

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ROKU, INC.,  
Petitioner

v.

ANONYMOUS MEDIA RESEARCH HOLDINGS, LLC,  
Patent Owner

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Case IPR2024-01056  
U.S. Patent No. 10,572,896

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**PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NO. 10,572,896**

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**EXHIBIT LIST**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                           |
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| 1001               | U.S. Patent No. 10,572,896 to Steuer et al. (“’896 patent”)                                                                                  |
| 1002               | File History of the ’896 Patent (“’896 Patent File History”)                                                                                 |
| 1003               | Declaration of Dr. Samuel Russ                                                                                                               |
| 1004               | <i>Curriculum Vitae</i> of Dr. Samuel Russ                                                                                                   |
| 1005               | U.S. Patent No. 7,248,777 to Feininger et al. (“Feininger”)                                                                                  |
| 1006               | U.S. Patent Appl. Publ. No. 2007/0271300 to Ramaswamy (“Ramaswamy”)                                                                          |
| 1007               | U.S. Prov. Pat. Appl. No. 60/574,836 (“’836 application”)                                                                                    |
| 1008               | U.S. Prov. Pat. Appl. No. 60/629,996 (“Ramaswamy provisional”)                                                                               |
| 1009               | Redline comparison of Ramaswamy specification and the Ramaswamy provisional application specification                                        |
| 1010               | WO 2004/051997 A1 to Conklin (“Conklin”)                                                                                                     |
| 1011               | U.S. Patent No. 5,581,658 to O’Hagan et al. (“O’Hagan658”)                                                                                   |
| 1012               | Hernandez et al., “Real-world Data is Dirty: Data Cleansing and the Merge/Purge Problem,” Kluwer Academic Publishers, 1998                   |
| 1013               | Lakshminarayan et al., “Imputation of Missing data in Industrial Databases,” Kluwer Academic Publishers, 1999                                |
| 1014               | Batlle et al., “Automatic Song Identification in Noisy Broadcast Audio,” 2002                                                                |
| 1015               | Interim Procedure for Discretionary Denials in AIA Post-Grant Proceeding with Parallel District Court Proceedings Memorandum, June 21, 2022. |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                          |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1016               | Mong Li Lee, W. Hsu and Vijay Kothari, “Cleaning the spurious links in data,” in IEEE Intelligent Systems, vol. 19, no. 2, 28-33, March-April 2004. (“Lee”)                                                                                                                 |
| 1017               | Ingunn Myrtveit, Erik Stensrud, and Ulf H. Olsson “Analyzing Data Sets with Missing Data: An Empirical Evaluation of Imputation Methods and Likelihood-Based Methods,” in IEEE Transactions on Software Engineering, vol. 27, no. 11, 999-1013, November 2001. (“Myrtveit”) |
| 1018               | U.S. Patent Appl. Publ. No. 2003/0037333 to Ghashghai et al. (“Ghashghai”)                                                                                                                                                                                                  |
| 1019               | Microsoft Computer Dictionary, Fifth Edition, Microsoft Press 2002                                                                                                                                                                                                          |

## I. INTRODUCTION

Roku, Inc. (“Roku” or “Petitioner”) petitions for *inter partes* review, seeking cancellation of claims 1-13 of U.S. Patent No 10,572,896 (“the ’896 patent”; EX1001), assigned to Anonymous Media Research Holdings LLC ( “Patent Owner”).

## II. IDENTIFICATION OF THE CHALLENGE (37 C.F.R. § 42.104(B))

Roku requests IPR based on the grounds below.

| Ground | 35 U.S.C. | Claims       | References         |
|--------|-----------|--------------|--------------------|
| 1      | § 103(a)  | 1, 3-6, 9-11 | Feininger          |
| 2      | § 103(a)  | 1-4, 7-13    | Ramaswamy, Conklin |
| 3      | § 103(a)  | 2, 7, 12, 13 | Feininger, Conklin |

The ’896 patent was filed on May 3, 2019, and claims priority through a chain of divisionals and continuations to U.S. Appl. No. 11/139,330, filed on May 26, 2005 (now abandoned), and U.S. Prov. Appl. No. 60/574,836 (“’836 application”), filed May 27, 2004. As explained below, the earliest effective priority date of the ’896 patent is May 26, 2005 because the ’896 patent is not entitled to priority to the ’836 application. Section IV.B.

**Feininger** issued on July 24, 2007, filed on January 13, 2004, is a National Stage Entry of PCT/US03/12001 filed on April 17, 2003 (published in English and

designating the U.S.). **Feininger** is prior art under 35 U.S.C. § 102(e) (pre-AIA) regardless of the '896 patent's priority date.

**Ramaswamy** published on November 22, 2007, was filed on May 22, 2007 as a continuation of PCT/US05/42561 filed on November 22, 2005 (published in English and designating the U.S.), and claims priority to Provisional Application No. 60/629,996 filed on November 22, 2004. **Ramaswamy** is prior art under 35 U.S.C. § 102(e) (pre-AIA) as of November 22, 2004 because (1) it is entitled to its provisional filing date for prior art purposes (Section VI.B.1) and (2) the '896 patent's earliest effective filing date is May 26, 2005 (Section IV.B).

**Conklin** published on June 17, 2004, and was filed as PCT/US02/038012 on November 27, 2002 (published in English and designating the U.S.). **Conklin** is prior art under 35 U.S.C. § 102(e) (pre-AIA) regardless of the '896 patent's priority date. **Conklin** also is prior art under 35 U.S.C. § 102(a) (pre-AIA) based on the '896 patent's earliest effective filing date of May 26, 2005.

### III. LEVEL OF ORDINARY SKILL IN ART

A person of ordinary skill in the art ("POSA") at the time the '896 patent was filed 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. EX1003, ¶31; EX1003, ¶¶6-14 (Dr. Russ is a POSA).

