copy of my current CV, which describes my education, patents and publications, employment and research history, and professional activities and awards.

1. Educational Background

3. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System

System, minor in Telecommunications Public Policy) earned in June 1997. During my education, I have taken a wide variety of courses as demonstrated by my minor. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

2. Career

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

5. One of the major concentrations of my research has been the delivery of multimedia content and data between computing devices, including various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged

between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

6. In 1992, the initial focus of my research was on the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

7. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based

applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

8. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech

dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

9. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the existing channels and watch the content at the point it was currently being transmitted.

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

11. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (*i.e.*, when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

12. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used

firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

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

14. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm

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Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI)

Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM

Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE

Network, ACM Computers in Entertainment, AACE Journal of Interactive

Learning Research (JILR), and ACM Computer Communications Review. I have

co-chaired a number of conferences and workshops including the IEEE

International Conference on Network Protocols (ICNP), IEEE Conference on

Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International

Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE

International Conference on Management of Multimedia Networks and Services

(MMNS), the International Workshop On Wireless Network Measurement

(WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the

Network Group Communication (NGC) workshop, and the Global Internet

Symposium, and I have served on the program committees for numerous

conferences.

15. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed

Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (EX1021).

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

17. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and

include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

18. Additional details about my employment history, fields of expertise, and publications are further included in my CV (EX1021).

3. Other Relevant Qualifications

19. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

20. As an important component of my research program, I have been involved in the development of academic research into available technology in the market place. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which

oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

21. I am an author or co-author of approximately 200 technical papers, published software systems, IETF Internet Drafts and IETF Request for Comments (RFCs). A complete list of my publications is in my CV (EX1021).

22. I have been awarded numerous teaching awards, including Computer Science Outstanding Faculty Member (1997-98, 1998-99, 1999-2000, 2004-06, UCSB Spotlight on Excellence Award (2000-01), and UCSB Academic Senate Distinguished Teaching Award (2006-07).

B. Previous Expert Witness Testimony

23. The list of recent matters in which I have testified can be found in EX1020.

C. Preparation for this Declaration

24. In forming my opinions, I have considered the '704 patent specification, including the Abstract, the figures, and the claim language itself, as would have been understood by a person having ordinary skill in the art. I have also reviewed the file history of the '704 patent, the Exhibits that are listed in the list of Exhibits within the Petition, and any other material cited in this declaration.

25. In forming my opinions, I have relied on my personal knowledge and professional experience, and on the documents and information referenced in this declaration.

26. This declaration explains, based on facts and information available to me to date, the subject matter and opinions related to this Proceeding. As such, I am prepared to provide expert testimony regarding opinions formed resulting from my analysis of the issues considered in this declaration if asked about those issues by the Board or by the private parties' attorneys.

27. Additionally, I may discuss my own work, teachings, and knowledge of the state of the art in the relevant time period. I may rely on handbooks, textbooks, technical literature, and the like to demonstrate the state of the art in the relevant period and the evolution of relevant technologies.

28. Throughout this declaration, I refer to specific pages of the '704 patent and other documents. The citations are intended to be exemplary and are not intended to convey that the citations are the only source of evidence to support the propositions for which they are cited.

29. I am being compensated for my time spent on this matter at a rate of \$850 per hour, and my compensation is in no way contingent upon the outcome of this matter or on the opinions I offer. All of the opinions expressed in this declaration are my own.

II. LEGAL UNDERSTANDINGS

30. In this section, I describe my understanding of certain legal standards that I have relied upon in forming my opinions set forth in this declaration. I have been informed of these legal standards by Petitioner's attorneys. I am not an attorney and I have not thoroughly researched the law on patent invalidity. I am relying only on instructions from Petitioner's attorneys for these legal standards.

A. Claim Construction

31. I have been instructed by counsel that claim construction is a matter of law for the arbiter of law to decide. I understand that in an *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claim in a civil action.

32. I understand that a patent may include two types of claims, independent claims and dependent claims. An independent claim stands alone and includes only the limitations it recites. A dependent claim can depend on 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 from which it depends.

B. Anticipation

33. I understand that a patent claim is anticipated when a single piece of prior art describes every element of the claimed invention, either expressly or

inherently, arranged in the same way as in the claim. For inherent anticipation to be found, it is required that the missing descriptive material is necessarily present in the prior art. I understand that, for the purpose of an *inter partes* review, prior art that anticipates a claim can include both patents and printed publications from anywhere in the world.

C. Obviousness

34. I understand that a patent claim is unpatentable and invalid if the subject matter of the claim as a whole would have been obvious to a person of ordinary skill in the art of the claimed subject matter as of the time of the invention at issue. I understand that the following factors must be evaluated to determine whether the claimed subject matter is obvious: (1) the scope and content of the prior art; (2) the difference or differences, if any, between each claim of the patent and the prior art; and (3) the level of ordinary skill in the art at the time the patent was filed. Unlike anticipation, which allows consideration of only one item of prior art, I understand that obviousness may be shown by considering more than one item of prior art. Moreover, I have been informed and I understand that the so-called objective indicia of non-obviousness, also known as “secondary considerations,” like the following are also to be considered when assessing obviousness: (1) commercial success; (2) long-felt but unresolved needs; (3) copying of the invention by others in the field; (4) initial expressions of disbelief

by experts in the field; (5) failure of others to solve the problem that the inventor solved; and (6) unexpected results. I also understand that evidence of objective indicia of non-obviousness must be commensurate in scope with the claimed subject matter.

III. The '704 Patent

A. Specification

35. The '704 patent is a pre-AIA patent that claims priority to June 13, 2007 based on the filing of U.S. Provisional Patent Application No. 60/934,456 ("the '456 provisional"). It is titled "Method and system for providing media programming" and lists a sole named inventor, Dwight Marcus. The '704 patent was filed as U.S. Patent Application No. 12/138,925 ("the '925 application") on June 13, 2008 and issued on March 27, 2012.

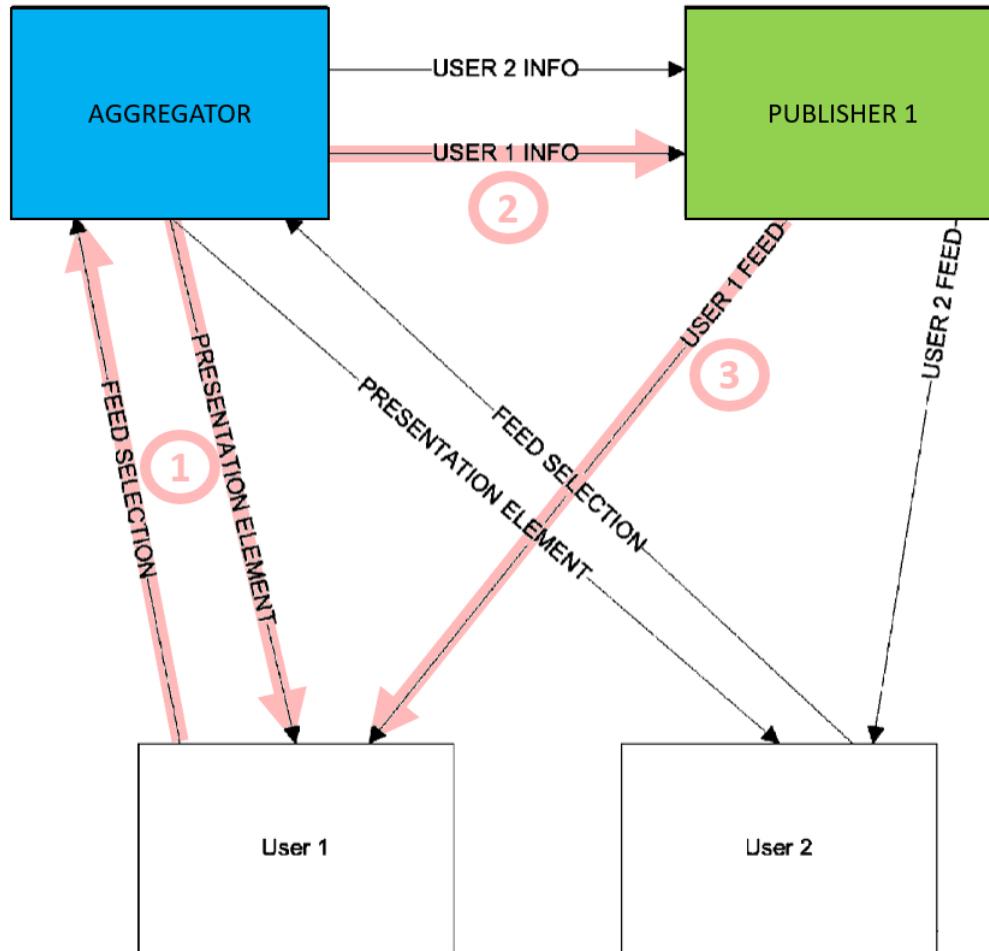
36. The '704 patent specification relies on long-existing technologies, such as "the Internet," "TCP/IP protocol," and "MPEG-3 format for video." EX1001 at 4:4-5, 14:15-25. In addition, like the Marcus '904 publication before it, the '704 patent specification relies on the Marcus '156 patent for all selecting, ordering, and assembling of media programming. EX1001 at 1:18-23, 5:40-47, 9:18-28, 9:43-47, 10:12-14.

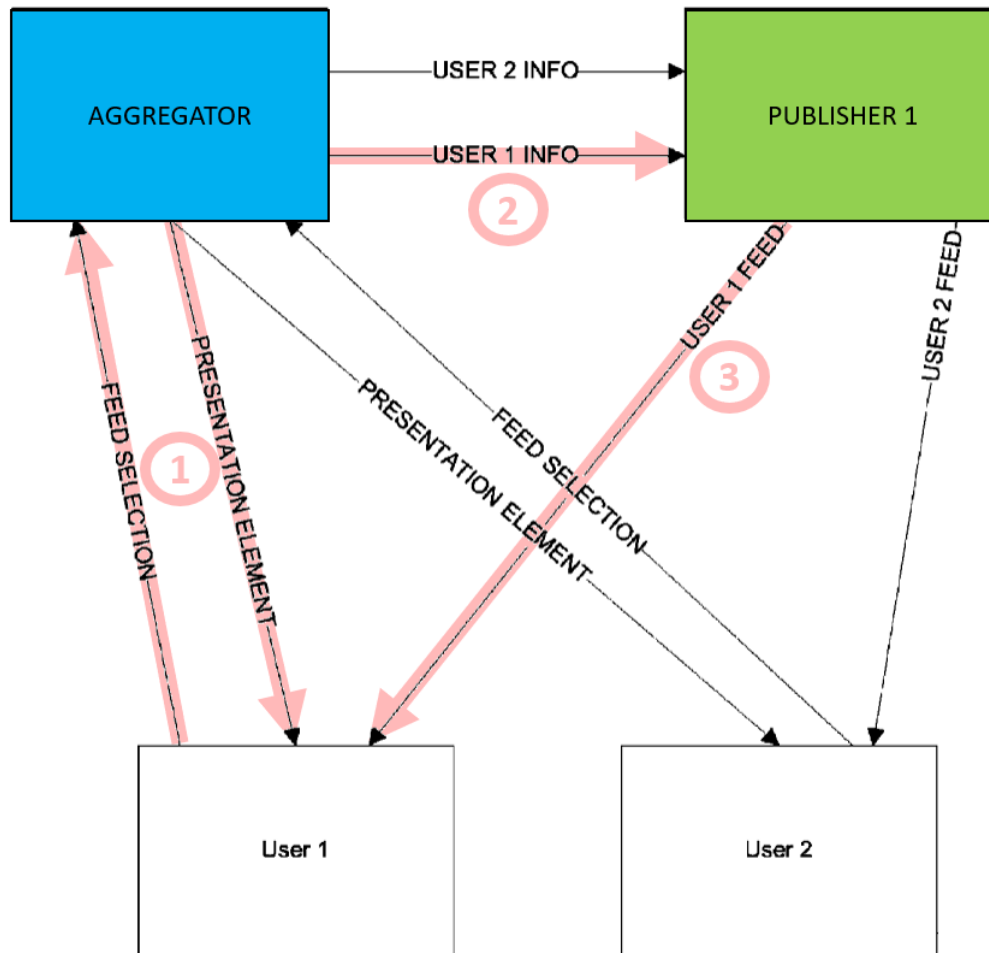
37. The '704 patent issued with claims 1-24, including independent claims 1, 19, and 23. Claims 19-24 are directed to the concept of generating

custom media programming using an “*aggregator*” and a “*publisher*.”¹ These components are shown in the ’704 patent’s Figure 1:

¹ References to claimed “*aggregator*” or a prior art system component being mapped to the “*aggregator*” claim limitation are in **blue**.

References to claimed “*publisher*” or a prior art system component being mapped to the claimed “*publisher*” are in **green**.





38. Claims 19-24 recite three basic steps. **Step 1:** The *aggregator* provides a user interface presenting available media streams and receives a user selection of one of those media streams. **Step 2:** The *aggregator* then provides the user selection and user profile information to the *publisher*. **Step 3:** The *publisher* generates custom media programming comprising the selected media stream and advertising or other media elements and provides the custom media programming to the user.

39. In contrast, claims 1-18 do not even require a separate “***publisher.***” Rather, claim 1 is directed to the basic concept of an “***aggregator***” generating custom media programming based on user profile information.

B. Provisional Application (EX1008)

40. PO filed the provisional application for the '704 patent (U.S. Prov. Appl. No. 60/934,456) on June 13, 2007. The “Detailed Description” in this provisional application consisted of less than 40 paragraphs and a single figure, which eventually became Figure 1 of the '704 patent.

C. Prosecution History (EX1016)

41. PO filed the non-provisional application for the '704 patent on June 13, 2008. The Examiner rejected the pending claims of the '704 patent application twice as anticipated or obvious. The Examiner issued a first non-final office action on February 2, 2010 rejecting all the pending claims in light of U.S. Pub. 2006/0167860 Eliashberg et al (“Eliashberg “). EX1016 at 65-72. On August 4, 2010 the applicant submitted remarks in an amendment that Eliashberg “lacks the concatenation of elements of a publisher initiated feed.” EX1016 at 80-92. On October 4, 2010 the Examiner issued a Final Rejection which included new grounds for rejection of the pending claims as obvious under Eliashberg in light of U.S. Pat. No. 7,617,190 (“Wright”). EX1016 at 98-107. On November 4, 2011 the applicant amended the claims to, among other changes, specify a temporal

sequence of media programming, and argued that Eliashberg and Wright did not disclose “a temporal sequence of media programming.”

19. (CURRENTLY AMENDED) A method for aggregating media programming, comprising:

- presenting to a user a list of media streams feeds;
- receiving an input signal having data indicative of a selection of one of the media streams feeds from the list;
- providing an output signal having data indicative of the selection;
- receiving, responsive to the output signal, at least the selected media stream a first feed; and
- responsive to the data indicative of the selection based on the first feed and user information, and using at least one algorithm for selection and sequencing of media elements, selecting a temporal sequence of media programming comprising the selected media stream and other media elements, and providing media programming a modified feed to the user, the media programming modified feed comprising the other media elements selected and concatenated in accordance with the temporal sequence with the selected media stream first feed based on the user information.

42. The applicant then argued the prior art lacks “a temporal sequence for generating media programming from a media stream and other media elements of a plurality of media streams.” EX1016 at 131. The Applicant argued the prior art was limited to disclosing a “feed in the form or, for example, a list of RSS headlines.” EX1016 at 131. After that, the Examiner allowed the claims. EX1016 at 140-147.

D. Prosecution Histories of Other Family Members

1. Prosecution History of Child '753 Patent (EX1017)

43. The Examiner rejected the pending claims of the '753 patent application twice as anticipated or obvious. EX1017 at 62-65, 88-93. After the first rejection, applicant made the following arguments:

“Client information” relates to information about a client device and user information relates to information about one or more users. A given user may use different clients and a given client may have different users. According to the specification, client information can include user selections and user information. See, Specification, ¶ [0004]. Client and user information can be independent of each other, such as information that identifies a particular client or user. Client and user information can become dependent, or user information may coincide with client information, at least temporarily, for example when a user is associated with or is using a client.

The Applicant respectfully disagrees with the Examiner. Original claim 1 specified that the media elements, among other things, are “concatenated” according to user information. The ordinary meaning of “concatenate” is this: “to link together, to unite in a successive series or chain, as things depending on each other.” See, Webster’s New Twentieth Century Dictionary (Unabridged), 2d Ed., William Collins + World Publishing Co., Inc. (1977), p. 735 (copy attached). According to the Specification, the invention provides “a concatenated *sequence* of media elements, in which the *order* and selection of media elements is determined by algorithms [and] the algorithms may include as variables the user information.” Specification, at ¶ [0017]. As claimed, the “concatenated” media elements are not just selected, they are ordered in a coherent sequence, in relation to and depending upon each other, and upon user information.

According to applicant, the cited art failed to disclose “‘concatenated’ media elements [that] are not just selected, they are ordered in a coherent sequence, in relation to and dependent upon each other, and upon user information.” EX1017 at 76.

44. After the second rejection, applicant amended then claims and then repeated the argument that the cited art does not disclose “providing to the client individual customized media programming based on a publisher-initiated feed responsive to the feed selection and including media elements selected ordered, and concatenated with the feed that are responsive at least in part to the user information.” EX1017 at 127-132. In response, the Examiner allowed the claims. EX1017 at 182-189.

2. Prosecution History of Grand-Child '261 Patent (EX1018)

45. The Examiner allowed the new claims of the '261 patent application in the first action. EX1018 at 71-79.

3. Prosecution History of Great-Grand-Child '947 Patent (EX1019)

46. The Examiner rejected the pending claims of the '947 patent application twice as anticipated or obvious. EX1019 at 86-89, 125-129. Eventually, applicant substantially amended the claims. EX1019 at 141. Applicant made the following argument:

This allows the publisher to customize additional elements in the media programming on a user by user basis. The publisher can receive information about a user's graphic location and provide an element (e.g. a sidebar) based on that location (e.g. an ad for a local restaurant). The system continually updates the element based on updated information. This also allows initial content streams to be progressively personalized and each user can receive a personalized 'page' created on the fly in real time for that user. Garcia-Martin is silent on this point and does not teach or suggest all of the elements of claim 1. Claim 2 depends from claim 1 and is allowable based on the above arguments. Applicant respectfully requests that the rejection be withdrawn.

47. The Examiner allowed the claims. EX1019 at 152-157.

E. Level of Ordinary Skill in the Art

48. I understand that a person of ordinary skill in the art (“POSITA”) is a hypothetical person who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity—not an automaton. In deciding the level of ordinary skill, I understand that the following factors may be considered:

- The levels of education and experience of persons working in the field;
- The types of problems encountered in the field; and
- The sophistication of the technology.

49. I understand that the asserted claims of the asserted patents must be evaluated from the perspective of a POSITA. In my opinion, the relevant art for this patent relates to delivery of video content over a computer network. I understand that the relevant point in time for determining the qualifications of a person of ordinary skill in the state-of-the-art is the time of the alleged invention, which I assume to be the earliest filing date for the patent. Here, I understand that the earliest alleged priority date is June 13, 2007.

50. In my opinion, a POSITA at the time of the alleged invention would have had at least a Bachelor of Science in electrical engineering, computer

engineering, or similar fields and at least two years of practical experience in the field of media processing and/or transmission. More education can supplement for less practical experience, and vice versa.

51. This level of skill is approximate, and more experience would compensate for less formal education, and vice versa. I meet these criteria now and met them at the time of the alleged invention. I have applied this level of skill in my analysis. My opinions would not change if a slightly higher or lower level of ordinary skill applied.

F. Claim Construction

52. I have been instructed by Petitioner to perform my technical analysis of the disclosures of the prior art by applying the plain and ordinary meaning of all claim terms. I have not been asked to opine on the correctness of any claim constructions.

53. I reserve the right to provide additional opinions concerning claim construction or the application of certain claim constructions to the prior art, as appropriate, and to respond to any particular claim construction-related argument advanced by PO and/or its expert.

54. As described in more detail in the remainder of this declaration, the prior art discloses or renders obvious the challenged claims under any reasonable potential claim interpretation.

G. Challenged Claims

55. I understand that claims 1-24 are at issue in Petitioner's petition for *inter partes* review. They are reproduced below for reference.

Claim	Limitation
1[pre]	A method of generating media programming for display on a client, comprising:
1[a]	receiving by an aggregator data relating to a plurality of media streams;
1[b]	accessing by the aggregator user information;
1[c]	based on the user information and the data related to the plurality of media streams, determining by the aggregator a temporal sequence of media programming comprising the media streams;
1[d]	accessing by the aggregator over a network the plurality of media streams; and
1[e]	providing by the aggregator to the client media programming in the determined temporal sequence, the media programming comprising concatenated elements of the plurality of media streams.
2	The method of claim 1, wherein the aggregator comprises a web server.
3	The method of claim 1, wherein the aggregator comprises software stored in a client memory device and adapted to be executed on a client processor.
4	The method of claim 1, wherein the aggregator comprises an electronic program guide.
5	The method of claim 1, wherein the user information comprises past usage information of the user.
6	The method of claim 1, wherein the media programming comprises a video feed.

Claim	Limitation
7	The method of claim 1, wherein the step of providing the media programming comprises providing from a web server via a network to the client the media programming.
8	The method of claim 1, wherein the step of providing the media programming comprises providing the media programming on a television channel.
9	The method of claim 1, wherein the media programming is provided through at least one of an XML feed, an RSS feed, Atom feed, and a podcast.
10	The method of claim 1, further comprising providing by the aggregator a presentation element for presenting data indicative of a plurality of media streams to the user, and, responsive to a user selection of one of the presented media streams, providing by the aggregator the selected media stream in the media programming.
11	The method of claim 10, further comprising, in response to user highlighting of one of the displayed media streams, displaying by the aggregator the highlighted media stream on a user display together with a list of media streams.
12	The method of claim 11, wherein the user information includes the identity of a media element playing on the displayed highlighted media stream prior to the receipt of the user selection.
13	The method of claim 10, further comprising, in response to the received selection, providing predetermined media programming during a first time period, and providing media programming responsive to the user information in a second time period after the first time period.
14	The method of claim 1, wherein the data related to the plurality of media streams comprises categorizing data associated with media elements of the media streams indicative of subjectively determined character of the media elements.

Claim	Limitation
15	The method of claim 14, wherein the user information comprises viewing history, user preference data and search queries.
16	The method of claim 14, further comprising deriving by the aggregator keywords from the media streams, deriving by the aggregator from the derived keywords further keywords from a map of synonyms, and employing the further derived keywords in determining the temporal sequence.
17	The method of claim 1, wherein at least one of the media streams comprises media elements having labels indicative of payment due from an advertiser and payment due to a content provider.
18	The method of claim 1, further comprising caching by the aggregator the media streams prior to providing the elements in the media programming, whereby switching between streams at optimal times is facilitated.
19[pre]	A system for providing media programming, comprising:
19[a][i]	an aggregator having a memory and a processor,
19[a][ii]	the [aggregator] processor adapted for presenting a plurality of media streams to a user
19[a][iii]	the [aggregator] processor adapted for ... receiving a signal having data indicative of a selection of one of the media streams
19[a][iv]	the [aggregator] processor adapted for ... providing an output signal including data indicative of the selection and of user data; and
19[b][i]	a publisher having a memory and a processor,
19[b][ii]	the publisher processor adapted to receive the output signal from the aggregator, and,
19[b][iii]	the publisher processor adapted to ... responsive to the data indicative of the selection and of user data, access from the memory at least one algorithm for selection and sequencing of media elements,

Claim	Limitation
19[b][iv]	the publisher processor adapted to ... select a temporal sequence of media programming comprising the selected media stream and other media elements based on an output of the algorithm using the selection and the user data,
19[b][v]	the publisher processor adapted to ... assemble the selected media stream and the other media elements in the temporal sequence, and
19[b][vi]	the publisher processor adapted to ... provide media programming to the user including the assembled media stream and other media elements in the temporal sequence.
20	The system of claim 19, wherein the aggregator comprises a web server, the aggregator processor being adapted to present a web page listing the media streams for display on a client device.
21	The system of claim 20, wherein the publisher comprises a web server, and wherein the aggregator processor is adapted to redirect a client device to the publisher web server.
22	The system of claim 19, wherein in response to the selection, the publisher provides a first media stream having content from concatenated elements of at least second and third media streams, and, in response to a further user selection, provides content preferentially from one of the second and third media streams.
23[pre]	A method for aggregating media programming, comprising:
23[a]	receiving an input signal having data indicative of a selection of one of the media streams feeds from the list;
23[b]	providing an output signal having data indicative of the selection;
23[c]	receiving, responsive to the output signal, at least the selected media stream; and
23[d]	responsive to the data indicative of the selection and user information, and using at least one algorithm for selection and sequencing of media elements, selecting a temporal sequence of media programming comprising the selected media stream and other media

Claim	Limitation
	elements and providing media programming to the user, the media programming comprising the other media elements selected and concatenated in accordance with the temporal sequence with the selected media stream.
24	The method of claim 23, further comprising receiving a second media stream, and wherein the step of providing media programming comprises switching at least between the selected media stream and the second media stream in accordance with the temporal sequence.

