UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROKU, INC.
Petitioner

v.

ANONYMOUS MEDIA RESEARCH HOLDINGS, LLC.
Patent Owner

Case IPR2024-01053
U.S. Patent 8,296,791

Case IPR2024-01056
U.S. Patent 10,572,896

DECLARATION OF W. LEO HOARTY

AMR EX. 2001
ROKU v AMR
IPR2024-01053

TABLE OF CONTENTS

I. INTRODUCTION 4

II. BACKGROUND AND QUALIFICATIONS 4

III. LEGAL STANDARDS 8

A. Patentability 8

B. Prior Art 13

C. Inherency 14

D. Person of Ordinary Skill In The Art 14

E. Claim Construction 16

IV. BASES FOR OPINIONS 17

V. LEVEL OF ORDINARY SKILL IN THE ART 18

VI. OPINIONS ON CLAIM CONSTRUCTION 19

A. content identification results corresponding to a sequence of submitted data samples 20

B. play lists and play streams 28

VII. OPINIONS ON PATENTABILITY OF THE CHALLENGED CLAIMS 35

A. Ground 1 35

1. Independent Claims 1 and 9 35

a. Claim Elements [1.1], [1.3], [9.1], [9.3] 38

b. Claim Elements [1.5], [9.6] 42

2. Claim 3 46

3. Claim 4 48

4. Claims 5 and 6 51

B. Ground 2 54

1. Whether the combination of Ramaswamy and Conklin would have been obvious. 54

2. Independent Claims 1 and 9 60

a. Claim Elements [1.1], [9.1] 60

b. Claim Elements [1.2], [9.2] 62

c. Claim Elements [1.4], [9.5] 68

d. Claim Elements [1.5], [9.6] 69

3. Claim 2 79

4. Claim 3 81

5. Claim 4 83

6. Claim 7 86

7. Claims 12, 13 ('896 Patent) 87

C. Ground 3 88

1. Whether the combination of Feininger and Conklin would have been obvious. 88

2. Claims 2, 7 (both Challenged Patents) and Claims 12, 13 ('896 Patent) 89

VIII. CONCLUSION 90

I. INTRODUCTION

1. My name is William Leo Hoarty. I have been retained as a technical expert by Anonymous Media Research Holdings ("Patent Owner") and asked to provide my objective and unbiased opinions concerning U.S. Patent No. 8,296,791 ("the '791 Patent") and U.S. Patent No. 10,572,896 ("the '896 Patent") (collectively, the "Challenged Patents"). Specifically, I have been asked to provide my opinions on the patentability of the challenged claims of each of the Challenged Patents in view of the grounds advanced in the pending Petitions for *Inter Partes* Review of these patents (IPR2024-01053, IPR2024-01056), the state of the art at the time of the claimed inventions, and the knowledge of a person of ordinary skill in the art at the time of the claimed inventions.

2. I understand that this declaration will be filed as an exhibit to the Patent Owner's Preliminary Response in each of the referenced IPR proceedings.

II. BACKGROUND AND QUALIFICATIONS

3. In forming the opinions expressed in this Declaration, I have considered and relied upon my education, background, and experience. In addition, I have reviewed and relied upon additional materials in preparation of this Declaration, as described herein.

4. I am currently the Principal of WLH Consulting LLC. My curriculum vitae is being provided as Ex. 2002 in the referenced IPR proceedings. I studied

electronic engineering and computer science at the Ohio State University for two years.

5. I am the founder of six technology startups over the last 30 years. While creating new technology companies over the preceding 30 years, I have raised over $600M of investment capital from the top venture capital firms as well as from top technology companies such as IBM, Intel, Cisco, Samsung, among others. The companies that I founded have created jobs for thousands of technology workers.

6. Most of my work has focused on developing set-top technology and digital advertising support systems. Relevant to this matter, an interactive cable television technology company, called ICTV Inc., was founded by me in 1990, and renamed ActiveVideo Networks (AVN) in 2003. The company developed video-on-demand (VOD) as well as virtual cable TV set-top cloud-based systems to deliver video as well as interactive program guide over managed (cable TV) and unmanaged (Internet) networks. My understanding is that AVN is currently providing service to 24 million cable TV set-top boxes in households serviced by Charter and TimeWarner systems throughout the U.S.

7. I founded the Dotcast company in 1999 and served as President and CTO. The company developed a set-top box and service, called MovieBeam, that received both over-the-air (OTA) and broadband (Internet) delivery of feature films stored on an internal hard drive in the set-top box. Movies were delivered slower

than real-time on a 24/7 schedule (trickle filled cache). Metadata about each movie was stored in the file header on the internal hard drive. This information included the usual fields of title, actors, director, and importantly, the rating. The set-top featured parental controls that would not play R-rated films without a password, among other useful controls. Consumers selected programming from an internal user interface guide and purchased movies for rental under similar rules as Blockbuster. Service was live from 2004 to 2007 in the top 50 television markets (DMAs) in the U.S. and was backed by all nine movie studios, led by the Walt Disney Company.

8. In 2015, I was granted a patent for an audio-based automated content recognition (ACR) system and sold it to Vizio, Inc. I was then contracted by the company to assemble a software development team and create the system based on the patent that would run in a smart TV generating fingerprints from TV audio and sending the fingerprints to a cloud-based server system. I also wrote much of server-side software that receives the streaming fingerprints in real-time from the TVs and identifies content currently playing. The Vizio ACR technology is currently running inside of over 20 million smart TVs and is widely used in the television industry for precision daily audience measurement. In some services provided by Vizio using the ACR technology, media related to currently playing programing is returned to the smart TV for display of supplemental information and for targeted advertising.

9. In 2018, I developed and patented a novel technology for video watermarking which places invisible data into the video signal for identification of the video segment. Under contract, I helped develop the software for a dynamic ad insertion system using the video watermarks. The technology is currently in use by major broadcast networks under the name Project OAR. Client software runs on smart TVs that detect and decode video watermarks and then communicates over the Internet to Content Delivery Network (CDN) servers to download a specific TV ad to substitute for the existing ad based on certain combinations of zip code, demographic profiles, and time of day. Ad swapping actions occur in less than a tenth of a second. Information about the ad, including whether the ad was viewed in its entirety, or whether the person switched the channel, is passed back to the advertiser.

10. Additional technology I developed and patented for Vizio includes a TV ad attribution system using what is colloquially known as "tracking pixels." The technology allows third-party verification of individual TVs displaying specific TV ads, a service of high value to advertisers.

11. Throughout my career I have received a variety of awards including, for example, the National Cable Television Association (NTSC)—Best New Technology 1996 for ICTV's interactive TV and VOD service; Consumer Electronics Society (CES)—Best of Show in 2005 and 2006 for the MovieBeam set-

top and service; 2023 Emmy Award went to Vizio, Inc for their precision audience measurement service which utilizes my patented audio automated content recognition (ACR) technology for high-resolution monitoring of household TV viewing.

12. I am an inventor on dozens of patents (as listed in my CV) and my patent portfolio has been extensively cited by over a hundred third-party patents. My past work has been cited in many technology articles on cable television as well as on consumer electronics.

13. I have no financial interest in Patent Owner or the ’791 Patent. I am being compensated for my time spent in connection with these proceedings at my standard hourly rate. I am also being reimbursed for reasonable expenses, such as travel expenses. My compensation is not contingent on my opinions, on the outcome of any matter, or on any of the technical positions I explain in this declaration.

III. LEGAL STANDARDS

14. I am not an attorney. For purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my opinions, as set forth below.

A. Patentability

15. I understand that for an invention claimed in a patent to be valid and patentable, it must be, among other things, new and not obvious in light of what was

known and came before it. That which was known or came before the invention claimed is generally referred to as "prior art."

16. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to "anticipate" the claim. Second, the prior art can show that the claim was obvious to a person of ordinary skill in the field of the invention at the time the invention was made.

17. I understand that, for a patent claim to be "anticipated" by the prior art, each and every element or requirement of the claim must be found, expressly or inherently, in a single prior art reference. Further, I understand that anticipation requires that the single prior art reference must disclose the elements of the claim arranged or combined in the same way as in the claim.

18. It is my understanding that whether a claimed invention is obvious is a question of law, with underlying factual inquiries that are determined from the perspective of a person of ordinary skill in the art at the time of the claimed invention.

19. It is my understanding that a claimed invention is obvious if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art (a "POSA").

20. It is my understanding that obviousness requires consideration of the following underlying factual inquiries:

- determining the scope and content of the prior art
- ascertaining the differences between the claimed invention and the prior art;
- resolving the level of ordinary skill in the art; and
- evaluating objective evidence or "secondary considerations" of non-obviousness, such as commercial success, long-felt but unresolved needs, failure of others, industry praise, and unexpected results.

21. It is my understanding that a reference must be analogous art to the claimed invention in order to be properly considered for use in an obviousness inquiry. It is my understanding that a reference is analogous art to the claimed invention if:

- the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or
- the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention).

22. It is my understanding that whether a reference is reasonably pertinent turns on how the problem faced by the inventor is reflected, either explicitly or implicitly, in the specification.

23. It is my understanding that the following are exemplary rationales that may support a conclusion of obviousness:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known techniques to improve a similar method or product in the same way;
- Applying a known technique to a known method or product ready for improvement to yield predictable results;
- Obvious to try – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

24. In addition to the above, I understand that a person of ordinary skill in the art may resort to logic, judgment and common sense available to him or her at the time of the invention to find a claim feature obvious, even if the prior art relied

on does not explicitly state or teach that feature. I understand that when common sense is relied on to find a feature obvious, the reasoning for that conclusion must be articulated with sufficient clarity.

25. I also understand that a patent claim is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. An obviousness determination requires finding both that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so. I understand that it is important to be careful not to allow hindsight reconstruction of references to produce the claimed invention, without any explanation as to how or why the references would be combined to produce the claimed invention.

26. Regarding "objective evidence" or "secondary considerations," I understand that for such evidence to be relevant to the obviousness of a claim, there must be a causal relationship (called a "nexus") between the claim and the evidence. I also understand that such objective evidence may include: commercial success of products covered by the patent claims; long-felt need for the invention; failed attempts by others to solve the problem addressed by the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention; the taking of licenses under the patent by others; expressions of

surprise by experts and those skilled in the art at the making or use of the invention; and that the patentee proceeded contrary to the accepted wisdom of the prior art.

27. I understand that a person of ordinary skill is also a person of ordinary creativity. I further understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take into account "ordinary innovation" that does no more than yield predictable results, which are inferences and creative steps that a person of ordinary skill in the art would be understood to employ.

28. I understand that sometimes it will be necessary to look to interrelated teachings of multiple patents and publications; the effects of demands known to the relevant field or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art. I understand that all these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

B. Prior Art

29. I understand that for purposes of this proceeding, prior art includes patents and printed publications in or outside the United States before the effective filing date of the claimed invention. I also understand that prior art includes U.S. patents, published U.S. patent applications, and published international applications (pursuant to the Patent Cooperation Treaty) that themselves have an effective filing

date before the effective filing date of the claimed invention, as long as they name another inventor.

C. Inherency

30. I understand that if a prior art reference does not expressly set forth a particular claim element, the prior art may still disclose that element if it is "inherent" in its disclosure. To establish inherency, it is my understanding that evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference. It is my understanding that inherency may not be established by probabilities or possibilities. In other words, it is my understanding that the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.

31. I understand that under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform a claimed method, then the method will be considered to be anticipated by the prior art device. I also understand that when the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process.

D. Person of Ordinary Skill In The Art

32. I understand that "a person of ordinary skill in the art" or POSA is a hypothetical person who is presumed to have known the relevant art at the time of

the invention. Such a person would necessarily have the capability of understanding any scientific and engineering principles applicable to the pertinent art.

33. I understand that factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the following:

a. the educational level of the inventor;

b. the type of problems encountered in the art;

c. prior art solutions to those problems;

d. the rapidity with which innovations are made;

e. the sophistication of the technology; and

f. the educational level of active workers in the field.

34. I understand that a person of ordinary skill in the art is not a real person, but rather is a hypothetical individual having the qualities reflected by the factors above. This hypothetical person has knowledge of all prior art in the relevant field as if it were arranged on a workshop wall and takes from each reference what it would teach to a person of ordinary skill in the art.

35. I understand that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton. In many cases a person of ordinary skill will be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

36. I understand that a person of ordinary skill in the art can collaborate with one or more other persons of ordinary skill in the art for one or more aspects with which the other person may have superior expertise, experience, and/or knowledge.

E. Claim Construction

37. It is my understanding that claim construction, or the interpretation of the claims of a patent, is ultimately a question of law. I have been informed that claim terms are generally presumed to carry their ordinary and customary meaning. However, I understand that a patent applicant is his own lexicographer and is entitled to provide alternate definitions of words in common usage, but if the patent applicant uses a term that is in common usage without providing an alternate definition, then that term should generally be understood as having its common meaning.

38. I understand that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent specification and the "file history" of the patent developed during examination by the Patent Office.

39. I understand that the claims, the specification, and the file history are referred to as "intrinsic evidence," and are to be read as a person of ordinary skill in the art at the time of the invention would have done at the time of the alleged invention.

40. In addition to the intrinsic evidence, I understand that the court or tribunal may also consider other relevant evidence, which is called "extrinsic evidence," concerning relevant scientific principles, the meaning of technical terms, and the state of the art. Such evidence includes the testimony of qualified expert witnesses. Although extrinsic evidence may be used to resolve ambiguities that may exist after reviewing the intrinsic evidence, I understand that extrinsic evidence cannot be used to contradict a claim construction that is clear from the intrinsic evidence.