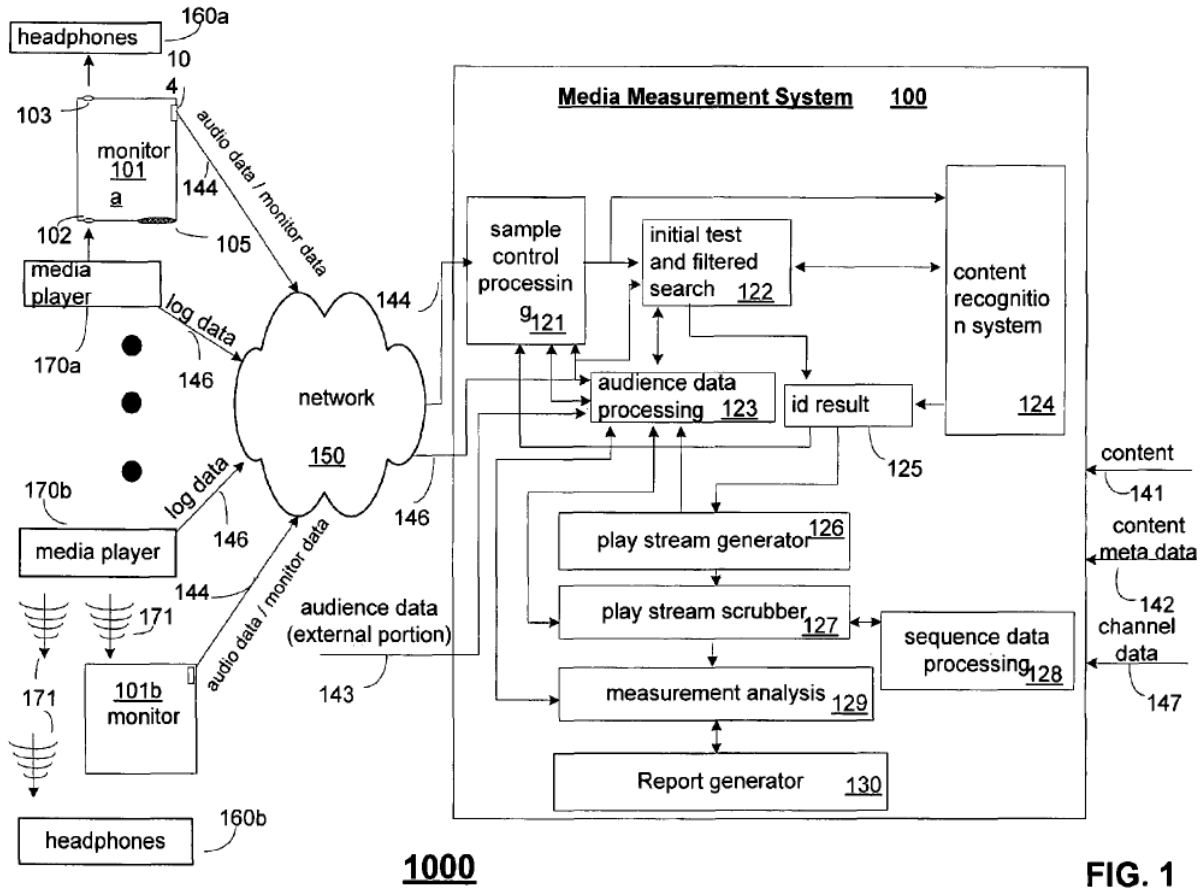
#### **IV. OVERVIEW OF THE '896 PATENT**

##### **A. Summary**

The '896 patent purports to “provide a media measurement system and method that enhances recognition (e.g. in terms of accuracy or efficiency) of the content of a media sample by analyzing information exogenous to the sample.”

EX1001, 1:66-2:3. In particular, it “provide[s] a method in which play-altering activity of an audience member is deduced from content offset values of identifications corresponding to captured samples.” EX1001, 2:14-17; EX1003, ¶52.

Figure 1 illustrates a media usage monitoring and measurement system 1000. EX1001, 3:5-9, FIG. 1.



EX1001, FIG. 1.

Figure 2 illustrates a media measurement method 200 carried out by system 100. EX1001, 7:1-5, FIG. 2. At step 201, system 100 receives audio data from a monitoring device 101 and caches a series of samples for content identification. EX1001, 7:5-8. This audio data is uploaded to the system 100 by monitoring device 101a, which includes a microphone 105 and a media player port 102 to capture audio energy when an audience member is consuming media from media player 170a. EX1001, 3:10-44, FIG. 2.

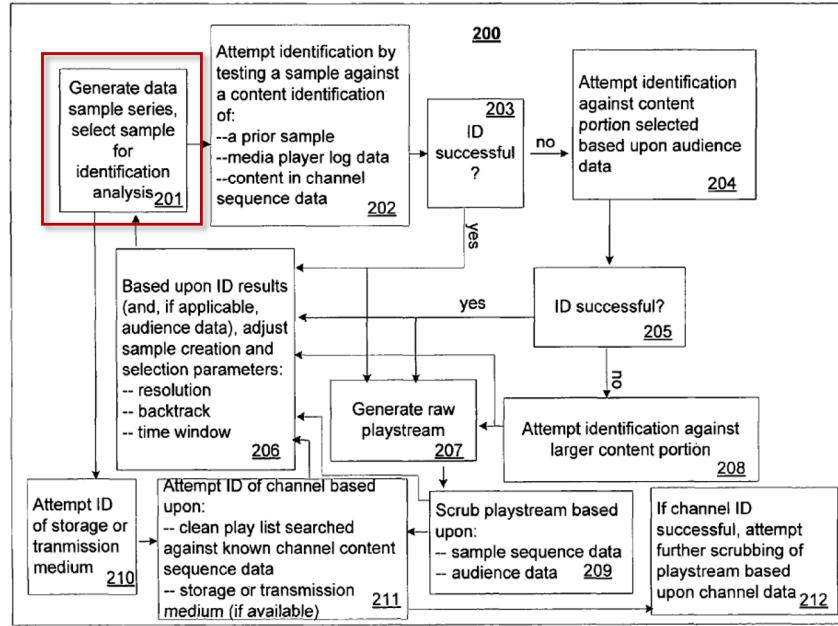


FIG. 2

EX1001, FIG. 2 (annotated).

At step 202, the initial test and filtered search module 122 attempts to identify a sample in a series of samples via initial test methods by determining whether the audio data in the tested sample matches data associated with the content ID corresponding to the most recently identified sample. EX1001, 5:7-10, 7:26-30.

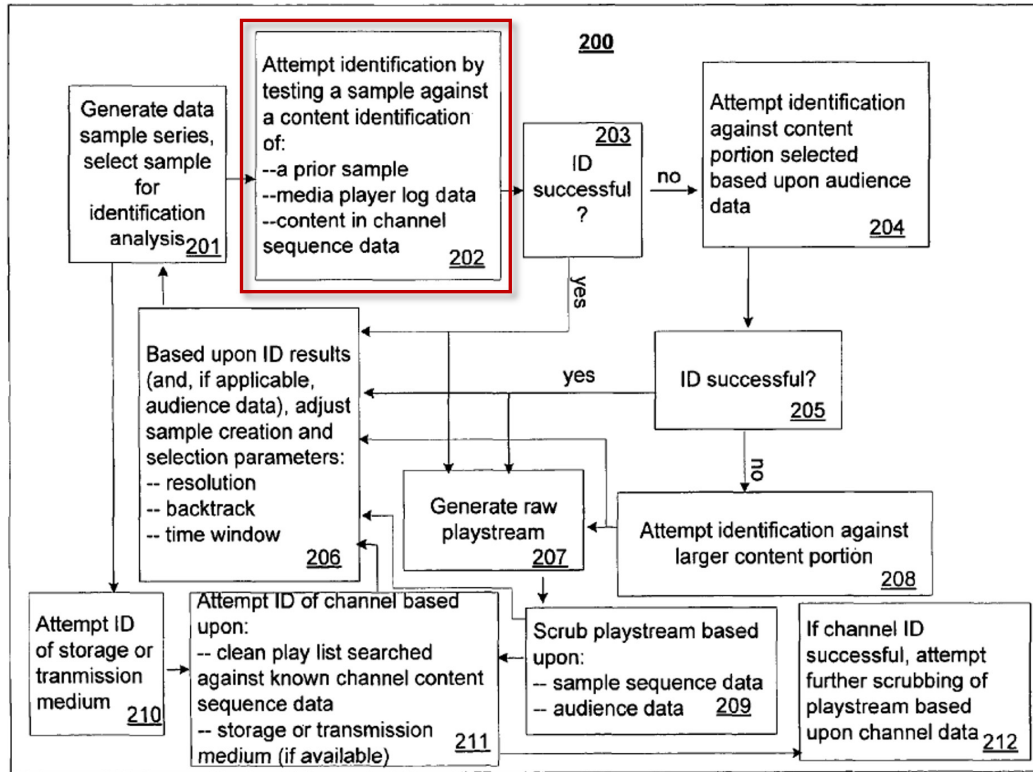


FIG. 2

EX1001, FIG. 2 (annotated).