IV. The Prior Art

56. All of the underlying technologies of the '704 patent claims were well-known to a POSITA. I briefly describe here some of the relevant technologies.

A. State of the Art

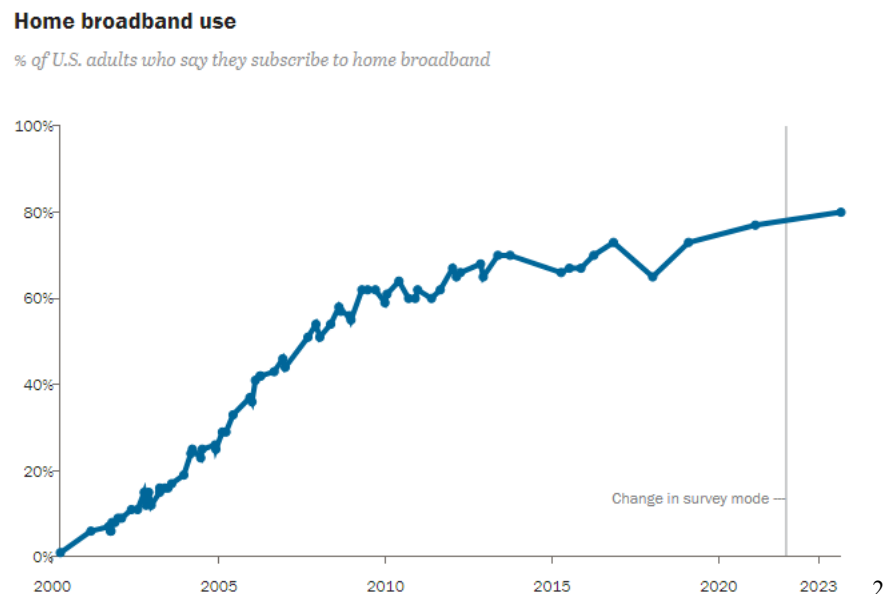
57. Since the early days of radio and television broadcasting, media providers have sought to understand their audience and cater to their preferences. By the 1970s, television programming became further customizable via the advent of local programming insertion. Cable providers would dedicate slots within their national programming for local affiliates to insert their own programming on a market-by-market level.

58. Programming became customizable on an individual subscriber level in the early 1990s with the introduction of electronic program guides (EPGs). With EPGs, a user was able to browse a menu of available television programming and

tune to a particular program by selecting its program listing. In addition, EPGs could automatically tune to channels based on user profile data, thereby creating custom media programming. For example, U.S. Pat. No. 6,177,931 (filed in 1998, issued Jan. 23, 2001, § 102(b) art) describes an EPG that monitors user interactions to generate viewer profile information, and then uses that information to automatically tune to a particular advertising channel during a commercial break. EX1006 at 28:11-35:36. As another example, U.S. Pat. No. 8,813,122 (filed in 1999, published July 6, 2000, § 102(b) art) describes generating a “virtual channel” of programming specifically selected based on the user’s profile and then automatically tuning to programming according to a defined schedule. EX1007 at 5-6.

59. The next step in the evolution of custom media programming was brought by advances in computer technology. By the early 1990s, most components of the modern Internet were in place—including web servers that support HTTP over TCP/IP traffic—and codecs for transmitting video over computer networks (such as MPEG) had also been standardized. Importantly, unlike broadcast technology, TCP/IP permits a web server to receive a request from a specific user and respond to that user’s request with individualized custom media programming.

60. One limiting factor was that most households in the 1990s did not have sufficient Internet speeds to support video streaming. Standard definition video requires about 0.5 – 1.5 Mbps. In the 1990s, only 56 kbps dial-up was available to most U.S. households with Internet access. This changed with the introduction of broadband Internet connections. In 2000, only 1% of U.S. households had broadband Internet subscriptions. By 2007, that had grown to about 50%.



² See <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/#who-has-home-broadband> (interactive graph); see also EX1022 at 4. Pew Research Center is a nonpartisan think tank based in Washington D.C. Moreover, based on

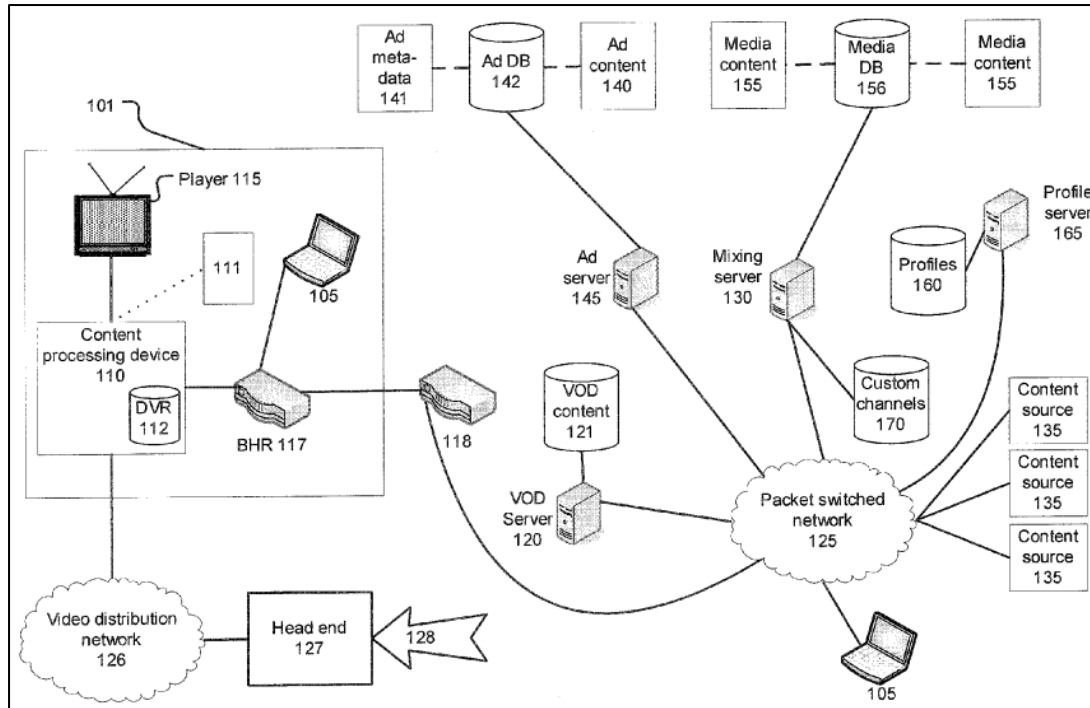
61. This rendered transmitting video programming over the Internet commercially desirable, leading to a rapid rise in Internet-based media companies. For example, YouTube was founded in 2005, Amazon Prime debuted in 2006, and Netflix launched its streaming service in January 2007.

B. Whitehead (EX1003)

62. In 2005-2006, Verizon was expanding its fiber-based broadband Internet and video services, allowing its customers to stream videos at speeds of up to 30 Mbps. EX1015. As part of this effort, Verizon also introduced its “FiOS TV service.” EX1015. Verizon filed the application for Whitehead, which related to Verizon’s broadband expansion, on Dec. 6, 2006. Whitehead issued as U.S. Pat. No. 8,555,318 on October 8, 2013 and is prior art under 35 U.S.C. § 102(e).

63. Whitehead describes “creat[ing] a custom media channel based on [a user] profile” and “provid[ing] the custom media channel upon a request from a user, wherein the custom media channel includes more than one item of multimedia content.” EX1003 at Abstract. Whitehead’s system is shown in its Figure 1:

my experience in the industry, I can independently confirm there was a dramatic rise in broadband availability from 2000 to 2007.

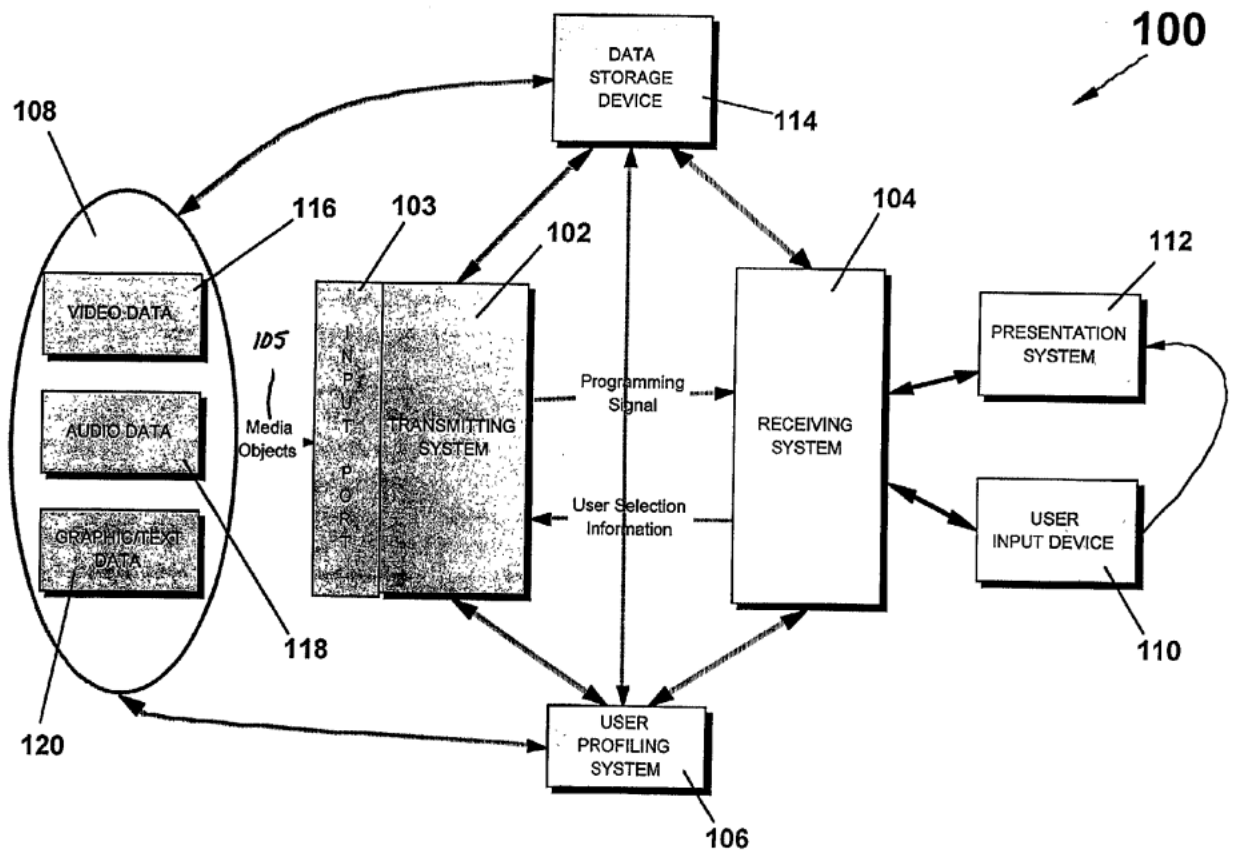


64. A mixing server 130 creates custom media channel 170 based on a profile 160 for that channel and metadata about multimedia content available from different content sources 135. The mixing server 130 also includes advertisements 140 in custom media channel 170. The custom media channel 170 is then transmitted to content processing device 110 for playback on player 115.

C. Cristofalo (EX1004)

65. ACTV developed technology for targeting advertisements to specific users by “trigger[ing] a set-top box to switch to the appropriate commercial.” EX1010. This functionality was deployed in early 2001 in partnership with AT&T. EX1010. ACTV also filed an application on this technology on April 12, 2001,

66. Cristofalo describes “[a] system and process for targeting programming (including, but not limited to, advertising) to users by utilizing media objects to provide specific content to a user, or groups of users, based upon profiling information.” EX1004 at Abstract. Cristofalo’s system is shown in its Figure 1:



67. Cristofalo teaches that media objects can be targeted to specific users at transmitting system 102, receiving system 104, or a combination of the two.

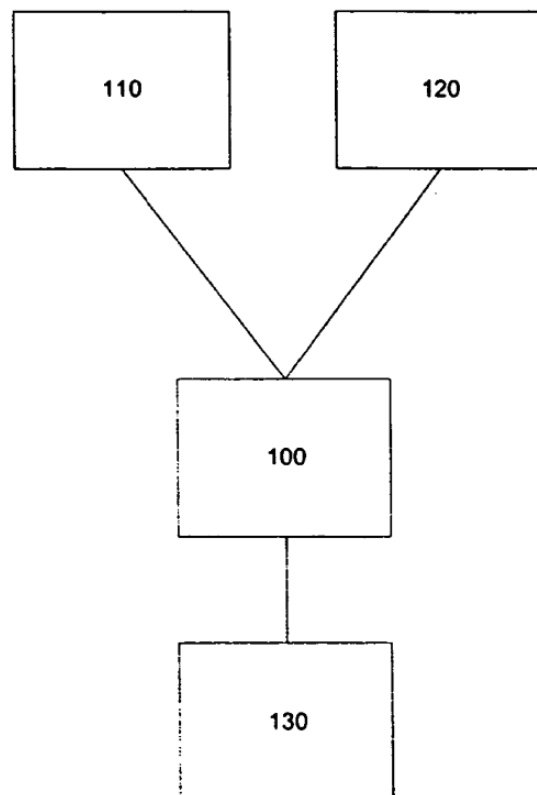
EX1004 ¶ 49. For example, transmitting system 102 may modify a commercial for

specific markets or groups of users. EX1004 ¶¶ 35, 47. Or, receiving system 104 may receive multiple, multiplexed media objects and select the appropriate media object for inclusion in the programming. EX1004 ¶ 36.

D. Marcus '904 (EX1005)

68. Marcus '904 was published on January 19, 2006. Marcus '904 is prior art under 35 U.S.C. §102(b). Marcus '904 has the same named inventor and assignee as the challenged '704 patent.

69. Marcus '904 describes a custom program assembled from content obtained from “a first media source 110 and a second media source 120.” EX1005 ¶ 31. Marcus '904's system is shown in its Figure 1:



E. Marcus '156 (EX1008)

70. U.S. Pat. No. 6,032,156 (“Marcus ’156”) is incorporated by reference in both Marcus ’904 and the ’704 patent. Marcus ’156 was issued on February 29, 2000.

71. Marcus ’156 describes delivering a custom media program to a user. EX1008 at Abstract. The system selects “[m]edia elements” in response to a user request for media programming, and those elements are then assembled into a temporal sequence. EX1008 at Abstract. Marcus ’156 relies on “tags” to implement this process, including “content tags” containing “information identifying the content of the clip” and “control tags” defining how clips are assembled. EX1008 at 3:2-13, 5:3-39. These tags are used in conjunction with a database of “viewer information” to select clips for the media programming and create “customized programming.” EX1008 at 10:9-20. This “customized programming” is then delivered to the user over the Internet as a “concatenated stream.” EX1008 at 3:44-46, 11:1-10.

V. Grounds

A. Ground 1: Whitehead

1. Claim 19³

(a) 19[pre]: *A system for providing media programming, comprising:*

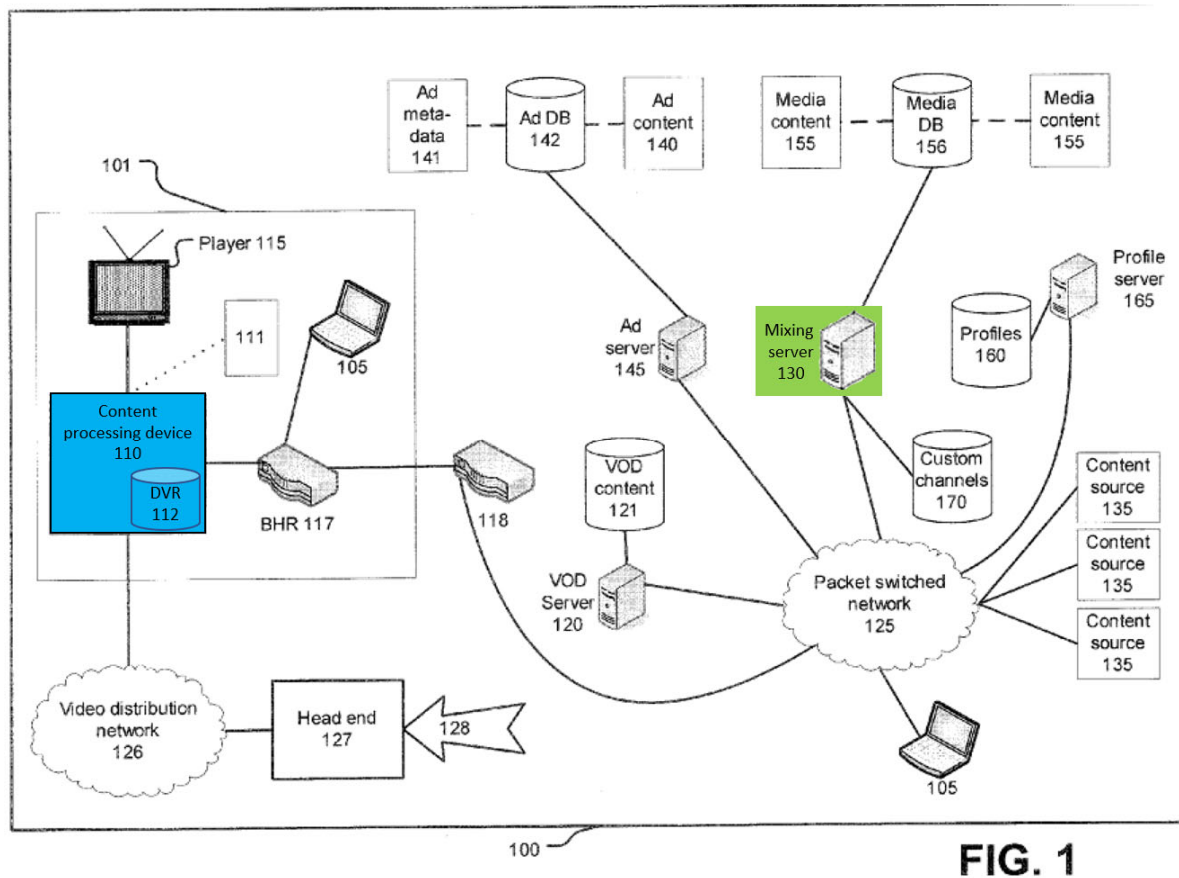
72. In my opinion, Whitehead discloses this element. Whitehead discloses system 100 for “receiving a video signal from a network and providing programming such as video to media player 115.” EX1003 at 2:4-16.

(b) 19[a][i]: *an aggregator having a memory and a processor,*

73. In my opinion, Whitehead discloses this element. Whitehead discloses **content processing device 110**, which is the claimed “**aggregator**,” and **mixing server 130**, which is the claimed “**publisher**” (see Section V.A.1.f).⁴ These are depicted in Whitehead’s Figure 1 (annotated):

³ I understand that PO’s complaint against Petitioner alleges infringement of “exemplary Claim 19.” EX1011 ¶ 52. Thus, I address independent claim 19 first.

⁴ In this declaration, references to the ’704 patent claim language are bold and italicized. Emphasis is bolded but not italicized. Emphasis is added unless otherwise indicated.



74. I note that the '704 patent specification describes an “*aggregator*” as “provid[ing] a presentation element to user 1 120 and 2 130” for content from different media feeds. EX1001 2:44-47, 3:6-18. The term “presentation element” is a reference to a user interface. I further note that Whitehead also discloses that its **content processing device 110** presents a menu of media programming available from different sources. For example, Whitehead discloses that its **content processing device 110** “performs operations relating to generating a user interface, e.g., that is displayed in media player 115.” EX1003 at 2:60-3:7; *see also* EX1003 at 15:16-22. Whitehead discloses an exemplary process 500, including the step 510

of “provid[ing] a menu of custom channel options to be displayed to the user,” “is generally performed by a playback application that may be executed within ...

content processing device 110.” EX1003 at 15:16-22. Whitehead further discloses that “an interactive program guide (IPG) or the like including video on demand options” is also accessible to the **content processing device 110.** *Id.* 4:45-52.

Whitehead also states that the exemplary step 510 of providing a menu to be displayed to the user “may indicate a plurality of custom media channels 170 that are available for playing, e.g., according to titles or other descriptions, categories of information, particular sources of media content 155, specified keywords, etc.”

Id. 18:47-62. A user may then “browse a menu of video-on-demand-options displayed on media player 115.” *Id.* 3:59-4:9, 6:47-7:2. For example, the user may use **content processing device 110** to “select a channel ... associated with a custom media channel 170.” *Id.* 15:23-41. The **content processing device 110** may also be used to “navigate an interactive program guide to access an area of the program guide’s menu structure dedicated to custom media channels.” *Id.*

Whitehead teaches that a collection of these custom media channels 170 covers multiple different content sources 135, because each of these custom media channels generated based on a profile 160 includes content from one or more different content sources 135. *Id.* 3:14-28, 5:56-6:9, 7:3-18. For example,

Whitehead discloses that “[m]edia content 155 is provided by content sources 135”

and that “[c]ontent sources 135 may include a wide variety of sources of multimedia content 155.” *Id.* 5:9-23. Whitehead also discloses that the purpose of a profile 160, based on which the custom media channels are generated, is “to provide criteria for selecting media content 155 to be included in a given custom media channel 170 for a user” *Id.* 5:56-6:9. The profile 160 “may include ... the identity of one or more content sources 135 of interest.” *Id.* 7:3-18.

75. Whitehead’s **content processing device 110** (“*aggregator*”) includes “*memory*” and a “*processor*.” EX1003 at 7:44-59. For example, Whitehead discloses that “[c]omputing devices such as ... **content processing device 110** ... generally each include instructions executable by one or more computing devices such as those listed above” and that “a **processor** (e.g., a microprocessor) receives instructions, e.g., from a **memory** ... and executes those instructions” *Id.* (*emphasis added*).

(c) **19[a][ii]: the [aggregator] processor adapted for presenting a plurality of media streams to a user**

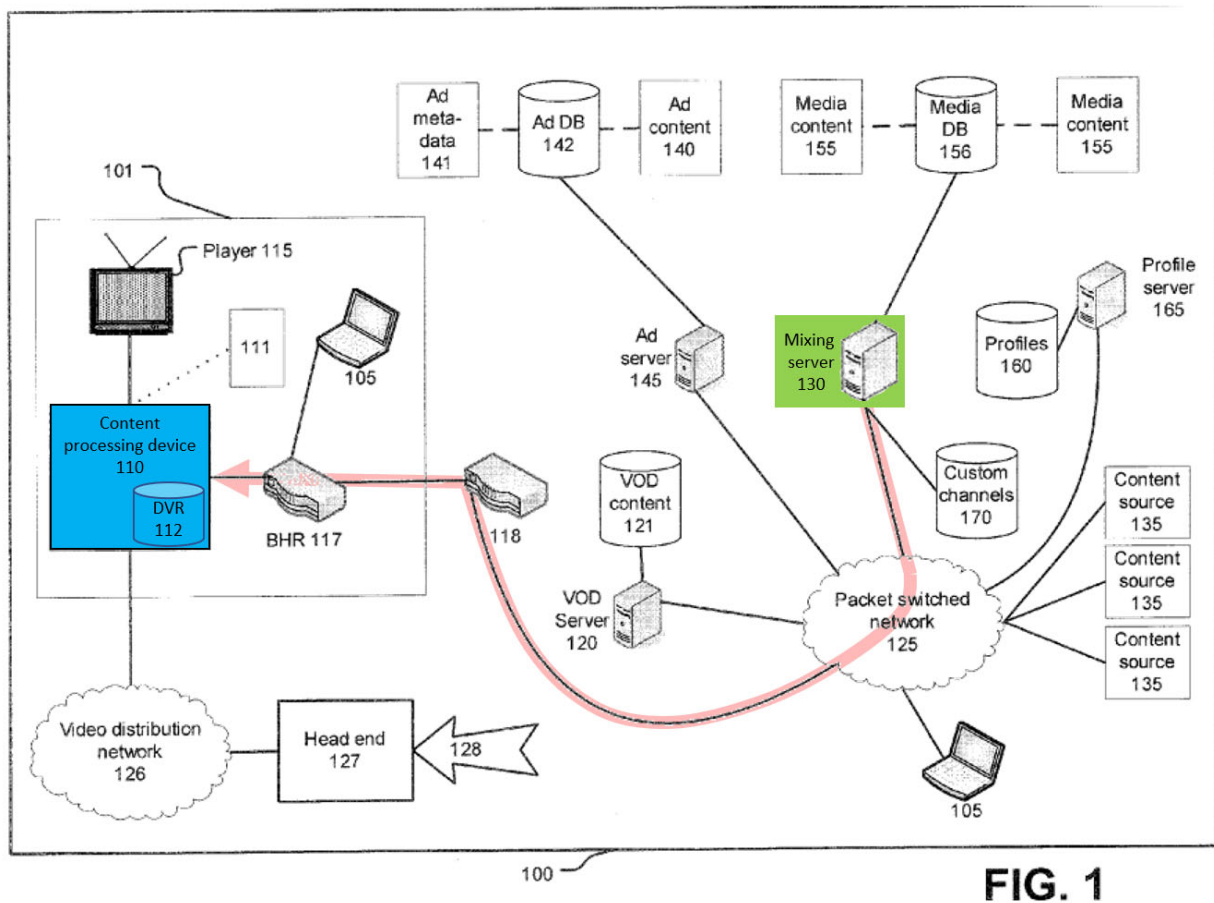
76. In my opinion, Whitehead discloses this element. For example, Whitehead’s **content processing device 110**, via instructions executed by its processor, displays a menu “indicat[ing] a plurality of custom media channels 170 that are available for playing” (“*presenting a plurality of media streams to a user*”). EX1003 at 18:47-62. The **mixing server 130** creates “one or more custom media channels 170 based on one or more custom channel profiles 160” and a

menu is “displayed in step 510 ... according to titles or other descriptions, categories of information, particular sources of media content 155, specified keywords, etc,” where the exemplary process 500 “is generally performed by a playback application that may be executed within ... **content processing device 110**.” EX1003 at 11:40-58, 15:16-22.