41. I understand that some claims are independent, and that those independent claims are complete by themselves. Other claims refer to these independent claims, or other dependent claims, and are "dependent" on those claims. The dependent claims include all of the limitations of the claims on which they depend.

IV. BASES FOR OPINIONS

42. The opinions set forth in this Declaration are my own. In forming the opinions herein, I have considered the exhibits to the Petitions for *Inter Partes Review* filed in the IPR proceedings referenced above, as well as the additional materials cited in this Declaration (including the exhibits to the Patent Owner's Preliminary Response cited herein), and my education, training, and experience.

43. My analysis of the materials relating to this matter is ongoing and I will continue to review any new material that is provided to me. This Declaration represents certain opinions that I have formed to date and the bases for those opinions. I reserve the right to revise, supplement, and/or amend my opinions based on new information presented to me and on my continuing analysis of the materials cited herein or later provided to me.

V. LEVEL OF ORDINARY SKILL IN THE ART

44. I understand that Petitioner has advanced the following definition of a POSA:

> A person of ordinary skill in the art ("POSA") … would have a bachelor's degree in electrical engineering, computer engineering, computer science, or equivalent degree with at least two years of relevant industry experience, including in digital media content delivery.

45. Petitioner's proposed definition appears unduly narrow because it appears to preclude a person having considerable industry experience designing and implementing ACR systems, but without a formal degree, from qualifying as a POSA. At the same time, Petitioner's proposed definition appears overly broad in that it only requires industry experience in "digital media content delivery," which relates broadly to *delivering* media content rather than *recognizing* or *identifying* media content, which is the subject matter of the Challenged Patents.

46. The level of ordinary skill in the art should require specific industry experience designing or implementing ACR systems, which is a fundamental aspect of the claimed inventions and the technology described in the Challenged Patents. It is the *recognition* or *identification* of delivered media content that is important, not simply delivering media content.

47. As discussed above, I have two years of college education in the field of electrical engineering. However, I have several decades of industry experience designing and implementing ACR systems, and have been awarded numerous patents covering ACR technologies. My experience and qualifications exceed that of a POSA as described in Section II above. This experience would make me qualified to testify as to the knowledge of a POSA under any reasonable definition.

48. With these understandings, my testimony herein relates to the knowledge of a POSA as of May 26, 2005. I understand this is the priority date of the inventions asserted by the Petitioner, and have been asked to use this priority date for the purposes of my testimony. At this time, I take no position on whether this is the correct priority date.

VI. OPINIONS ON CLAIM CONSTRUCTION

49. I have applied the plain and ordinary meaning to a POSA of all claim terms at issue. In this section, I provide additional clarification as to what that plain and ordinary meaning would be for certain terms, based on the understanding of a

POSA after reviewing the claims and specifications of the Challenged Patents.[1] For other terms, to the extent I believe additional explanation of the plain and ordinary meaning is necessary, I have provided it where appropriate in the sections relating to the specific asserted grounds (Section VII.A.-VII.C.).

A. content identification results corresponding to a sequence of submitted data samples

50. Claims 1 and 9 of both patents require generating "a play stream of content identification results corresponding to a sequence of submitted data samples," with "sample sequence data corresponding to a sequence of the content identification results," and "submitted data samples and corresponding content identification results." '791 Patent,[2] 14:38-59, 15:16-16:15; '896 Patent,[3] 15:12-35, 16:10-36. In the '791 Patent, the submitted data samples correspond to audio data

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[1] The specifications (excluding the Claims) of the Challenged Patents are, with minor exceptions, substantively identical, and therefore in this declaration my discussion of the "specification" relates to the specification of each Challenged Patent. Citations to the cited portions of each of the Challenged Patents are included for specific reference.

[2] IPR2024-01053, EX1001

[3] IPR2024-01056, EX1001

samples captured at a monitoring device associated with a monitored audience member. ’791 Patent, 14:38-59, 15:16-16:15. In the ’896 Patent, the submitted data samples correspond to “video data samples captured at a monitoring device associated with a monitored audience member.” ’896 Patent, 15:12-35, 16:10-36. In both patents, Claim 8, depending from claim 1, requires the “content offset data [be] derived from a comparison … comparing the submitted data samples against known content such that content offset data is obtainable without using time codes accompanying the captured audio data samples.” ’791 Patent, 15:11-15; ’896 Patent, 16:4-9.

51. The specification explains that prior art systems which focused on monitoring channels did not allow for tracking consumption of particular media content, and that prior art systems using codes to tag or track particular content could not identify content that had not been encoded. ’791 Patent, 1:12-36; ’896 Patent, 1:18-38. Thus, the specification recites a system and method “that enhances recognition … of the content of a media sample” via various means, as well as embodiments that deduce play-altering actions “from content offset values of identifications corresponding to captured samples.” ’791 Patent, 1:58-2:15; ’896 Patent,1:64-2:22.

52. Generally, the specification describes embodiments of the invention in the context of media samples comprising audio data. However, the specification of the ’896 Patent makes clear that these disclosures apply equally to video data:

> In alternative embodiments to what is illustrated and described in FIGS. 1-6, a record is created of individual media usage over time by means of an open-ended measurement system that employs portable and stationary detection devices to generate digital fingerprints of the **video signal portion** of the media content itself and identifies media played in the environment by means of matching such fingerprints against a database of known media. Such a video-based system may be built upon direct electrical connections and optical sensors (rather than microphones). Thus, various alternatives to the exemplary methods discussed in the context of the audio data-based embodiments illustrated in FIGS. 1-6 **rely instead on video data**.

’896 Patent, 14:17-29.[4] Thus, although referenced passages of the specifications discussed below may reference only embodiments relating to audio data, it should be understood that the same disclosure applies to video data.

53. An exemplary system practicing the claimed methods is illustrated in Fig. 1, reproduced below. The system captures “audio data” (which alternatively comprises video data as referenced above) at monitoring devices (101) and then

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[4] Unless otherwise noted, all emphasis herein in bold has been added.

uploading that data to the system (100). ’791 Patent, 3:38-54; ’896 Patent, 3:45-62. The data is described as alternatively “raw” data or “data that has undergone one of a variety of levels of processing prior to upload.” *Id.* However, this data is not described as a “data sample.” *See id.*

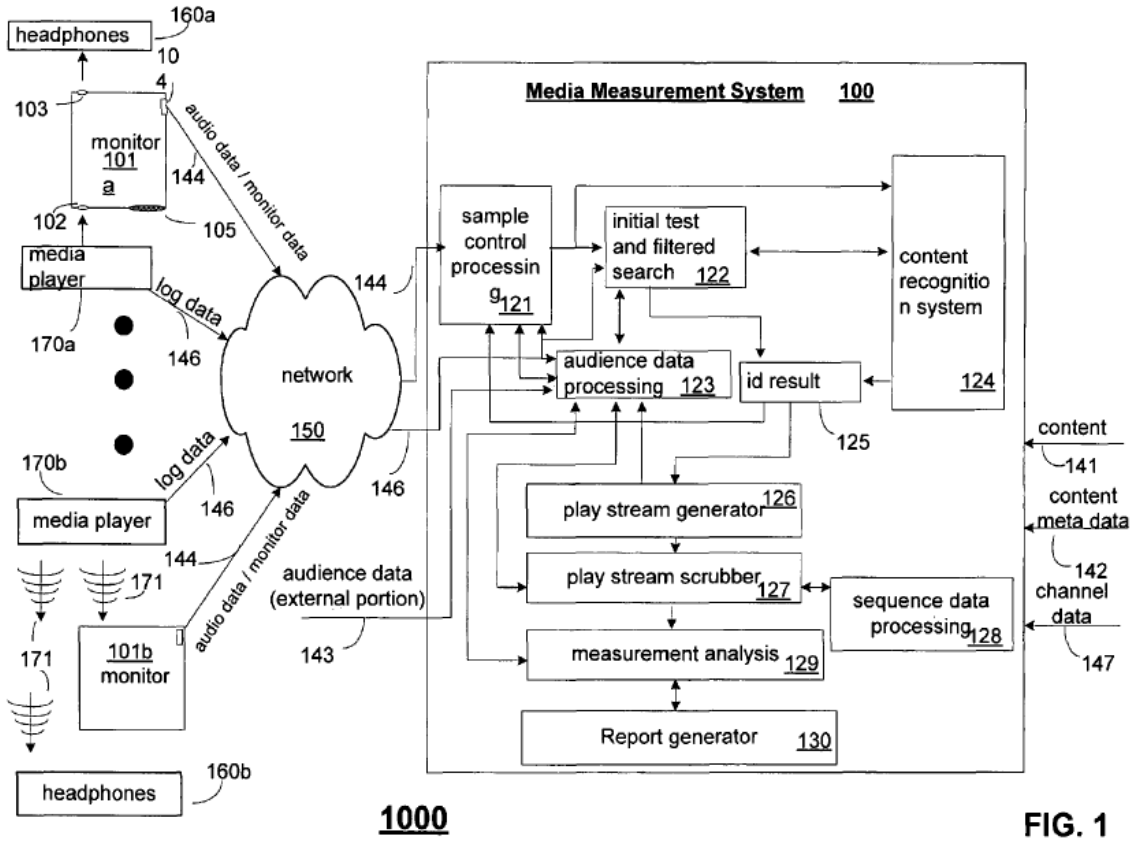

FIG. 1

54. The system contains a “sample control processing module” (121) that first receives the audio data and which then “**divides the audio data into samples** and **determines which samples should be submitted for further content recognition testing**.” ’791 Patent, 4:49-62; ’896 Patent, 4:58-5:5. Alternative embodiments are described wherein the “audio data may already have been **divided**

into samples prior to receipt" by the system. *Id.* Thus, the captured data is always described as being divided into samples. *Id.*

55. This module submits such samples to either an "initial test and filtered search module" (122) or a "content recognition system" (124). *Id.* The test/search module "conducts one or more initial identification attempts." '791 Patent, 4:63-5:28; '896 Patent, 5:6-38. "After completing the initial identification attempt," the module "passes the identification result" to an "ID result" module (125). '791 Patent, 5:29-6:13; '896 Patent, 5:39-6:23. If there was a successful identification, the result is passed to a play stream generator (126); if no identification was made, the content recognition system makes another attempt by performing "a search using a larger portion of its content to identify the data sample." *Id.* The content recognition system uses known content recognition methods that "identify content by extracting parameters from a media signal and applying an algorithm to those parameters to search for a content match." *Id.*

56. This search result, whether successful in identifying the content or not, is passed to the ID result module, which passes the result to the play stream generator and to the "sample control module." '791 Patent, 5:29-6:13, 7:16-38; '896 Patent, 5:39-6:23, 7:26-48. The play stream generator generates "a raw play stream relating a sequence of samples to content identification results." '791 Patent, 6:14-27; '896 Patent, 6:24-37.

57. A disclosed method is illustrated in Figure 2, reproduced below. The method recites as a first step (201) the receipt of "audio data from a monitoring device." '791 Patent, 6:58-7:3; '896 Patent, 7:1-13. This step (201) is labeled in Figure 2 as "Generate data sample series, select sample for identification analysis" and caches a series of samples. '791 Patent, Fig. 2, 6:58-7:3; '896 Patent, Fig 2, 7:1-13.

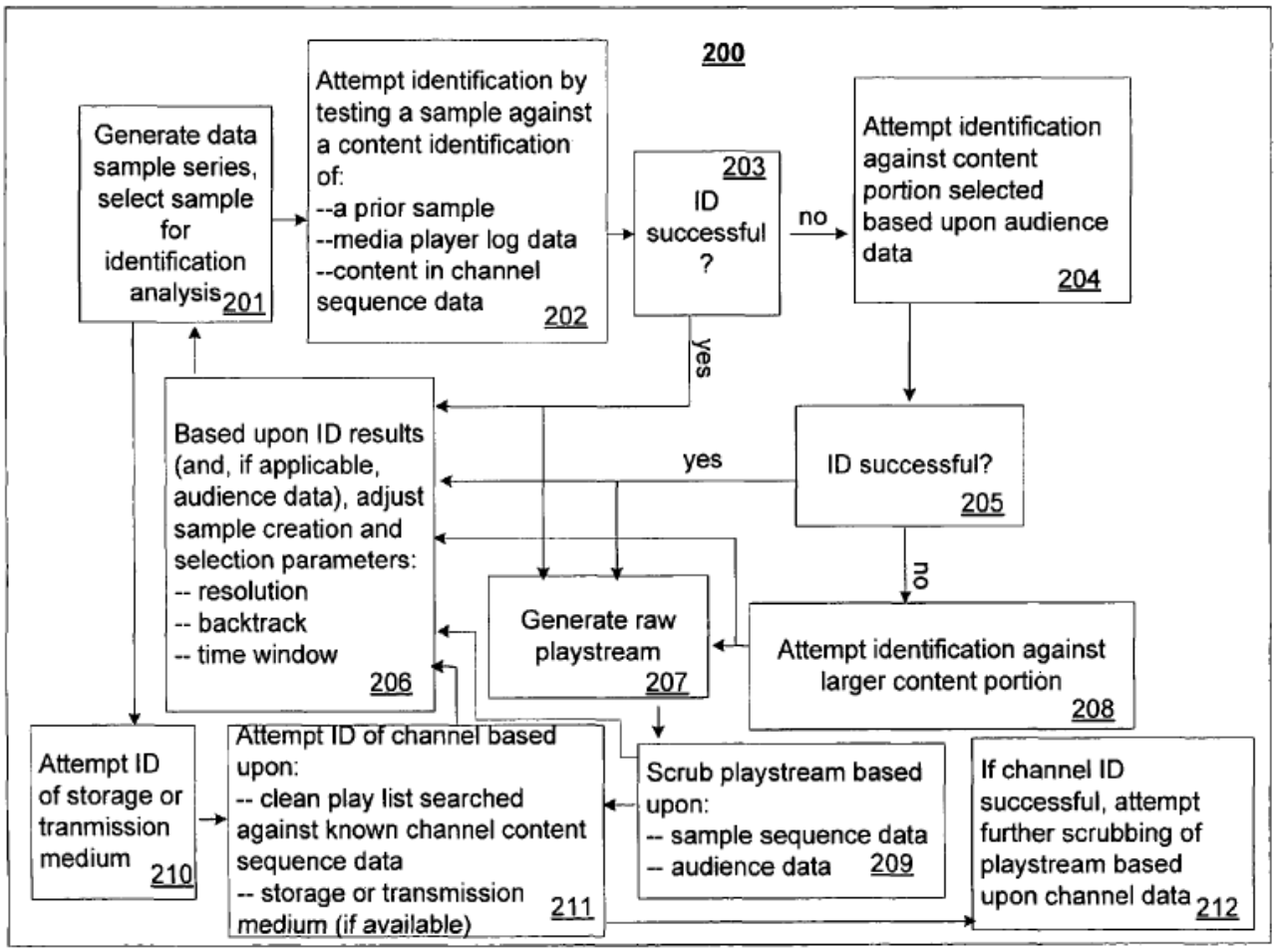

FIG. 2

58. The method (step 202) describes initial identification attempts, which if successful are passed on to subsequent steps described below. ’791 Patent, 7:16-38; ’896 Patent, 7:26-48. If unsuccessful, additional identification attempts are made. *Id.* (step 204).