If the sample is identified, the result is provided to play stream generator 126 (step 207). EX1001, 7:34-36. If not, then the initial test and filtered search module 122 may search (step 204) for a content match against targeted content selected based at least in part upon additional audience data. EX1001, 7:36-38, FIG. 2.

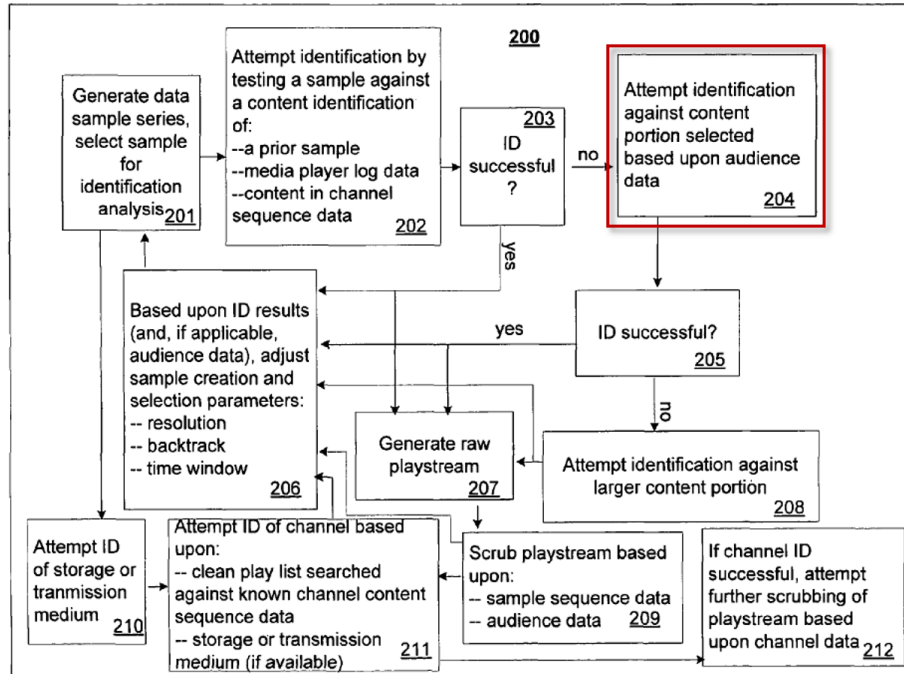


FIG. 2

EX1001, FIG. 2 (annotated).

If the sample is identified here, the result is provided to play stream generator 126 (step 207). EX1001, 7:40-41. If not, the content recognition system 124 performs a search using a larger portion of the content to identify the data sample at step 208. EX1001, 5:42-46, 7:41-42, FIG. 2.

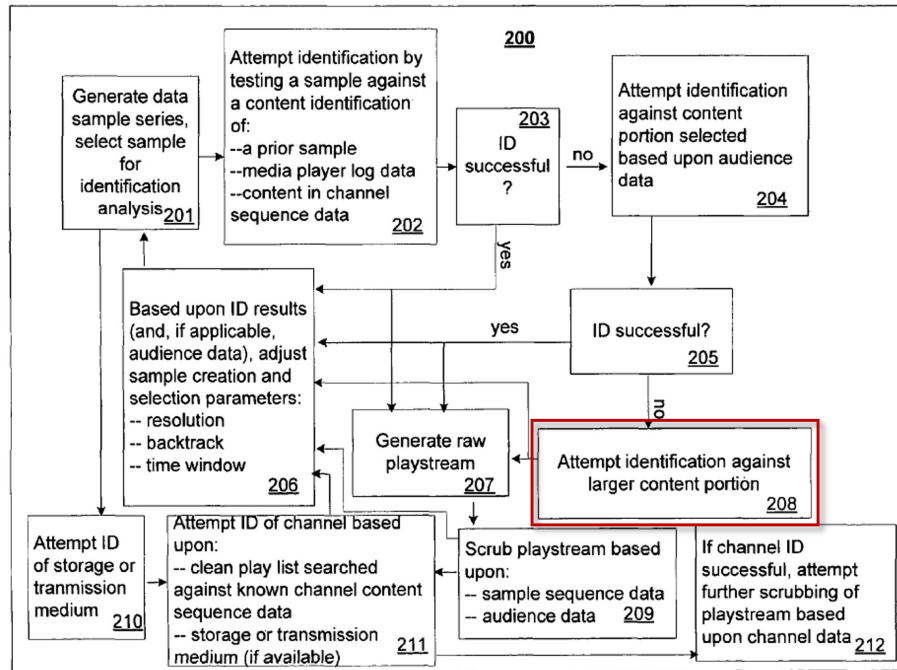


FIG. 2

EX1001, FIG. 2 (annotated).

The '896 patent admits that the content recognition system 124 did not implement a new or novel method or technique of identifying content but instead simply “implement[s] one or more 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.” EX1001, 5:48-52; EX1001, 5:53-62.

Subsequently, there are two possible results of steps 202, 204, and 208: an identification has been made or no identification has been made. EX1001, 7:42-45. Whatever the result is at step 208 (identification or no identification) that result is passed to steps 207 and 206. EX1001, 7:46-48.

At step 207, a raw play stream is generated by play stream generator 126 indicating a series of samples and corresponding identification results. EX1001, 6:24-27, 8:13-15, FIG. 2.

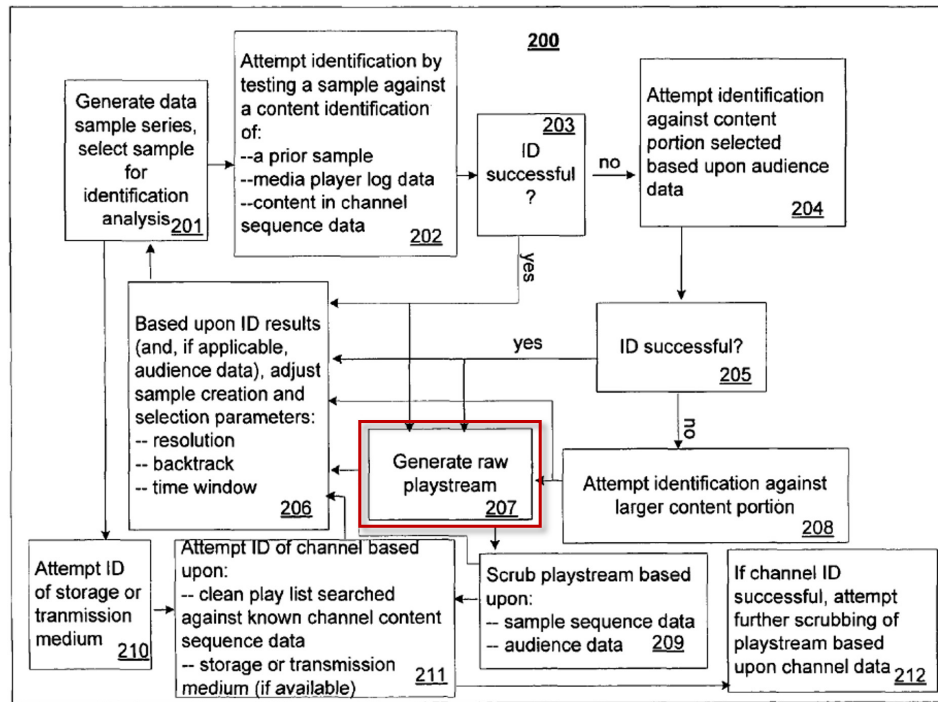


FIG. 2

EX1001, FIG. 2 (annotated).