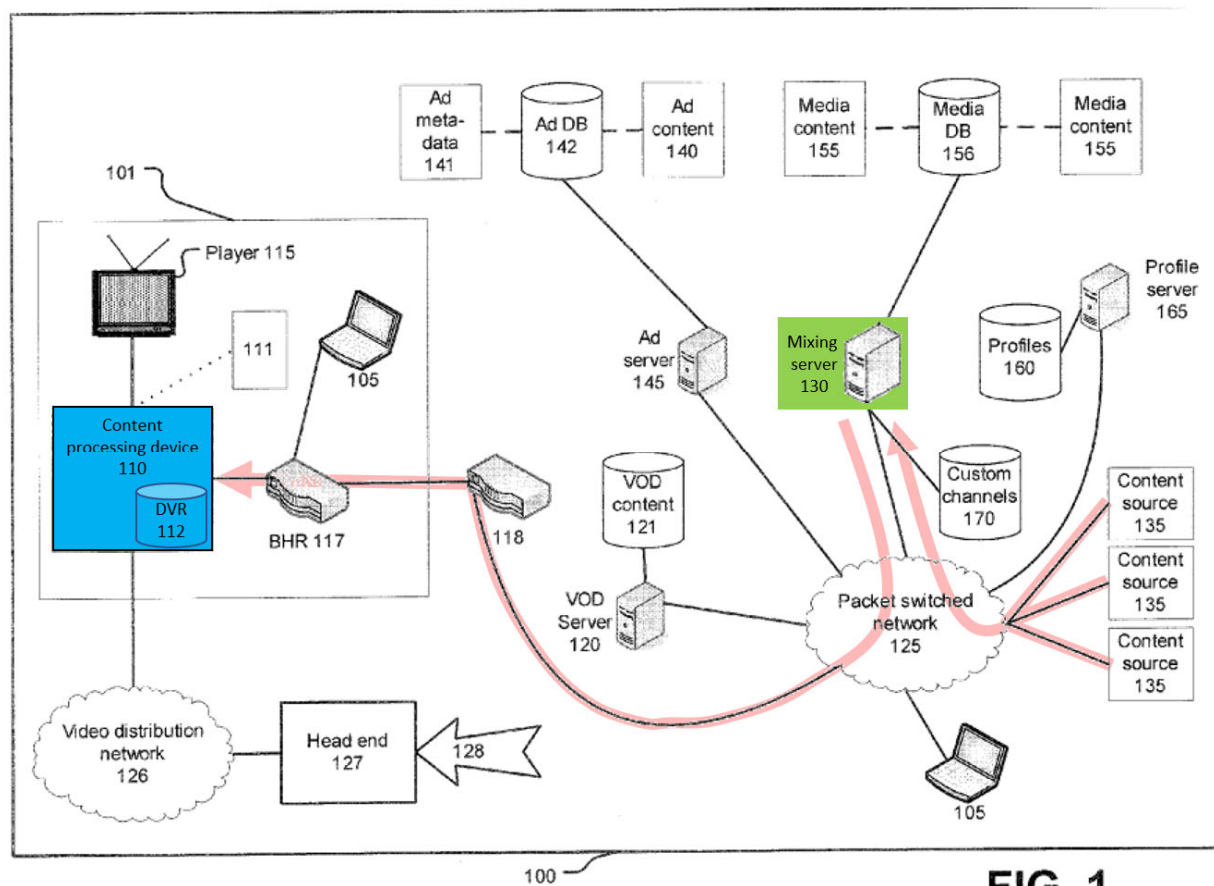
77. In my opinion, Whitehead discloses this limitation under either of two different mappings. In the first mapping, the “*plurality of media streams*” are custom media channels 170 made available by **mixing server 130** to **content processing device 110** (Media Stream Mapping 1). In the second mapping, the “*plurality of media streams*” are media content transmitted by content sources 135 to **mixing server 130** (Media Stream Mapping 2). Each mapping independently discloses the relevant claim limitations. Below, I provide more detail on each mapping.

(i) Media Stream Mapping 1: custom media channels 170 are claimed “*media streams*”

78. Because Whitehead discloses that each custom **media** channel 170, if selected, can be “**streamed** ... to **content processing device 110**” as “a single multimedia file,” its menu of available custom media channels thus “*present[s] a plurality of media streams.*” EX1003 at 8:42-64. In this mapping, the custom media channels 170 themselves are the claimed “*plurality of media streams.*” This mapping can be shown in Fig. 1 below:



(ii) **Media Stream Mapping 2: content sources 135 provide claimed “media streams”**



79. In my opinion, Whitehead’s menu of available custom media channels “*present[s] a plurality of media streams*” because each custom media channel 170 generated by **mixing server 130** corresponds to a “*media stream*” from a different content source 135.

80. Whitehead discloses that **mixing server 130** creates each custom media channel 170 based on a different profile 160, and each profile 160 “identit[ies] ... **one** or more content sources 135 of interest.” EX1003 at 5:56-6:9,

7:3-18. For example, “the menu displayed in step 510 may indicate a plurality of custom media channels 170 that are available for playing, e.g., according to titles or other descriptions, categories of information, *particular sources of media content 155*, specified keywords, etc.” EX1003 at 18:47-62.

81. A POSITA would therefore have recognized that each of Whitehead’s plurality of custom media channels 170 can correspond to a different content source 135. Specifically, Whitehead discloses that “a particular user may be associated with multiple profiles 160” and “[h]aving multiple profiles 160 would, among other things, allow the user to define multiple custom media channels 170, i.e., one associated with each profile associated with the user.” *Id.* 11:9-16.

82. A POSITA would further have recognized that, in Whitehead’s system, each content source 135 provides a “*media stream*.” For example, Whitehead discloses that “[c]ontent sources 135 may include a wide variety of sources,” including sources that “broadcast” content “on a particular data at a particular time,” *i.e.*, television channels. EX1003 at 5:9-23, 10:46-67. Specifically, Whitehead discloses that its “[m]edia player 115 may be a television receiver” (EX1003 at 2:52-59) and that the content from content sources 135 may include “segment[s] of a popular television show” (EX1003 at 5:24-42). Television channels provide content as continuous streams (“*media streams*”).

83. Additionally, it is my opinion that, to the extent PO argues that Whitehead's content sources 135 do not provide "*media streams*," Whitehead nevertheless renders that limitation obvious. Even before the '704 patent's priority date, it was well-known that television channels were sources of media content. In my opinion, a POSITA would have been motivated to use television channels as content sources 135, and in turn for content sources 135 to provide "*media streams*." For example, because having more sources and variety improves the likelihood of having the best media content in custom media channel 170, it would have been desirable to maximize the number and variety of content sources. Also, because many users would have already been entitled to access television channels via their regular cable subscriptions, and television channels were and are one of the most popular, highest quality, and most abundant sources of media content, users would have expected to have access to such content sources. A POSITA would therefore have been motivated to use television channels as content sources 135 in order to meet customer expectations.

84. In my opinion, there would also have been a reasonable expectation of success of using television channels as content sources 135. I note that Whitehead already discloses that media content 155 "provided by content sources 135" is "stored in a media database 156." EX1003 at 5:9-23. Therefore, **mixing server 130** could have, for subsequent inclusion in a custom media channel 170, stored media

content 155 from television channels in database 156. As an alternative way to generate custom media channel 170, Whitehead's **mixing server 130** could have switched to the appropriate channels in real time as the media content 155 is being broadcast. Before the '704 patent's priority date, there were well-known systems for directly integrating content from television broadcasts into custom programming. For example, Alexander disclosed that real-time advertising customization could be achieved by tuning the television automatically to a particular advertising channel at the time during the telecast of the television program. EX1006 at 32:61-33:8. As another example, Montie disclosed a scheduler module that composed personalized program schedules by selecting from both recorded programs and broadcast streams. EX1007 at 5-6. A POSITA could have enhanced Whitehead's mixing server 130 in a similar fashion, without any hardware changes and with minimal reconfiguration of software.

(d) 19[a][iii]: *the [aggregator] processor adapted for ... receiving a signal having data indicative of a selection of one of the media streams, and*

85. In my opinion, Whitehead discloses this element. Whitehead's **content processing device 110** receives a user selection of one of these custom media channels 170 ("*receiving a signal having data indicative of a selection of one of the media streams*"). For example, I note that Whitehead discloses that "a custom media channel 170 may be created in real-time or near real-time when a

user ‘*tunes*’ to the channel 170 or otherwise *selects* the channel 170 for viewing through playback device 115.” EX1003 at 11:40-58. Specifically, “in step 520, the playback application determines whether a request for a custom media channel 170 has been received,” where the step 520 included in the process 500 “is generally performed by a playback application that may be executed within ... **content processing device 110**.” EX1003 at 15:16-22, 16:45-53. A POSITA would have recognized that the selection here corresponds to both the selection of custom media channel 170 itself (“*media stream*” under **Media Stream Mapping 1**) and selection of the content source 135 corresponding to that custom media channel 170 (“*media stream*” under **Media Stream Mapping 2**).

(e) **19[a][iv]: the [aggregator] processor adapted for ... providing an output signal including data indicative of the selection and of user data; and**

86. In my opinion, Whitehead discloses this element or, in the alternative, renders it obvious. In Whitehead’s system, the **content processing device 110**, via instructions executed by its processor (EX1003 at 7:44-59), transmits “*an output signal including data indicative of the selection and of user data*” in response to the user selection. This “output signal” could be (1) a request sent from **content processing device 110** directly to **mixing server 130** (Output Signal Mapping 1), (2) data sent by **content processing device 110** to profile server 165, and then from profile server 165 to **mixing server 130** (Output Signal Mapping 2), or a

(i) Output Signal Mapping 1: request from content processing device 110 to mixing server 130

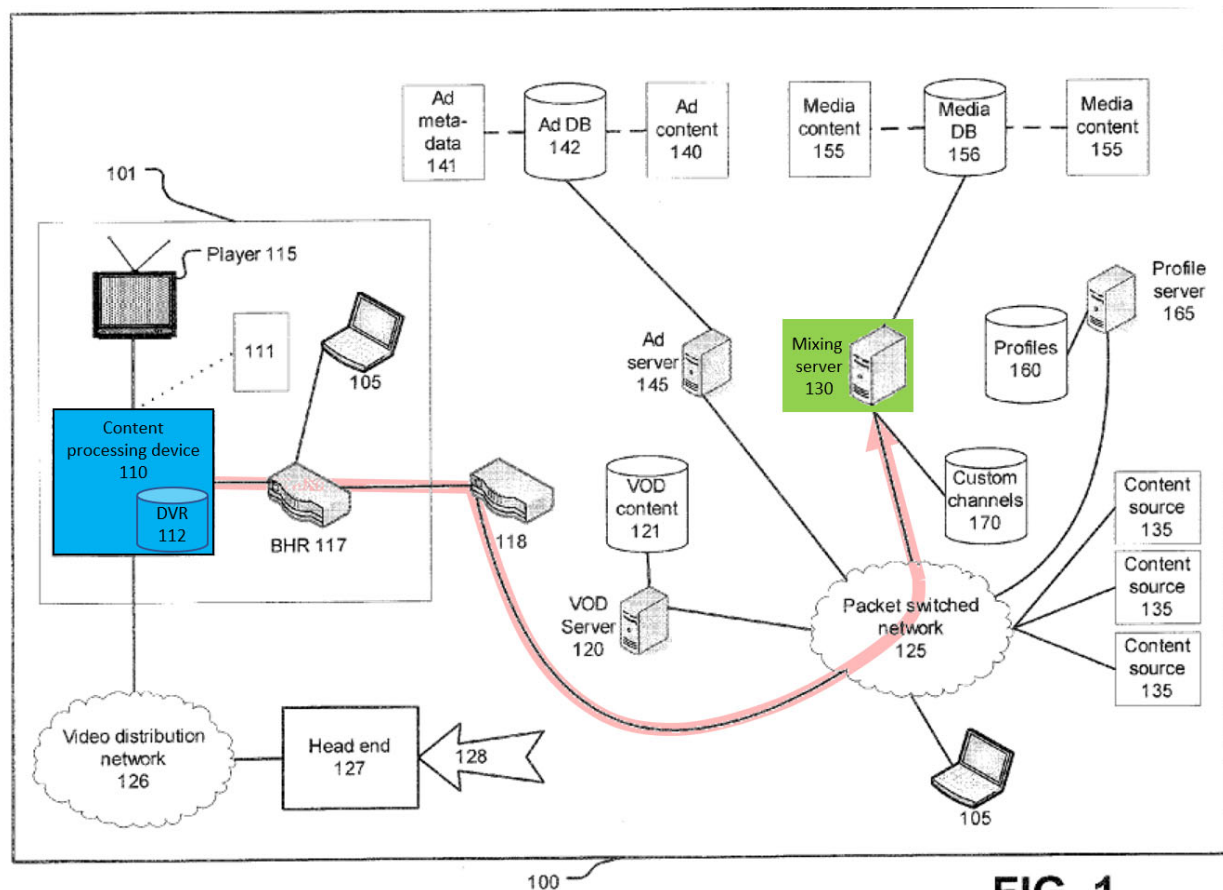


FIG. 1

87. Whitehead discloses that “[c]ontent processing device 110 may ... make requests to ... [mixing server] 130, etc. via network 125,” a request that could be sent “for a custom media channel 170.” EX1003 at 3:40-51, 9:30-58. This request “trigger[s]” mixing server 130 “to create one or more custom media channels 170 based on one or more custom channel profiles 160” in “real-time or

near real-time.” EX1003 at 11:40-58. Receipt of this request “may then cause **mixing server 130** to invoke a process for creating or modifying one or more custom media channels 170 based on a profile 160 provided in the message.” In my opinion, this request (“*output signal*”) necessarily identifies the selected custom media channel 170 (“*include[es] data indicative of the selection*”) where the user has multiple custom media channels 170 to choose from (EX1003 at 11:9-16). This is because, otherwise, the **mixing server 130** would not be able to identify which custom media channel was selected by the user and thus should be created. Accordingly, content processing device 110 necessarily provides data indicative of that custom media channel as part of its request triggering creation of custom media channel 170.

88. Additionally, it is my opinion that, to the extent PO argues Whitehead does not disclose that its custom channel request from **content processing device 110** to **mixing server 130** includes data indicative of the selected custom media channel 170 (“*data indicative of the selection*”) in its request to **mixing server 130** (“*output signal*”), Whitehead nevertheless renders the claim limitation obvious. Because Whitehead discloses that **mixing server 130** must know which custom media channel 170 the user selected to create that channel, the **mixing server 130** must know which of the available custom media channels 170 the user selected to create that channel. EX1003 at 3:40-51, 11:40-58. An obvious implementation is

for the **content processing device 110** to include in its request (“*output signal*”) an identifier or other data corresponding to the selected custom media channel 170 (“*data indicative of the selection*”). A POSITA would have been motivated to include the identifier in the request because, compared to conveying it in some other manner, including the identifier allows **mixing server 130** to locate the corresponding profile 160 faster and thus allows it to create the selected custom media channel 170 in real time or near-real-time. EX1003 at 11:40-58.

89. As addressed in Section V.A.1.e.iii, the claimed “*output signal*” does not require transmitting in a single request both “*data indicative of the selection*” and “*data indicative of ... user data*.” Even if that were required, however, it is my opinion that it would have been obvious to also include “*data indicative ... of user data*” in Whitehead’s request from **content processing device 110** to **mixing server 130** (“*an output signal including data indicative of the selection*”). I note that Whitehead discloses that **mixing server 130** creates and delivers the custom media channel 170 “in real-time or near real-time.” EX1003 at 11:40-58. A POSITA would have recognized that processing efficiency must be considered to achieve this goal, because too much delay in retrieving user data would result in a custom media channel 170 that is no longer created “in real-time or near real-time.” *Id.* A POSITA would have been motivated to include “*user data*” such as the “subject matter categories of interest to the user” in the request itself, because

that would have sped up processing, since **mixing server 130** would be able to start creating custom media channel 170 even before receiving the remainder of profile 160. EX1003 at 7:3-18. Additionally, a POSITA would have been motivated to include some “***user data***,” such as username (EX1003 at 7:3-18), in order to allow the retrieval of profile 160 quickly. A POSITA would have recognized that, instead of having to search through all profiles 160, the username could have been used to identify a specific user first, and then other data could have been used to identify a specific profile 160 of that user. A POSITA would have been mindful that other “***user data***” can be subject to change. One example is the user’s geographic location used for targeting advertisements and/or the “geographic location of interest to the user” for content targeting, because computer 105 with media player 115 may be a mobile device (e.g., “notebook, laptop, or handheld computer”). EX1003 at 7:19-43. In my opinion, the **content processing device 110** could have improved convenience and accuracy by automatically including the user’s geographic location and looking up the geolocation of an IP address in the request instead of requiring the user to update profile 160 every time.

90. In my opinion, one obvious design option would have been to include in any request for custom media channel 170 (“***output signal***”) the complete profile 160 (“***user data***”), and to implement profile server 165 as part of **content**

processing device 110. I note that Whitehead already recognizes and discloses that various functionalities in its Figure 1 can be combined or shifted between system components. EX1003 at 2:52-59, 4:10-26, 6:35-46, 15:16-22, 19:44-63. A POSITA would have recognized that maintaining profiles 160 on **content processing device 110** would eliminate the need for a separate profile server 165, or for looking up specific sets of profiles a user of **content processing device 110** is permitted to update, thus simplifying processing and communications. Then, when **content processing device 110** requests a particular custom media channel 170 from **mixing server 130** (EX1003 at 3:40-51, 9:30-58), the message (“*output signal*”) containing this request (“*data indicative of the selection*”) would also contain the specific profile 160 corresponding to the requested custom media channel 170 (“*user data*”).

91. In my opinion, there would also be a reasonable expectation of success for including “*data indicative of the selection and of user data*” in Whitehead’s request from **content processing device 110** directly to **mixing server 130** (“*output signal*”). Whitehead already discloses, for communications between **content processing device 110** and **mixing server 130**, using common communication protocols including TCP/IP. Those protocols allow for the inclusion of this data in each request. For example, a maximum size of a single TCP packet is 64 KB, and 1.5 KB is a common MTU size, both of which would

have permitted the inclusion of “*data indicative of the selection and of user data.*”

For example, a 1.5 KB *output signal* could have easily included data indicating a custom media channel selection, username, current geographic location, content source, and subject matter of interest. Including that data would have entailed no changes to hardware, and only a minor change to the software of **content**

processing device 110. Further, it is also my opinion that there is no practical

reason to limit the request to a single TCP packet. Indeed, Whitehead already

discloses that an entire “profile 160 [is] provided in [a] message,” rendering

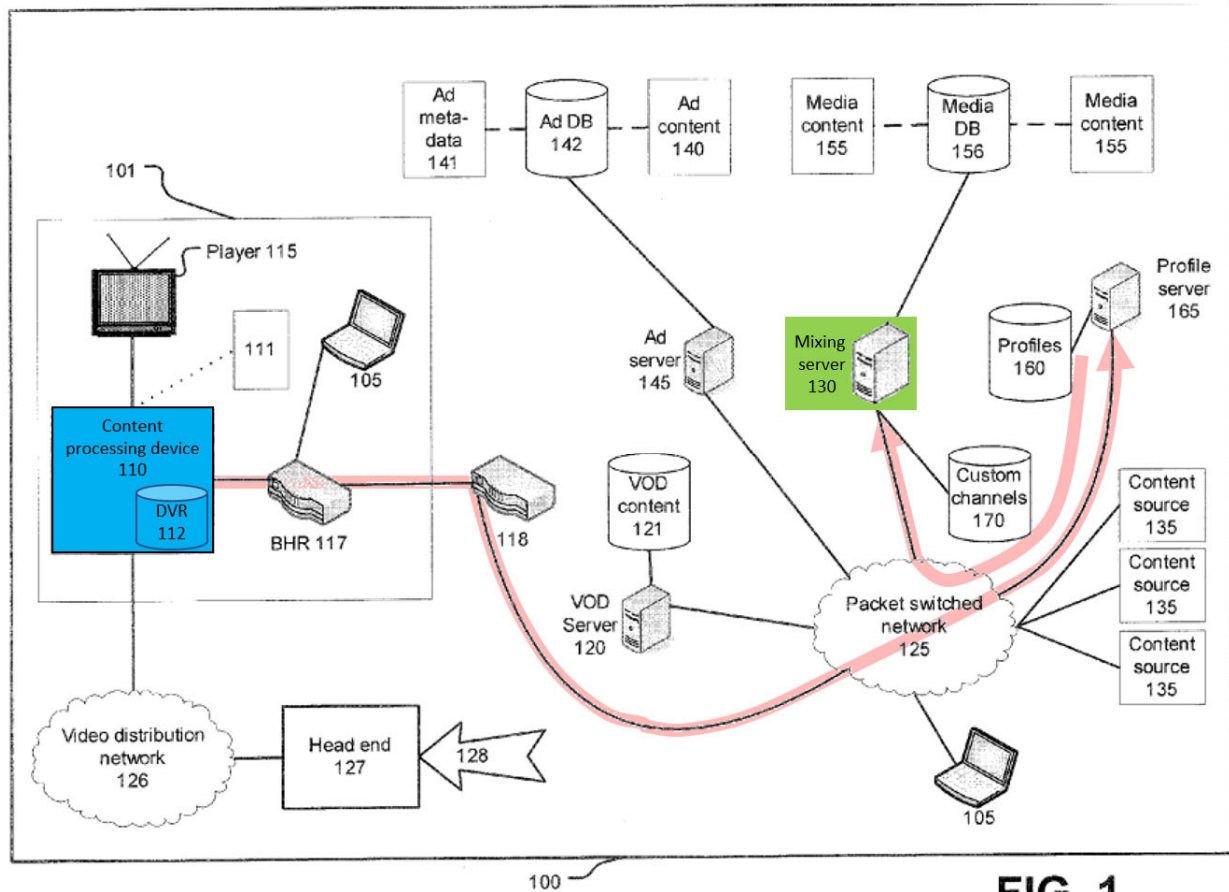
obvious providing some or all of profile 160 (“*user data*”) in addition to data

identifying the selected custom media channel 170 (“*data indicative of the*

selection”) in a request message (“*output signal*”) from **content processing device**

110 to **mixing server 130**. EX1003 at 12:8-17.

(ii) **Output Signal Mapping 2: data from content processing device 110, via profile server 165, to mixing server 130**



92. Whitehead discloses that **content processing device 110** can be “used to create, modify, and/or delete profiles 160,” including provision of “*user data*” in those profiles, such as a “username,” “information concerning topics of interest to the user,” and “[o]ther information relevant to retrieval and playback of the channel 170” to profile server 165. EX1003 at 5:56-6:9, 6:35-46, 7:3-18, 10:6-32, 15:16-22, 15:65-16:21. For example, in step 570, the playback application which may be executed within **content processing device 110** “causes the appropriate

updates to be made to profile 160 and profile server 165.” *Id.* 19:16-38. Profile server 165 then transmits a message containing that profile 160 (“*user data*”) to the **mixing server 130**. EX1003 at 11:40-12:17. Thus, it is my opinion that Whitehead discloses a **content processing device 110**, in connection with creating or modifying a profile 160, transmitting “*an output signal including ... user data.*” It is also my opinion that Whitehead discloses that, when the user selects the corresponding custom media channel 170, the **mixing server 130** receives that same “*user data.*”

93. As addressed in Section V.A.1.e.iii, a POSITA would have known that the claimed “*output signal*” does not require transmitting both “*data indicative of the selection*” and “*data indicative of ... user data*” in a single message. However, even if that were required, it is my opinion that it would have been obvious for Whitehead’s message from **content processing device 110** to profile server 165 (“*output signal*”) to also include the claimed “*data indicative of the selection.*” Because Whitehead discloses that users can have multiple profiles 160 for different custom media channels 170, each profile 160 and corresponding custom media channel 170 would require an identifier (“*data indicative of the selection*”) to distinguish it from other profiles. EX1003 at 11:9-16. This identifier (“*data indicative of the selection*”) would be included in any message from **content processing device 110** to profile server 165 alongside any new or updated

profile information (“*output signal including data indicative of ... user data*”), as well as any message from profile server 165 to **mixing server 130** (“*output signal*”) containing this profile. EX1003 at 11:59-12:17. In my opinion, a POSITA would have been motivated to include this identifier in the profile (and any messages regarding the same) to allow the system to differentiate and track different profiles in a simple manner. Moreover, because identifiers were well known in the art and commonly used for this same purpose, a POSITA would have also had a reasonable expectation of success in enhancing Whitehead’s system in this manner to achieve the claimed features. For example, Whitehead itself already discloses “unique or substantially unique” identifiers for users and content. EX1003 at 5:43, 10:6-32, 15:23-41. A POSITA could have used a similar identifier for profiles 160 to allow the system to track those profiles and for different system components to easily reference specific profiles in messages. This would have entailed a routine software change, without any changes to hardware.