59. Successful initial identification attempts are used to generate a raw play stream “indicating a series of samples and corresponding identification results” (step 207). ’791 Patent, 8:1-22; ’896 Patent, 8:13-34. Subsequent steps relate to scrubbing this raw play stream based on sample sequence and audience data, as well as further attempts to correctly identify the content based on known channel data. *Id.*

60. The raw play stream itemizes a sequence of analyzed samples and relates that sequence to corresponding content identification results in a data structure (e.g., a table) containing the sample sequence data. ’791 Patent, 9:12-31, Fig. 4; ’896 Patent, 9:25-45, Fig. 4. A content identification result corresponds to a particular piece of content, or indicates that no identification was made. *Id.* The sample sequence data includes log times (the time at which capture of the analyzed sample began by a monitor), which may be relative to an arbitrary value (the beginning of the sequence) or represent absolute times (actual time the sample started to be captured). ’791 Patent, 9:12-31, 11:10-26; ’896 Patent, 9:25-45, 11:29-46.

61. The specification plainly distinguishes between audio and/or video data and audio/video "data samples" and "submitted data samples." It explicitly states that data samples are "generated from" the audio /video data itself. A POSA would have understood from the plain language of the specification that "audio data" and "video data" are not equivalents to audio/video "data samples." Rather, it is clear that data samples are generated from the audio/video data.

62. The specification also exclusively uses "content identification results" to refer to the results of a content identification process, having the express purpose of recognizing the content of the submitted data samples. Both the specification and the claim language repeatedly require that the content identification results correspond to the submitted data samples: "content identification results corresponding to a sequence of submitted data samples," "the sample sequence data corresponding to a sequence of the content identification results," and "submitted data samples and corresponding content identification results." '791 Patent, 14:38-59; '896 Patent, 15:12-35. This may be a successful result (the content is identified) or unsuccessful (no identification is made). But in all cases, "content identification results" in the specification entails more than merely using the prior art systems referenced in the specification, which rely solely on embedded tags or encoding, which "are limited in that they can only track content that has been properly encoded." '791 Patent, 1:33-36; '896 Patent, 1:39-43. Such systems do not require

any process to identify content, or have any need to generate and submit data samples for content identification. In these systems, the content was previously identified when encoded or tagged, and that identification accompanies the data.

63. Thus, based on the specification, a POSA would understand that *content identification results corresponding to a sequence of submitted data samples* refers to the results of an attempt to accurately identify the content of submitted data samples generated from audio data. This requires first generating data samples, which are then submitted for content identification, yielding a resulting content identification for the submitted sample.

B. play lists and play streams

64. The specification states, with regard to "raw play stream," "clean play stream, and "clean play list," that "the particular organization, division, and content of the data may vary considerably from that illustrated … without departing from the spirit and scope of the present invention." '791 Patent, 10:34-56; '896 Patent, 10:51-11:7. This passage indicates that *play stream* and *play list* may vary in form and content, and need not conform precisely to the disclosed embodiments. However, because the specification uses different terms when discussing these data sets, and the discussion in the specification clearly shows they are different, a POSA would not interpret this passage to mean that these terms are interchangeable, or that they can be met by any data set whatsoever. That is, while these data sets may be

represented in different ways and have varying additional content, they are not the same and correspond to clearly different data sets in the claimed invention.

65. In both patents, Claims 1 and 9 require generation of a "play stream of content identification results." '791 Patent, 14:38-59, 15:16-16:15; '896 Patent, 15:12-35, 16:10-36. Claim 2 requires "generating a play list including content offset data." '791 Patent, 14:60-63; '896 Patent, 15:36-39. Claim 4 specifies a "clean play list" "including deduced play-altering actions." '791 Patent, 15:1-3; '896 Patent, 15:44-46. Claims 5 and 6 alternatively require a "raw play stream" and a "clean play stream." '791 Patent, 15:4-7; '896 Patent, 15:47-50.

66. The specification explains that the disclosed methods conduct multiple identification attempts. '791 Patent, 7:16-7:38; '896 Patent, 7:26-48. Both successful and (if present) unsuccessful results are ultimately provided for inclusion in the raw play stream. *Id.* (steps 207, 208). The "raw play stream" relates a sequence of samples to their corresponding content identification results. '791 Patent, 6:14-27, 8:1-22; '896 Patent,6:24-37, 8:13-34. This raw play stream is then "scrubbed" to generate a "clean play stream" which is then converted to a "play list" listing the content in the order captured. '791 Patent, 8:1-22; '896 Patent, 8:13-34.

67. "Scrubbing" refers to the process of reviewing, and then correcting, the play stream or play list for missing or incorrect data by using additional data. '791 Patent, 8:30-49; '896 Patent, 8:42-61. As described in the specification and detailed

below, this process includes both reviewing the raw stream or list, and then correcting it (either by adding missing data or changing incorrect data) based on one or more of sequence information, channel data, and non-channel data.

68. The specification explains that contents of the play stream may be compared with known channel data to identify a channel. ’791 Patent, 8:50-9:3; ’896 Patent, 8:62-9:16. A play stream or play list may be scrubbed with channel and/or non-channel data to generate a clean play list. ’791 Patent, 8:50-9:11; ’896 Patent, 8:62-9:24. When deduced user actions are sought, these actions may be included on the clean play list. ’791 Patent, 9:4-9:11; ’896 Patent,9:17-24.

69. As described with reference to the embodiment of Figure 4, the scrubbing process for generating a clean play stream and clean play list begins with the raw play stream which lists the sequence of analyzed samples and relates them to their corresponding identification results (including whether no identification was made). ’791 Patent, 9:12-9:31; ’896 Patent, 9:25-45. As described, this involves locating and correcting any likely incorrect identifications, or supplying missing identifications where they do not yet exist. ’791 Patent, 9:32-37; ’896 Patent, 9:46-51. This is done by analyzing the pattern of identified samples, where unidentified samples may be reasonably assumed as containing the same content as preceding or succeeding samples. ’791 Patent, 9:38-51; ’896 Patent, 9:52-65. Thus, the clean (“scrubbed”) play stream fills in this content identification for the identifications

missing from the raw play stream. *Id.* Based on the sequence of content, a play list can be generated. ’791 Patent, 9:52-10:4; ’896 Patent, 9:66-10:19. Channel and audience data may be used to correct unidentified and misidentified samples. ’791 Patent, 9:52-10:33; ’896 Patent, 9:66-10:50.

70. The difference between a play stream and a play list is illustrated in Figures 4 and 5. While a play stream contains the content identification result and log (capture) times of each sample (with one or more samples for each specific item of media content), the play list condenses this information to correspond to the start/end time of each separate piece of media content (such as a particular song, ad, or television program). ’791 Patent &’896 Patent, Fig. 4 (reproduced and highlighted below).

71. From the foregoing, a POSA would understand that a “play list” lists each item of media content once per event. This is consistent with the plain and ordinary meaning of the term “play list.” *See, e.g.*, Ex. 2005, 32:2-5 (referencing a process “to create personalized play-lists of streaming media files”); Ex. 2006, 1:29-31 (“As is known by those skilled in the art, a playlist is the documentation of the performance of one or more works at a particular time over a particular media.”)

410

Raw Play Stream

row	log time	content ID
1	t_0	song 51
2	t_0+1	none
3	t_0 +2	song51
4	t_0+3	song51
5	t_0+4	movie 81
6	t_0+5	song51
7	t_0+6	song51
8	t_0+7	song72
9	t_0+8	song72
10	t_0+9	none
11	t_0+10	song72
12	t_0+11	song72
13	t_0+12	song72
14	t_0+13	song65
15	t_0+14	song65
16	t_0+15	TVprgm58
17	t_0+16	song65
18	t_0+17	song65
19	t_0+18	song65
20	t_0+19	song65
21	t_0+20	song21
22	t_0+21	song21
23	t_0+22	song21
24	t_0+23	song21
25	t_0+24	song21
26	t_0+25	song21
27	t_0+26	ad49
28	t_0+27	ad49
29	t_0+28	song81
30	t_0+29	song35

ssd

450

Clean Play Stream

row	log time	content ID
1	t_0	song 51
2	t_0+1	song51
3	t_0 +2	song51
4	t_0+3	song51
5	t_0+4	song51
6	t_0+5	song51
7	t_0+6	song51
8	t_0+7	song72
9	t_0+8	song72
10	t_0+9	song72
11	t_0+10	song72
12	t_0+11	song72
13	t_0+12	song72
14	t_0+13	song65
15	t_0+14	song65
16	t_0+15	song65
17	t_0+16	song65
18	t_0+17	song65
19	t_0+18	song65
20	t_0+19	song65
21	t_0+20	song21
22	t_0+21	song21
23	t_0+22	song21
24	t_0+23	song21
25	t_0+24	song21
26	t_0+25	song21
27	t_0+26	ad49
28	t_0+27	ad49
29	t_0+28	song35
30	t_0+29	song35

470

Channel Data for "radio 35"

row	start time	end time	content ID
1	C(0)	C(0)+6	song21
2	C(0)+6	C(0)+8	ad49
3	C(0)+8	C(0)+13	song35

480

Channel Data for "album 12"

row	start time	end time	content ID
1	C(0)	C(0)+7	song51
2	C(0)+7	C(0)+13	song72
3	C(0)+13	C(0)+23	song65
4	C(0)+23	C(0)+30	song29

490

Clean Play List

row	start log time	end log time	content ID	Channel ID
1	t_0	t_0+7	song51	album12
2	t_0+7	t_0+13	song71	album12
3	t_0+13	t_0+20	song65	album12
4	t_0+20	t_0+26	song21	radio35
5	t_0+26	t_0+28	ad49	radio35
6	t_0+28	t_0+30	song34	radio35

ssd = "sample sequence data"

FIG. 4

72. Clean play streams and play lists may show deduced play-altering actions. '791 Patent, 10:57-11:9; '896 Patent, 11:8-28. Such actions include pausing, reversing, fast-forwarding, and skipping backwards or forwards. *Id.* The clean play stream contains log times (the time at which capture of the analyzed sample began), content identifiers, and content offset values for a series of samples. '791 Patent, 11:10-26; '896 Patent, 11:29-46. The content offset value for each sample represents a time offset from the beginning of a particular piece of content. *Id.*

73. A play list may thus provide a start and end time for each "internally continuous media consumption event." '791 Patent, 11:27-37; '896 Patent, 11:47-58. That is, when an entire piece of media content is consumed without interruption,

the play list notes it as a single entry. *Id.* If there is an interruption or "discontinuity" in consumption, it forms a boundary to the consumption event, and the play list will note the interruption in a separate entry. *Id.*, Fig. 5 (reproduced and highlighted below).