Figure 4 illustrates a raw play stream 410, generated at step 207, which includes a sequence of analyzed samples, log times (e.g.,  $t_0$ ), and corresponding identification results (“content ID” column), where the content ID result indicates either a reference to a particular piece of content (e.g., “song 51”) or indicates that no identification was made (e.g., none). EX1001, 9:25-45. This sample sequence data (“ssd”) also includes time data (“log time” column); the times in list 410 may

be relative to an arbitrary value (e.g., “ $t_0$ ”) rather than representing an absolute time, or the times may indicate the actual time the sample started to be captured.

EX1001, 9:40-45.

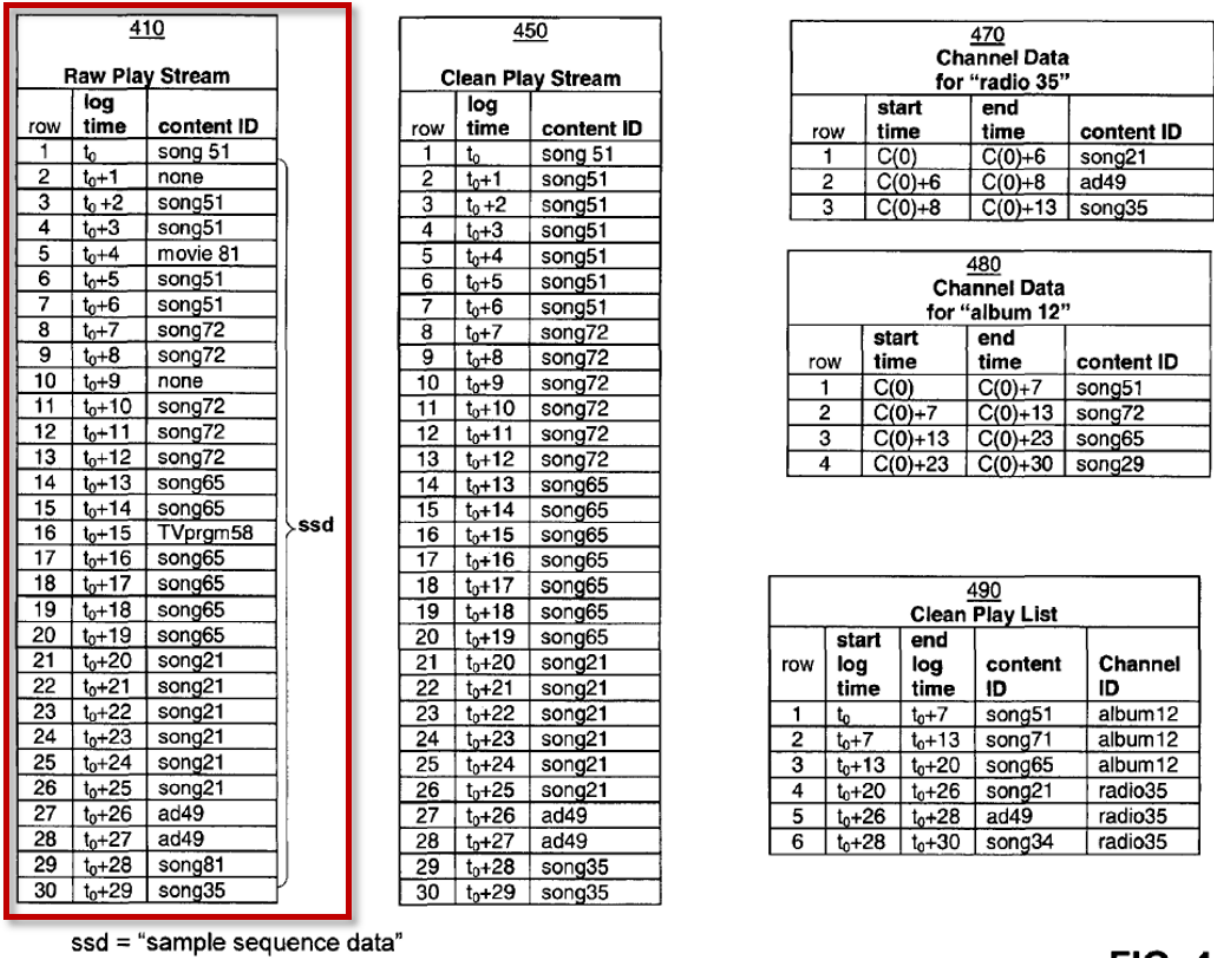


FIG. 4

EX1001, FIG. 4 (annotated).

At step 209, play stream scrubber 127 scrubs the raw play stream based upon the sample sequence data and, where appropriate, audience data, and creates a clean play stream. EX1001, 6:30-37, 8:15-18, FIG. 2.

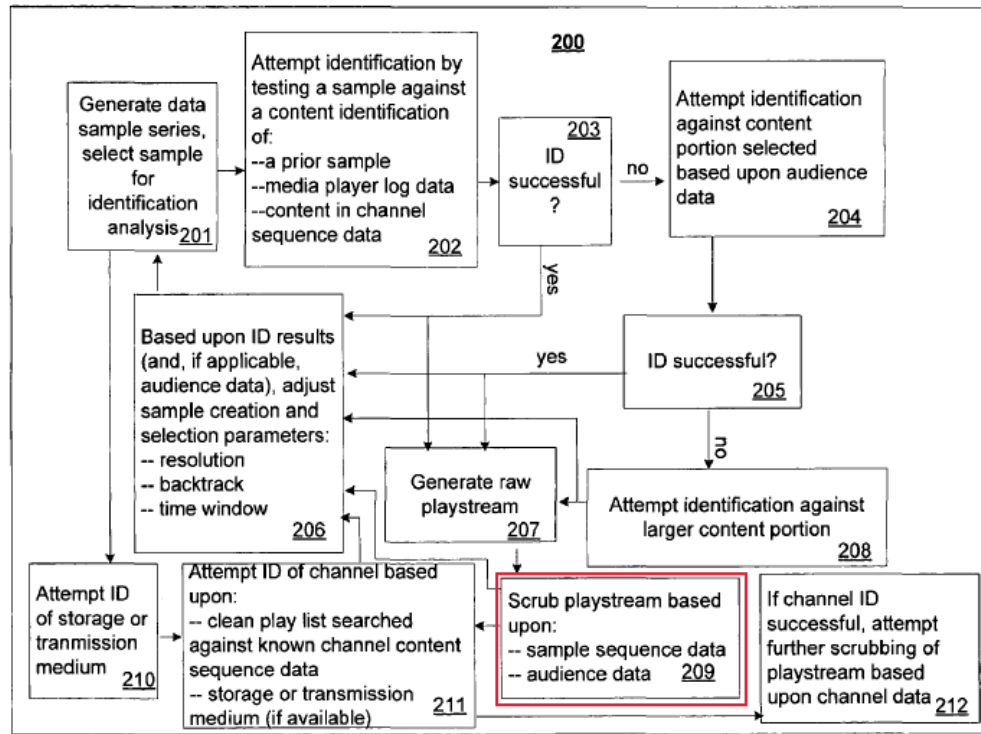
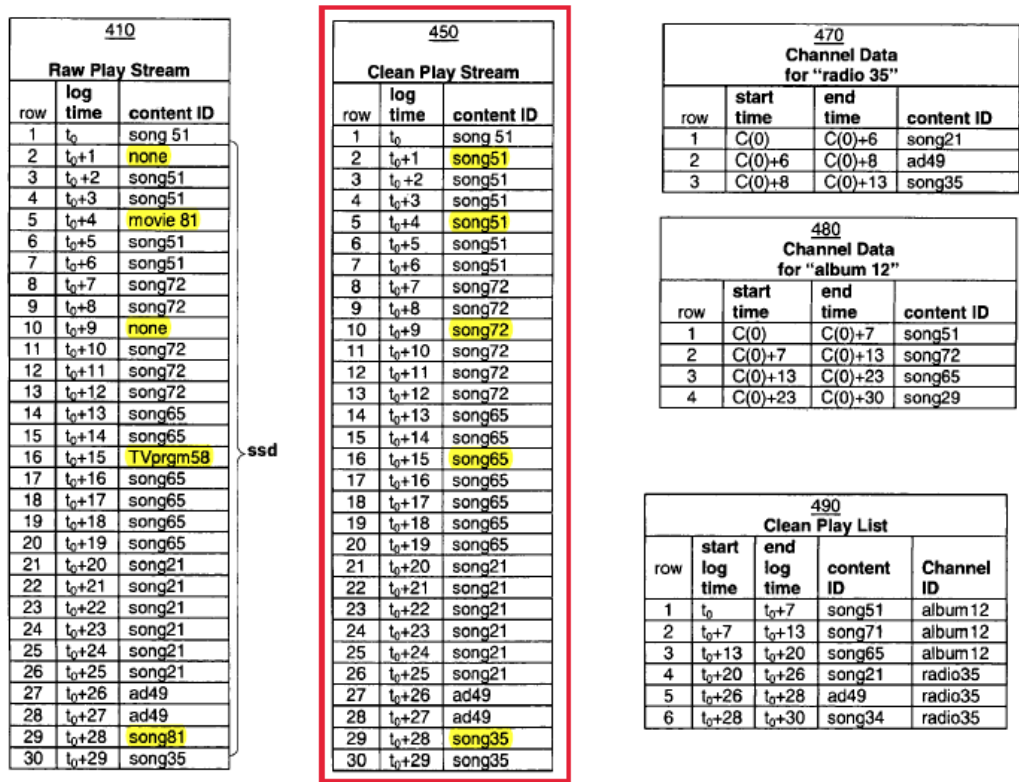