(iii) Combining Output Signal Mapping 1 and 2

94. It is my opinion that the plain meaning of the claimed “*output signal*” refers to “*output[ting]*” a “*signal*” by the claimed “*aggregator*.” It does not require the signal to be in any specific output format. Nothing in the specification or prosecution history suggests a narrower interpretation that imports a formatting requirement into the claim language. Specifically, a POSITA would have

recognized that there is no requirement for the “*data indicative of the selection*” and “*data indicative ... of user data*” be transmitted simultaneously, or consecutively, or via the same path. A POSITA reading the claim language and the relevant intrinsic evidence would have understood that these two types of data can be outputted at different times and that one piece of “*data*” can be transmitted directly while the other can be forwarded via other system components.

95. In my opinion, Whitehead, under this plain meaning of “*output signal*,” discloses that its **content processing device 110** “*output[s]*” a “*signal*” containing a request for custom media channel 170 (“*data indicative of the selection*” under **Output Signal Mapping 1**, addressed in Section V.A.1.e.i) and data for the creation and modification of profiles 160 (“*data indicative ... of user data*” under **Output Signal Mapping 2**, addressed in Section V.A.1.e.ii). Additionally, as addressed in Section V.A.1.e.i-ii, it is my opinion that even under a narrower interpretation requiring both types of “*data*” in a single message, Whitehead renders this claim obvious under either mapping.

(f) 19[b][i]: *a publisher having a memory and a processor*,

96. In my opinion, Whitehead discloses this element. For example, Whitehead discloses **mixing server 130**, which is a “*publisher*.” I note that the claimed “*publisher*” is described as a “source[] of media content” in the ’704 patent. EX1001 at 6:4-16. That is also the case for Whitehead’s **mixing server**

130: “A basic purpose of [Whitehead’s] **mixing server 130** is to assemble and deliver to **content processing device 110** one or more custom media channels.”

EX1003 at 4:10-26. For example, **mixing server 130** may generate a “single multimedia file ... by aggregating or concatenating various items of advertising content 140 and/or media content 155,” and this file is then “streamed, as a single custom media channel 170, to **content processing device 110**.” EX1003 at 8:42-64. Whitehead further discloses that the **mixing server 130** may be “combined” with “a VOD server 120.” EX1003 at 4:10-26. Thus, at least from the perspective of **content processing device 110**, Whitehead’s **mixing server 130** is a source of media content (custom media channels 170 and content from VOD server 120) and

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 Decl. of Dr. Kevin Almeroth
 accordingly the claimed “***publisher.***”

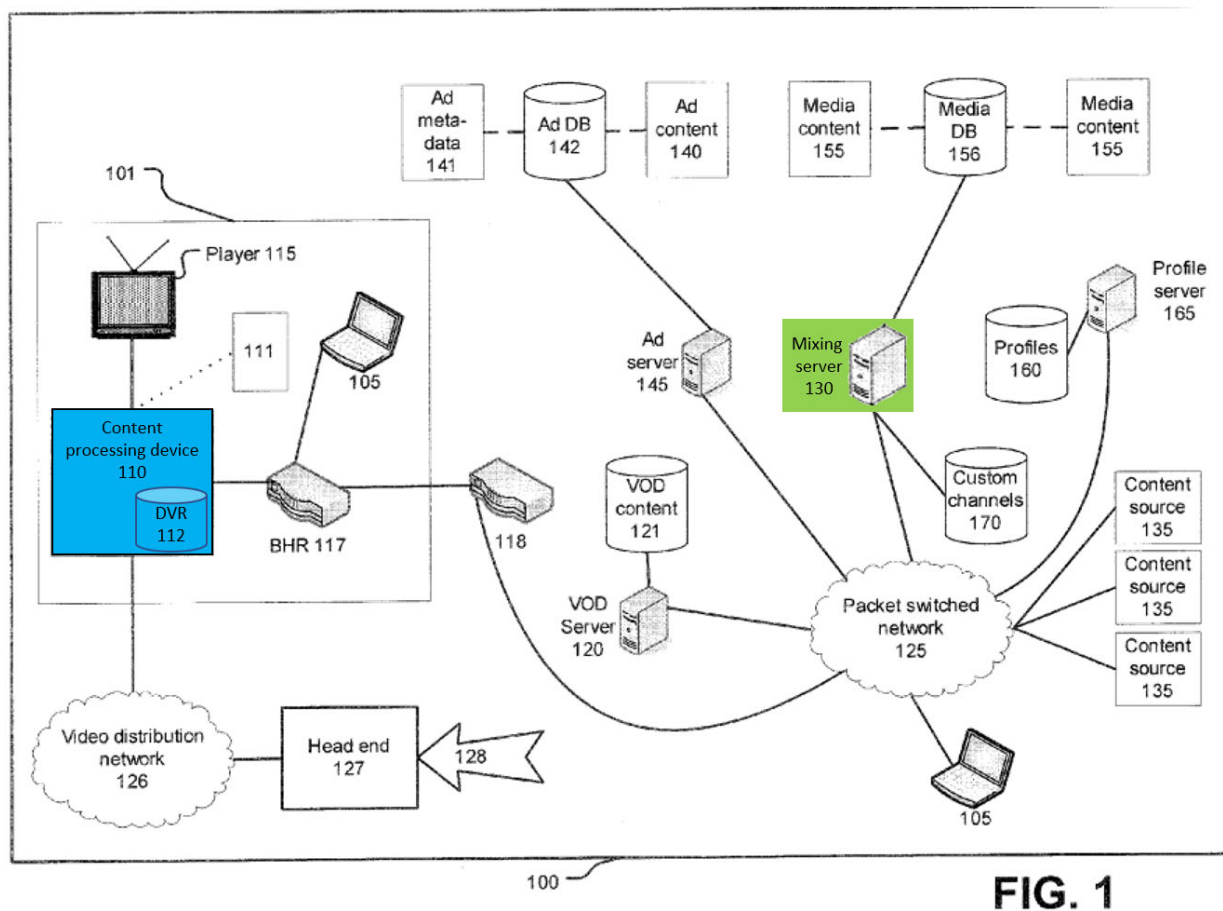


FIG. 1

97. Whitehead’s **mixing server 130** includes “***memory***” and a “***processor.***” EX1003 at 7:44-59 (“Computing devices such as ... [mixing server] 130, etc., generally each include instructions executable by one or more computing devices such as those listed above. ... [A] **processor** (e.g., a microprocessor) receives instructions, e.g., from a **memory** ... and executes those instructions”) (emphasis added).

(g) **19[b][ii]: *the publisher processor adapted to receive the output signal from the aggregator, and***

98. In my opinion, Whitehead discloses this element. As described above in Section V.A.1.e, Whitehead's **mixing server 130** ("*publisher*"), directly or indirectly, receives a request from **content processing device 110** ("*the output signal*") for creating a custom media channel and/or corresponding profile information.

(h) **19[b][iii]: *the publisher processor adapted to ... , responsive to the data indicative of the selection and of user data, access from the memory at least one algorithm for selection and sequencing of media elements,***

99. In my opinion, Whitehead discloses this element. Whitehead discloses that **mixing server 130** triggers "process 400" ("*at least one algorithm*") in response to data received from the **content processing device 110**, for creating custom media channel 170. EX1003 at 11:38-39 ("FIG. 4 illustrates an exemplary process 400 for instantiating one or more custom media channels 170."); EX1003 at 11:40-58 ("In step 405, mixing server 130 receives an instruction, e.g., a message triggering it to create one or more custom media channels 170 based on one or more custom channel profiles 160."); EX1003 at 12:8-17 ("Receipt of the message may then cause mixing server 130 to invoke a process for creating or modifying one or more custom media channels 170 based on a profile 160 provided in the message."). A POSITA would have recognized that this limitation

does not specify a particular type of algorithm for the selection or sequencing functions. It only requires ***“at least one algorithm for selection and sequencing of media elements.”***

100. **Mixing server 130** accesses instructions corresponding to process 400 from its memory (***“access from the memory at least one algorithm”***). EX1003 at 7:44-59. Further, **mixing server 130** “formulate[s] a query” in process 400 to identify “media content 155, e.g., any video file or files” for inclusion in playlist 205, which in turn is used to generate custom media channel 170 (***“algorithm for selection ... of media elements”***). EX1003 at 12:18-37, 13:7-14. As part of process 400, **mixing server 130** also determines “the order of media content 155” in playlist 205 (***“algorithm for ... sequencing of media elements”***). EX1003 at 13:35-46; *see also* EX1003 at 11:1-8 (“[A] user may also specify an order in which such categories or items of media content 155 are to be presented in playlist 205.”).

- (i) **19[b][iv]: the publisher processor adapted to ... select a temporal sequence of media programming comprising the selected media stream and other media elements based on an output of the algorithm using the selection and the user data,**

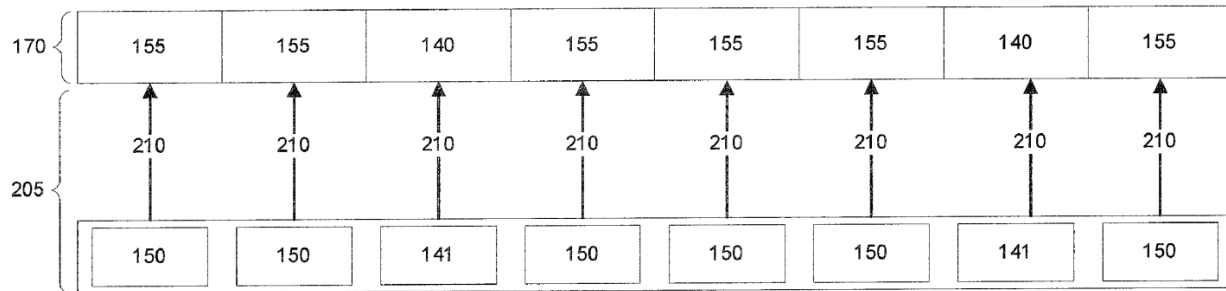
101. In my opinion, Whitehead discloses this element. Whitehead discloses that **mixing server 130** (***“publisher”***), via instructions executed by its processor (EX1003 at 7:44-59), generates a playlist 205 with a particular “order of media content 155” (***“select a temporal sequence of media programming”***) as the output

of step 422 of process 400 (“*based on an output of the algorithm*”). A POSITA would have considered the order of programming in this playlist 205 to be a “temporal sequence” because the programming is assembled into a single file, streamed to the content processing device 110, and displayed to the user in that order. EX1003 at 8:42-64, 16:66-17:17, 20:8-21:11. This playlist is generated based on the user selection of a particular custom media channel 170 (“*using the selection*”) and other information from profile 160 (“*user data*”). EX1003 at 11:40-58 (“[T]he trigger to create a custom media channels 170 results from a user request to access the channel 170. That is, a playlist 205 may be generated and a custom media channel 170 may be created in real-time or near real-time when a user ‘tunes’ to the channel 170 or otherwise selects the channel 170 for viewing through playback device 115.”); EX1003 at 13:35-46 (“Information from profile 160 may be used to generate the playlist 205. For example, profile 160 may include an indication that media content 155 relating to a first category of media content, e.g., sports, is of more interest to a user than media content 155 relating to a second category, e.g., weather. Thus, the order of media content 155 reflected in playlist 205 may be at least partly determined by profile 160.”). Additionally, playlist 205 includes “*the selected media stream and other media elements*” under both **Media Stream Mapping 1** (“*selected media stream*” is the selected custom media channel 170) and **Media Stream Mapping 2** (“*selected media stream*” is a

particular content source 135 corresponding to a selected custom media channel

170). Whitehead discloses an exemplary “*temporal sequence of media*

programming” in Figure 2:



(i) Media Stream Mapping 1

102. Whitehead discloses that the **mixing server 130** generates the user-selected custom media channel 170 (“*selected media stream*”) and then further inserts advertisements (“*other media elements*”). EX1003 at 4:27-44, 12:56-63. In my opinion, the advertisements disclosed in Whitehead are “*other media elements*” because the user does not specifically request the advertisements while selecting a particular custom media channel 170, and also because the advertisements are added after the custom media channel 170 is already generated. EX1003 at 12:56-63 (“[E]mbodiments are possible and likely in which advertising content 140 is inserted into custom media channel 170 after process 400 is complete. For example, a number of items of advertising content 140 to be inserted into custom media channel 170 may be determined according to an overall length of custom media channel 170, it may be selected in inserted at appropriate intervals

into custom media channel 170 after custom media channel 170 is complete.”). As

I previously discussed, the ’704 patent specification states that “advertising” is

included in “*other media elements*.” EX1001 at 12:35-13:12.

(ii) Media Stream Mapping 2

103. Whitehead discloses that the **mixing server 130** generates a custom media channel 170 containing material from both the selected content source 135 (“*selected media stream*”) as well as advertisements (“*other media elements*”). For example, Whitehead’s custom media channel 170 includes “a logical concept of an aggregated collection of media content 155 and/or advertising content 140.”

EX1003 at 4:27-44. I note that the ’704 patent specification is clear that “*other media elements*” include “advertising.” EX1001 at 12:35-13:12 (“Targeted

Advertising Implementations: One or more feeds may include elements that are tagged or labeled to indicate the generation of revenue or royalty. ... *Such*

elements may include ... advertising Revenue/royalty-generating elements may be inserted in one or more feeds and/or streams dynamically in the same way as other media elements.”). Whitehead further discloses the content included in

channel 170 may be identified by querying for content from a specific, user-indicated content source 135 (“*selected media stream*”). EX1003 at 4:27-44,

12:18-37, 12:64-13:14, 13:28-13:46. The content from the user-indicated content

source 135 (“*selected media stream*”) is then combined with advertisements

(“*other media elements*”). *Id.*

- (j) **19[b][v]: the publisher processor adapted to ... assemble the selected media stream and the other media elements in the temporal sequence, and**

104. In my opinion, Whitehead discloses this element. Whitehead discloses that **mixing server 130** (“*publisher*”), via instructions executed by its processor (EX1003 at 7:44-59), assembles the content and advertisements that comprise custom media channel 170 (“*the selected media stream and the other media elements*”) according to the order specified by playlist 205 (“*the temporal sequence*”). EX1003 at 4:10-26 (“A basic purpose of the mixing server 130 is to assemble and deliver to content processing device 110 one or more custom media channels 170.”); EX1003 at 8:28-41 (“[A]s seen in FIG. 2, a custom media channel 170 includes advertising content 140 and media content 155, generally assembled and provided to content processing device 110 according to playlist 205.”); *see also* EX1003 at 8:42-64, 13:35-46.

- (k) **19[b][vi]: the publisher processor adapted to ... provide media programming to the user including the assembled media stream and other media elements in the temporal sequence.**

105. In my opinion, Whitehead discloses this element. Whitehead discloses that **mixing server 130** (“*publisher*”), via instructions executed by its processor (EX1003 at 7:44-59), “stream[s]” the assembled custom media channel 170 to

content processing device 110 for display via media player 115 for example as a “single multimedia file” (“*provide[s] media programming to the user including the assembled media stream and other media elements in the temporal sequence*”). EX1003 at 2:7-16 (“Content processing device 110 may be a set top box (STB) or similar device known for receiving a video signal from a network and for providing programming such as video to media player 115.”); EX1003 at 8:42-64 (“A custom media channel 170 may include multiple multimedia files that are retrieved by mixing server 130 from databases 142 and/or 156 and sequentially streamed, as a single custom media channel 170, to content processing device 110 or computer 105, possibly in response to a user request for a custom media channel 170 on a real time or near real-time basis. ... [A] custom media channel 170 may be instantiated as a single multimedia file, e.g., an MPEG file, created by aggregating or concatenating various items of advertising content 140 and/or media content 155.”).

2. **Claim 20: *The system of claim 19, wherein the aggregator comprises a web server, the aggregator processor being adapted to present a web page listing the media streams for display on a client device.***

106. In my opinion, Whitehead discloses this claim. Whitehead discloses or at least renders obvious that **content processing device 110** may be a “*web server*” that presents the custom media channels 170 as a “*web page listing the media streams*” on a *client device* such as computer 105 with media player 115.

For example, **content processing device 110** may communicate with *client device*

such as computer 105 with media player 115 via packet switched network 125,

“include[ing] the Internet,” using “known protocols for transporting data” such as

TCP/IP and HTTP. EX1003 at 2:17-30, 2:52-59, 3:14-28. It is my opinion that the

plain meaning of “*web server*” is software that services HTTP requests over

TCP/IP and thus, **content processing device 110** may be a “*web server*.”

Whitehead also teaches that “a menu of custom channel options to be displayed to

the user ... may be provided as a *webpage*.” EX1003 at 15:52-64. Thus, a POSITA

would have recognized that Whitehead discloses that **content processing device**

110 communicating via HTTP is a “*web server*,” and the displayed menu

“indicat[ing] a plurality of media channels 170 that are available for playing” is a

“*web page listing the media streams*.” EX1003 at 18:47-62.

107. Additionally, it is my opinion that, to the extent PO argues that Whitehead does not disclose this claim, Whitehead renders this claim obvious. By the '704 patent's priority date, Internet technology such as the use of “*web server[s]*” and “*web page[s]*” had become ubiquitous. A POSITA would have been motivated to employ existing technology such as readily-available, commoditized software for web servers and web pages to present the consumer with an environment (the web) the user is already familiar and comfortable with. A POSITA would have had a reasonable expectation of success in enhancing

Whitehead to use web servers and web pages, because Whitehead already discloses the technology and numerous well-understood software frameworks for creating web servers and web pages were readily available as of the priority date of the '704 patent.

3. Claim 21: *The system of claim 20, wherein the publisher comprises a web server, and wherein the aggregator processor is adapted to redirect a client device to the publisher web server.*

108. In my opinion, Whitehead discloses or at least renders obvious this claim. Whitehead discloses or renders obvious that **mixing server 130** is a “*web server*.” Whitehead describes **mixing server 130** communicating with **content processing device 110** via “packet switched network 125,” “include[ing] the Internet,” using “known protocols for transporting data” such as TCP/IP and HTTP. EX1003 at Figure 1, 3:14-28, 4:10-26, 10:6-32. It is my opinion that the plain meaning of “*web server*” is software that services HTTP requests over TCP/IP, and thus includes Whitehead’s **mixing server 130**. Whitehead also discloses that computer 105 with media player 115 (“*client device*”) can be redirected by **content processing device 110** to the **mixing server 130**. A POSITA would have recognized that the term “*redirect*” in the '704 patent encompasses “providing instructions and addresses for a user to furnish to the browser.” EX1001 at 3:18-21. Whitehead similarly discloses that “a user of computer 105 ... may select a webpage or a link in a webpage associated with a custom media channel

170.” EX1003 at 15:23-41. Moreover, “a user may select a menu option ... by selecting a link in a webpage displayed on computer 105, etc.” EX1003 at 16:22-35. As addressed above in Section V.A.1.e., selecting a custom media channel 170 causes **content processing device 110** to send a request to **mixing server 130** to generate the corresponding custom media channel. This process involves furnishing the webpage address corresponding to **mixing server 130** to Whitehead’s playback application when viewed in context with Whitehead’s disclosure of using links.

109. Additionally, it is my opinion that, to the extent PO argues that Whitehead does not disclose this claim, Whitehead renders this claim obvious. It would have been obvious given the ubiquity and commoditized of such technology that **mixing server 130** can be implemented as a “*web server*” Section V.A.2. A POSITA would have been motivated to enhance Whitehead in order to “*redirect*” a user from **content processing device 110** to **mixing server 130** because users would have been familiar with the redirection process and would not be suspicious of being taken to a different web page. Furthermore, a POSITA would have had a reasonable expectation of success in implementing **mixing server 130** as a “*web server*” that the **content processing device 110** redirects traffic to. The concept of redirection between web servers long predates the ’704 patent. Given the ubiquity and commodity nature of such technology as of the priority date of the ’704 patent,

using redirection would be easy to implement. It would entail minor software changes, using established frameworks and libraries, and would not require any changes to hardware.

4. **Claim 22:** *The system of claim 19, wherein in response to the selection, the publisher provides a first media stream having content from concatenated elements of at least second and third media streams, and, in response to a further user selection, provides content preferentially from one of the second and third media streams.*

110. In my opinion, Whitehead discloses or renders obvious this claim under both **Media Stream Mapping 1**, where “*selected media stream*” is the selected custom media channel 170, and **Media Stream Mapping 2**, where “*selected media stream*” is a particular content source 135 corresponding to a selected custom media channel 170.

(i) **Media Stream Mapping 1**

111. Under Media Stream Mapping 1, it is my opinion that Whitehead discloses that **mixing server 130** provides a custom media channel (“*first media stream*”) which concatenates elements from several different content sources 135 (“*at least second and third media streams*”). EX1003 at 5:9-23 (“Media content 155 is provided by content sources 135. ... Content sources 135 may include a wide variety of sources for multimedia content 155.”). Whitehead states that “a profile 160 may include fields corresponding to fields stored in metadata 150, e.g., the identity of one *or more* content sources 135 of interest to a user” EX1003 at

7:3-18; 14:23-55 (“[P]ointers 210 in playlist 205 could be used to indicate a wide variety of content sources 135”); *see* Section V.A.1.c.

(ii) Media Stream Mapping 2

112. Under Media Stream Mapping 2, it is my opinion that Whitehead renders obvious that **mixing server 130** provides a custom media channel (“*first media stream*”) which concatenates elements from both the corresponding content source 135 (“*second media stream*”) and advertising content 140 (“*third media stream*”). For example, Whitehead’s media channel 170 “may be instantiated as a single multimedia file, e.g., an MPEG file, created by aggregating or *concatenating* the various items of advertising content 140 and/or *media content 155*.” EX1003 at 8:42-64 (emphasis added). As addressed in section V.A.1.c, Whitehead discloses or renders obvious that content source 135 could be a broadcast television channel. For those same reasons, Whitehead also renders obvious that advertising content 140 could also be from a broadcast television channel. A POSITA would have been motivated to alter Whitehead’s system in order to provide advertising content 140 from a broadcast channel because if media content 155 is from a broadcast television channel, receiving advertising content 140 also from a broadcast television channel would have simplified the system and reduced processing burdens. A POSITA would have had a reasonable expectation of success in performing the alteration because Whitehead’s system could have

used the same receiving, processing, and concatenating technology for advertising as it did for other types of content.

(iii) Other Requirements of Claim 22

113. In my opinion, Whitehead discloses receiving user input (“*a further user selection*”) that skips to different content elements in custom media channel 170, thereby, under **Media Stream Mapping 1**, going from media content 155 from one content source 135 (“*second media ... stream[]*”) to media content 155 from another content source 135 (“*third media stream[]*”), or under **Media Stream Mapping 2**, going from advertising content 140 (“*second media ... stream[]*”) to media content 155 from content source 135 (“*third media stream[]*”). EX1003 at 6:20-34 (“a playback profile 160 may specify available playback options, e.g., ... whether the user may fast forward through items of advertising content 140, etc.”); *see also* EX1003 at 5:56-6:9, 8:65-9:29, 18:19-62. Whitehead also teaches that “‘skip commands’ and the like” can trigger “a skip not just from one item of media content 155 to another, but from one category of media content 155 to another,” including “from an item in a first category to an item in a second category, or even from one custom media channel 170 to another customer media channel 170.” EX1003 at 6:47-7:2.

114. Even if PO argues that this is insufficient to disclose claim 22, Whitehead at least renders claims 22 obvious. If a user is able to fast forward

through an advertisement, the advertiser already sees little benefit from that advertisement. But from a user perspective, the advertisement is still an inconvenience, since fast-forwarding requires time. Thus, a POSITA would be motivated to allow the user to simply skip an advertisement once it starts playing rather than fast-forward through it, since doing so would (1) not further degrade the benefit of the advertisement to the advertiser, but (2) improve the user experience. Since Whitehead discloses skipping between different items in a playlist 205, allowing a user to skip an advertisement in this manner would not pose any technical challenge.

115. I also note that Whitehead discloses “**concatenating** the various items of advertising content 140 and/or media content 155” to form a custom media channel consisting of a single file (“***first media stream***”). EX1003 at 8:42-64.

116. During prosecution of the related ’753 patent, applicant argued that “concatenate” requires clips “to link together, to unite in successive series or chain, as things depending on each other.” EX1017 at 76. Whitehead’s generation and transmission of custom media channel 170 as a single file (EX1003 8:42-64) meets that description of “concatenating” because the individual media content 155 and advertising content 140 are “link[ed] together” and “unite[d]” in a single video file and each media element “depends” on the prior media element to finish playing before it starts playing back.

5. Claim 23

117. In my opinion, Whitehead discloses this claim. Claim 23 recites most of the same limitations as claim 19. Whitehead thus discloses or renders obvious the corresponding limitations in claim 23 for the same reasons given above for claim 19.