510

Clean Playstream

row	log time	content ID	content offset
1	t_0	TVprgm 27	(0)
2	t_0+1	TVprgm 27	(0)+1
3	t_0+2	none	n/a
4	t_0+3	none	n/a
5	t_0+4	none	n/a
6	t_0+5	TVprgm 27	(0)+2
7	t_0+6	TVprgm 27	(0)+3
8	t_0+7	TVprgm27	(0)+9
9	t_0+8	TVprgm27	(0)+10
10	t_0+9	TVprgm27	(0)+9
11	t_0+10	TVprgm27	(0)+10
12	t_0+11	none	n/a
13	t_0+12	TVprgrm27	(0)+29
14	t_0+13	TVprgrm27	(0)+30
15	t_0+14	ad23	(0)
16	t_0+15	none	n/a
17	t_0+16	ad25	(0)+2
18	t_0+17	TVprgm28	(0)
19	t_0+18	TVprgm28	(0)+1
20	t_0+19	TVprgrm28	(0)+2

560

Clean Play List

row	start log time	end log time	content ID	content offset
1	t_0	t_0+2	TVprgrm27	(0)
2	t_0+2	t_0+5	none	n/a
3	t_0+5	t_0+7	TVprgrm27	(0)+2
4	t_0+7	t_0+9	TVprgrm27	(0)+9
5	t_0+9	t_0+11	TVprgrm27	(0)+9
6	t_0+11	t_0+12	none	n/a
7	t_0+12	t_0+14	TVprgrm27	(0)+29
8	t_0+14	t_0+15	ad23	(0)
9	t_0+15	t_0+16	none	n/a
10	t_0+16	t_0+17	ad25	(0)+2
11	t_0+17	t_0+20	TVprgrm28	(0)

570

Channel Data for TV C4

row	start time	end time	content ID
1	C(0)	C(0)+31	TVprgrm27
2	C(0)+31	C(0)+34	ad23
3	C(0)+34	C(0)+37	ad24
4	C(0)+37	C(0)+40	ad25
5	C(0)+40	C(0)+50	TVprgrm28

590

Clean Play List with Deduced Actions

row	log time	end log time	content ID and <deduced action>	content offset
1	t_0	t_0+2	TVprgrm27	(0)
2	t_0+2	t_0+5	<pause for 3 units>	n/a
3	t_0+5	t_0+7	TVprgrm27	(0)+2
4	t_0+7	t_0+7	<skip frwrd 5 units>	n/a
5	t_0+7	t_0+9	TVprgrm27	(0)+9
6	t_0+9	t_0+9	<skip bckwrd 2 units>	n/a
7	t_0+9	t_0+11	TVprgrm27	(0)+9
8	t_0+11	t_0+12	<fast frwrd 18 units>	n/a
9	t_0+12	t_0+14	TVprgrm27	(0)+29
10	t_0+14	t_0+15	ad23	(0)
11	t_0+15	t_0+16	<fast frwrd 7 units>	n/a
12	t_0+16	t_0+17	ad25	(0)+2
13	t_0+17	t_0+20	TVprgrm28	(0)

FIG. 5

74. These discontinuities are identified by reference to the sample log times and the corresponding content offsets in the play stream. '791 Patent, 11:38-55; '896 Patent, 11:59-12:10. An equivalent progression of log times and content offsets signifies continuous consumption, while a difference in the progression of log times and content offsets shows a discontinuity. *Id.* Based on this information, a clean play

list may be constructed with deduced play-altering actions. ’791 Patent, 11:62-67; ’896 Patent, 12:17-22. Thus, when log time values in the clean play stream reflect advancing time units with no corresponding content ID, and the preceding and succeeding content offset values in the clean play stream indicate advancing no more than a single time unit within the same content ID, it can be deduced that the program was paused for those time units. ’791 Patent, 12:1-12:13; ’896 Patent, 12:23-35. Similar analyses are used to deduce fast-forwarding, rewinding, and skipping, which may also use channel data and gaps in content offset times with no corresponding gap in log times. ’791 Patent, 12:51-61, 12:62-13:7; ’896 Patent, 13:7-31.

75. Thus, “play stream” and “play list” have plainly different meanings and contents in the specification. A “play stream” contains content identifications and log (capture) times of each submitted data sample (where each specific piece of media content may be represented by multiple samples). A “play list” is generated from a “play stream,” and condenses the information therein to correspond to the log times of each continuous media consumption event, for each separate piece of media content.

VII. OPINIONS ON PATENTABILITY OF THE CHALLENGED CLAIMS

A. Ground 1

76. I understand that under Ground 1 Petitioner asserts that U.S. Patent 7,248,777 to Feininger, et al. ("Feininger")[5] alone renders claims 1, 3-6, and 9-11 of the '791 Patent obvious, and claims 1, 3-6, and 9-11 of the '896 Patent obvious.

77. Below, I address Ground 1 as set forth in the Petition with respect to certain claims and claim elements. My opinions do not encompass all aspects of the asserted grounds or all challenged claims. To the extent the Petition is granted I may provide additional opinions addressing these, or any other aspects of the asserted grounds and the challenged claims.

1. Independent Claims 1 and 9

78. Claim 1 of each of the Challenged Patents is set forth below, using Petitioner's division and designation of the different limitations:

Limitation	Claim 1, '791 Patent	Claim 1, '896 Patent
1.P	A media measurement method comprising:	A media measurement method comprising:
1.1	using one or more computers to generate a play stream of content identification results corresponding to a sequence of submitted data samples, the submitted data samples corresponding to audio data	using one or more computers to generate a play stream of content identification results corresponding to a sequence of submitted data samples, the submitted data samples corresponding to video data

[5] EX1005 for both IPR2024-1053 and IPR2024-01056.

Limitation	Claim 1, ’791 Patent	Claim 1, ’896 Patent
	samples captured at a monitoring device associated with a monitored audience member; and	samples captured at a monitoring device associated with a monitored audience member;
1.2	using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member,	using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member,
1.3	the sample sequence data corresponding to a sequence of the content identification results,	the sample sequence data corresponding to a sequence of the content identification results,
1.4	the content offset data including content offsets associated with the content identification results, a content offset indicating a time position of a content identification result within identified content,	the content offset data including content offsets associated with the content identification results, a content offset indicating a time position of a content identification result within identified content,
1.5	wherein to utilize comprises, for a particular plurality of submitted data samples and corresponding content identification results, comparing a progression of log times associated with capture timing of each of the particular plurality of submitted data samples and a progression of content offsets of the corresponding content identification results.	wherein to utilize comprises, for a particular plurality of submitted data samples and corresponding content identification results, comparing a progression of log times associated with capture timing of each of the particular plurality of submitted data samples and a progression of content offsets of the corresponding content identification results; and
1.6		using one or more computers to utilize deduced play altering actions of the monitored audience member to generate a media measurement report.

79. Claim 9 of each of the Challenged Patents is set forth below, using Petitioner’s division and designation of the different limitations:

Limitation	Claim 9, ’791 Patent	Claim 9, ’896 Patent
9.P	A media measurement method comprising:	A media measurement method comprising:
9.1	using one or more computers to generate a play stream of content identification results corresponding to a sequence of submitted data samples, the submitted data samples corresponding to audio data samples captured at a monitoring device associated with a monitored audience member; and	using one or more computers to generate a play stream of content identification results corresponding to a sequence of submitted data samples, the submitted data samples corresponding to video data samples captured at a monitoring device associated with a monitored audience member
9.2	using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member,	using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member
9.3	the sample sequence data corresponding to a sequence of the content identification results,	the sample sequence data corresponding to a sequence of the content identification results
9.4	wherein play-altering actions include actions that alter at least one of a pace and a sequence of a media stream,	wherein play-altering actions include actions that alter at least one of a pace and a sequence of a media stream
9.5	the content offset data including content offsets associated with the content identification results, a content offset indicating a time position of a content identification result within identified content,	the content offset data including content offsets associated with the content identification results, a content offset indicating a time position of a content identification result within identified content

Limitation	Claim 9, ’791 Patent	Claim 9, ’896 Patent
9.6	wherein to utilize comprises, for a particular plurality of submitted data samples and corresponding content identification results, comparing a progression of log times associated with capture timing of each of the particular plurality of submitted data samples and a progression of content offsets of the corresponding content identification results.	wherein to utilize comprises, for a particular plurality of submitted data samples and corresponding content identification results, comparing a progression of log times associated with capture timing of each of the particular plurality of submitted data samples and a progression of content offsets of the corresponding content identification results
9.7		using one or more computers to utilize deduced play altering actions of the monitored audience member to generate a media measurement report.

80. As can be seen, the claims are substantially similar, except that the ’896 Patent requires “video data samples” instead of “audio data samples” in claim elements [1.1] and [9.1], and also requires the additional elements [1.6] and [9.7]. As Petitioner’s assertions regarding these claims for both Challenged Patents is substantially identical, I address them together.

a. Claim Elements [1.1], [1.3], [9.1], [9.3]

81. Claim elements [1.1] and [9.1] require “using one or more computers to generate a play stream of content identification results corresponding to a sequence of submitted data samples, the submitted data samples corresponding to” audio [’791 Patent] or video [’896 Patent] data samples captured at a monitoring device associated with a monitored audience member.” Claim elements [1.3] and

[9.3] each require "the sample sequence data corresponding to a sequence of the content identification results." In my opinion, Feininger neither discloses these elements or claims, nor render them obvious.

82. I understand that Petitioner asserts that Feininger's presentation time retriever *generates a play stream of content identification results* when it "periodically creates a running list of log entry data structures 58" and populates the data structures with a program identifier retrieved from the packet data in a datastream of a played-back program. EX1005, 4:61-64, 5:28-42, 16:56-64; Paper 1, IPR2024-01053 ('791 Petition"), 41; Paper 1, IPR2024-01056 ("'896 Petition"), 36. Petitioner explains that Feininger's DVR receives broadcast program data which is "packetized" into datastreams of audio and video packets. Petition, 42. A user's playback of this stored program data results in the creation of the log entry data structures created in response to the playback. *Id.* Petitioner thus asserts that the "user's viewing activity corresponds to the claimed *sequence of submitted data samples*." *Id.*

83. Feininger's log entry data structures optionally include, for each section of the recorded program, the playback date and time, recording date and time, and program identifier. EX1005, 5:3-42. A program identifier included in the data structures definitively identifies the program being played back. EX1005, 5:32-37 ("The program identifier may be any form of information that identifies the program

being played back.”). This program identifier is received by Feininger’s system and then extracted from the “packet data” of the program as it is played. *Id.*; Petition, 41. There is nothing in Feininger indicating that the program identifier is generated or otherwise determined by any portion of Feininger’s system; rather, it accompanies the program data as an embedded code or tag, as described in the specification. ’791 Patent, 1:33-36; ’896 Patent, 1:40-43.

84. While Feininger does generate data structure entries populated with a content identifier, this is not what the claim requires. The claim requires *generat[ing] a play stream of content identification results corresponding to a sequence of submitted data samples*. As discussed with regard to claim construction above, the claim requires data samples submitted for the purpose of content identification (which is done using various described processes). Section VI.A. Feininger never submits any samples for content identification. Rather, when program data is first received, Feininger’s recording device “packetizes the received program data into one or more datastreams,” including writing “other data” such as the program identifier into the datastreams. EX1005, 16:1-21 (referencing Fig. 9 block 206). This identifier is a code or tag received along with the program data; there is no indication that Feininger performs any content identification process to somehow derive it. Feininger’s system then reads the identifier embedded in the

datastream, and writes it in the log entry data structures. EX1005, 16:39-17:2 (referencing Fig. 10 blocks 228, 230).

85. Feininger never submits any data samples to obtain content identification results for those samples. It does not do this, or need to do this, because its system receives the content identification for all program data before any samples could even be created. Just as in the prior art referenced in the specification, it then simply reads the program identifier encoded in the datastream. Like that prior art, these identifications are limited in that they cannot track content unless it is properly encoded.

86. Thus, a POSA would not understand Feininger's mere reading of the pre-encoded content identifier to be a *content identification result*, or *correspond to a sequence of submitted data samples*, because they are not results of any content identification process, and because no data samples are ever submitted for content identification. Instead, there are merely "various sections of a received broadcast program" that require no identification. EX1005, 4:20-22.

87. Because Feininger's system does not submit any data samples to generate content identification results, its log entry data structures also do not contain any *content identification results* from any *submitted data samples*. Therefore, Feininger's log entry data structures do not contain *sample sequence data corresponding to a sequence of the content identification results*.

88. Although I do not address this separately, this failure to disclose *content identification results* also precludes Feininger from disclosing or suggesting claim elements [1.4], [1.5], [9.5], and [9.6]. Claim elements [1.4] and [9.5] require *content offsets associated with the content identification results*. Claim elements [1.5] and [9.6] require comparing *a progression of content offsets of the corresponding content identification results*. Because Feininger does not disclose or suggest *content identification results* as discussed above, it cannot disclose or suggest these elements.

b. Claim Elements [1.5], [9.6]

89. I understand that Petitioner asserts that Feininger's playback times are *log times*, and maps the "creation time" of its log entry data structures to *the capture timing of each of the ... submitted data samples* because the data structures "are created at substantially the same time" as playback. '791 Petition, 50; '896 Petition, 44-45. Petitioner further asserts that the playback/log time is *associated with* the *capture timing* because the playback times are recorded in the data structures. *Id.*

90. It appears that Petitioner has misidentified, or misunderstood, the claimed *log times associated with capture timing of each of the ... submitted data samples* in the Challenged Patents. The claims specify that the data samples are *captured at a monitoring device associated with a monitored audience member*. '791 Patent, 14:42-44, 15:20-22; '896 Patent, 15:14-17, 16:14-16. The specification

explains that the system captures data via monitors which can alternatively "capture audio energy acoustically through a microphone" (or microphone port) or "capture[] audio energy through [a] media player port." '791 Patent, 3:4-3:25; '896 Patent, 3:10-32. Alternatively, a monitor may capture samples via wireless transmission ('791 Patent, 3:26-37; '896 Patent, 3:33-44) or (in the '896 Patent) "direct electrical connections and optical sensors." '896 Patent, 14:24-26. However captured, the captured data from the monitoring device is uploaded to the system where it is then divided into samples, some subset of which are then selected for submission for content recognition. '791 Patent, 3:38-3:53, 4:49-62, 6:58-7:3 ; '896 Patent, 3:45-62, 4:58-5:5, 7:1-13. The submitted data samples are consistently referred to as "captured samples." '791 Patent, 4:63-5:28, 8:1-22, 11:10-11:26; '896 Patent, 5:3-38, 8:13-34, 11:29-46. These samples are captured at the time an audience member plays the media content. '791 Patent, 3:4-3:54; '896 Patent, 3:10-62.