FIG. 2

EX1001, FIG. 2 (annotated).

During this scrubbing process, the raw play stream 410 is reviewed for missing or incorrect data in order to generate a clean play stream 450. EX1001, 8:44-47, 9:25-65, FIG. 4.



ssd = "sample sequence data"

FIG. 4

EX1001, FIG. 4 (annotated).

Figure 5 illustrates another example of clean play stream 510, in which the sample sequence data also includes content offsets. EX1001, 9:38-40.

| 510<br>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                      | $t_0+12$ | TVprgm27   | (0)+29         |
| 14                      | $t_0+13$ | TVprgm27   | (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                      | $t_0+19$ | TVprgm28   | (0)+2          |

| 560<br>Clean Play List |                |              |            |                |
|------------------------|----------------|--------------|------------|----------------|
| row                    | start log time | end log time | content ID | content offset |
| 1                      | $t_0$          | $t_0+2$      | TVprgm27   | (0)            |
| 2                      | $t_0+2$        | $t_0+5$      | none       | n/a            |
| 3                      | $t_0+5$        | $t_0+7$      | TVprgm27   | (0)+2          |
| 4                      | $t_0+7$        | $t_0+9$      | TVprgm27   | (0)+9          |
| 5                      | $t_0+9$        | $t_0+11$     | TVprgm27   | (0)+9          |
| 6                      | $t_0+11$       | $t_0+12$     | none       | n/a            |
| 7                      | $t_0+12$       | $t_0+14$     | TVprgm27   | (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                     | $t_0+17$       | $t_0+20$     | TVprgm28   | (0)            |

| 570<br>Channel Data for TV C4 |            |          |            |
|-------------------------------|------------|----------|------------|
| row                           | start time | end time | content ID |
| 1                             | C(0)       | C(0)+31  | TVprgm27   |
| 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  | TVprgm28   |

| 590<br>Clean Play List with Deduced Actions |          |              |                                 |                |
|---------------------------------------------|----------|--------------|---------------------------------|----------------|
| row                                         | log time | end log time | content ID and <deduced action> | content offset |
| 1                                           | $t_0$    | $t_0+2$      | TVprgm27                        | (0)            |
| 2                                           | $t_0+2$  | $t_0+5$      | <pause for 3 units>             | n/a            |
| 3                                           | $t_0+5$  | $t_0+7$      | TVprgm27                        | (0)+2          |
| 4                                           | $t_0+7$  | $t_0+7$      | <skip frwrd 5 units>            | n/a            |
| 5                                           | $t_0+7$  | $t_0+9$      | TVprgm27                        | (0)+9          |
| 6                                           | $t_0+9$  | $t_0+9$      | <skip bckwrd 2 units>           | n/a            |
| 7                                           | $t_0+9$  | $t_0+11$     | TVprgm27                        | (0)+9          |
| 8                                           | $t_0+11$ | $t_0+12$     | <fast frwrd 18 units>           | n/a            |
| 9                                           | $t_0+12$ | $t_0+14$     | TVprgm27                        | (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                                          | $t_0+17$ | $t_0+20$     | TVprgm28                        | (0)            |

FIG. 5

EX1001, FIG. 5 (annotated).

“Each log time indicates a time at which capture of the analyzed sample began, where  $t_0$  simply represents a beginning time for samples on Play Stream 510.” EX1001, 11:32-35. “Each content ID indicates an identifier of the content that has been identified as corresponding to the captured sample” (e.g., TVprgm 27). EX1001, 11:35-40. “Each content offset value represents a time offset from the beginning of a particular piece of content” (e.g., 9 time units in row 8, shown as “(0)+9”). EX1001, 11:41-46.

Media measurement system 100 can use this content offset data to deduce play-altering user actions. EX1001, 11:8-28. Such “play-altering actions” can include pausing, reversing, or fast forwarding the media player, or instantly

skipping back or forward in played content. EX1001, 11:14-23. More generally, the '896 patent references “activities of manipulating the pace and order in which media is consumed” as “play-altering actions or activities.” EX1001, 11:23-25.