Claim 23	Claim 19
A method for <u>aggregating media programming</u> , comprising:	A system for <u>providing media programming</u> , comprising:
<u>presenting to a user a list of media streams</u> ;	an <u>aggregator</u> having a memory and a processor, the processor adapted for
<u>receiving an input signal having data indicative of a selection of one of the media streams feeds from the list</u> ;	<u>presenting a plurality of media streams to a user</u> , <u>receiving a signal having data indicative of a selection of one of the media streams</u> , and <u>providing an output signal including data indicative of the selection</u> and of user data; and
<u>providing an output signal having data indicative of the selection</u> ;	
<u>responsive to the data indicative of the selection and user information</u> , and <u>using at least one algorithm for selection and sequencing of media</u>	a publisher having a memory and a processor, the publisher processor adapted to receive the output signal from the aggregator, and, <u>responsive to</u>

<u>elements</u>, <u>selecting a temporal sequence of media programming comprising the selected media stream and other media elements</u>, and <u>providing media programming to the user</u>, the media programming comprising the other media elements selected and concatenated in accordance with the temporal sequence with the selected media stream.	<u>the data indicative of the selection and of user data</u>, access from the memory <u>at least one algorithm for selection and sequencing of media elements</u>, <u>select a temporal sequence of media programming comprising the selected media stream and other media elements based on an output of the algorithm using the selection and the user data</u>, assemble the selected media stream and the other media elements in the temporal sequence, and <u>provide media programming to the user</u> including the assembled media stream and other media elements in the temporal sequence.
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118. There are only two differences between the two claims.

119. First, claim 23 is directed to a method, where claim 19 is directed to a system. However, Whitehead's disclosure addresses "the processes, *systems*,

methods, heuristics, etc. described herein” and thus a POSITA would have recognized that it is equally applicable to both systems and methods of using those systems. EX1003 at 22:14-40 (emphasis added).

120. Second, claim 23 also requires “*concatenate[ing]*,” instead of “*assembl[ing]*” as required by claim 19. However, Whitehead specifically discloses this because it states that a media channel 170 may be created “by aggregating or *concatenating* the various items of advertising content 140 and/or media content 155.” EX1003 at 8:42-64 (emphasis added).

6. **Claim 24:** *The method of claim 23, further comprising receiving a second media stream, and wherein the step of providing media programming comprises switching at least between the selected media stream and the second media stream in accordance with the temporal sequence.*

121. In my opinion, Whitehead discloses this claim. For example, Whitehead discloses receiving either advertising content (“*second media stream*”) or media content from multiple different content sources 135 (including “*second media stream*”) or from both, and discloses switching between content elements based on the order defined in playlist 204 (“*in accordance with the temporal sequence*”). As addressed in Section V.A.4, such order can be determined either in response to user input to skip to another item of media content or automatically as the media content is being streamed.

7. **Claim 1**

(a) **1[pre]: *A method of generating media programming for display on a client, comprising:***

122. In my opinion, Whitehead discloses this element. For example, Whitehead discloses this preamble by describing systems and methods for generating and providing a custom media channel 170 (“*media programming*”) for display on media player 115 (“*client*”). EX1003 at Abstract (“A mixing server is configured to create a custom media channel based on the profile.”); EX1003 at 2:7-16 (“receiving a video signal from a network and providing programming such as video to media player 115”); EX1003 at 9:30-58 (“playlist 205 is generally generated upon a user request for custom media channel 170”).

(b) **1[a]: *receiving by an aggregator data relating to a plurality of media streams,***

123. In my opinion, Whitehead discloses this element. Whitehead discloses a **mixing server 130**, which is an “*aggregator*.” My analysis here for claim 1 relies on the embodiment in Whitehead where the playback application is running on **mixing server 130**. In this scenario, **mixing server 130** is the claimed “*aggregator*.” For example, it states that a playback application “may be executed within ... content processing device 110, or mixing server 130.” EX1003 at 15:16-22. The **mixing server 130** is highlighted in Fig. 1 (annotated):

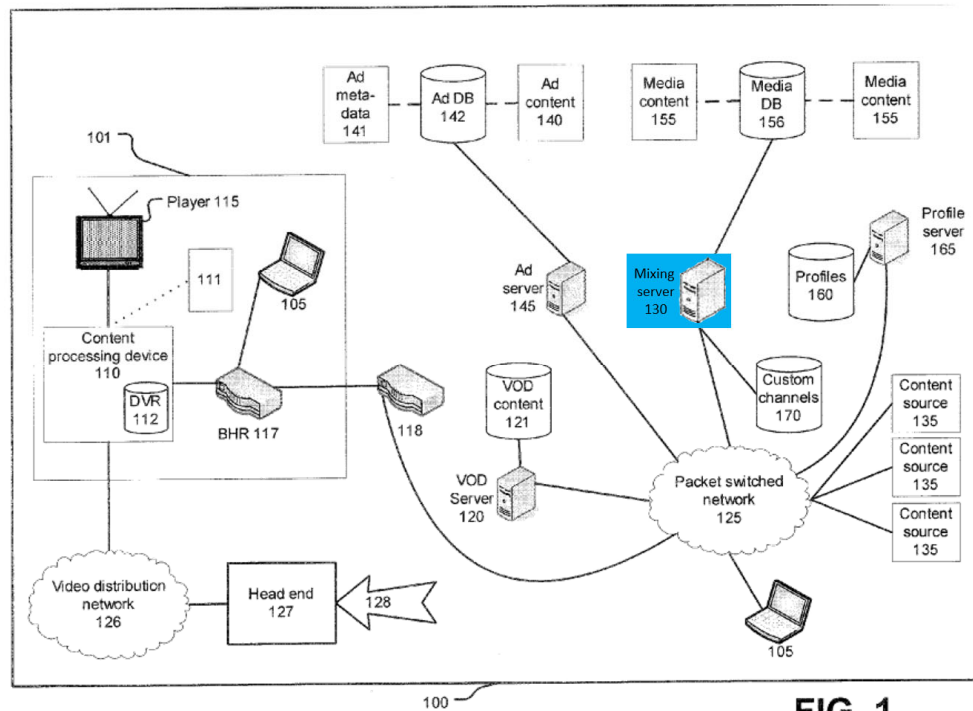


FIG. 1

124. The '704 patent specification describes an “*aggregator*” as “provid[ing] a presentation element to user 1 120 and 2 130” for content from different sources. EX1001 2:44-47, 3:6-18. Similarly, Whitehead discloses that its *mixing server 130* presents a menu of media programming available from different sources. Specifically, Whitehead discloses that *mixing server 130* can execute a playback application which displays a menu “indicat[ing] a plurality of custom media channels 170 that are available for playing.” EX1003 at 15:16-22 (“Process 500 is generally performed by a playback application that may be executed within ... mixing server 130.”); EX1003 at 18:47-62 (“[T]he menu displayed in step 510 may indicate a plurality of custom media channels 170 that are available for playing, e.g., according to titles or other descriptions, categories

of information, particular sources of media content 155, specified keywords, etc.”).

A POSITA would have recognized that, because content from one or more different content sources 135 are included in each of these custom media channels 170, a collection of custom media channels would therefore cover multiple different content sources 135. EX1003 at 5:9-23 (“Media content 155 is provided by content sources 135. Content sources 135 may include a wide variety of sources of multimedia content 155.”); EX1003 at 5:56-6:9 (“The purpose of a profile 160 is to provide criteria for selecting media content 155 to be included in a given custom media channel 170 for a user”); EX1003 at 7:3-18 (“[A] profile 160 may include ... the identity of one or more content sources 135 of interest”).

125. As addressed above in Section V.A.1.c, it is my opinion that Whitehead discloses or renders obvious that its content sources 135 are broadcast television channels and thus provide “*media streams*.” Whitehead’s **mixing server 130** (“*aggregator*”) also receives metadata 150 about media content 155 available from multiple content sources 135 (“*data relating to a plurality of media streams*”). For example, “[t]o create and/or store custom media channels 170, mixing server 130 also accesses media metadata 150 and custom channel profiles 160” where media metadata 150 “includes information about media content 155.” EX1003 at 4:27-44, 5:9-23.

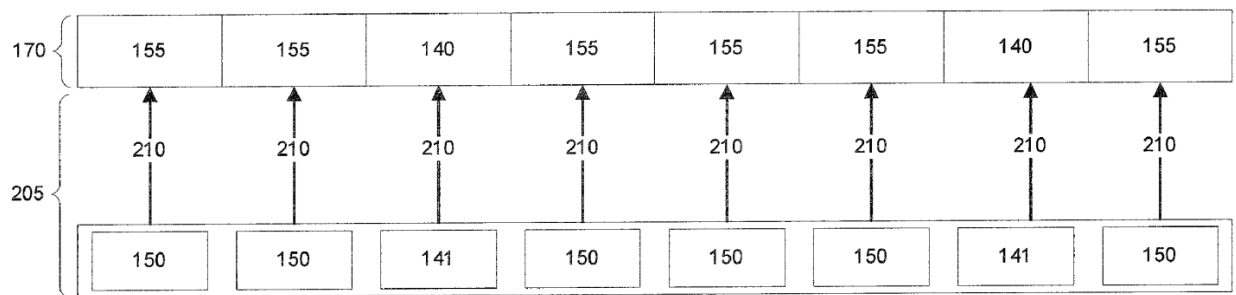
(c) 1[b]: *accessing by the aggregator user information;*

126. In my opinion, Whitehead discloses this element. Whitehead's **mixing server 130** ("*aggregator*") accesses *user information* from profile 160 for a particular custom media channel. EX1003 at 4:27-44 ("To create and/or store custom media channels 170, *mixing server 130 also accesses* media metadata 150 and *custom channel profiles 160.*"); EX1003 at 7:3-18 ("[P]rofile server 165 generally provides a graphical user interface (GUI) through which a user may provide information for a profile 160. Such information generally includes a username and may include other identifying information along with information concerning topics of interest to the user."); *see also* EX1003 at 11:59-12:37.

(d) 1[c]: *based on the user information and the data related to the plurality of media streams, determining by the aggregator a temporal sequence of media programming comprising the media streams;*

127. In my opinion, Whitehead discloses this element. Whitehead's **mixing server 130** ("*aggregator*") generates a playlist 204 which identifies media content 155 and an order for that media content 155 in custom media channel 170 ("*a temporal sequence of media programming*"). Whitehead also teaches that the content is selected from multiple content sources 135 ("*media streams*") based on media metadata 150 ("*data relating to the plurality of media streams*") and profile 160 ("*user information*"). EX1003 at 4:27-44 ("To create and/or store custom media channels 170, mixing server 130 also accesses media metadata 150 and

custom channel profiles 160.”); EX1003 at 4:10-26 (“A basic purpose of the mixing server 130 is to assemble and deliver to content processing device 110 one or more custom media channels 170.”); EX1003 at 8:28-41 (“[A]s seen in FIG. 2, a custom media channel 170 includes advertising content 140 and media content 155, generally assembled and provided to content processing device 110 according to playlist 205.”); EX1003 at 13:35-46 (“Information from profile 160 may be used to generate the playlist 205. For example, profile 160 may include an indication that media content 155 relating to a first category of media content, e.g., sports, is of more interest to a user than media content 155 relating to a second category, e.g., weather. Thus, the order of media content 155 reflected in playlist 205 may be at least partly determined by profile 160.”). An exemplary “*temporal sequence of media programming*” is shown in Whitehead’s Figure 2:



(e) 1[d]: *accessing by the aggregator over a network the plurality of media streams; and*

128. In my opinion, Whitehead discloses or renders obvious that **mixing server 130** (“*aggregator*”) accesses media content 155 from content sources 135 (“*plurality of media streams*”) over packet switched network 125 (“*network*”).

Whitehead teaches that content source 135 provides media content 155, and media content 155 is then stored in content database 156. EX1003 at Fig. 1; EX1003 at 5:9-23 (“Media metadata 150 and media content 155 may be stored in a media database 156, e.g., a relational database or the like. ... Media content 155 is provided by content sources 135.”). From there, **mixing server 130** (“*aggregator*”) accesses the content database 156 (again over packet switched network 125 (“*network*”)) to retrieve media content 155 originally received from content sources 135 (“*plurality of media streams*”). EX1003 at 5:9-23 (“A custom media channel 170 may include multiple multimedia files that are retrieved by mixing server 130 from databases 142 and/or 156 ...”).

129. Additionally, it is my opinion that, to the extent PO argues that the “accessing” requires **mixing server 130** to “*access[]*” content sources 135 directly—rather than via storage in content database 156—Whitehead discloses or renders this limitation obvious. As shown in Whitehead’s Figure 1, **mixing server 130** is connected to packet switched network 125 and thus can access content from content sources 135 via that network 125. In contrast, media database 156 lacks such a direct connection. A POSITA analyzing Figure 1 would understand that **mixing server 130** is responsible for accessing content sources 135 to receive content 155 that it then stores to database 156. Even if not expressly disclosed, doing so would be obvious. The alternative, whereby database 156 accesses

content sources 135 without going through **mixing server 130**, would require introducing additional components and connections not reflected in Figure 1.

Rather than complicating the system in this manner, the easier and simpler solution would be for **mixing server 130** to access media content 155 provided by content sources 135 over network 125.

- (f) **1[e]: *providing by the aggregator to the client media programming in the determined temporal sequence, the media programming comprising concatenated elements of the plurality of media streams.***

130. In my opinion, Whitehead discloses this element. For example, Whitehead discloses that via content processing device 110, its **mixing server 130** (“**aggregator**”) streams the custom media channel 170 (“**media programming**”) to media player 115 (“**client**”). Whitehead further discloses that the custom media channel 170 can be streamed as a “single multimedia file” consisting of “concatenat[ed]” media content 155 and/or advertising content 140. EX1003 at 8:42-64 (“[M]edia channel 170 may be instantiated as a single multimedia file, e.g., an MPEG file, created by aggregating or **concatenating** the various items of advertising content 140 and/or media content 155.”); EX1003 at 2:7-16 (“Content processing device 110 may be a set top box (STB) or similar device known for receiving a video signal from a network and for providing programming such as video to media player 115.”).

8. Claim 2: *The method of claim 1, wherein the aggregator comprises a web server.*

131. In my opinion, Whitehead discloses this claim. As addressed above in Section V.A.3, Whitehead discloses that its **mixing server 130** (“*aggregator*”) can be implemented as a “*web server*.”

9. Claim 3: *The method of claim 1, wherein the aggregator comprises software stored in a client memory device and adapted to be executed on a client processor.*

132. In my opinion, Whitehead discloses this claim. For example, Whitehead discloses that **mixing server 130** (“*aggregator*”) can be a device with software stored in memory executed by a processor—including “computer workstation, desktop, notebook, laptop, or handheld computer” (“*client memory device*” and “*client processor*”). EX1003 at 2:7-16, 7:19-43, 7:44-59. Furthermore, Whitehead also discloses that “**mixing server 130** ... may employ any of a number of computer operating systems known to those skilled in the art” and “include instructions executable by one or more computing devices.” EX1003 at 7:19-43, 7:44-59.

10. Claim 4: *The method of claim 1, wherein the aggregator comprises an electronic program guide.*

133. In my opinion, Whitehead discloses this claim. Whitehead discloses that an interactive program guide (“*electronic program guide*”) can be included in the **mixing server 130** (“*aggregator*”). EX1003 at 4:45-52 (“mixing server 130 may also provide an interactive program guide (IPG)”), 15:23-41, 19:44-63.

11. Claim 5: *The method of claim 1, wherein the user information comprises past usage information of the user.*

134. In my opinion, Whitehead discloses this claim. Whitehead discloses that *past usage information of the user* such as “a history of items of media content 155 that a user has viewed in a custom media channel 170” is included in its user profile 160 (“*user information*”). EX1003 at 13:47-61.

12. Claim 6: *The method of claim 1, wherein the media programming comprises a video feed.*

135. In my opinion, Whitehead discloses this claim. Whitehead’s custom media channel 170 includes “*video*,” and Whitehead discloses streaming using a “single multimedia file, e.g., an MPEG file,” which is a “*video feed*.” EX1003 at 2:40-51, 5:9-23, 8:42-64.

13. Claim 7: *The method of claim 1, wherein the step of providing the media programming comprises providing from a web server via a network to the client the media programming.*

136. In my opinion, Whitehead discloses this claim. As addressed above in Section V.A.3, Whitehead discloses that its mixing server 130 can be implemented as a “*web server*.” Further, As addressed above in Section V.A.7.f, the mixing server 130 “provid[es] programming such as video to media player 115” (“*client*”) via packet-switching network 125 (“*network*”) including Inernet. EX1003 at Fig. 1.

14. Claim 8: *The method of claim 1, wherein the step of providing the media programming comprises providing the media programming on a television channel.*

137. In my opinion, Whitehead discloses this claim. For example, Whitehead's custom media channel 170 ("***media programming***") may be displayed on a television set and a user can "tune[]" to that channel. Thus, it is my opinion that Whitehead discloses that the custom media channel 170 is provided as "***a television channel.***" EX1003 at 2:7-16 ("Content processing device 110 provides video or other multimedia to a user on a media player 115, e.g., a ***television set*** or video monitor."); EX1003 at 11:40-58 ("[A] playlist 205 may be generated and a custom media channel 170 may be created in real-time or near real-time when a user '***tunes***' to the channel 170 or otherwise selects the channel 170 for viewing through playback device 115.").

15. Claim 9: *The method of claim 1, wherein the media programming is provided through at least one of an XML feed, an RSS feed, Atom feed, and a podcast.*

138. In my opinion, Whitehead discloses this claim. For example, Whitehead's custom media channel 170 ("***media programming***") can include "audio content." EX1003 at 4:53-5:3. Furthermore, at the time of the '704 patent's priority date, "***podcast[s]***" were rapidly gaining popularity. For example, an article published on the Guardian in February 2004 by Ben Hammersley recites that "[w]ith the benefit of hindsight, it all seems quite obvious [that] MP3 players, like

Apple's iPod, in many pockets, audio protection software cheap or free, and weblogging an established part of the internet; all the ingrediencies are there for a new boom in amateur radio," also called "podcasting." EX1012.⁵ Thus, in my opinion, a POSITA would have been motivated to provide Whitehead's audio content as a "*podcast*," and would have had a reasonable expectation of success in doing so.

139. The same is true for using an "*XML feed*," "*RSS feed*," or "*Atom feed*" to provide programming. These content formats were well-known before the priority date of the '704 patent. A POSITA would have been motivated to use one or more of these existing content formats, rather than undertake the burden and risk of designing a new format. A POSITA would have had a reasonable expectation of success in using these formats, because software tools to convert data into these formats were readily-available as of the priority date of the '704 patent.

⁵ Online databases confirm that EX1012 was published in 2004.

<https://www.bibsonomy.org/bibtex/3316c7f81ec824902239ab87db316ca5>. In addition, I can independently attest based on my experience in the industry as well as a consumer that podcasts were a well known and growing segment of the audio content market in the early 2000s.

16. **Claim 10:** *The method of claim 1, further comprising providing by the aggregator a presentation element for presenting data indicative of a plurality of media streams to the user, and, responsive to a user selection of one of the presented media streams, providing by the aggregator the selected media stream in the media programming.*

140. In my opinion, Whitehead's playback application, when incorporated into **mixing server 130**, discloses or renders obvious this claim. EX1003 at 15:16-22. As addressed above in Sections V.A.1.c, d, k, and Section V.A.7.f, Whitehead discloses or renders obvious the limitations of claim 19, including "*presenting a plurality of media streams to a user,*" "*receiving a signal having data indicative of a selection of one of the media streams,*" and "*provide media programming to the user including the [selected and] assembled media stream and other media elements in the temporal sequence.*" For the same reasons addressed in those sections, Whitehead discloses this claim.

17. **Claim 11:** *The method of claim 10, further comprising, in response to user highlighting of one of the displayed media streams, displaying by the aggregator the highlighted media stream on a user display together with a list of media streams.*

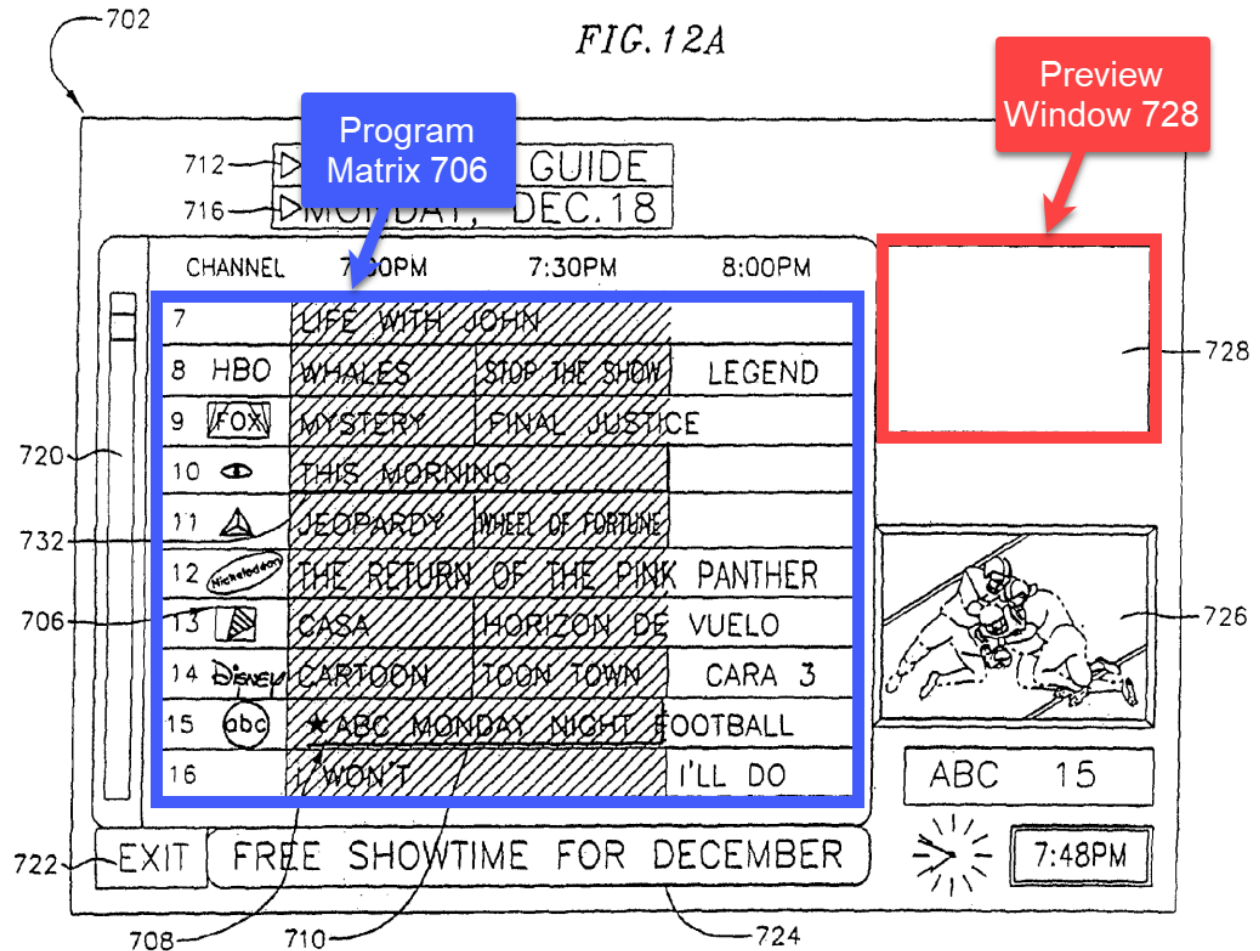
141. In my opinion, Whitehead discloses this claim. For example, Whitehead discloses that **mixing server 130** ("*aggregator*") allows the user to highlight one of the available custom media channels in its menu ("*one of the displayed media streams*"), and further discloses that each of the custom media channels in turn could correspond to a particular content source 135. A POSITA

would have recognized that this allows users to play the selected custom media channel 170 (“*the highlighted media stream*”) on a media player 115 (“*user display*”). EX1003 at 18:47-62 (“[T]he menu displayed in step 510 may indicate a plurality of custom media channels 170 that are available for playing, e.g., according to titles or other descriptions, categories of information, particular sources of media content 155, specified keywords, etc.”); EX1003 at 16:22-35 (“From the foregoing it should be clear that a user may select a menu option by navigating with arrow keys or the like using control 111 to highlight options displayed on media player 115 ...”).

142. Additionally, it is also my opinion that Whitehead renders obvious displaying the selected custom media channel 170 (“*the highlighted media stream*”) together with the menu listing available customer media channels (“*a list of media streams*”). Whitehead’s custom media channels 170 are provided to users in the context of a program guide user interface. EX1003 at 4:45-52, 15:23-41, 19:44-63. Since at least the 1990s, displaying a preview for a highlighted channel alongside programming information was a well-known program guide user interface configuration. For example, U.S. Pat. No. 6,388,714 was filed on April 11, 1997 and issued May 14, 2002, making it § 102(b) art. This patent describes a program guide that presents “the shows that are being presented on each channel” alongside a preview window area 728 displaying “a short preview of the show that

is currently being highlighted in show matrix 706.” EX1013 at 17:41-44, 18:11-17.