91. The specification also explains that the sample log time recorded in the play stream(s) may be relative to an arbitrary value or reflect an actual time, but in each case "indicates a time at which capture of the analyzed sample began." '791 Patent, 11:10-11:26, *see also id.*, 9:12-31; '896 Patent, 11:29-46; *see also id.*, 9:25-45. Discontinuities in consumption (playback) are identified by comparing the progression of sample log times to the progression of corresponding content offset times. '791 Patent, 11:38-55; '896 Patent, 11:59-12:10.

92. As shown, in the specification, *log time* refers to the capture timing of the analyzed sample—the time when the sample's data is first captured by the system. This is not the same as the time that the captured data is uploaded to the system from the monitors, or the time it is divided into samples, or the time it is added to a play stream or play list. Thus, *log times associated with capture timing* of the data samples refers to the time the data was captured by the system—the time the content was consumed or played (or played back).

93. Returning to Feininger, it explains that the system's recording device captures the media data, which may be contained in a series of data packets. EX1005, 4:19-31. The recording times (also called the presentation times)—the "times at which various sections of a received broadcast program are received and/or stored"—are recorded by a time stamper, which may add the time to the data packet headers in the audio and/or video datastreams. *Id.*, 4:15-48. Thus, Feininger's system captures the data when it is first received and stored by the recording device.

94. When a previously recorded program is played back in Feininger, the presentation time retriever "retrieves the recording/presentation times of some or all of the sections of the program being played back and stores those recording times in association with the playback time of the corresponding sections of the program." *Id.*, 4:49-61. This is done via the log entry data structures. *Id.*, 4:61-5:2 (referencing Figs. 3A-3C). Although each data structure is "preferably created at substantially the

time that a corresponding section of the recorded program is being played," (*id.*), this is not the time at which the data or sample was captured. The presentation time retriever merely retrieves the recording/presentation time at playback and correlates it with each segment's playback time. However, Feininger's system captured the data earlier, when it was recorded by the DVR (at the recording/presentation time).

95. I note that this distinction highlights a basic, fundamental distinction between Feininger and the claimed inventions. In the specification and claims, access to the captured samples at the time of recording/presentation is not required, as it is in Feininger. Rather, the capture occurs at the time of consumption (playback), and does not reflect the recording/presentation time. This is the *log time associated with capture timing* of each sample. In Feininger, the data is captured and, critically, time-stamped when received by the system (recording/presentation time). EX1005, 16:1-13. Feininger's playback time (mapped as the *log time* by Petitioner)—is thus not *associated with the capture timing* of the data samples, because Feininger does not capture the data at the time of playback.

96. To the extent there is any ambiguity, there is certainly no data or sample capture at the time Feininger creates its log entry data structures, which Petitioner identifies as the *capture timing*. '791 Petition, 51; '896 Petition, 45. Feininger therefore does not teach or suggest *comparing a progression of log times associated with capture timing of each of the … submitted data samples*.

2. Claim 3

97. Claim 3 of both Challenged Patents requires "[t]he method of claim 1 further comprising: utilizing sample sequence data together with corresponding channel data to deduce play-altering actions of a monitored audience member." '791 Patent, 14:64-67; '896 Patent, 15:40-43.

98. Petitioner asserts that Feininger may include channel data in the data log entry for a program section along with the program identifier. '791 Petition, 54; '896 Petition, 50. Petitioner also asserts that a channel number can be used to identify a program schedule "to discern additional information about the broadcast programming on that channel," and that this schedule is used by Feininger's non-real time content identifier to determine the particular segments of a program that were affected by a play-altering action. '791 Petition, 54-55; '896 Petition, 50-51. Thus, Petitioner is asserting that Feininger uses channel data (the channel number) to identify a program schedule that contains additional information about that channel's programming, and that this schedule is used in Feininger to identify those program segments that were affected by a play-altering action. Therefore, under Petitioner's analysis of Feininger, Feininger first determines that play-altering actions occurred, without reference to channel data. Only then, after this determination is made, is the channel data used—not to determine or deduce play-altering actions, but to identify the program segments affected.

99. However, this is not what Claim 3 requires. Claim 3 requires *utilizing sample sequence data together with corresponding channel data to deduce play-altering actions* of an audience member. That is, the channel data is used (along with the sample sequence data) to determine in the first instance that there were play-altering actions, and which play-altering actions occurred.

100. In Feininger, the non-real time content identifier is used to "identify the segment(s) in the portion of the recorded program that were not played back in real time." EX1005, 9:61-63. The non-real time content identifier "responds to detection of non-zero differences by the difference detector" "by searching a database to determine the identities of the program segments that were skipped, fast forwarded, and/or rewound." *Id.*, 9:63-10:1. That is, before the non-real time content detector is activated, Feininger's system has already determined that "portion[s] of the recorded program … were not played back in real time"—meaning that Feininger's system has already "deduced play-altering activities of the audience member" in playing back the recorded program. *Id.*, 9:25-60, 9:61-62.

101. Feininger thus only uses "channel data" to identify the segments that were subject to the previously deduced play-altering actions. It does not use the channel data to deduce the play-altering actions themselves, as required by the claim. Thus, Feininger does not teach or suggest Claim 3.

3. Claim 4

102. Claim 4 of both Challenged Patents requires "[t]he media measurement method of claim 1 wherein a clean play list is generated including deduced play-altering actions." '791 Patent, 15:1-3; '896 Patent, 15:44-46.

103. Petitioner identifies Feininger's recapture table as a "clean play list" that includes deduced play-altering actions. '791 Petition, 56-57; '896 Petition, 52. Feininger teaches that the recapture table stores the identities of segments identified as having been skipped or fast forwarded, and the identities of all segments of the recorded program that were rewound. EX1005, 12:40-48, Fig. 6.

104. Feininger's recapture table does not qualify as a *clean play list* as that term is used in the specification. As discussed above with regard to claim construction, a "play list" includes a list of each distinct piece of media content in the sequence in which it was played. *See* Section VI.B. above. A "clean play list" refers to a play list that has been scrubbed. *Id.* Scrubbing involves correcting the raw play list by correcting any mistaken or missing identifications of the listed content. *Id.*

105. Feininger's recapture table is not the claimed *play list* because it does not provide a sequence of the particular pieces of media content that have been consumed. Rather, it only lists those program segments that have been subjected to play-altering. This would more accurately be considered a "not played list," because

it does not list the segments played but the segments which were paused, skipped, fast-forwarded, or rewound.

106. Even if it were considered a play list, the recapture table is not a *clean play list*. Feininger does not teach or suggest scrubbing or cleaning the data captured in any of its data structures. As I explain further with regard to Claim 6 below, a POSA would have understood that Feininger would not have missing or incorrect data in its various listings of content segments. *See* Section VII.A.4. below. This is because Feininger relies exclusively on embedded codes or tags that were included with its received program data, which definitively identify the program being played back, as I explained for claim elements [1.1] and [9.1] above. A POSA would have understood that every entry in Feininger's log entry data structure, which is used as the sole basis for deducing play-altering activities under Petitioner's analysis, is already conclusively identified before inclusion in the data structure. Therefore, a POSA would have understood that there would be no unidentified or misidentified entries in Feininger's data structures. Likewise, Feininger's recapture table is never scrubbed to remove missing or incorrect data. Thus, it is not a *clean play list*.

107. I note that neither Petitioner nor its technical expert Dr. Russ reference or rely on Feininger's "recapture identifier," which modifies entries in the recapture table. EX1005, 12:49-13:48. Although I understand that this means that the modified recapture table cannot be considered for the purposes of evaluating patentability, I

think it important to explain that a POSA would not understand this modification to equate to scrubbing as that term is used in the Challenged Patents.

108. Feininger's recapture identifier is used to determine if a portion of a recorded program that was initially skipped or fast forwarded is later viewed in real time, after rewinding the recorded program. EX1005, 12:49-56. The recapture identifier compares segment names appearing in the first column of its recapture table with those in the second. *Id.*, 12:56-60 (referencing Fig. 6). The first column shows "Advanced Segment Names" and the second column shows "Rewound Segment Names." *Id.*, 12:38-48; Fig. 6. If the same segment name appears in both columns, the recapture identifier removes those segment names from the table. *Id.,* 12:61-63. This leaves a recapture table containing an "Advanced Segment Names" column containing only those segments that were skipped or fast-forwarded and never rewound. *Id.*, 12:63-13:1. In the "Rewound Segment Names" column, only those segments which were rewound and later reviewed. *Id.*, 13:1-6.

109. Thus, the modified recapture table indicates those segments that were advanced and never rewound (and thus never reviewed) and those segments that were rewound and reviewed. Therefore, the recapture identifier does not correct any mistaken or missing entries in the recapture table, but rather indicates which segments were advanced without subsequent rewinding/review, and those segments which were subsequently rewound and reviewed. Accordingly, after modification

by the recapture identifier, the recapture table does not contain a list of those segments that were not subject to play-altering actions, but only those that were. This is not a play list, but as mentioned, a "not played list" (or at least, a list of only those segments that were played after being rewound). Nor is this procedure the same as scrubbing in the Challenged Patents, which corrects the play list by correcting any mistaken or missing identifications of the listed content.

4. Claims 5 and 6

110. Claim 5 of both Challenged Patents requires "[t]he media measurement method of claim 1 wherein the play stream is a raw play stream." '791 Patent, 15:4-5; '896 Patent, 15:47-48. Claim 6 of both Challenged Patents requires "[t]he media measurement method of claim 1 wherein the play stream is a clean play stream." '791 Patent, 15:4-5; '896 Patent, 15:47-48.

111. Petitioner identifies the same component of Feininger—its log entry data structures 58—as both the claimed *raw play stream* and *clean play stream*. '791 Petition, 57-58; '896 Petition, 53-54. Petitioner states that "Feininger does not describe that the running log entry data structures 58 are scrubbed," and on that basis asserts that they comprise a raw play stream. '791 Petition, 57-58; '896 Petition, 53. That is, Petitioner construes a "raw play stream" as a play stream that is "not scrubbed." '791 Petition, 57; '896 Petition, 53.

112. Logically, one would therefore conclude that a "clean play stream" is a play stream that has been scrubbed. However, Petitioner does not construe "clean play stream" in this manner. Instead, Petitioner construes "clean play stream" as "a play stream that contains no missing or incorrect data." '791 Petition, 58; '896 Petition, 53-54.

113. Thus, asserting that the sequence data in Feininger's data "ensures that the log entry data structures 58, 70 are transmitted, analyzed, and/or processed in the correct order" and therefore prevents such missing or incorrect data, Petitioner asserts that the data structures are both a raw play stream and a clean play stream. '791 Petition, 58-59; '896 Petition, 54.

114. However, a POSA would not have construed these terms in this manner in view of the specification. A "clean play stream" as that term is used in the specification plainly requires scrubbing the "raw play stream" for missing or incorrect data. *See* Section VI.B. above. Even if a "raw play stream" contains no such data, in order to be considered a "clean play stream," the specification indicates that it must at least be reviewed for missing or incorrect data. *Id.* There is no indication that this occurs in Feininger. Accordingly, a POSA would not have understood Feininger's log entry data structures to satisfy Claim 6, which requires a clean play stream.

115. I understand that Petitioner argues that it would have been obvious to scrub Feininger's data structures "to ensure accurate results," because cleaning data was within the general knowledge of a POSA. '791 Petition, 59; '896 Petition, 54-55. However, a POSA would have had no reason to scrub Feininger's log entry data structures. This is because, as Petitioner admits, "a POSA would have understood that the safeguards provided by utilizing sequence number field 72 would result in a running list of log entry data structures 70 that do not include any missing entries." *Id.* This is correct, because as noted above (*see* Claim Elements [1.1], [9.1] above), Feininger's datastreams definitively identify the media content. Thus, a POSA understood that the log entry data structures would not contain any missing or incorrect entries. Therefore, a POSA had no reason to scrub Feininger's data structures "to ensure accurate results" because there would be no missing or incorrect data to supply or correct. Accordingly, Feininger does not render claim 6 obvious.

116. If, however, Feininger's log entry data structure is considered a "clean play stream" because it has been scrubbed (reviewed for any missing or incorrect data), it is not at the same time a "raw play stream." In this case, Feininger does not disclose or suggest the limitations of Claim 5.

B. Ground 2

117. I understand that under Ground 2 Petitioner asserts that U.S. Patent Application Publication No. 2007/0271300 to Ramaswamy ("Ramaswamy"),[6] in combination with World Intellectual Property Organization International Publication Number WO 2004/051997 A1 to Conklin ("Conklin)[7] renders claims 1-4 and 7-11 of the '791 Patent obvious, and claims 1-4 and 7-13 of the '896 Patent obvious.

118. Below, I address Ground 2 as set forth in the Petition with respect to certain claims and claim elements. My opinions do not encompass all aspects of the asserted grounds or all challenged claims. To the extent the Petition is granted I may provide additional opinions addressing these, or any other aspects of the asserted grounds and the challenged claims.

1. Whether the combination of Ramaswamy and Conklin would have been obvious.

119. I understand that Petitioner asserts that it would have been obvious to combine Ramaswamy with Conklin ("Ramaswamy-Conklin"), on the basis that the combination is simply the application of known techniques to a known system or

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[6] EX1006 for both IPR2024-1053 and IPR2024-01056.

[7] EX1010 for both IPR2024-1053 and IPR2024-01056.

method ready for improvement, yielding predictable results. ’791 Petition, 62-63; ’896 Petition, 56.

120. Petitioner asserts that a POSA would have had a motivation to combine the two references based on the desire to provide Conklin’s “ability to determine more complex time shifting viewing behaviors” to Ramaswamy. ’791 Petition, 62; ’896 Petition, 56. Petitioner specifies that this would merely entail applying Conklin’s sequence of events analysis to Ramaswamy’s method. ’791 Petition, 62-63; ’896 Petition, 57-58.