In the embodiment of Figure 5, “[d]iscontinuities in consumption of the identified media may be identified by comparing the progression of sample log times to progression of corresponding content offset times in Play Stream 510.” EX1001, 11:59-62. The deduced user actions can be added to clean playlist 510 to create a new playlist 590. EX1001, 12:17-22.

| 510<br>Clean Playstream |                    |            |                |
|-------------------------|--------------------|------------|----------------|
| row                     | log time           | content ID | content offset |
| 1                       | t <sub>0</sub>     | TVprgm 27  | (0)            |
| 2                       | t <sub>0</sub> +1  | TVprgm 27  | (0)+1          |
| 3                       | t <sub>0</sub> +2  | none       | n/a            |
| 4                       | t <sub>0</sub> +3  | none       | n/a            |
| 5                       | t <sub>0</sub> +4  | none       | n/a            |
| 6                       | t <sub>0</sub> +5  | TVprgm 27  | (0)+2          |
| 7                       | t <sub>0</sub> +6  | TVprgm 27  | (0)+3          |
| 8                       | t <sub>0</sub> +7  | TVprgm27   | (0)+9          |
| 9                       | t <sub>0</sub> +8  | TVprgm27   | (0)+10         |
| 10                      | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 11                      | t <sub>0</sub> +10 | TVprgm27   | (0)+10         |
| 12                      | t <sub>0</sub> +11 | none       | n/a            |
| 13                      | t <sub>0</sub> +12 | TVprgm27   | (0)+29         |
| 14                      | t <sub>0</sub> +13 | TVprgm27   | (0)+30         |
| 15                      | t <sub>0</sub> +14 | ad23       | (0)            |
| 16                      | t <sub>0</sub> +15 | none       | n/a            |
| 17                      | t <sub>0</sub> +16 | ad25       | (0)+2          |
| 18                      | t <sub>0</sub> +17 | TVprgm28   | (0)            |
| 19                      | t <sub>0</sub> +18 | TVprgm28   | (0)+1          |
| 20                      | t <sub>0</sub> +19 | TVprgm28   | (0)+2          |

| 560<br>Clean Play List |                    |                    |            |                |
|------------------------|--------------------|--------------------|------------|----------------|
| row                    | start log time     | end log time       | content ID | content offset |
| 1                      | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27   | (0)            |
| 2                      | t <sub>0</sub> +2  | t <sub>0</sub> +5  | none       | n/a            |
| 3                      | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27   | (0)+2          |
| 4                      | t <sub>0</sub> +7  | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 5                      | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27   | (0)+9          |
| 6                      | t <sub>0</sub> +11 | t <sub>0</sub> +12 | none       | n/a            |
| 7                      | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27   | (0)+29         |
| 8                      | t <sub>0</sub> +14 | t <sub>0</sub> +15 | ad23       | (0)            |
| 9                      | t <sub>0</sub> +15 | t <sub>0</sub> +16 | none       | n/a            |
| 10                     | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad25       | (0)+2          |
| 11                     | t <sub>0</sub> +17 | t <sub>0</sub> +20 | TVprgm28   | (0)            |

| 570<br>Channel Data for TV C4 |            |          |            |
|-------------------------------|------------|----------|------------|
| row                           | start time | end time | content ID |
| 1                             | C(0)       | C(0)+31  | TVprgm27   |
| 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  | TVprgm28   |

| 590<br>Clean Play List with Deduced Actions |                    |                    |                                 |                |
|---------------------------------------------|--------------------|--------------------|---------------------------------|----------------|
| row                                         | log time           | end log time       | content ID and <deduced action> | content offset |
| 1                                           | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27                        | (0)            |
| 2                                           | t <sub>0</sub> +2  | t <sub>0</sub> +5  | <pause for 3 units>             | n/a            |
| 3                                           | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27                        | (0)+2          |
| 4                                           | t <sub>0</sub> +7  | t <sub>0</sub> +7  | <skip frwrd 5 units>            | n/a            |
| 5                                           | t <sub>0</sub> +7  | t <sub>0</sub> +9  | TVprgm27                        | (0)+9          |
| 6                                           | t <sub>0</sub> +9  | t <sub>0</sub> +9  | <skip bckwrd 2 units>           | n/a            |
| 7                                           | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27                        | (0)+9          |
| 8                                           | t <sub>0</sub> +11 | t <sub>0</sub> +12 | <fast frwrd 18 units>           | n/a            |
| 9                                           | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27                        | (0)+29         |
| 10                                          | t <sub>0</sub> +14 | t <sub>0</sub> +15 | ad23                            | (0)            |
| 11                                          | t <sub>0</sub> +15 | t <sub>0</sub> +16 | <fast frwrd 7 units>            | n/a            |
| 12                                          | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad25                            | (0)+2          |
| 13                                          | t <sub>0</sub> +17 | t <sub>0</sub> +20 | TVprgm28                        | (0)            |

FIG. 5

EX1001, FIG. 5 (annotated).

As one example of deducing play-altering actions, the '896 patent describes:

[R]eferring to rows 2, 3, 4, 5, and 6, of Play Stream 510, the content offset values of rows 2 and 6 indicate advancing for one time unit within TV program 27 while no content ID (or corresponding offset value) is available for rows 3-5. From this information, and the fact that log times of rows 3-5 together correspond to progression through three time units, it is reasonable to deduce that the audience member paused a media player for three time units from log time  $t_0+2$  to log time  $t_0+5$ .

EX1001, 12:26-34. *See also* EX1003, ¶¶52-71.

**B. The '896 Patent is Not Entitled to Provisional Priority Date**

Patent Owner bears the burden of establishing priority. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1379-80 (Fed. Cir. 2015).

The '896 patent claims priority to the '836 provisional application, filed May 27, 2004. However, none of the challenged claims are entitled to the May 27, 2004 priority because the '836 application does not contain adequate 35 U.S.C. § 112 written description support for at least the claimed “using one or more computers to utilize sample sequence data and content offset data to deduce play-altering actions of the monitored audience member, . . . 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 Board has the authority to analyze § 112 issues when determining

whether the challenged claims are entitled to a certain priority date. *Indivior UK Ltd. v. Dr. Reddy's Labs. S.A.*, 18 F.4th 1323 (Fed. Cir. 2021). To satisfy the written description requirement, “the disclosure of the application relied upon [must] reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *See, e.g., Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). The application’s disclosure of the claimed subject matter must be: (1) express or necessarily present, *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998); (2) complete, *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571-72 (Fed. Cir. 1997); and (3) unambiguous, *Hyatt v. Boone*, 146 F.3d 1348, 1354 (Fed. Cir. 1998).

The alleged invention here is “to deduce play-altering actions of the monitored audience member” by “utiliz[ing] sample sequence data and content offset data,” by “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,” where “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.” But the ’836 application does not disclose at least “content offset data,” as claimed, nor does it disclose the claimed

comparison of this content offset data with capture log times. Rather, the '836 application simply states "[o]nce the playstream has been cleaned, salient media usage events are much more easily detected," including, e.g., "[p]ausing," "[s]kipping," "[s]canning," "[s]low motion," "[p]rogram change," and "[d]evice change." EX1007, 5. Elsewhere, the '836 application states: "[t]he system uses correlation of time-sequenced samples to detect manipulation of the media playback stream." *Id.*; EX1003, ¶¶80-81.

It is also not enough that the claims would have been obvious in view of the ancestor application's disclosure. *Lockwood*, 107 F.3d at 1571-72 ("Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. . . . A description which renders obvious the invention for which an earlier filing date is sought is not sufficient."); *Rivera v. Int'l Trade Comm'n*, 857 F.3d 1315, 1322 (Fed. Cir. 2017) (finding that the specification did not provide written description support for a claimed device even if the specification might render it obvious). Thus, to the extent this supposed invention was even supported by the '896 patent itself (which is questionable), the patentability of the '896 patent should be evaluated as of May 26, 2005 (i.e., not May 27, 2004). EX1003, ¶82.

## **V. CLAIM CONSTRUCTION**

Claims must be given their ordinary and customary meaning in light of the specification—“the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-1313 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,358 (Oct. 11, 2018).

Solely for purposes of this Petition, Petitioner believes that no claim terms require explicit construction. Accordingly, all claim terms have been given their plain and ordinary meaning, in the context of the '896 patent specification, under the *Phillips* standard. EX1003, ¶¶131-132.

## **VI. OVERVIEW OF THE APPLIED REFERENCES**

### **A. Feininger (EX1005)**

Feininger's system detects content skipping by a consumer of a recorded program. EX1005, Abstract

Figure 1 illustrates a system for developing audience measurement statistics.