This interface is depicted in Fig. 12A below (annotated):



143. Thus, in my opinion, it would have been obvious to enhance Whitehead’s system to use a program guide user interface configuration that both the developer and user would be familiar with, such as the one shown above. Among other things, users would prefer familiar user interfaces. The enhanced interface would have allowed users to observe the content of a highlighted custom media channel 170 while still having the opportunity to highlight a different

custom media channel 170 if the user is dissatisfied with that content. Further, using a known user interface configuration would have simplified the development and design process. A POSITA would have had a reasonable expectation that such a known interface configuration would be successful, including because software libraries to implement the interface were in common usage as of the priority date of the '704 patent, and no changes to hardware would be required.

18. Claim 12: *The method of claim 11, wherein the user information includes the identity of a media element playing on the displayed highlighted media stream prior to the receipt of the user selection.*

144. In my opinion, Whitehead discloses this claim. For example, Whitehead discloses that *user information* in the profile 160 may at least include information “indicat[ing] an interest in receiving a particular media file or set of media files” (“*identity of a media element*”). EX1003 at 10:46-67. As another example, Whitehead also teaches that the user is allowed to identify a particular item of media content and to request “show me more like this” (alternative “*identity of a media element*”) EX1003 at 18:63-19:15.

145. As addressed above in Section V.A.17, Whitehead renders obvious the displaying of a preview window. Thus, it is also my opinion that it would have been obvious that the media element playing as a preview of a highlighted custom media channel 170 (“*a media element playing on the displayed highlighted media stream prior to the receipt of the user selection*”) could have been reflected in

profile 160 (“*user information*”). A POSITA would have been motivated to enhance Whitehead’s system in this manner. For example, since the media element was specifically requested by the user, including it would have provided helpful information about the media element most relevant to the user. Also, it would have also provided more information about the nature of the highlighted media stream, which would have been particularly useful if a user subsequently requested “show me more like this.” Additionally, a POSITA would have recognized that a basis for selecting the media element to be previewed in response to the user highlighting a media channel must exist in the system, and a logical choice would have been to select the media element expressly identified in profile 160. A POSITA would also have had a reasonable expectation of success. The change would entail a minor modification to the data included in profile 160, which would be a small software change. As addressed above in Section V.A.17, displaying a preview of a media element was well known in the art. The display process is agnostic as to which media element is selected for display, so the change would not have interfered with any existing display behavior.

19. **Claim 13:** *The method of claim 10, further comprising, in response to the received selection, providing predetermined media programming during a first time period, and providing media programming responsive to the user information in a second time period after the first time period.*

146. In my opinion, Whitehead discloses this claim. Whitehead specifically discloses that custom media channel 170 may be dynamically generated in “near real-time.” EX1003 at 11:40-58. But a POSITA would have recognized that “near real-time” is different from “real time” and thus, there is a short interval after the user selects the custom media channel 170 and before that custom media channel 170 is generated (“*a first time period*”) where non-custom programming is played (“*predetermined media programming*”). Thus, it is my opinion that Whitehead discloses that the system begins playing the custom programming (“*providing media programming responsive to the user information*”) after it completes this processing (“*after the first time period*”).

147. It is also my opinion that it would have been obvious to instead provide “*predetermined media programming*” during this “*first time period*” before dynamic programming becomes available. As an example, a POSITA would have been motivated to alter Whitehead’s system to play a predetermined advertisement during this time, especially considering that Whitehead already discloses that advertisements need not be based on user information. EX1003 at 12:38-55. Showing a predetermined advertisement to the user instead of forcing

the user to wait while the custom media channel 170 is being created would have generated additional advertising revenue and lowered the likelihood of the user losing interest while waiting for custom media channel 170. A POSITA would have had a reasonable expectation of success in enhancing Whitehead's system in this manner because Whitehead already discloses providing such predetermined advertisements.

20. Claim 14: *The method of claim 1, wherein the data related to the plurality of media streams comprises categorizing data associated with media elements of the media streams indicative of subjectively determined character of the media elements.*

148. In my opinion, Whitehead discloses this claim. Whitehead teaches that, "for a particular item of media content 155 ... a subject matter associated with media content 155" and "one or more keywords associated with the multimedia content 155" are included in the media metadata 150 ("*the data related to the plurality of media streams*"). Thus, a POSITA would have recognized that Whitehead discloses "*categorizing*" the media content 155 based on its "*character*." EX1003 at 5:9-23. Additionally, Whitehead also states that "subject matter categories of interest to the user" are also included in the profile 160. EX1003 at 7:3-18.

149. In my opinion, it would also have been obvious to make Whitehead's "subject matter categories" and "keywords" assigned to media content 155 "*subjectively determined*." As of the '704 patent's priority date, media

analysis and AI technology had not advanced to the point where assigning categories and keywords to media content could be fully automated without any human input. Instead, a human needed to assign or confirm assignment of categories and keywords at some point in the processing pipeline – rendering them “*subjective*.” The most straightforward implementation of this would have been having a human involved in this manner, due to the unreliability of automated processes to make that assessment alone. Comparing to a fully automated the process, having a human make or confirm that assessment would also have been easier to implement.

21. Claim 15: *The method of claim 14, wherein the user information comprises viewing history, user preference data and search queries.*

150. In my opinion, Whitehead discloses this claim. Whitehead’s profile 160 includes *user information* such as “a history of items of media content 155 that a user has viewed in a custom media channel 170” which constitute as *viewing history*. EX1003 at 13:47-61. Further, Whitehead teaches that *user preference data* is also included, such as “subject matter categories of interest to the user” and other information on the user’s “interest[s],” including that “media content 155 relating to a first category of media content, e.g., sports, is of more interest to a user than media content 155 relating to a second category, e.g., weather.” EX1003 at 13:35-

46. Finally, Whitehead discloses that *search queries* are also included, such as

“one or more keywords ... for keyword searches or queries” EX1003 at 7:3-18.

22. **Claim 16:** *The method of claim 14, further comprising deriving by the aggregator keywords from the media streams, deriving by the aggregator from the derived keywords further keywords from a map of synonyms, and employing the further derived keywords in determining the temporal sequence.*

151. In my opinion, Whitehead discloses this claim. Whitehead describes its media content 155 from content sources 135 (“*media streams*”) as associated with “*keywords*.” These keywords are then used to select and order media content 155 in custom media channel 170 (“*in determining the temporal sequence*”). EX1003 at 5:9-23, 7:3-18, 10:46-67, 12:18-37, 18:47-62, 19:16-38.

152. Additionally, it is also my opinion that it would have been obvious for those “*keywords*” to be derived by **mixing server 130** (“*aggregator*”), and to further “*derive[] additional keywords from a map of synonyms*,” possibly further with a human involved to confirm applicability of those keywords. For example, as addressed above in Section V.A.1.c, Whitehead discloses that the content sources 135 actually or at least obviously include broadcast television sources, which may not provide sufficient metadata (or at least not in the format needed by Whitehead’s **mixing server 130**). However, a POSITA would have recognized that systems for deriving keywords and then deriving additional keywords from them based on a thesaurus database from broadcast television were well-known in the art

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as of the priority date of the '704 patent. For example, U.S. Pat. No. 7,467,398 was filed on Mar. 21, 2002 and issued on Dec. 16, 200, making it § 102(e) art. The patent describes receiving a “closed captioned text signal” alongside cable television and using keywords obtained either from that text signal or by analyzing the audio signal. EX1014 at 3:11-4:8. Such systems also included a “thesaurus database[s]” such that searches would not be limited to just the express keywords but would also include “relevant synonyms” derived from those same keywords. EX1014 at 4:9-26.

153. In my opinion, a POSITA would have been motivated to implement such a system as part of Whitehead’s **mixing server 130** to derive its own keywords and further “synonym” keywords for use in creating Whitehead’s custom media channels 170. Doing so would have allowed Whitehead’s **mixing server 130** broader flexibility in defining the format and content of those keywords rather than relying on keywords (if any) generated by other entities for potentially different purposes. Doing so would have allowed Whitehead’s **mixing server 130** to skip the step of determining whether and in what format each source provides keywords. It would also have removed the need to contend with differently-formatted keywords from different sources. Thus, altering Whitehead’s system in this manner would have improved its processing efficiency. Moreover, given the established nature of technology for deriving keywords, including specifically in

the field of broadcast television, a POSITA would have had a reasonable

expectation of successfully implementing this system in Whitehead's context.

23. Claim 17: *The method of claim 1, wherein at least one of the media streams comprises media elements having labels indicative of payment due from an advertiser and payment due to a content provider.*

154. In my opinion, Whitehead discloses this claim. For example, as addressed in Section V.A.4, Whitehead discloses that custom media channel 170 includes advertising content 140 ("***media elements***") and renders obvious that the advertising content 140 is a "***media stream***." Whitehead further renders obvious that the advertising content 140 includes "***labels indicative of payment due from an advertiser and payment due to a content provider***." Specifically, Whitehead recognizes that "[i]ncluding advertising content 140 in custom media channel 170 advantageously provides additional revenue opportunity for a provider of system 100." EX1003 at 12:38-55. It was also well known before the '704 patent's priority date that some content sources required subscription fees, such as HBO, or one-time payments like Pay-Per-View (PPV) events. Thus, Whitehead's system would have received revenue from advertisers and in turn would have needed to make payments to content providers. In light of this, it would have been obvious for the system to track both the incoming revenue ("***payment due from an advertiser***") as well as the outgoing expenses ("***payment due to a content provider***") via Whitehead's advertising metadata 141 and media metadata 150 ("***labels***"). A

POSITA would have been motivated to enhance Whitehead's system in this manner because maintaining the payment-related information with other information about the advertising and media content would eliminate the need for a separate database just for the payment-related information. It would have also made the payment-related information accessible as part of the same search used to identify the advertising and media content, and would have thereby simplified payment processing. Moreover, because the POSITA would be merely using existing metadata databases to store additional information, a POSITA would have had a reasonable expectation of success.

24. Claim 18: *The method of claim 1, further comprising caching by the aggregator the media streams prior to providing the elements in the media programming, whereby switching between streams at optimal times is facilitated.*

155. In my opinion, Whitehead discloses this claim. As addressed above in Section V.A.1.c, Whitehead discloses or at least renders obvious that media content 155 from content sources 135 includes broadcast television channels. Whitehead further discloses that this media content 155 is stored ("***cach[ed]***") in media database 156 for subsequent inclusion (alongside content 155 from other content sources 135) in custom media channel 170 according to playlist 205 ("***whereby switching between streams at optimal times is facilitated***"). EX1003 at 5:9-23 ("Media metadata 150 and media content 155 may be stored in a media database 156, e.g., a relational database or the like. ... Media content 155 is

provided by content sources 135.”); *see also* EX1003 at 8:42-64, 11:1-8, 11:40-58, 12:18-37, 13:7-14, 13:35-46, 16:66-17:17, 20:8-9-21:11.

B. Ground 2: Whithead and Marcus '904

156. It is my opinion that all limitations of the challenged claims not expressly addressed in Ground 2 are disclosed or rendered obvious by Whitehead for the reasons in Ground 1.

1. Motivation to Combine & Reasonable Expectation of Success

157. In my opinion, a POSITA would have been motivated to enhance Whitehead's mixing server 130 to incorporate Marcus '904's algorithm that runs on Marcus '904's receiver for receiving, selecting, ordering, and assembling different media streams including both content and advertising.

158. *Incorporating Marcus '904's content and advertising sources would provide more choices to the users:* Offering a broader range of content sources for custom media programming would have been desirable because would have increased the chances that the system identifies the content that is most appropriate for a specific user. In general, people prefer to have more options for video programming. Additionally, more advertising options would have allowed for more precise targeting and the potential for greater revenue generation. If people view advertising for products that they are already interested in, the chance for a conversion from an advertising view to a purchase is higher. Indeed, there has been

a historic market trend towards more content sources: a few broadcast television channels have turned to hundreds of cable channels, and those have since been supplemented by additional content sources accessible over the Internet. Marcus '905 discloses one solution for incorporating content and advertisement from media streams. To the extent PO argues Whitehead does not disclose including media content or advertising content from such sources, enhancing Whitehead's system to incorporate the content and advertising sources described in Marcus '904 would have therefore enhanced Whitehead's ability to target content and advertising effectively for individual users.

159. ***Incorporating Marcus '904's content and advertising sources would unlock new revenue sources for Whitehead:*** By integrating the content and advertising sources, such as those disclosed in Marcus '904, Whitehead's system could have accessed new avenues for revenue generation. Marcus '904 states that it facilitates generating income by delivering content from niche content and advertising sources. EX1005 ¶¶ 5-13. In my opinion, a POSITA would have been motivated to leverage Marcus '904's content and advertising sources to open up additional revenue streams for Whitehead's system. As one example, customers could pay more for premium or niche content.

160. ***Incorporating aspects of Marcus '904's content selection and concatenation algorithm improves Whitehead's efficiency:*** Incorporating Marcus

'904's content selection and concatenation algorithm could have improved

Whitehead's system efficiency. Marcus '904 discloses how to create custom media programming by inserting targeted content or advertising into a "primary" stream.

EX1005 ¶¶ 48, 82-87, 148, 237, 251, 594. By utilizing or defaulting to Marcus

'904's "primary" stream rather than selecting each piece of media content

individually, Whitehead's system would have needed to make fewer selections for

its custom media channels and requires less resources. In turn, this would have

allowed Whitehead's system to run on less expensive hardware, and would have

allowed it to consume less electricity.

161. ***Whitehead and Marcus '904 are directed towards similar field of art:*** Both Whitehead and Marcus '904 are related to generating custom media programming based on a user profile. EX1003 at Abstract; EX1005 ¶¶ 82-87. A POSITA starting with Whitehead would have naturally turned to the teachings of the Marcus '904 in order to improve Whitehead's system.

162. ***Implementing software modification requires no architecture re-designing:*** Whitehead already discloses different content sources, including broadcast sources, and discloses focusing a custom media channel on a specific content source. As addressed above in Section V.A.1.c, Whitehead discloses various content sources, including broadcast television content sources, and further discloses that a particular user profile can identify a specific content source. Thus,

incorporating Marcus '904's teachings would not have required redesigning

Whitehead's architecture, and instead would have involved adding functionality improvements to Whitehead's system.

163. *Implementing software modification would be predictable*: The proposed modifications could all have been done entirely in software, with no need for hardware alterations. Whitehead even notes that such software changes are feasible. EX1003 at 19:64-20:6, 22:26-40.

2. Common Limitations Among All Claims

164. “*A plurality of media streams*” are required by all independent claims. As addressed above in Ground 1, it is my opinion that Whitehead discloses content sources 135 and, under the **Media Stream Mapping 2** content sources 135 are the required “*plurality of media streams*.” In my opinion, Marcus '904 further renders obvious that Whitehead's content providers 135 are “*media streams*.” Specifically, Marcus '904 discloses a “receiver” that receives “a plurality of tagged media streams” and “assembles” those “media streams” into “programming.” EX1005 ¶¶ 34, 40-42, 48. As for **Media Stream Mapping 1**, in my opinion, there should be no dispute that Whitehead's custom media channels are “media streams.” For example, Whitehead expressly teaches “stream[ing]” these channels. EX1003 at 8:42-64.

3. Claims 22 and 24

165. In my opinion, Whitehead in combination with Marcus '904 discloses claims 22 and 24, or at least renders them obvious. “[A]t least second and third media streams” is required by claim 22 and claim 24 further requires “a second media stream.” As addressed above in Ground 1, Whitehead discloses advertising content 140 which corresponds to this “second” or “third” media stream. In my opinion, Marcus '904 further renders obvious that such advertising content can be received in the form of a “media stream.” For example, Marcus '904 teaches that “a media stream containing advertising is received by the receiver” before the receiver “assembl[ing] programming for the user based upon the advertising information provided by the user.” EX1005 ¶ 48. Furthermore, Marcus '904 discloses that “the media/data stream of an (existing) medium is entirely or partially repurposed to become a source for insertion media, such as advertising media” and there could even be a channel “dedicated to advertising only.” EX1005 ¶¶ 252, 275.

4. Claims 18 and 24

166. In my opinion, Whitehead in combination with Marcus '904 discloses claims 18 and 24, or at least renders them obvious. Claim 18 requires “caching by the aggregator the media streams prior to providing the elements in the media programming, whereby switching between streams at optimal times is

facilitated,” and claim 24 requires “switching at least between the selected media stream and the second media stream in accordance with the temporal sequence.”

Marcus '904 further renders obvious these caching and switching steps. As an example, Marcus '904 specifically discloses that a “cache-enabled” players, “by means of intelligent filters and/or embedded markers or cues in the transmitted signal, reorganize the linear stream of programming by means of either or both caching of a given stream, or switching between streams of cached and/or uncached programming.” EX1005 ¶¶ 250-252, 301, 641.

5. Claim 17

167. In my opinion, Whitehead in combination with Marcus '904 discloses claim 17, or at least renders it obvious. For example, Marcus '904 discloses “headers” (“*labels*”) which are stored with the media and indicate an advertiser’s “willingness, or contractual commitment, to underwrite the delivery and/or creation of all or part of the value-item” (“*indicative of payment due from an advertiser*”) or “the relative royalties each creator will receive from the anticipated download of the item.” EX1005 ¶¶ 520, 547-575, 580, 582. In my opinion, when Marcus '904’s advertising and content media streams are incorporated into Whitehead’s system along with these headers, the resulting system renders obvious claim 17.

6. Claims 1[a]-[e], 19[b], 23[b]

168. As addressed in Ground 3, Marcus '904 discloses all aspects of the challenged claims pertaining to the selection, ordering, and assembling of media programming by a “***publisher***.” See Section V.C.2.e-g. It is my opinion that, to the extent PO contends that any of those elements are missing from Ground 1, they are rendered obvious by Marcus '904.

C. Ground 3: Cristofalo and Marcus '904

1. Motivation to Combine & Reasonable Expectation of Success

169. In my opinion, for claims 19-24, a POSITA would have enhanced Cristofalo's transmitting system 102 or, for claims 1-18, Cristofalo's receiving system 104 to incorporate Marcus '904's algorithm that runs on Marcus '904's receiver for receiving, selecting, ordering, and assembling different media streams including both content and advertising.

170. *Cristofalo's transmitting system 102 benefits from gaining ability to target content to specific users based on the teachings in Marcus '904:* In my opinion, at least for claims 19-24, Cristofalo's transmitting system 102 would benefit from targeting content to specific users by incorporating the teachings of Marcus '904. Cristofalo explains that rather than creating a unique media object for each user profile, the transmitting system 102 “preferably pushes media objects to specific users based upon user identifiers.” EX1004 ¶ 48. However, Cristofalo also acknowledges that “as bi-directional data link throughput capacity increases,

various other routing techniques may be utilized to push media object based targeted advertising and programming to users.” EX1004 ¶ 48. Further, Cristofalo expressly discloses that its system is designed for use in a unicast environment, “where the content/media objects are transmitted to a single user.” EX1004 ¶¶ 9, 19. As addressed in Section IV.A, given that transmission capacity has increased since Cristofalo’s filing in 2001, it is unsurprising that Marcus ’904 offers additional insights into targeting media programming to specific users, thereby improving the customization capabilities of Cristofalo’s transmitting system 102 to target individual users rather than groups of users, while retaining the ability of Cristofalo’s receiving system 104 to insert media objects as overlays. See EX1004 ¶ 41.

171. ***Cristofalo’s receiving system 104 benefits from additional flexibility by incorporating the teachings in Marcus ’904:*** In my opinion, at least for claims 1-18, Cristofalo’s receiving system 104 can achieve additional flexibility by incorporating Marcus ’904’s teachings. Cristofalo’s receiving system 104 selects specific media objects based on user profile information for playback or overlay. See EX1004 ¶¶ 36, 41. However, Cristofalo’s receiving system 104 is limited to inserting media objects into predetermined slots without customizing the sequence of media elements in the programming. A POSITA would recognize that further customizing the user experiencing by enabling the system to target not just what

media objects are displayed, but also when they are displayed, is more likely to ensure an advertisement reaches a user at the right time to convert into a sale (thereby making the system's advertisement capabilities more desirable to advertisers, allowing the system operator to charge more). One reference that discloses such capabilities is Marcus '904. By adapting Cristofalo's receiving system 104 to incorporate Marcus '904's algorithm for selection, ordering, and assembly, the system would have gained the ability to tailor the sequence of media elements, leading to a more customized and dynamic user experience.

172. ***Cristofalo's targeting system benefits from additional implementation details by incorporating Marcus '904's content selection, ordering, and assembly algorithm (all claims):*** In my opinion, for all claims, incorporating Marcus '904's algorithm for content selection, ordering, and assembly would have resulted in valuable implementation-based improvements to Cristofalo's targeting system. Cristofalo discloses that targeted content may be selected at either the transmitting system 102, receiving system 104, or a combination of the two. EX1004 ¶¶ 35-36, 44, 49. While Cristofalo describes the general process of creating custom programming, it does not provide specific details on how media objects are selected or how the final media programming is produced and formatted for display. The additional details provided by Marcus '904, and Marcus '156 which is referenced within, would have supplied these

specifics, enabling a more comprehensive implementation within Cristofalo's transmitting system 102 or receiving system 104.

173. ***Cristofalo benefits from additional revenue sources by incorporating Marcus '904's content and advertising (all claims)***: In my opinion, for all claims, incorporating Marcus '904's content and advertising sources would have unlocked new revenue sources for Cristofalo. Marcus '904 discloses the potential for generating income through the transmission of content from niche content and advertising sources. EX1005 ¶¶ 5-13. A POSITA would have seen the value in using and would have been motivated to employ Marcus '904's content and advertising sources to enhance Cristofalo's system, thereby unlocking additional streams of revenue. For example, users could pay more for premium or niche content.

174. ***Cristofalo and Marcus '904 are directed towards similar field of art (all claims)***: Cristofalo and Marcus '904 share a common focus on the creation of custom media programming. EX1004 at Abstract; EX1005 ¶¶ 82-87. This shared objective highlights the compatibility of incorporating Marcus '904's methods into Cristofalo's systems.

175. ***Implementing software modification requires no architecture re-designing (all claims)***: In my opinion, Cristofalo's systems are already equipped with the foundational structure needed to implement Marcus '904's selection,

ordering, and assembly algorithm. Both the transmitting system 102 and receiving system 104 in Cristofalo's design are capable of accessing user profile data and customizing media programming accordingly. EX1004 ¶¶ 35-36, 44, 49. Thus, integrating Marcus '904's teachings would have enhanced Cristofalo's existing system without requiring a complete architectural overhaul.

176. *Software modification would be predictable (all claims)*: The proposed modifications are entirely achievable through software updates, with no need for hardware alterations. Cristofalo acknowledges the practicality of implementing such software modifications (EX1004 ¶ 57), making the integration of Marcus '904's approaches both feasible and predictable.

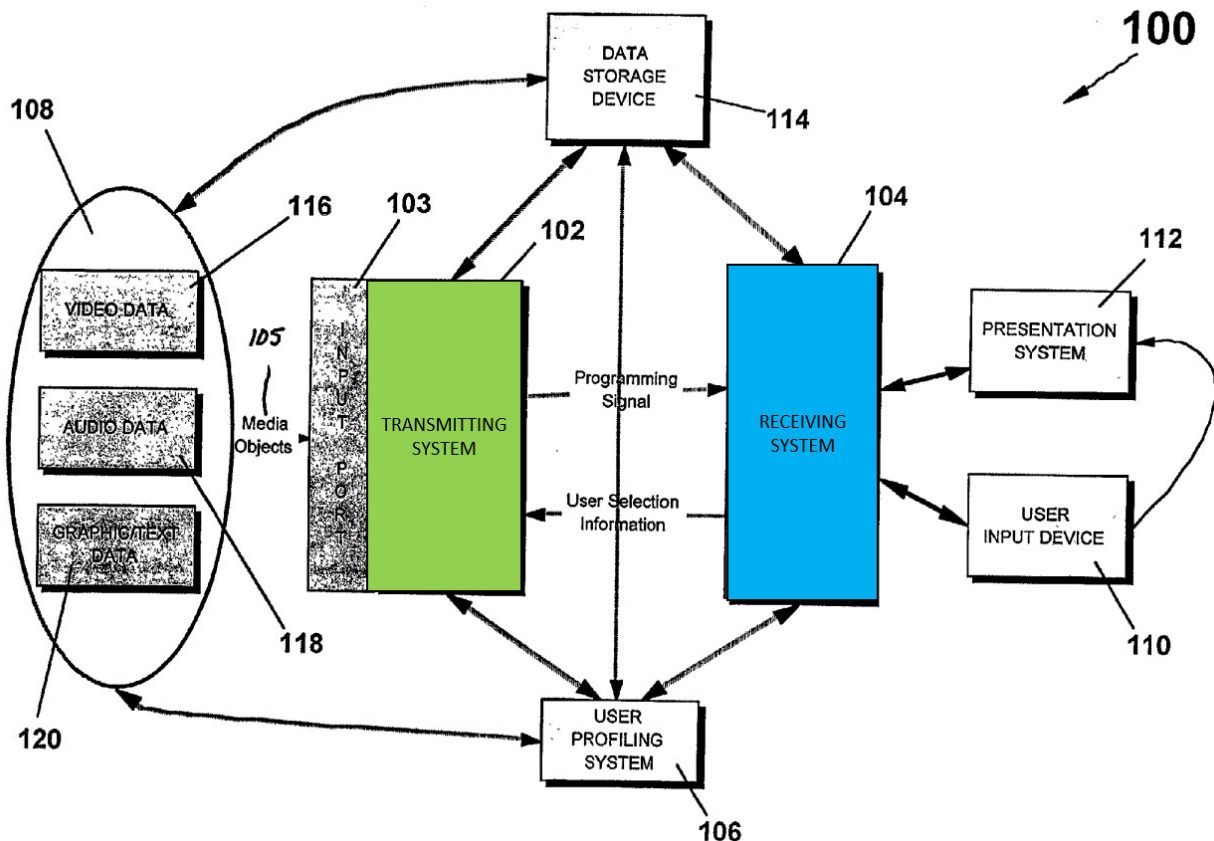
2. Claim 19

(a) 19[pre]: *A system for providing media programming, comprising:*

177. In my opinion, Cristofalo discloses this element. For example, Cristofalo discloses “[a] a system and process for targeting programming (including, but not limited to, advertising) to users.” EX1004 at Abstract, ¶ 46.