121. Conklin discloses a system for tracking events on a digital recording device, one which requires access to the internal data bus that transmits information to the device’s hard drive and media display devices. EX1010 [0022]-[0030]. Conklin’s information monitor/analyzer “reads (i.e., snoops) control or command information” transmitted on the data bus between a mass storage device (hard drive) and a local processing unit (which processes received audio/video data and sends it to the mass storage device or to viewing devices) to “identify sets of digital information or digital information packets to be stored on or retrieved from the mass storage device.” *Id.* [0027], [0024]. Conklin does not describe any way to identify the media content or its boundaries (when one program has ended and another started). Rather, it merely infers that data packets contain audio or video information by their size. *Id.* [0039]. Conklin explains that “[i]n general, audio, video and/or

image information is written in relatively large sets or packets such as, for example, packets containing 65,536 bytes of information." *Id.* Conklin's access detector uses the packet size to discriminate between audio, video, and/or image information and other information. *Id.* The latter information need not be recorded by the event record generator 56. *Id.*

122. Conklin's monitor/analyzer records source information (e.g., channel number) as well as storage location of the data packets on the hard drive when it recognizes that digital data is transferred on the bus. EX1010 [0029]-[0032]. This is what Conklin describes as generating its "sequence of events record," which "reflect[s] a series of data transfers between the local data processing unit" "and the mass storage device." *Id.* [0031]. The sequence of events record also records current times (time stamps) for recording and playback/viewing times for each data packet, which are used to determine time shifting activities. *Id.* [0042]-[0045], [0070]-[0071]. The events record "enables tracking of read and write operations" on the hard drive, which can be "indexed by the storage location on the mass storage device." *Id.* [0045]-[0046]. I note that Conklin alternatively describes embodiments where the storage information is inserted into the data packet headers and not stored in the sequence of events record. EX1010 [0029]. This distinction is not relevant here.

123. Thus, Conklin relies on analyzing data packets sent to and from a mass storage device, with indexing based on their storage location. As I mentioned above, and as further explained with regard to claim elements [1.5] and [9.6] below, Conklin does not disclose or suggest any knowledge or concern with the beginning (or any other boundaries) of any particular piece of media content contained in the indexed data packets, or any method of determining same. Rather, it only discloses determining the source and size of the data packets.

124. Ramaswamy identifies media sources by using signature information generated based on the media presented, including not only the source but also the content. EX1006 [0019], [0024], [0030]-[0031]; *see also* claim elements [1.2] and [9.2] below. Ramaswamy identifies traditionally time shifted content based on matching of these signatures between recording times and playback times, represented by time stamps. *Id.* [0031]-[0034], [0036]-[0038], [0040]-[0041]. Matching signatures are assumed to represent the same media content. *Id.* [0060].

125. Although it generally asserts that Conklin's sequence of events record would be added to Ramaswamy, Petitioner does not explain how the sequence of events record could be used in Ramaswamy's signature-based system to determine the "more complex time shifting behaviors" such as fast forwarding, rewinding, pausing, and skipping. Conklin's sequence of events record relies on the read and write times to and from the hard drive and does not reflect whether a specific record

denotes the beginning, middle, or end of any content. *See* claim elements [1.5] and [9.6] below. Because Ramaswamy relies on content signatures, it cannot use the information in Conklin's sequence of events record to determine these time shifting behaviors, because Conklin's sequence of events record is not indexed to content, but to storage location on the mass storage device.

126. Conklin itself explains that it was known that systems using program signatures, like Ramaswamy's, were not well suited for determining these behaviors:

> The use of processing techniques **based on recognition of program signatures** has been employed in some cases where it is difficult to obtain accurate tuning information and in cases where it may otherwise be difficult to obtain viewing time information and channel information associated with the currently viewed program content. **Unfortunately, these techniques are not well suited for use in situations where a recording device enables rapid changes between live viewing of a program, delayed viewing of the program, viewing of another program while recording the program, etc.**

EX1010 [0007]. Thus, a POSA reading Conklin would have been discouraged from combining it with Ramaswamy to achieve the claimed invention.

127. Petitioner asserts that there was a reasonable expectation of success in combining the two references' teachings because both "relate to processing data," and "teach that data can be stored in well-known data structure formats and then

analyzed" "using [v]arious [well known] database processing techniques." '791 Petition, 63; '896 Petition, 58. This only addresses whether a POSA would have known how to store, analyze, and process the data in Conklin's sequence of events record for use in Ramaswamy. But the proposed combination entails more than this.

128. As discussed, Conklin's sequence of events record records source information, storage location, and time stamps for the individual data packets read from or written to its hard drive. However, it does not explain or teach how to determine the beginning or end of any specific media content. *See* claim elements [1.5] and [9.6] below. Conklin teaches using the delay time (the difference between playback or viewing time and record time) for specific packets of data, without reference to their content. EX1010 [0071]. It is unclear how a POSA could use the information in Conklin's sequence of events record to detect the "more complex time-shifting behaviors" in Ramaswamy's system, given that Ramaswamy instead relies on identifying content using signatures. I do not find any explanation in the Petition, or Dr. Russ's declaration, explaining how a POSA would have done this, or why a POSA would have had a reasonable expectation of success in doing so. Thus, based on the information presented by the Petitioner, a POSA would not have considered there to be a reasonable expectation of success in detecting these behaviors in Ramaswamy's system using Conklin's blind reading of hard drive data packets.

2. Independent Claims 1 and 9

a. Claim Elements [1.1], [9.1]

129. Petitioner identifies Ramaswamy's output signals (210 and/or 214) as the claimed *audio data samples* ('791 Petition, 65) and *video data samples* ('896 Petition, 59-60). In Ramaswamy, the output signal is received by the signature information generator directly from the media delivery device, or a transducer such as a microphone. EX1006 [0030]. This mirrors the description in the specification for audio data (whether raw or processed), which is captured by a monitoring device and uploaded to the system. '791 Patent, 3:38-54; '896 Patent, 3:45-62. As explained in discussing claim construction, in the challenged patent this data is divided into samples for subsequent analysis and content recognition. *See* Section VI.A.; '791 Patent, 4:49-62; '896 Patent, 4:58-5:5. However, Ramaswamy does not disclose dividing or processing the output signals into samples, for subsequent content recognition analysis or any other purpose, as required by the Challenged Patents.

130. The division of data into data samples is not required in ACR systems and thus cannot be presumed to be present in Ramaswamy. For example, U.S. Patent No. 6,990,453 B2 to Wang et al. (Ex. 2003) (currently assigned to the well-known music identification company Shazam) describes processing approximately five to

ten seconds of (raw) audio. Ex. 2003, 6:66-7:1.[8] This audio is processed into a spectrogram, which is then tested for events such as a kick drum or cymbal crash or any other high-energy acoustic event. Ex. 2003, 9:20-10:40. The events are then mapped by their center frequency and the time interval from the previous event. *Id.*, 10:41-60. This pattern then forms a list of identifying attributes (fingerprints), made up of center frequency, amplitude, and time between events. The list of features is then used to search a reference database to find a matching sequence. *Id.*, 16:3-16. Thus, the Shazam method does not divide up the raw audio into multiple samples for content recognition, but instead performs its content recognition analysis on undivided raw audio data.

131. Thus, Ramaswamy-Conklin does not disclose the use of *audio data samples* ('791 Patent) or *video data samples* ('896 Patent) as required by claim elements [1.1] and [9.1].

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[8] Although the patent describes this audio data as a "sample," a POSA would have understood that "sample" as used in this patent refers to the entire raw audio file received for content recognition. *See* Ex. 2003, 5:36-38 (explaining that the patent provides a method for recognizing a single "exogenous media sample given a database containing a large number of known media files); *id.* 5:60-62 ("[A]n exogenous media sample is a segment of media data of any size."); *see also id.* Fig. 1 (referencing capture of single sample).

132. Petitioner states that Ramaswamy sequentially generates signature information from the submitted data samples, but does not actually state what the submitted data samples are. Petition, 65; '896 Petition, 60. These data samples are required by the challenged claims to correspond to the captured audio or video data samples. In the specification, they are selected from the captured audio or video data samples. '791 Patent, 4:49-62; '896 Patent, 4:58-5:5. However, because Ramaswamy does not teach or suggest generating data samples from the audio or video data, it cannot teach or suggest selecting any portion of such samples for submission for signature generation (and content identification). Instead, it appears that Ramaswamy generates signatures based on analysis of the entire raw media output signal. EX1006 [0030]-[0031]. This appears confirmed by Ramaswamy's description explaining that its signature information generator may be coupled to an acoustic transducer such as a microphone proximate to a speaker. *Id.* [0030]. Thus, Ramaswamy does not disclose the use of *a sequence of submitted data samples, the submitted data samples corresponding to* either *audio data samples* ['791 Patent] or *video data samples* ['896 Patent]. Therefore, Ramaswamy-Conklin does not disclose or suggest this limitation.

b. Claim Elements [1.2], [9.2]

133. For these elements, Petitioner does not rely on any disclosure in Conklin as disclosing or suggesting the *content offset data* required by claim

elements [1.2] or [9.2]. ’791 Petition, 67-70, 71-74; ’896 Petition, 62-65, 66-68. Petitioner asserts that Ramaswamy alone discloses or renders this element obvious when *play-altering actions* includes traditional time shifting activity, and that Ramaswamy-Conklin renders it obvious when play-altering actions must include more complex actions. ’791 Petition, 67-70; ’896 Petition, 62-65. Petitioner asserts, in both instances, that Ramaswamy’s use of time stamps, contained in its signature information to detect time shifted media consumption, discloses the use of content offset data as required by the claim. ’791 Petition, 67-68; ’896 Petition, 63-64.

134. The specification explains that each content offset “represents a time offset from the beginning of a particular piece of content.” ’791 Patent, 11:22-23; ’896 Patent, 11:41-43. Petitioner correctly understands this as meaning a determination “in relation to the beginning time of reference content.” ’791 Petition, 72; ’896 Petition, 66-67. As indicated by the name itself and as described in the specification, a content offset, is a relative value—the difference, or offset, between the beginning time of a sample within a particular piece of content from the beginning time of that specific content.

135. Petitioner explains that Ramaswamy describes generating signature information for content received by a media source, which is stored in a local reference library. ’791 Petition, 73; ’896 Petition, 67. Ramaswamy explains that this signature information may include a time stamp, which Ramaswamy explains is

simply the time at which an event occurs. EX1006 [0036]-[0038], [0050]. Petitioner acknowledges that the time stamps that may be included in the signature information "would be the absolute time of the broadcast data." '791 Petition, 73; '896 Petition,67. Because the time stamp is an absolute time, it is not of course a relative or offset time, and therefore cannot be the claimed *content offset data*.

136. Despite this, Petitioner asserts that a POSA would have "understood that the claimed *content offset* would encompass at least using absolute times, as opposed to arbitrary reference times, for broadcast channels." '791 Petition, 73; ''896 Petition, 66-67. If Petitioner is asserting here that a *content offset* as used in the Challenged Patents could be an absolute time, such as represented by Ramaswamy's time stamp, I strongly disagree. A *content offset* is a value explicitly internal to the content itself. It has nothing to do with absolute times. Further, the concept of a content offset was known to a POSA. *See, e.g.*, Ex. 2004 [0084]-[0085] ("offset is the time offset into the sound recording corresponding to the beginning of the exogenous sound sample").

137. Petitioner goes on to assert that a POSA would have understood that the "the difference between the time stamp of an identified segment of the broadcast … and the time stamp of the beginning of that broadcast corresponds to the claimed *content offset*." '791 Petition, 73-74; '896 Petition, 68. Petitioner then asserts that by considering the relative broadcast times of "that particular piece of

reference signature information" (corresponding to the broadcast segment) and the "recorded program as a whole," the "*time position* of that section … within the content as a whole … can be determined." '791 Petition, 74; '896 Petition, 68. Thus, Petitioner here asserts that a content offset for each broadcast segment can be calculated using this information. '791 Petition, 74; '896 Petition, 68

138. First, the Petition does not detail where Ramaswamy discloses time stamping both "an identified segment of the broadcast" and the "time stamp of the beginning of that broadcast." '791 Petition, 73-74; '896 Petition, 67-68. Petitioner points only to the time stamp for signature information 220 as indicating the "time at which that particular section of the recorded program was broadcasted." '791 Petition, 74; '896 Petition, 68. But Ramaswamy does not discuss time stamps for particular media segments, and instead only broadly states that signatures are generated for "each program, channel, or, more generally, any and all [presented] media content." EX1006 [0033].

139. It appears that Petitioner is merely assuming that Ramaswamy generates signatures and associated time stamps for individual program segments. I do not find any explanation or evidence supporting this assumption in either the Petition or in Dr. Russ's declaration. Based on my review of Ramaswamy, this assumption is not justified. Ramaswamy appears to indicate that broadcasts are stored in its reference database as a single signature, which would have a single time

stamp. EX1006 [0019] (referencing "media (e.g., a television program, a radio program, etc.")), [0024] (referencing "identifying media content" with "reference signature information associated with media content broadcast on a specific channel at a specific time" and specifically indicating a (singular) "time at which that media content was received at the reference site"), [0032] (referencing storage of "signature information corresponding to thirty minutes" of content), [0036] (referencing "a signature" and "a time stamp" when media content is played back), [0039] (discussing usage of "fixed preamble sounds" to generate signatures to identify associated games, not segments of such games).

140. Assuming that a POSA could determine content offsets in Ramaswamy using its time stamps, I do not find anything in Ramaswamy that discloses or suggests actually using such content offsets in any way.