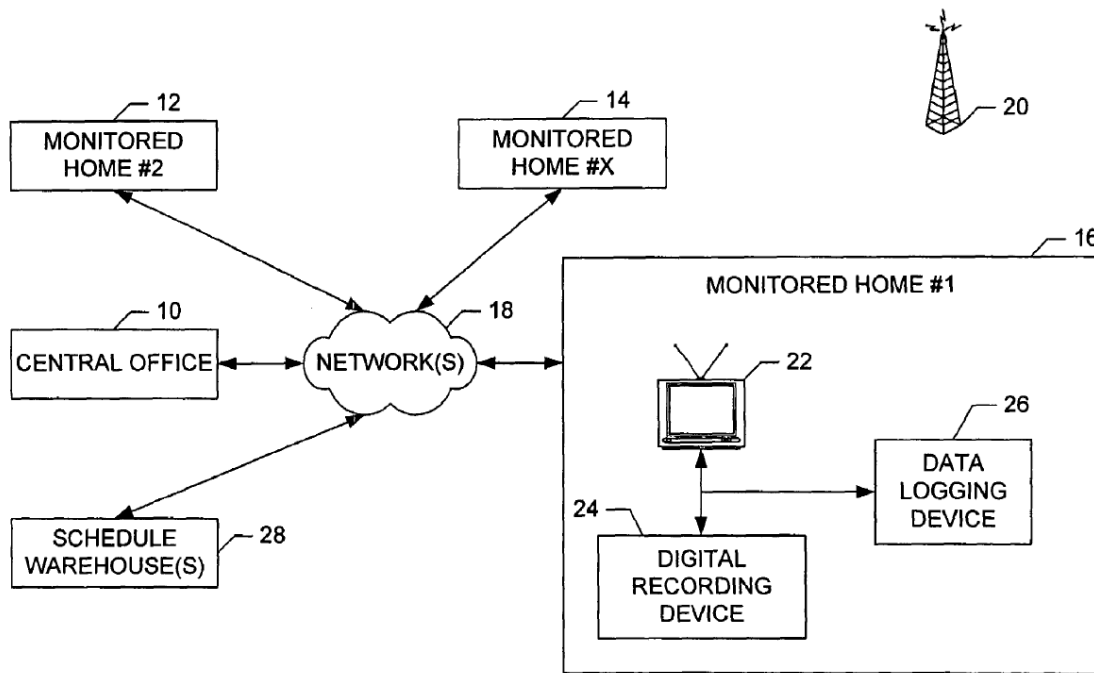


FIG. 1

EX1005, FIG. 1.

Each of monitored home sites 12, 14, and 16 may include a presentation device 22 (e.g., a television), a digital recording device 24 and a data logging device 26. EX1005, 3:18-35. Digital recording device 24 receives and records content video and/or audio programs broadcast from broadcasting system(s) 20. EX1005, 2:61-63, 3:21-27. Data logging device 26 “collect[s], record[s] and/or analyze[s] data reflecting usage of the digital recording device 24.” EX1005, 3:28-31. Such data may be “periodically exported to the central office 10.” EX1005, 3:31-34.

Apparatus 50 (Figure 2) detects “portions of a recorded program that were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or rewind).” EX1005, 4:4-7.

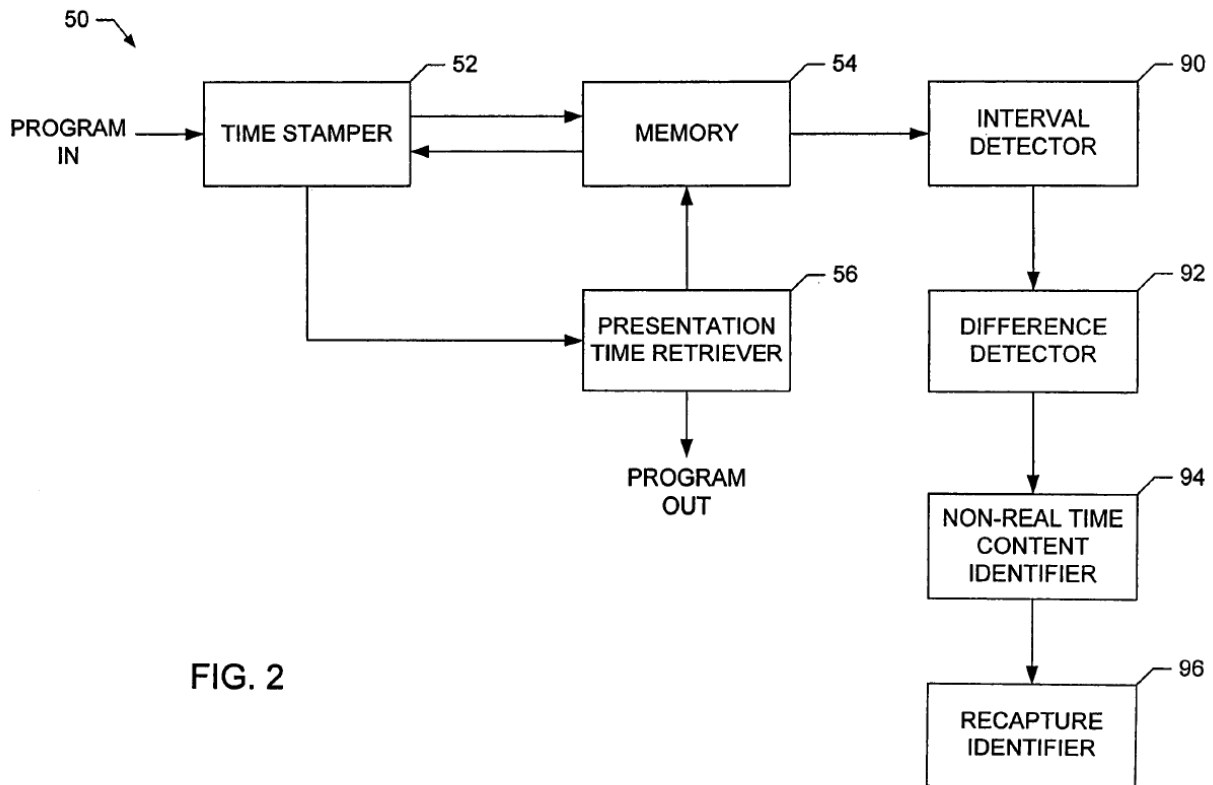


FIG. 2

EX1005, FIG. 2.

Time stamper 52 “records the times at which various sections of a received broadcast program are received,” i.e., “recording or presentation times.” EX1005, 4:15-23. When a program recorded in memory 54 is played back, presentation time retriever 56 retrieves the recording dates/times from the header(s) of the packet(s) currently being played and “stores those recording times in association with [a]

playback time of the corresponding sections of the program.” EX1005, 4:51-61, 5:16-19. That is, “presentation time retriever 56 periodically creates a running list of log entry data structures 58.” EX1005, 4:61-64. Exemplary log entry data structures are shown in Figures 3A-3C.

|            |              |            |              |       |    |
|------------|--------------|------------|--------------|-------|----|
| 60         | 62           | 64         | 66           | 68    | 58 |
| 01/23/2003 | 13:12:45.500 | 01/16/2003 | 21:57:20.920 | 13252 |    |

FIG. 3A

|            |              |            |              |       |    |
|------------|--------------|------------|--------------|-------|----|
| 60         | 62           | 64         | 66           | 68    | 58 |
| 01/23/2003 | 13:12:48.200 | 01/16/2003 | 21:59:23.420 | 13252 |    |

FIG. 3B

|            |              |            |              |       |    |
|------------|--------------|------------|--------------|-------|----|
| 60         | 62           | 64         | 66           | 68    | 58 |
| 01/23/2003 | 13:12:50.900 | 01/16/2003 | 21:59:26.120 | 13252 |    |

FIG. 3C

EX1005, FIGs. 3A-3C.