(b) 19[a][i]: *an aggregator having a memory and a processor,*

178. In my opinion, Cristofalo discloses this element. For example, Cristofalo discloses **receiving system 104**, which is an “**aggregator**,” and **transmitting system 102**, which is the claimed “**publisher**.” This is shown in Fig. 1 below and further addressed in detail in Section V.C.2.e.



179. The '704 patent specification describes an “*aggregator*” as “provid[ing] a presentation element to user 1 120 and 2 130.” EX1001 2:44-47, 3:6-18. Cristofalo similarly discloses a *receiving system* 104 which allows a user to “select[] the described programming ... to be received and presented” from among “numerous programming options.” EX1004 ¶ 46. Cristofalo further discloses that those “programming options” can be from different “media object creators 108, broadcasters, local affiliates, and others,” such as “a cable signal ... contain[ing] numerous programming signals (i.e., ABC, CBS, FOX, etc.).” EX1004 ¶¶ 29, 37, 52.

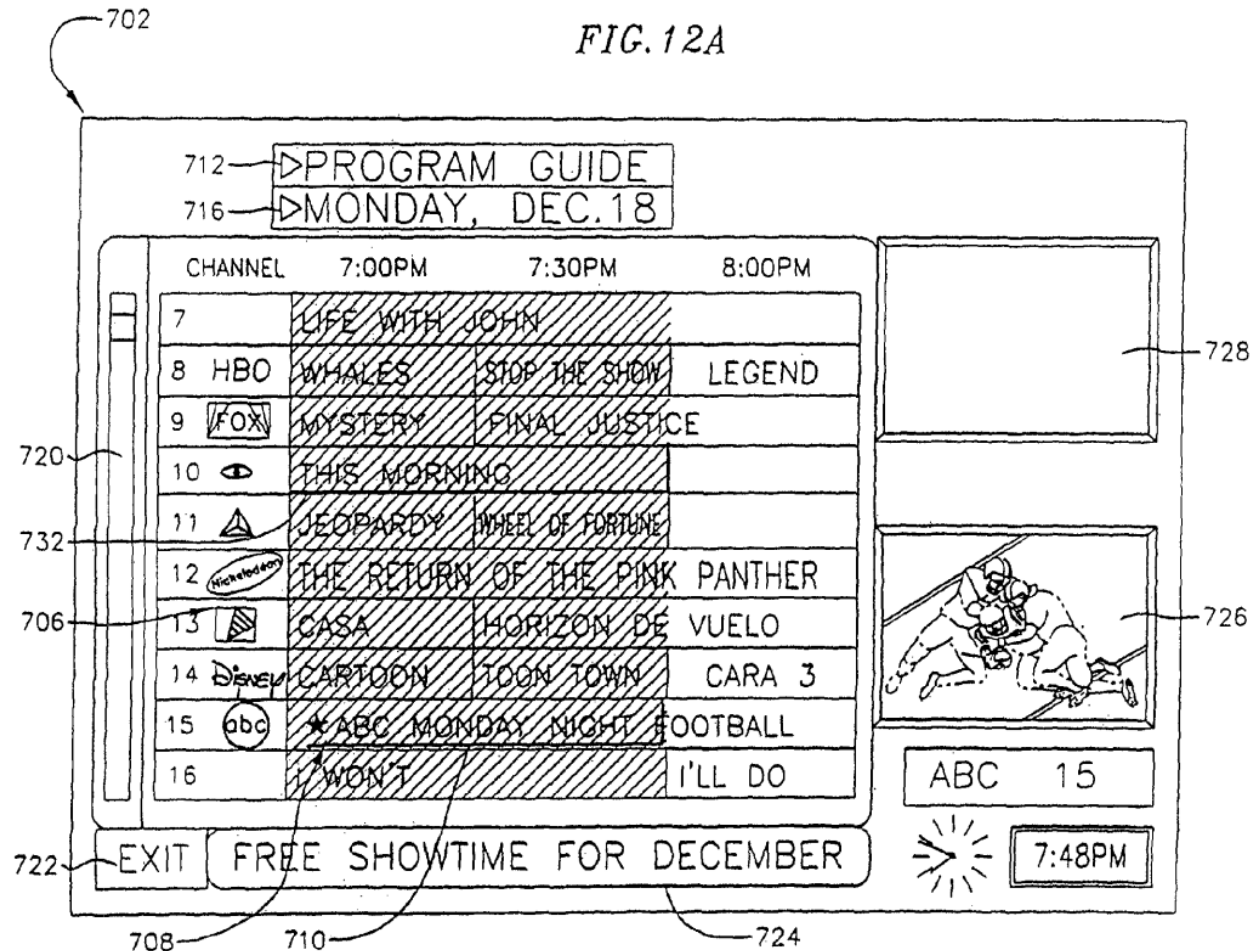
180. Additionally, Cristofalo discloses that **receiving system 104** “may be provided in hardware and/or software formats.” EX1004 ¶ 27. In my opinion, implementing **receiving system 104** in software necessarily requires “*memory*” for storing an executable of that software and a “*processor*” for executing the same.

(c) 19[a][ii] & 19[a][iii]: *the [aggregator] processor adapted for presenting a plurality of media streams to a user [and] receiving a signal having data indicative of a selection of one of the media streams*

181. In my opinion, Cristofalo discloses these elements. For example, Cristofalo discloses the **receiving system 104** presents the user with the programming options (e.g., different broadcast channels) (“*presenting a plurality of media streams to a user*”) so the user is able to “select[] the desired programming” from “numerous programming options.” EX1004 ¶ 46. The system then receives user input corresponding to that selection via a user device 110 (“*receiving a signal having data indicative of a selection of one of the media streams*”). EX1004 ¶¶ 20, 25, 29, 32, 49.

182. Moreover, in my opinion, it would have been obvious to present programming options from different channels (“*a plurality of media streams*”) by implementing Cristofalo’s **receiving system 104** as a program guide, before receiving a user selection of one of those channels. Program guides were a well-known UI format even before the ’704 patent’s priority date for interacting will

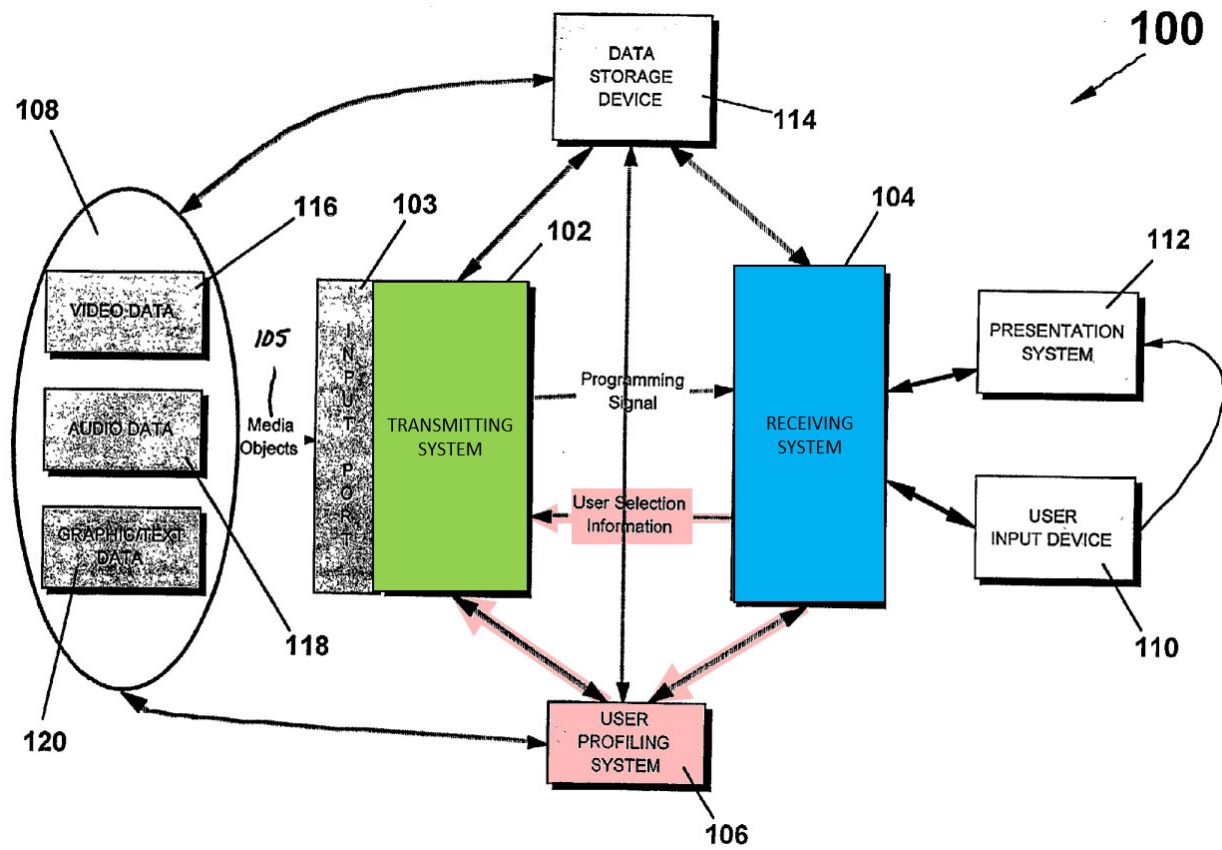
broadcast television sources. One such program guide UI is shown in Figure 12A of U.S. Pat. No. 6,388,714 (EX1013):



183. In my opinion, a POSITA would have been motivated to present users with a UI they were already familiar with while implementing Cristofalo and thus would find it obvious to use a program guide. Using such a well-known system would also ensure there would have been a reasonable expectation that the implementation would be successful.

- (d) 19[a][iv]: *the [aggregator] processor adapted for ... providing an output signal including data indicative of the selection and of user data; and*

184. In my opinion, Cristofalo discloses this element. For example, Cristofalo discloses that its **receiving system 104** provides to its **transmitting system 102** “the user’s choice of programming” (“*output signal including data indicative of the selection*”). EX1004 ¶ 46. This process is also shown in Fig. 1 below (annotated), with the output signal, including the “User Selection Information,” highlighted. Cristofalo further discloses that its **receiving system 104** provides to its **transmitting system 102** information on programs selected by the user and content to receive (“*output signal including data indicative ... of user data*”). A POSITA would therefore have recognized that Cristofalo’s **receiving system 104** provides *user data* in the form of user profile information to the user profiling system 106 that is co-located with **transmitting system 102**. EX1004 ¶¶ 37, 39. Overall, the **transmitting system 102** receives the user profile information (“*user data*”). EX1004 ¶¶ 28, 37-39, 47, 53.



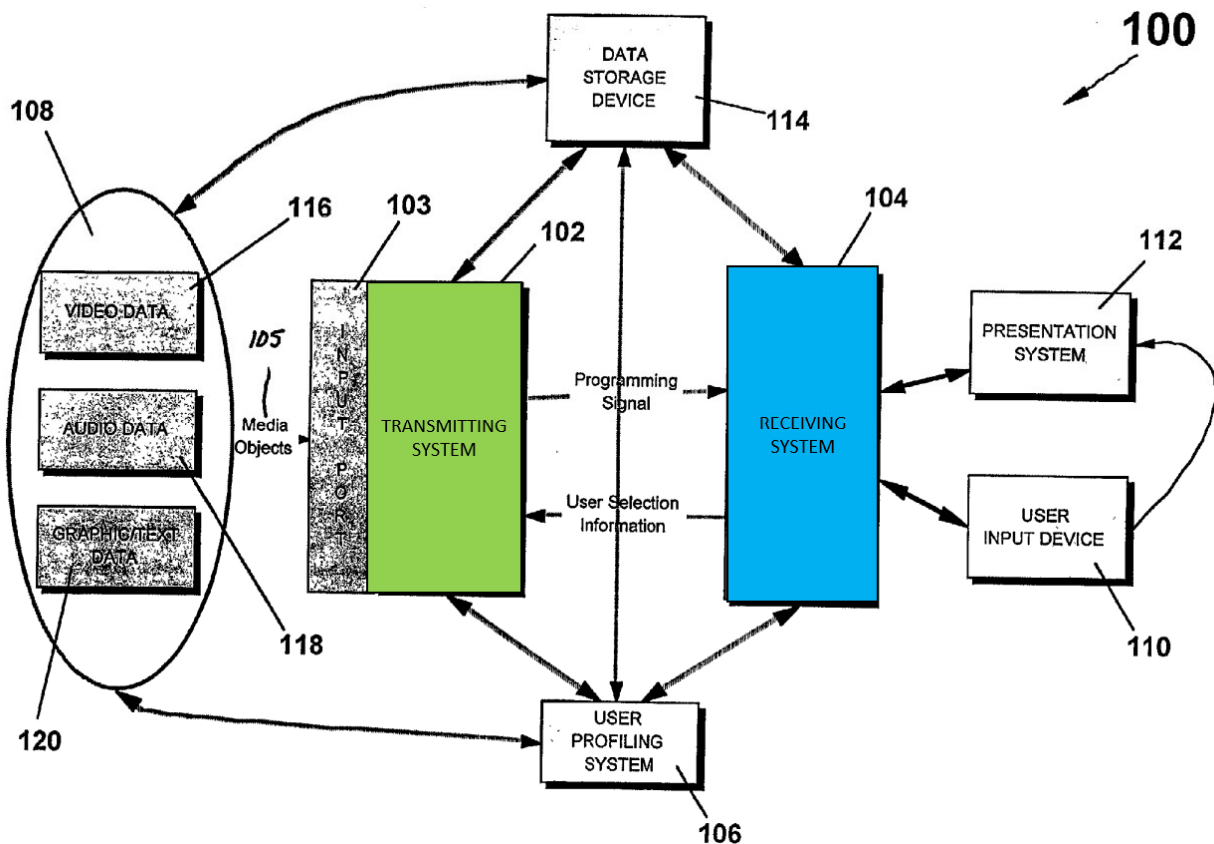
185. As addressed above in Section V.A.1.iii, the '704 patent does not limit the claimed “*output signal*” to any specific format and does not require both the “*data indicative of the selection*” and “*data indicative ... of user data*” to be sent in a single message. Thus, it is my opinion that Cristofalo discloses this claim limitation. Even if the claimed “*output signal*” requires a single message, Cristofalo still renders this limitation obvious.

186. It is my opinion that, for Cristofalo’s **transmitting system 102** to receives some or all relevant information at the same time, a POSITA would have been motivated to combine the user selection and any user profile information

necessary for customizing the programming in a single message. Specifically, to facilitate targeting content based on factors like a location of the user, the message could have contained both the user's choice and the user's geographic information. This would have been especially desirable because the presentation system 112 could be a mobile device, and therefore the user's location could change each time the user watched programming. See EX1004 ¶¶ 24, 35. Furthermore, a need for further processing and delay associated with retrieving or correlating profile information could have been eliminated by receiving all relevant user profile information together with the user's choice. Moreover, as addressed in Section V.A.1.e, there would have been a reasonable expectation of success given the large amount of data that can be transmitted in a single packet or message.

(e) 19[b][i]: *a publisher having a memory and a processor,*

187. In my opinion, Cristofalo discloses this element. Cristofalo's transmitting system 102 is a "publisher." The '704 patent describes the claimed "*publisher*" as a "source[]s of media content." EX1001 at 6:4-16. Cristofalo similarly discloses that its **transmitting system 102** is the source of programming such as media objects for the **receiving system 104** and ultimately for the user. EX1004 ¶¶ 9, 19, 22, 34, 38, 47-48, 54. This is also shown in Fig. 1 (annotated) below, where the **transmitting system 102** sends a "Programming Signal" to the

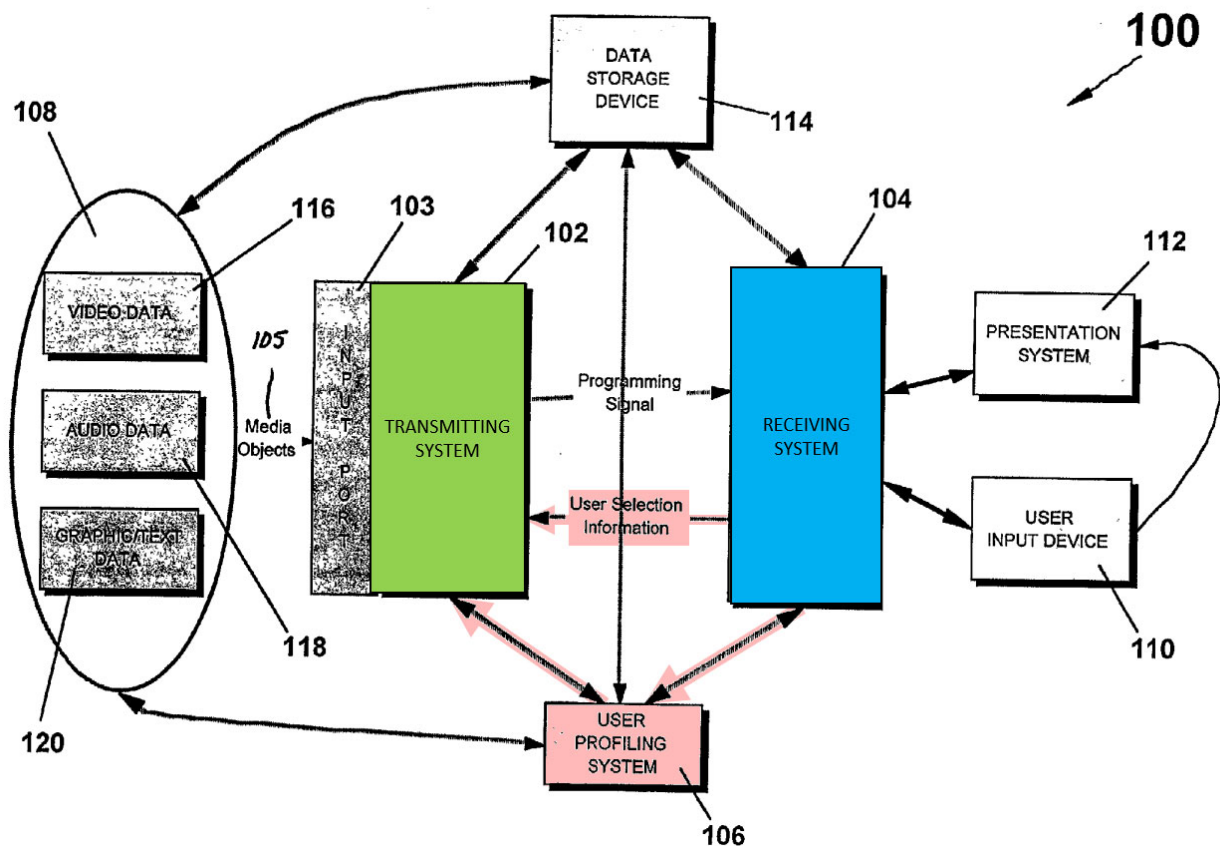


188. Furthermore, Cristofalo specifically discloses that **transmitting system 102** “may include any “medium, system, or device capable of communicating media object oriented content to a user,” such as over “the Internet.” EX1004 ¶ 21. It was well-known as of the priority date of the ’704 patent that communication over the Internet was done by computers, and computers necessarily had “*memory*” storing software instructions to be executed and a “*processor*” for executing the same. At a minimum, implementing **transmitting**

system 102 as a computer with “*memory*” and a “*processor*” would have been the most natural and efficient solution, and thus an obvious implementation.

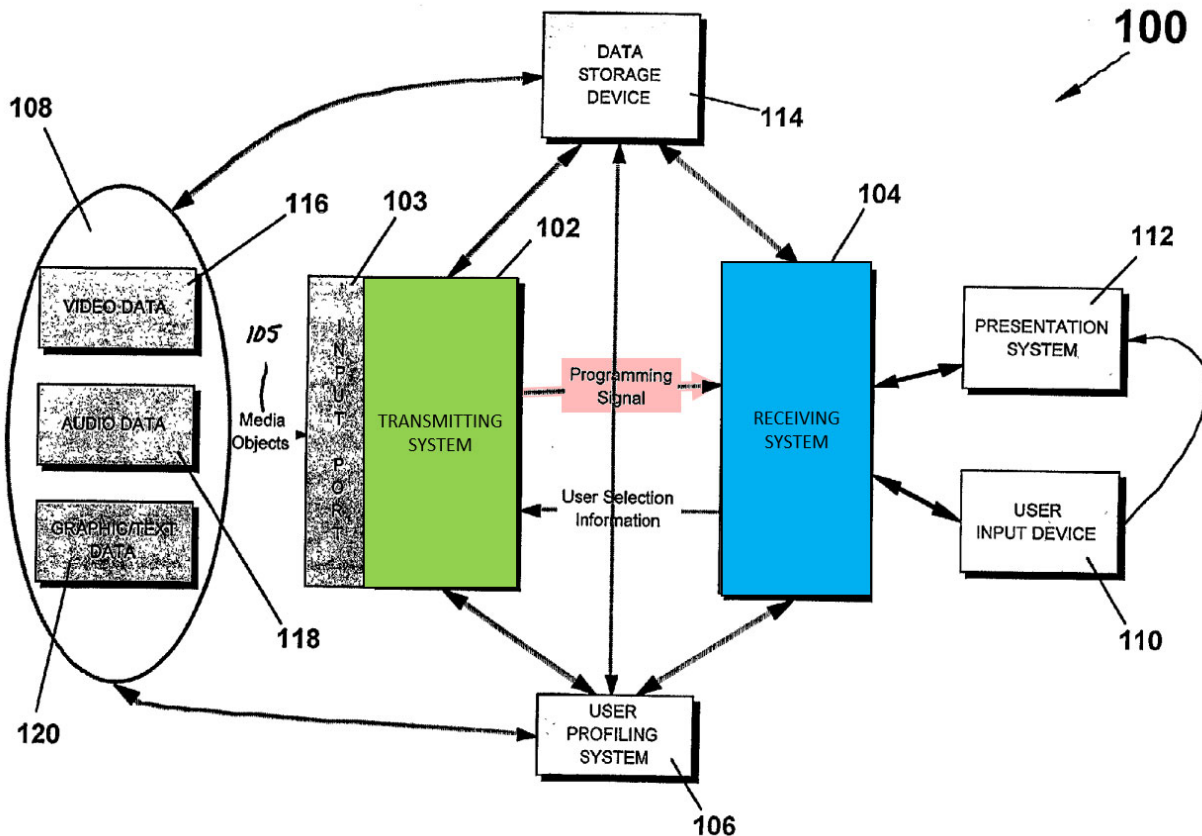
(f) 19[b][ii]: *the publisher processor adapted to receive the output signal from the aggregator, and*

189. In my opinion, Cristofalo discloses this element. As addressed in Section V.C.2.d, Cristofalo’s **transmitting system 102** receives from the **receiving system 104** the user’s choice and user profile information (“*the output signal*”). This is also shown in Fig. 1 (annotated) below, where the “*output signal*” is highlighted.



- (g) 19[b][iii]-[vi]: *the publisher processor adapted to ... , responsive to the data indicative of the selection and of user data, access from the memory at least one algorithm for selection and sequencing of media elements, select a temporal sequence of media programming comprising the selected media stream and other media elements based on an output of the algorithm using the selection and the user data, assemble the selected media stream and the other media elements in the temporal sequence, and provide media programming to the user including the assembled media stream and other media elements in the temporal sequence.*

190. In my opinion, Cristofalo discloses these elements. Cristofalo teaches that, based on the user's choice and user profile information, the **transmitting system 102** generates media programming consisting of media objects ("*access from the memory at least one algorithm for selection and sequencing of media elements*"). Cristofalo further discloses that the **transmitting system 102** also provides that media programming to the user ("*provide media programming to the user*"). EX1004 ¶¶ 9, 19, 22, 34, 38, 47-48, 54. This process is shown in Fig. 1 (annotated) below, where the "programming signal" is highlighted.