141. When Ramaswamy monitors for time shifted information, the library generator associated with the media source generates signature information for the media content when it is first recorded, which is then stored in the reference library. EX1006 [0036]. When that content is ultimately played back, the signature information generator generates a signature for the played content from the media delivery device. *Id.* [0038]. In both cases, time stamp information—the absolute time the recording or playback occurs—is included in the signature information. *Id.* [0036]-[0038], [0050]. Ramaswamy's matcher compares the time stamps, and when

they are the same or substantially similar the matcher compares the signature information associated with the matching time stamps. *Id.* [0038].

142. The matcher sends matcher collections to a "time shift analyzer" which converts each collection to a "time shift analysis data structure." *Id.* [0040]. The analyzer flags the collection in the data structure to denote that it includes time shifted information. *Id.* [0040]-[0041]. The analyzer determines whether there is time shifted information by determining whether two records have the same signature values but different time stamp values. *Id.* [0046]. Thus, the time shift analysis renders a binary determination (contains or does not contain time shifted information). *Id.* [0040]-[0041]; *see also id.*, [0062]. The time shift analysis data structure thus captures whether a "tuning time" (the time the media is viewed) is "subsequent to the time at which the media content was downloaded, stored, recorded, etc." *Id.* [0066].

143. From this description, a POSA would have understood that Ramaswamy relied solely on comparing the absolute times shown in the time stamps to determine time shifting. When the playback time was subsequent to the download/recording time, Ramaswamy would determine that time shifting activity has occurred. This does not require the use of content offsets in any way, which is why Ramaswamy never discusses calculating a content offset. Thus, I do not find any reason a POSA would have modified Ramaswamy to actually use content

offsets. Therefore, I do not agree that the use of content offset data, as required by the claims, is rendered obvious by Ramaswamy.

144. If Petitioner is instead or additionally relying on Conklin for the use of content offsets (which is not apparent from the Petition) it does not disclose or suggest such use. This is explained in detail in regard to claim elements [1.5] and [9.6] below. Because neither reference teaches or suggests "using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member," Ramaswamy-Conklin does not render this limitation or claim obvious.

c. Claim Elements [1.4], [9.5]

145. These claim elements require "the content offset data including content offsets associated with the content identification results, a content offset indicating a time position of a content identification result within identified content." '791 Patent, 14:38-59, 15:16-16:15; '896 Patent, 15:12-35, 16:10-36. As previously mentioned, Petitioner relies on Ramaswamy alone as rendering this element obvious. '791 Petition, 71-74; '896 Petition, 67-68. However, as explained above for claim elements [1.2] and [9.2], Ramaswamy does not teach or suggest the use of content offsets anywhere.

146. Ramaswamy does not disclose the use of content offsets in using time stamps, because those time stamps are absolute times, and therefore do not denote *a*

time position … within identified content. Petitioner thus suggests that a POSA could determine a content offset for a particular segment by referring to the time stamp for the recorded broadcast "as a whole." '791 Petition, 74; '896 Petition, 68. However, Petitioner does not explain or show why a POSA would have been motivated to calculate or use content offsets in Ramaswamy. '791 Petition, 70-74; EX1003 (IPR2024-1053) ¶¶ 253-255; '896 Petition, 51; EX1003 (IPR2024-01056) ¶¶ 263-265. As discussed for claims elements [1.2] and [9.2] above, there was no such motivation.

d. Claim Elements [1.5], [9.6]

147. For these limitations, Petitioner first identifies Ramaswamy's time stamps for consumed signature information[9] as the claimed *log times associated with capture timing*. '791 Petition, 75; '896 Petition, 69. Petitioner then asserts that these are compared to a *progression of content offsets* "determined based on the time stamps in the reference signature information." '791 Petition, 75-76; '896 Petition,

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[9] For this element, Petitioner asserts that "signature information 217 corresponds to the *submitted data samples*." '791 Petition, 75; '896 Petition, 69. However, for element [1.1], Petitioner stated that the signature information was generated **from** the submitted data samples ('791 Petition, 65;'896 Petition, 60), but the submitted data samples were not identified.

69. However, Petitioner does not explain where Ramaswamy calculates or uses these content offsets. *See id.*

148. Petitioner asserts that "it would have been obvious to a POSA that a *progression* of such comparisons will be made because a single comparison would not be useful in the context of Ramaswamy's system." '791 Petition, 75-76; '896 Petition, 69-70. However, while Ramaswamy does compare time stamps of consumed and reference signature information, it does not ever do so by calculating or using a content offset. *See* Claim Elements [1.2] and [9.2] above. Thus, Ramaswamy does not disclose making even a single comparison between a the consumed signature time stamp and a content offset.

149. Petitioner asserts it would be obvious to make a progression of these comparisons (although no such comparisons are made in Ramaswamy). '791 Petition, 76 (asserting that it was "well known in order to detect time-shift behavior, the timing of content being played back is examined, which requires analysis of multiple samples in order to identify the time-shifted portions of content"); '896 Petition, 70 (asserting this was merely "comparing the collected data in a slightly different way"). The support for this conclusion is a citation to Dr. Russ's declarations. '791 Petition, 76; '896 Petition, 70. *Id.* But Dr. Russ only states that it was well known to compare time stamps—which Ramaswamy already does. Dr.

Russ never asserts that it was well known to compare log times **to content offsets** as required by the claim, instead stating that:

> To the extent not expressly disclosed by Ramaswamy, a POSA would know that comparing time stamps (*e.g.* to confirm that content was or was not being viewed at the same rate at which it was originally recorded) would be a simple way to detect "trick play" behavior such as fast-forward or rewind.

EX1003 (IPR2024-01053) ¶ 264; EX1003 (IPR2024-01056) ¶ 274. This does not suggest comparing "a progression of log times" with "a progression of content offsets" as required by the claims.

150. In addition, Petitioner's reference to a "*progression* of such comparisons" does not follow the claim language, which requires instead a comparison of progressions. A progression of comparisons is a series of comparisons between (a) a *single* log time and (b) a *single* calculated content offset. The claimed comparison of progressions is a comparison between (a) a *progression* of log times and (b) a *progression* of content offsets.

151. Assuming as an underlying foundation that Ramaswamy actually uses content offsets (which as previously explained, it does not), Petitioner's analysis states that Ramaswamy's "stream of matcher collections" sequentially compares, for each matched content segment, the consumed signature time stamp (alleged *log time*) with the difference between the reference signature time stamp for the content

segment and the reference signature time stamp for the beginning of the content as a whole (alleged *content offset*). ’791 Petition, 75; ’896 Petition, 70. As described, each comparison would require three data points—the consumed signature time stamp and the two reference signature time stamps used to determine the content offset.

152. In contrast, the claimed *comparing a progression of log times* with the *progression of content offsets* would require a comparison of the changes (progressions) between those singular comparisons. ’791 Patent, 11:38-55; ’896 Patent, 11:59-12:10. Using Petitioner’s analytical framework from Ramaswamy, this comparison would require at least five data points—the time stamps for two consumed signatures and at least three reference signature time stamps (one for the beginning of the content as a whole, and one for each matched segment). Nothing in Ramaswamy suggests making such a comparison between the progression of log times and progression of content offsets.

153. Also, I note that if Ramaswamy were modified as Petitioner suggests, so that it compared time stamps of consumed signature information with content offsets calculated from the time stamps of reference signature information (’791 Petition, 76; ’896 Patent, 70), Ramaswamy would no longer be capable of determining whether any content was time shifted. As previously discussed for claim elements [1.2] and [9.2], Ramaswamy determines time shifting by detecting

differences between playback and recorded times. If Ramaswamy were instead comparing playback times to calculated content offsets, it could no longer detect this difference, as the relative content offset values would always be different from the playback times. That is, while the playback times would be absolute times, the content offset values would be relative times. If these times were compared by Ramaswamy's time shift analyzer, it would always conclude that there is a time shift, regardless of whether the segment was actually played back at a later time. This is because the relative value of the content segment would never match the absolute value of the playback time. In effect, Ramaswamy would be attempting to compare two different types of values—one absolute versus one relative. This is an apples to oranges comparison that would render Ramaswamy non-functional, at least for determining time shifted viewing, which is its stated goal. EX1006, Abstract.

154. Petitioner alternatively argues that Ramaswamy in combination with Conklin renders this element obvious. '791 Petition, 76; '896 Petition, 70. Petitioner explains that the "View Time" on the horizontal axis of Conklin's Figure 13 is an absolute local time denoting the playback time. '791 Petition, 77; '896 Petition, 71. Petitioner maps this to the *progression of log times*. *Id.* Petitioner then explains that the vertical axis in Figure 13 represents the delay time—the difference between the view time and the recording time. '791 Petition, 77-78; '896 Petition, 72.

155. Petitioner does not map this delay time to the claimed content offsets. Instead, Petitioner asserts that the claimed content offsets "are a function" of the record time, and that "it would have been obvious, knowing the start time of the full program and the broadcast/record time of the identified segment of content, to determine the content offset therefor." '791 Petition, 78; '896 Petition, 72. Based on this, Petitioner asserts that Conklin's record times render obvious the claimed progression of content offsets. *Id.*

156. There are several problems with Petitioner's analysis. First, Conklin's view/playback times are not *associated with capture timing of each of the ... submitted data samples*. As previously discussed, the claimed *log time* is the time the sample started to be captured. *See* Section VII.A.1.b. above. But the view/playback times in Conklin are not associated with the capture timing of any data at all. Instead, they represent the time at which Conklin's information monitor/analyzer determines that "a previously stored packet of digital information is to be retrieved" from the storage device for playback. EX1010 [0033]. The monitor/analyzer merely associates this time with the event record or adds it to the packet header. *Id.* But the determination that a stored packet is to be played back is not the time at which that data was captured. That occurred earlier—when it was first stored on the storage device by the DVR's local data processing unit. *Id.* [0024] ("The local data processing unit 22 processes received signals and stores the

processed signals as digital information on the mass storage device 24 … sends the processed signals … to one or more devices such as …a television, for live viewing, and/or retrieves and outputs … digital information previously stored on the mass storage device 24."). Thus, Conkin's view/playback times cannot be the claimed *progression of log times associated with capture timing of each of the ... submitted data samples.*

157. Second, if one first assumes that Conklin "know[s] the start time of the full program" and the "broadcast/record time of the identified segment," Petitioner does not assert that Conklin actually discloses using content offsets. Rather, Petitioner asserts that it was obvious to determine content offsets using this information. Here, as for Ramaswamy, there is no reasoning explaining why a POSA would have been motivated to use content offsets to deduce *play-altering actions*. There would not be any such reason, because Conklin was already able to accomplish this without considering content offsets at all.

158. Third, neither Ramaswamy nor Conklin discloses or suggests using content offsets at all. Petitioner does not assert that either reference discloses the use of content offsets. Petitioner asserts that their calculation and use would have been obvious in Ramaswamy and in the Ramaswamy-Conklin combination. But neither of the references actually discloses doing so. Nor is there any explanation for why it was obvious to use them given that neither reference actually does. It appears then

that Petitioner supplies the use of content offsets from some unidentified third source. While I understand that it may be permissible to rely on common sense or general knowledge of a POSA to supply missing claim limitations, it does not appear that Petitioner has done so as there is no such discussion in the Petition. While it may be a simple matter to calculate a content offset, if given the beginning of a piece of media content and the time of a particular content segment, this does not mean it was obvious to use that content offset as described in the claims.

159. Fourth, a POSA would have recognized that it was impossible to determine content offsets based on Conklin's disclosure. As discussed, a content offset is an offset from the beginning of a particular piece of media content, such as the beginning of a song or television program. '791 Patent, 11:10-26; '896 Patent, 11:29-46. Conklin discloses using an information monitor/analyzer which reads the digital packets transmitted on a data bus between a mass storage device (hard drive) and a local processing unit (which processes audio/video data and sends it to the mass storage device or to viewing devices). EX1010 [0024], [0027]-[0028]. This information contains "storage location information" (the physical memory location on the hard drive, or a logical block address) for the data packets. *Id.* [0028]. For the data packets, the monitor/analyzer can also store time information—a time stamp containing a current time. *Id.* [0029], [0031]. Alternatively, the time and storage location are stored as a header in the data packets. *Id.* [0029], [0031]. The

monitor/analyzer also includes source information (e.g., channel number) with the storage location and time stamp. *Id.* [0032].

160. The monitor/analyzer thus monitors the data bus to recognize when digital data is transferred—the individual read/write events where information is recorded or retrieved. *Id.* [0030]. This is described as generating "a sequence of events record reflecting a series of data transfers between the local data processing unit" "and the mass storage device." *Id.* [0031]. When an event record having the same storage location information is found in the sequence of events record, "a playback time, which is preferably a current local time, is associated" with the event record. *Id.* [0033].

161. The record generator therefore records source, time and storage location information uniquely corresponding to each packet written to the mass storage device. *Id.* [0042]. It may store this information in memory in a lookup table, which may be used to modify the event record to include a read or playback (viewing) time. *Id.* [0044]. This is the "sequence of events record," "which enables tracking of read and write operations." *Id.* [0045].

162. Conklin discloses that its sequence of events record is "used to maintain a record of write or record events that is indexed by the storage location on the mass storage device … In other words, for each storage location (e.g., each logical block address) on the mass storage device" "there is a corresponding event record

containing the time at which the [data] associated with the write operation was written or recorded on the mass storage device" "as well as the source or channel from which the audio, video and/or image information within the data packet was originally derived." *Id.* [0046]. When played back, "a current local time is added to the event record" to record the event. *Id.*

163. When media content is to be recorded on (written to) the mass storage device, the monitor/analyzer's access detector determines the source and current time and generates an event record containing that information, which is stored in the sequence of events record. *Id*. [0055]. When that stored event is to be played back (read from) the mass storage device, the access detector determines the locations on the storage device from which the data packets associated with the event are to be read. *Id.* [0057]. The event record generator uses the location information to look up the previously stored event record corresponding to that location in the sequence of events record/look-up table. *Id.* The generator adds the current local time to the event record. *Id.*

164. A POSA would have understood from the foregoing that Conklin tracks the precise storage location for each individual data packet written on its system's hard drive. However, Conklin does not describe that the sequence of events record records what data packet or packets mark the beginning of a particular piece of content. A POSA would have recognized that Conklin's system does not require it

to know where any particular media content began or end, because it functions to achieve its goal (as stated in its abstract, "tracking a sequence of events associated with a digital recording device") while being agnostic to this information.

165. Therefore, Conklin does not disclose any mechanism that would enable it to even calculate a content offset using Petitioner's proposed methodology. Because Conklin does not disclose any way to determine the beginning of any piece of content or any particular content segment, it is unable to calculate the offset from that beginning point to the time stamp of any particular content segment.

166. For the foregoing reasons, even in combination, Ramaswamy-Conklin does not possess the ability to "compar[e] a progression of log times associated with capture timing of each of the particular plurality of submitted data samples and a progression of content offsets of the corresponding content identification results." Thus, it would not render these claim elements, or the claims, obvious.

3. Claim 2

167. Claim 2 of both Challenged Patents requires "[t]he method of claim 1 further comprising: generating a play list including content offset data as part of deducing media play-altering actions of a monitored audience member." '791 Patent, 14:60-63; '896 Patent, 15:36-39.

168. For Claim 2, Petitioner cites only to Conklin's disclosure. '791 Petition, 79-80; '896 Petition, 73-74. Petitioner asserts that it was obvious to insert content

offsets in Conklin's sequence of events analysis, and therefore obvious to include them in Conklin's sequence of events record (which Petitioner characterizes as the claimed play list) "in place of or in addition to the record time information." '791 Petition, 80; '896 Petition, 74.

169. However, I could not find any reasoning or explanation explaining why a POSA would have made these changes, nor any support for Petitioner's obviousness assertion in Dr. Russ's testimony. I disagree with Petitioner's conclusion, because as discussed for claim elements [1.5] and [9.6] above, Conklin does not disclose or suggest using content offsets at all. In fact, as discussed there, one cannot even calculate content offsets in Conklin's systems. Therefore, Conklin does not disclose or suggest incorporating content offsets into a play list as required by Claim 2.

170. Additionally, Conklin's sequence of events record is not the claimed play list. Unlike a play stream, a play list contains entries for each item of media content (which is useful for content identification in channel matching), not for each individual content sample. *See* Section VI.B. Conklin's sequence of events record may (at best) be considered a play stream, which in this case does not have any content identification results. However, it is not a play list. As discussed for claim elements [1.5] and [9.6] above, the record contains the absolute time stamps for specific data packets based on their storage location, not their content. It is therefore

not the claimed play list. For the foregoing reasons, Ramaswamy-Conklin does not render Claim 2 obvious.

4. Claim 3

171. For Claim 3, Petitioner relies on Ramaswamy alone. '791 Petition, 80; '896 Petition, 74-75. The claim requires "utilizing sample sequence data **together with** corresponding channel data **to deduce play-altering actions** of a monitored audience member." '791 Patent, 14:64-67; '896 Patent, 15:40-43.

172. Petitioner points to Ramasamy's teaching that it uses channel data to identify specific television programming contained in media content. EX1006 [0060]; '791 Petition, 81; '896 Petition, 74-75. Ramaswamy explains that:

> **collecting and analyzing … matching signatures** also **enables the identification of the delivery paths** of the media content that may be used to develop information about the manner in which that media content was received at a consumption site (e.g., a home), stored for later consumption, and consumed at a later time(s). In an example down load, storage and retrieval process, **a set of matching signatures** … each providing various media source information and time stamp information **may be used to determine that the media content was delivered** on a particular channel at a particular time, **then stored** on a particular device at a particular time, … **and subsequently displayed** one or more times at the direction of the user.

EX1006 [0060]. From this disclosure, a POSA would have understood that, Ramaswamy first determines whether content was time shifted based on its signature matching process, without reference to channel data. That is, the signature match process is first performed, and once done, it enables identification of the delivery paths—such as a particular channel. As previously discussed for claim elements [1.2] and [9.2] above, the signature information includes the times stamps of reference and consumed content, which is used to determine if time shifted viewing has occurred.

173. Only once there is a signature match does Ramaswamy use channel data. However, this is not to deduce time shifting as Petitioner asserts, but to efficiently identify the particular programming displayed so that it can be "credited" as having been consumed:

> If the initial delivery of the media content corresponds to a broadcast channel having a known lineup, then the signature information associated with the download may be compared to the lineup **to identify the television programming** contained in the media content in an efficient manner. The identified programming can then be **credited with having been consumed** at the times indicated by the signatures captured in connection with the playback of the programming, i.e., the signatures associated with the subsequent display of the media content.

EX1006 [0060]. Ramaswamy thus teaches that "behaviors and characteristics

associated with time-shifted media consumption … can be accurately and efficiently captured and analyzed." *Id.* While Ramaswamy does use channel data to capture and analyze "behaviors and characteristics associated with" time shifting, it is not used to deduce that time shifting occurred in the first instance as required by the claim (assuming that time shifting is a *play-altering action*). Therefore, Ramaswamy-Conklin does not disclose the limitations of claim 3.

5. Claim 4

174. Petitioner cites to Ramaswamy alone in its analysis of Claim 4. '791 Petition, 81; '896 Petition, 75. Petitioner identifies Ramaswamy's "collection of consumption records," specifically "consumption reports" that detail viewed content, as including a *clean play list*. '791 Petition, 81; '896 Petition, 75-76. Petitioner specifically asserts that these reports are created by the time shift analyzer and included in the time shift analysis data structure. '791 Petition, 81-82; '896 Petition, 75-76.

175. Ramaswamy's time shift analysis data structure includes the source of time shifted content, and a time stamp for both a tuning (recording) time and playback time. EX1006, [0065]. However, nothing in Ramaswamy indicates that this data structure is a clean play list, or in fact even a play list at all.

176. This data structure appears to be, at best, a raw play stream, because it provides sample content and time stamps. Ramaswamy teaches that its signature

information generator "sequentially generates reference signatures for each program, channel or, more generally, any and all media content," with the signatures representing the media content for media played on a delivery device. EX1006 [0030]-[0031], [0033]. That information is used by Ramaswamy's matcher for comparison with signature information in the local reference libraries. *Id.* [0032]-[0034]. Resulting signature matches are included in a matcher collection. *Id.* [0033]-[0034]. This matcher collection may be sent to the time shift analyzer, resulting in a time shift analysis data structure which denotes whether or not the matches contain time shifted information. *Id.* [0040], [0046], [0062]. This data structure may be stored in a consumption record, which may include signatures associated with the time shift analysis data structure, with collections thereof sent to a central processing facility. *Id.* [0041]. This association enables "the identity of media content" to be determined at the facility. *Id.*

177. Assuming along with Petitioner that Ramaswamy discloses generating signatures for content segments—which is not apparent as discussed for claim elements [1.2] and [9.2] above—the foregoing disclosure indicates at most that its matcher collections and associated time shift analysis data structures are a raw play stream containing sequentially generated signatures for the consumed media content (that is, a series of signatures for content as it is consumed and a notation of whether there was time shifting). This appears to be the same type of data set described in

the specification as a raw play stream, which contains a sequential listing of selected media data samples, as they are played, with first-pass content identification results (or denoting that no initial content identification was determined).[10] '791 Patent, 6:14-27, 7:16-7:38, 8:1-22; '896 Patent, 6:24-37, 7:26-48, 8:13-34. That is in fact how Petitioner maps Ramaswamy's matcher collections for claim element [1.1]. '791 Petition, 66; '896 Petition, 61-62. Even assuming with Petitioner that Ramaswamy generates signatures for content segments instead of content as a whole, it contains no indication that a POSA would reasonably construe as analyzing or condensing the sequentially generated signatures or signature matches into a structure identifying entire programs, songs, or ads, versus a stream of data containing only portions of such items. That is, a play list. *See* Section VI.B. Thus, Ramaswamy does not teach or suggest a play list.

178. Assuming that any of these data structures are play lists, there is no indication in Ramaswamy that they are ever scrubbed to convert them into clean play lists. Ramaswamy does states that the data structures may be stored in

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[10] Alternatively, if Ramaswamy generates signatures for entire programs versus mere portions (as discussed for claim elements [1.2] and [9.2]), then its matcher collections are not play streams, but are play lists. In that case, Ramaswamy does not teach *generat[ing] a play stream* under claims 1 or 9 (elements [1.1], [9.1]).

consumption records (which may be called a "consumption report," "viewing records," or something else) sent to a central facility. EX1006 [0041]. However, Ramaswamy never indicates or even suggests that these records are ever scrubbed to remove or correct misidentified or unidentified media content. Accordingly, Ramaswamy-Conklin does not disclose this claim limitation and cannot render Claim 4 obvious.

6. Claim 7

179. Claim 7 of both Challenged Patents requires "[t]he method of claim 1 wherein utilizing further comprises determining if one or more discontinuities exist in the progression of content offsets." '791 Patent, 15:8-10; '896 Patent, 16:1-3.

180. Petitioner states that a POSA would have understood from the specification that a "discontinuity" "may identify non-continuous values in the progression of content offsets." '791 Petition, 83; '896 Petition, 77. As it did for claim element [1.5], Petitioner asserts that "the claimed *content offsets* are a function of Conklin's record time." '791 Petition, 84; '896 Petition, 78. Petitioner identifies the "transition point[s] between each identified region of Figure 13 (i.e., regions 400, 402, 404, 406, etc.)" as corresponding to the claimed discontinuities. '791 Petition, 84; '896 Petition, 78.

181. As discussed for claim elements [1.5] and [9.6] above, Conklin does not teach using content offsets, and in fact it would have been impossible to

determine content offsets based on Conklin's record time. Thus, even assuming that the transition points in Conklin's Figure 13 corresponded to discontinuities in media consumption, there is nothing in Conklin that discloses determining them in relation to the claimed *progression of content offsets* as required by Claim 7. Ramaswamy-Conklin thus fails to render claim 7 obvious.

7. Claims 12, 13 ('896 Patent)

182. Claim 12 of the ''896 Patent requires "[t]he method of claim 9 wherein at least one of a play list and a play stream is generated, by one or more computers, including content offset data as part of deducing media play-altering actions of a monitored audience member." '896 Patent, 16:43-46. Claim 13 requires "[t]he method of claim 12 wherein the at least one of a play stream and play list including content offset data comprises the play stream of content identification results." *Id.*, 16:47-49.

183. In its analysis of these claims, Petitioner relies on Conklin's disclosure alone, specifically referencing Petitioner's analysis of Claim 2. '896 Petition, 82-83. In doing so, Petitioner states that there is "no real distinction between" a play stream and play list in the specification. *Id.*, 82-83.

184. First, I disagree that the '896 Patent makes no distinction between a play stream and a play list. *See* Section VI.B. above.

185. Second, even assuming with Petitioner that there is no distinction between these terms, as I explained with regard to claim elements [1.2], [1.5], [9.2], and [9.5] above, the proposed combination does not teach or suggest the use of content offset data, as required by both claims. Accordingly, I disagree that Ground 2 renders these claims obvious.

C. Ground 3

186. I understand that under Ground 3 Petitioner asserts that Feininger in combination with Conklin renders claims 2 and 7 of the '791 Patent obvious, and claims 2, 7, 23, and 13 of the '896 Patent obvious.

187. Below, I address Ground 3 as set forth in the Petition with respect to certain claims and claim elements. My opinions do not encompass all aspects of the asserted grounds or all challenged claims. To the extent the Petition is granted I may provide additional opinions addressing these, or any other aspects of the asserted grounds and the challenged claims.

1. Whether the combination of Feininger and Conklin would have been obvious.

188. Petitioner asserts as a motivation for the asserted combination adding Conklin's sequence of events analysis to Feininger to "improve a similar method" in the same way. '791 Petition, 89; '896 Petition, 84. Petitioner does not explain how Conklin's analysis would "improve" Feininger, however.

189. Petitioner asserts that Feininger already possessed the ability to detect whether recorded content was paused, skipped, fast forwarded, or rewound. *See* '791 Petition, 53, 56-57; '896 Petition, 48-49, 51-53. Given that, using Petitioner's analysis, Feininger was already able to perform the functions allegedly enabled by Conklin's sequence of events analysis, adding Conklin's functionality to Feininger would add nothing to Feininger. It thus would not improve Feininger as asserted. Accordingly, I disagree that a POSA would have been motivated to combine these two references in order to improve Feininger in the same way as Conklin. Therefore, it would not have been obvious to combine these references to achieve the claimed inventions.

2. Claims 2, 7 (both Challenged Patents) and Claims 12, 13 ('896 Patent).

190. Each of the claims challenged under Ground 3 requires the inclusion of content offsets. For all of these claims, Petitioner relies solely on the disclosure of Conklin as supplying the claim limitations to the proposed combination. '791 Petition, 79-80, 82-85, 90; '896 Petition, 73-74, 78-79, 82-83, 85. As explained for Ground 2, Claim Elements [1.5] and [9.5], and Claims 2, 7, 12, and 13, Conklin does not disclose or suggest the calculation or use of content offsets. Therefore, Ground 3 does not render obvious any of these claims.

VIII. CONCLUSION

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

Dated: November 13, 2024

W. Leo Hoarty