191. Furthermore, to the extent that Cristofalo does not provide additional details regarding targeting done by **transmitting system 102**, Marcus '904 provides them by disclosing a receiver 100 which “collects media” from different “media source[s]” and “assembles a program from the collected media.” EX1005 ¶ 30. Marcus '904 states that the receiver “selects media elements from the media streams for inclusion in the programming based upon the user data” and then “arranges the selected data elements into an order based upon the user data” (“*select a temporal sequence of media programming*”). EX1005 ¶ 40. Marcus '904 discloses that the media elements include both “*the selected media stream*” in

the form of a “primary” stream desired by the user as well as “*other media elements*,” including additional media elements such as advertising or other programming. EX1005 ¶ 41-42, 252, 275; *see also* EX1005 ¶¶ 48, 148. These media elements are then assembled in the arranged order (“*assemble the selected media stream and the other media elements in the temporal sequence*”) and the resulting media programming is streamed to the user (“*provide media programming to the user including the assembled media stream and other media elements in the temporal sequence*”). EX1005 ¶¶ 40, 48, 148-49.

192. Additionally, Marcus ’704 incorporates by reference Marcus ’156 EX1005 ¶ 30. The ’704 patent also relies on incorporating by reference that same Marcus ’156 prior art reference for its disclosure of selecting, ordering, and assembling media elements into media programming for a particular user. EX1001 at 1:18-23, 5:40-47, 9:18-28, 9:43-47, 10:12-14. Marcus ’156 provides additional details regarding the selection, ordering, and assembly of media elements into media programming for a particular user. For example, Marcus ’156 discloses a “Editor Program” that “selects and orders” clips (EX1008 at 8:1-9:) and an “Assembly Program” (EX1008 at 9:22-10:8). As a result, Marcus ’904, at least via its incorporation of Marcus ’156, discloses the very same “*algorithm for selection and sequencing of media elements*” and associated steps described and claimed in the ’704 patent by incorporating the same Marcus ’156 prior art patent.

3. **Claim 20:** *The system of claim 19, wherein the aggregator comprises a web server, the aggregator processor being adapted to present a web page listing the media streams for display on a client device.*

193. In my opinion, Cristofalo renders this claim obvious. Cristofalo discloses presentation systems 112 that include “web tablets” and “web phones” and that its **receiving system 104** communicates with the presentation systems 112. EX1004 ¶ 24. In my opinion, a POSITA would be motivated to implement **receiving system 104** as a “*web server*” that displays available programming options as “*web page/s*” to support such “web”-based devices. As addressed in Section V.A.2, this would be the format users of such devices are most familiar with, and would it be readily implementable using existing Internet/web technologies.

4. **Claim 21:** *The system of claim 20, wherein the publisher comprises a web server, and wherein the aggregator processor is adapted to redirect a client device to the publisher web server.*

194. In my opinion, Cristofalo renders this claim obvious. Because Cristofalo’s **transmitting system 102** transmits media objects over “an Internet connection,” in my opinion, A POSITA would be motivated to implement **transmitting system 102** communicating over the Internet as a “*web server*” and to redirect communication to that web server. As addressed in Section V.A.3, this is a format most Internet users would have been familiar with, and it would have

been easy to implement given the ubiquity of these Internet/web technologies even before the '704 patent's priority date.

5. **Claim 22:** *The system of claim 19, wherein in response to the selection, the publisher provides a first media stream having content from concatenated elements of at least second and third media streams, and, in response to a further user selection, provides content preferentially from one of the second and third media streams.*

195. In my opinion, Cristofalo discloses this claim. Cristofalo discloses that the **transmitting system 102** streams media programming to users (“*provides a first media stream*”). EX1004 ¶ 22. In the proposed obviousness combination, this programming concatenates (1) a desired media stream, such as a particular channel (either “*first media stream*” or “*second ... media stream[]*”) with (2) advertising or other programming from other streams (“*third media stream[]*”). See Section V.C.2.g; see also EX1005 ¶¶ 87, 237, 287 (addressing concatenating); EX1008 at 14:13-17 (same). Cristofalo further discloses that a user then interacts with the system to receive segments of the custom program (“*in response to a further user selection, provides content preferentially from one of the second and third media streams*”). EX1004 ¶¶ 52-56.

6. **Claim 23**

196. Claim 23 recites most of the same limitations as claim 19. Cristofalo and Marcus '904 thus also render obvious the corresponding limitations in claim

23 for the same reasons given above in the context of claim 19. There are only two differences between the two claims.

197. First, claim 23 is directed to a method, where claim 19 is directed to a system. Cristofalo, however, discloses both methods and systems. EX1004 at Abstract.

198. Second, claim 23 requires “*concatenate[ing]*,” whereas claim 19 is directed to “*assembl[ing]*.” This “*concatenate[ing]*” is disclosed by Marcus ’904. EX1005 ¶¶ 87, 237, 287; *see also* EX1008 at 14:13-17.

7. **Claim 24:** *The method of claim 23, further comprising receiving a second media stream, and wherein the step of providing media programming comprises switching at least between the selected media stream and the second media stream in accordance with the temporal sequence.*

199. In my opinion, Cristofalo discloses this claim. In the proposed obviousness combination, the programming provided to the user consists of (1) a desired media stream, such as a particular channel (“*selected media stream*”) and (2) advertising or other programming from other streams (“*second media stream*”). *See* Section V.C.2.g. Marcus ’904 further discloses that these media streams are assembled by switching between them according to the determined selection and order of media elements (“*switching at least between the selected media stream and the second media stream in accordance with the temporal sequence*”). EX1005 ¶¶ 250-252, 301, 641.

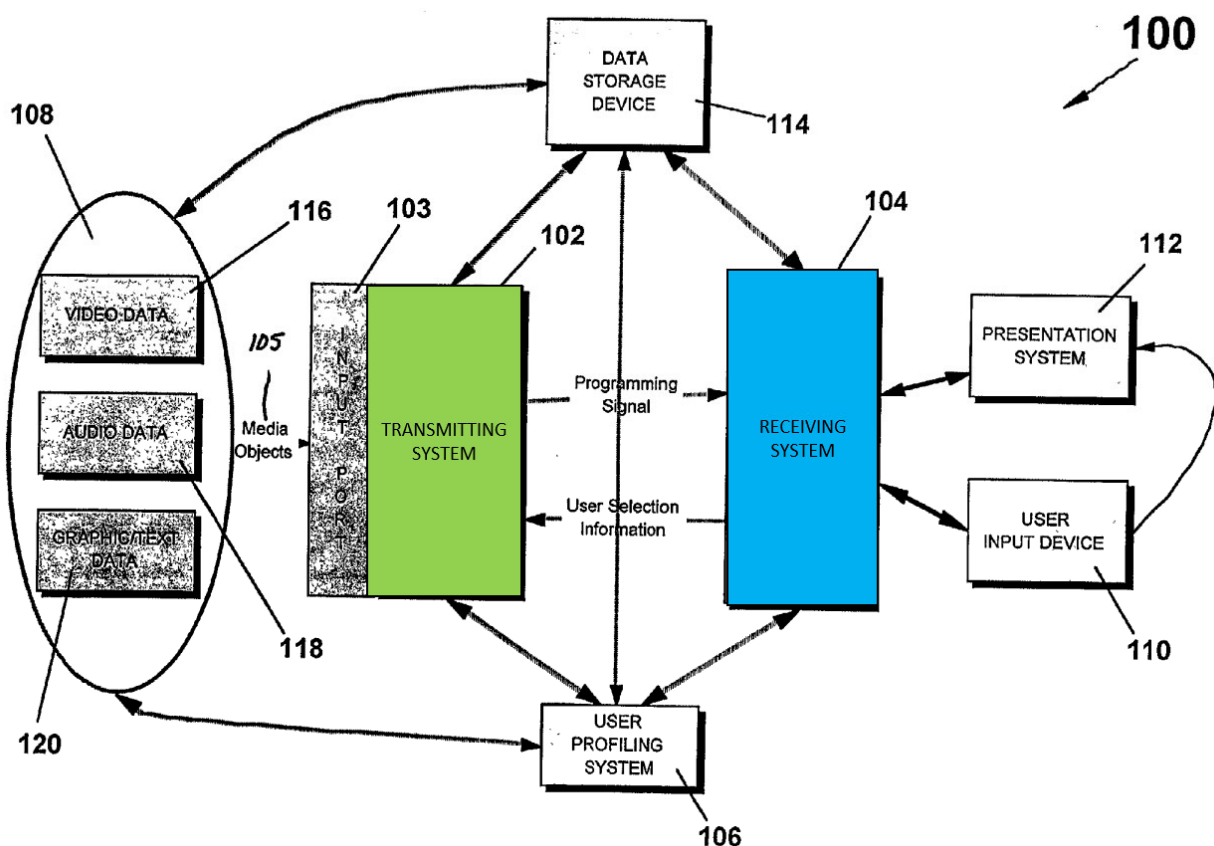
8. Claim 1

(a) 1[pre]: *A method of generating media programming for display on a client, comprising:*

200. As addressed in Sections V.C.2.a and V.C.6 above, it is my opinion that Cristofalo discloses this preamble.

(b) 1[a]: *receiving by an aggregator data relating to a plurality of media streams,*

201. In my opinion, Cristofalo discloses this element. As addressed in Section V.C.2, Cristofalo discloses a **receiving system 104**, which is an “**aggregator**.”



202. Cristofalo further discloses that its **receiving system 104** receives “user identifiers” (“*data*”) relating to received media objects, which (when combined with Marcus ’904) are “*media streams*.” EX1004 ¶ 48; *see also* Section V.C.2.c, g. Marcus ’904 similarly describes that receiving tags (“*data*”) related to media streams (EX1005 ¶ 34), confirming that the combination of implementing Marcus ’904’s selecting, ordering, and assembling at Cristofalo’s **receiving system 104** meets this limitation.

- (c) **1[b] – 1[e]: *accessing by the aggregator user information; based on the user information and the data related to the plurality of media streams, determining by the aggregator a temporal sequence of media programming comprising the media streams; accessing by the aggregator over a network the plurality of media streams; and providing by the aggregator to the client media programming in the determined temporal sequence, the media programming comprising concatenated elements of the plurality of media streams.***

203. In my opinion, Cristofalo discloses these elements. Cristofalo’s **receiving system 104** access user profile information and, based on that user information and user identifiers, generates custom media programming that is provided to presentation system 112 (“*client*”). EX1004 ¶¶ 24, 36, 38-41, 47-49. When Cristofalo’s **receiving system 104** is further combined with Marcus ’904’s selection, ordering, and assembly algorithm, the combination renders obvious “*accessing by the aggregator user information*”; “*based on the user information*

and the data related to the plurality of media streams, determining by the aggregator a temporal sequence of media programming comprising the media streams”; “providing by the aggregator to the client media programming in the determined temporal sequence, the media programming comprising concatenated elements of the plurality of media streams.” See Section V.C.2.f-g; see also EX1005 ¶¶ 87, 237, 287 (addressing concatenating); EX1008 at 14:13-17 (same).

204. In addition, Cristofalo’s **receiving system 104** receives media objects (which when enhanced by Marcus ’904 are the claimed “*the plurality of media streams*”) over the Internet (“*network*”). EX1004 ¶¶ 21-22. Marcus ’904 similarly discloses accessing those media streams over the Internet (“*a network*”). EX1005 ¶ 17.

9. Claim 2: *The method of claim 1, wherein the aggregator comprises a web server.*

205. In my opinion, Cristofalo discloses this claim. As addressed in Section V.C.3, Cristofalo discloses that its **receiving system 104** can be implemented as a “*web server*.”

10. Claim 3: *The method of claim 1, wherein the aggregator comprises software stored in a client memory device and adapted to be executed on a client processor.*

206. In my opinion, Cristofalo discloses this claim. As addressed in Sections V.C.2.d and V.C.2.e, Cristofalo discloses that its **receiving system 104** is

a client relative to at least the **transmitting system 102**, thereby rendering its memory a “*client memory device*” and its processor a “*client processor*.”

11. Claim 4: *The method of claim 1, wherein the aggregator comprises an electronic program guide.*

207. As addressed in Section V.C.2.c, in my opinion, Cristofalo renders obvious having its **receiving system 104** present the user with the programming options in the context of “*an electronic program guide*.”

12. Claim 5: *The method of claim 1, wherein the user information comprises past usage information of the user.*

208. In my opinion, Cristofalo discloses this claim. Cristofalo discloses that its user profile information (“*user information*”) includes information on programs the user selected and content received (“*past usage information of the user*”). EX1004 ¶ 39.

13. Claim 6: *The method of claim 1, wherein the media programming comprises a video feed.*

209. In my opinion, Cristofalo discloses this claim. Cristofalo discloses that its media programming may include a video feed. EX1004 ¶ 22, 44.

14. Claim 7: *The method of claim 1, wherein the step of providing the media programming comprises providing from a web server via a network to the client the media programming.*

210. In my opinion, Cristofalo discloses this claim or at least renders it obvious. As addressed in Sections V.C.4, Cristofalo renders obvious that its **receiving system 104** can be implemented as a “*web server*” providing custom

media programming to “web phones” or “web tablets” over the Internet (“*via a network*”).

15. Claim 8: *The method of claim 1, wherein the step of providing the media programming comprises providing the media programming on a television channel.*

211. In my opinion, Cristofalo discloses this claim. Cristofalo discloses that its presentation system 112 (“*client*”) includes “television receivers” and that media programming is received as “channels” and “sub-channels” (“*television channel*”). EX1004 ¶¶ 24, 29.

16. Claim 9: *The method of claim 1, wherein the media programming is provided through at least one of an XML feed, an RSS feed, Atom feed, and a podcast.*

212. In my opinion, Cristofalo renders this claim obvious. Cristofalo discloses that its media programming can be audio programming. EX1004 ¶¶ 27. At the time of the ’704 patent’s priority date, one type of audio programming that was growing in popularity, and that would have been obvious to use, was “*podcast[s]*.” See Section V.A.15. Cristofalo also renders obvious other well-known transmission formats, such as an XML, RSS, and Atom. See *id.*

17. **Claim 10:** *The method of claim 1, further comprising providing by the aggregator a presentation element for presenting data indicative of a plurality of media streams to the user, and, responsive to a user selection of one of the presented media streams, providing by the aggregator the selected media stream in the media programming.*

213. In my opinion, the combination of Cristofalo and Marcus '904 renders this claim obvious for at least the reasons identified above in connection with the *“presenting a plurality of media streams to a user,” “receiving a signal having data indicative of a selection of one of the media streams,”* and *“provide media programming to the user including the [selected and] assembled media stream and other media elements in the temporal sequence”* limitations of claim 19. See Section V.C.2.c, g, Section V.C.8.c.

18. **Claim 11:** *The method of claim 10, further comprising, in response to user highlighting of one of the displayed media streams, displaying by the aggregator the highlighted media stream on a user display together with a list of media streams.*

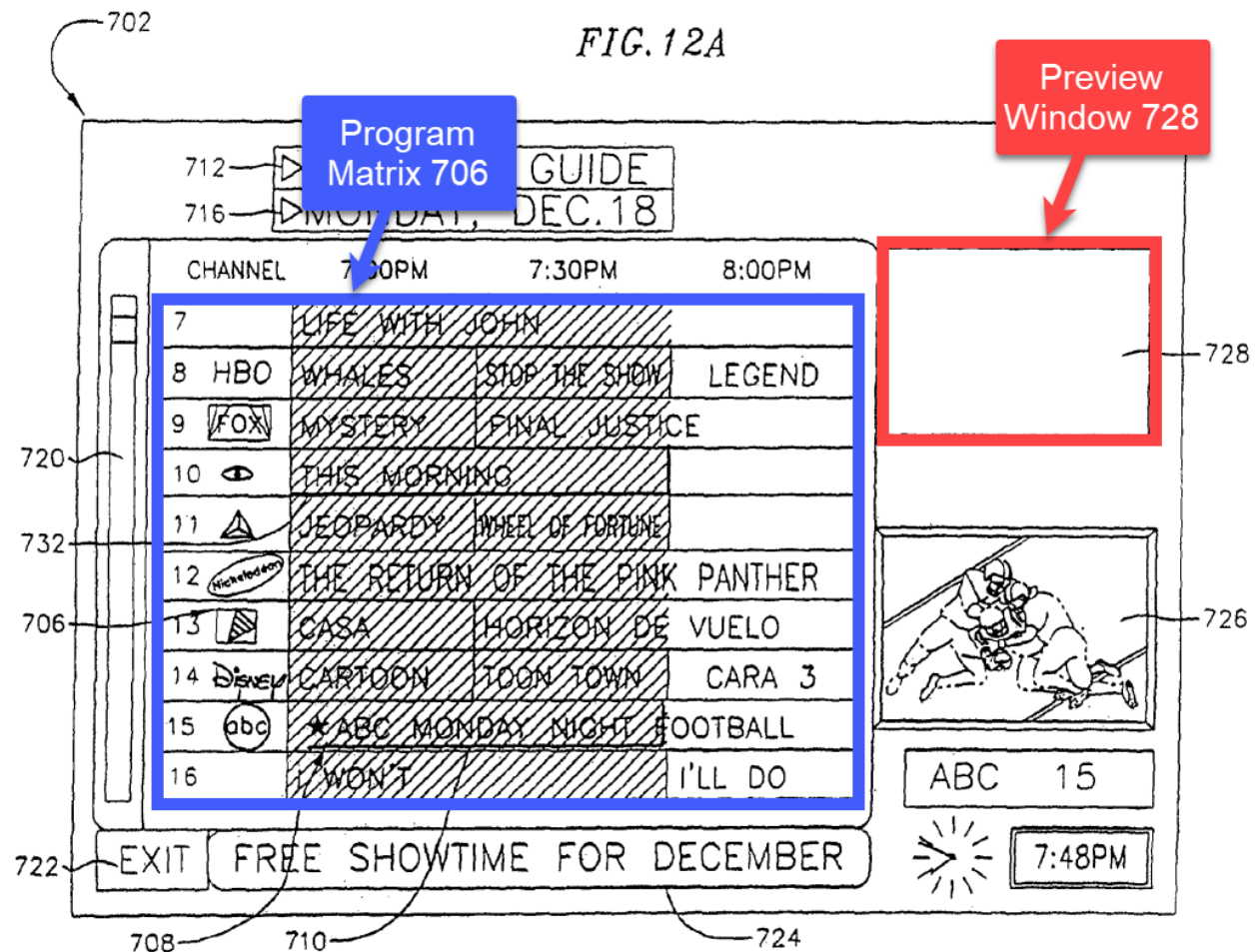
214. Cristofalo is silent as to how its user interface is configured, but, in my opinion, it would have been obvious to use a user interface configuration (such as a program guide) that both the developer and user would have been familiar with. See Section V.C.2.c. It was well-known as of the priority date of the '704 patent that such a program guide interface allowed the user to highlight a channel (*“one of the displayed media stream”*) and then displayed a preview for a highlighted channel (*“the highlighted media stream”*) alongside programming

information (“*a list of media streams*”). This is shown, for example, by U.S. Pat.

No. 6,388,714 (filed April 11, 1997, issued May 14, 2002, § 102(b) art). *See*

Section V.A.17; EX1013 at Fig. 12A (annotated below);17:41-44, 18:11-17, Fig.

1:



19. **Claim 12:** *The method of claim 11, wherein the user information includes the identity of a media element playing on the displayed highlighted media stream prior to the receipt of the user selection.*

215. In my opinion, Cristofalo discloses this claim. Cristofalo teaches that its user profile information tracks when “the user selects programs and content to

receive.” EX1004 ¶ 39. When Cristofalo is implemented using a program guide interface, this user profile information would have obviously included information on channels highlighted by the user and content received as a preview (“*identity of a media element playing on the displayed highlighted media stream prior to the receipt of the user selection*”). Tracking details regarding a user’s interactions with a program guide and the benefits of doing so were well known in the art. EX1006 at 28:11-30:45. A POSITA would have been motivated to capture information about a user’s interactions with the program guide in order to glean further insights into the user’s interests. For example, the system could have tracked channels highlighted for longer periods of time as an indication of user interest. And given the availability of this software technology, a POSITA would have had a reasonable expectation of success.

20. **Claim 13:** *The method of claim 10, further comprising, in response to the received selection, providing predetermined media programming during a first time period, and providing media programming responsive to the user information in a second time period after the first time period.*

216. In the proposed combination of Cristofalo and Marcus ’904, the generated media programming consists of a desired program selected by the user from available media programming (“*predetermined media programming*”) and other data elements inserted in response to the user profile information (“*media programming responsive to the user information*”). See Section V.C.2.g. In this

combination, the desired program plays initially (“*during a first time period*”), and the other media elements only play once they are reached (“*a second time period after the first time period*”).

21. **Claim 14:** *The method of claim 1, wherein the data related to the plurality of media streams comprises categorizing data associated with media elements of the media streams indicative of subjectively determined character of the media elements.*

217. Marcus ’904 discloses that “Macro-tags containing the defining tagging characteristics of the show are ... created in advance of the airing.”

EX1005 ¶ 321. Thus, as addressed in Section V.A.20, the received tags (“*data related to the plurality of media streams*”) include media “*characteristics*,” and such “*characteristics*” are obviously “*subjective*” since at the time of the ’704 patent’s priority date, it was easier and more accurate to have a human user identify media “*characteristics*.”

22. **Claim 15:** *The method of claim 14, wherein the user information comprises viewing history, user preference data and search queries.*

218. The combination of Cristofalo and Marcus ’904 renders obvious that the user profile information includes “*viewing history, user preference data and search queries*.” EX1004 ¶¶ 32, 34, 39, 48, claim 2; EX1008 at 9:9-14; EX1005 ¶ 669. It is my opinion that the combination renders obvious generating a user profile based on these different categories of user information. Each of these categories of information was disclosed in either Cristofalo or Marcus ’904, and

tracking these categories of information as part of the user profile information would have further improved targeting, since more information would have allowed a profile to be more specific and therefore would have enabled better content targeting.

23. ***Claim 16: The method of claim 14, further comprising deriving by the aggregator keywords from the media streams, deriving by the aggregator from the derived keywords further keywords from a map of synonyms, and employing the further derived keywords in determining the temporal sequence.***

219. Marcus '904 discloses “clip-specific tags” that are “swiftly added” by its algorithm. EX1005 ¶¶ 39, 321. Moreover, it would have been obvious for those “clip-specific tags” to be “***keywords,***” and further to then “***derive[] additional keywords from a map of synonyms.***” Systems for deriving keywords (and then deriving additional keywords therefrom based on a thesaurus database) were well known in the art, and those systems also used “thesaurus database[s]” to further expand the range of relevant keywords. EX1014 at 3:11-4:8; Section V.A.22. A POSITA would have been motivated to implement such a system as part of Cristofalo’s **receiving system 104** to derive clip-specific tags, including keywords, and further “synonym” keywords to allow the system to generate its own keywords/synonyms. *See* Section V.A.22.

24. **Claim 17:** *The method of claim 1, wherein at least one of the media streams comprises media elements having labels indicative of payment due from an advertiser and payment due to a content provider.*

220. Cristofalo discloses targeting media objects in the form of advertising.

EX1004 ¶ 38. Marcus '904 further discloses that payment information (such as royalties due for streaming content) can be tracked via “headers” (“*labels*”) included with media content. EX1004 ¶¶ 464, 469, 520, 547-575, 580, 582. For example, these “headers” (“*labels*”) may indicate an advertiser’s “willingness, or contractual commitment, to underwrite the delivery and/or creation of all or part of the value-item” (“*indicative of payment due from an advertiser*”) or “the relative royalties each creator will receive from the anticipated download of the item” (“*payment due to a content provider*”). EX1004 ¶¶ 520, 582. Incorporating headers in this manner would have been obvious because doing so would have simplified the process of settling money to be exchanged between the various entities involved and would have been as simple as adding an additional data field or header to an existing database or data structure. *See* Section V.A.23.

- 25. Claim 18: *The method of claim 1, further comprising caching by the aggregator the media streams prior to providing the elements in the media programming, whereby switching between streams at optimal times is facilitated.***

221. In my opinion, Cristofalo combined with Marcus '905 renders obvious generating the custom media programming by caching media streams and switching between streams. EX1005 ¶¶ 250-252, 301, 641.

VI. No Secondary Considerations of Non-Obviousness

222. I understand that so-called “secondary considerations” are legally relevant to an obviousness analysis. It is my opinion that the secondary considerations I considered here further weigh in favor of obviousness. In any event, secondary considerations cannot overcome the strong showing of obviousness. First, as addressed above in Section IV.A-B, market trends incentivized development work into generating custom media programming for specific users and resulted in simultaneous development by multiple entities. Second, PO alleges in its complaint that its product, “StimTV” was launched in 2005 and won an award in 2007 but without alleging that such product practiced the '704 patent. EX1011 ¶ 12. Given that StimTV was allegedly released more than a year before the '704 patent's effective filing date, PO seemingly never deemed the '704 patent sufficiently valuable or innovative to practice the claims. And even if PO did release any product practicing the '704 patent, I understand

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Decl. of Dr. Kevin Almeroth

that PO ceased operations at some point in time, evidencing a lack of success for any product practicing the '704 patent.

VII. Conclusion

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

* * *

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

Respectfully submitted,

Date: August 23, 2024



Kevin C. Almeroth, Ph.D.