Log entry data structures 58 may be generated in real time such that each of data structures 58 are “created at substantially the time that a corresponding section of the recorded program is being played.” EX1005, 4:66–5:2. As shown in Figures 3A-3C, each log entry data structure 58 includes a playback date field 60 (which stores the date the corresponding section of the recorded program is played back) and a playback time field 62 (which stores the time the corresponding section of

the recorded program is played back). EX1005, 5:3-10. Each log entry data structure 58 also includes a recording date field 64 (which stores the date at which the section of the program was recorded) and a recording time field 66 (which stores the time at which the section of the program was recorded). EX1005, 5:10-16.

Presentation time retriever 56 may also “retrieve a program identifier from the packet header of the section of the recorded program currently being played back and store that identifier” in a program identification field 68 of log entry data structure 58. EX1005, 5:28-32. The program identifier may include a program name, a program identification number, a universal program identifier, and/or a station identifier (e.g., a broadcast channel number, a station name, etc.). EX1005, 5:32-42.

Interval detector 90 “retrieves a pair of contiguous log entry data structures 58” and calculates a recording time difference (i.e., a recording time interval) by subtracting the recording time value recorded in the older log entry data structure 58 of the pair from the recording time value recorded in the newer log entry data structure 58 of the pair. EX1005, 18:1-8, FIG. 12 (block 272). Interval detector 90 also calculates a real time difference (i.e., a playback time interval) by subtracting the playback time value recorded in the older log entry data structure 58 of the pair from the playback time value recorded in the newer log entry data structure 58 of

the pair. EX1005, 18:8-13, FIG. 12 (block 274). Difference detector 92 uses the recording time interval and the playback time interval to determine whether any portions of a recorded program were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or rewound). EX1005, 18:17-19:9, FIGs. 12A-C. *See also* EX1003, ¶¶83-105.

**B. Ramaswamy (EX1006)**

**1. Ramaswamy is prior art as of November 22, 2004**

Ramaswamy is prior art as of the November 22, 2004 filing date of U.S. Provisional Patent Application 60/629,996 (EX1008, “Ramaswamy provisional”) to which it claims priority. EX1003, ¶106. A nonprovisional patent application publication is prior art as of the earlier filing date of a provisional application if the disclosure of the provisional provides § 112 support for at least one claim in the publication, and the provisional describes the subject matter relied upon as prior art. *Dynamic Drinkware*, 800 F.3d at 1381-82.

The Ramaswamy provisional application provides support for at least Ramaswamy claim 1, as shown below; EX1003, ¶107.

| <b>Ramaswamy Claim 1</b>                               | <b>Ramaswamy Provisional (EX1008)</b>                                                                                            |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1. A method of identifying a media source, comprising: | “Methods and apparatus for media source identification and time shifted media consumption measurements are disclosed.” Abstract. |
| generating first signature information                 | “A disclosed method identifies a media                                                                                           |

| Ramaswamy Claim 1                                                                                                                                                                                                 | Ramaswamy Provisional (EX1008)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>based on media presented via a media delivery device;</p>                                                                                                                                                      | <p>source by generating first signature information based on media presented via a media delivery device.” Abstract.</p> <p>“After invoking the update library process (block 302), the consumption site process 300 generates or collects signatures or signature information (block 304) associated with media content currently being consumed. . . . The signature information may be generated at block 304 by, for example, the signature information generator 208 of FIG. 2.” ¶43; FIG. 3.</p> <p><i>See also</i> ¶¶27, 29, FIG. 2.</p>                                                                                                                                                                                                       |
| <p>comparing the first signature information to second signature information, wherein the second signature information is derived from a library of signature information local to the media delivery device;</p> | <p>“After generating the signatures or signature information (block 304), the consumption site process 300 matches the newly generated signature information to the signature information stored in the library (e.g., the local reference library 222) by invoking a match signature in information process (block 306). The match signature information process (block 306) compares first signature information (e.g., the signature information generated by the signature information generator 208 and stored in the signature information buffer 218) to second signature information (e.g., the signature information generated by the library generators 230, 232, and 234 and stored in the local reference library 222).” ¶44; FIG. 3.</p> |

| Ramaswamy Claim 1                                                                                                                                                                                                                                      | Ramaswamy Provisional (EX1008)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                        | <i>See also</i> Abstract, ¶¶31, 32, 56, FIG. 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| generating a collection of matching signature information based on the comparison of the first and second signature information;                                                                                                                       | <p>“The match signature information process (block 306) . . . generates a matcher collection of signature information (i.e., a collection of signature information corresponding to signature information for which substantial or identical matches were found at block 306).” ¶44; FIG. 3.</p> <p><i>See also</i> Abstract, ¶32, FIG. 2.</p>                                                                                                                                                                                                                                      |
| identifying a source of the media presented via the media delivery device based on the collection of matching signature information; and                                                                                                               | <p>“The media source (i.e., a PVR, a DVD player, a DVR, a VCR, an STB, a game console, etc.) of the media presented via the media delivery device may be identified based on the collection of matching signature information.” ¶18.</p> <p>“When a match is detected, the matching reference signature information is used to identify the channel on which the associated media content was received at the reference site and to identify the time at which the associated media content was received at the reference site 108.” ¶23.</p> <p><i>See also</i> Abstract, ¶17.</p> |
| performing a time shift analysis on the collection of matching signature information by identifying records in the collection of matching signature information having substantially identical signature values and substantially different time stamp | <p>“After invoking the match signature information process (block 306), the consumption site process 300 analyzes the data in the matcher collection returned by the match signature information process (block 306) for time shifted information (block 308).</p>                                                                                                                                                                                                                                                                                                                  |

| Ramaswamy Claim 1 | Ramaswamy Provisional (EX1008)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| values.           | <p>The time shifted information may be analyzed by the consumption site process 300 via a time shift analyzer (e.g., the example time shift analyzer 246 of FIG. 2). The time shift analyzer may determine that the matcher collection includes time shifted data by analyzing the number of records. . . . For example, if the matcher collection has two or more records with the same signature values (e.g., the first record and the second record of FIG. 4 have the same signature values [i.e., SIG1 equals SIG2]) but different time stamp values (e.g., if TS2 is greater than TS1), the time shift analyzer may be adapted to consider these two or more records as being associated with time-shifted consumption and, thus, may determine that the matcher collection includes time shifted data.” ¶45 (bracketed material in original); FIG. 3.</p> <p><i>See also</i> ¶¶39, 60, FIGs. 2, 8.</p> |

Indeed, apart from the first paragraph which adds the priority claim, Ramaswamy’s specification and figures are identical to those in the Ramaswamy provisional. EX1003, ¶108; EX1009 (redline comparison); *compare* EX1006, ¶¶2-75, FIGs. 1-10, *with* EX1008, ¶¶1-74, FIGs. 1-10.

## 2. Overview

Ramaswamy identifies and measures media that has been “time shifted” via a local content delivery device. EX1006, ¶18.

Figure 1 illustrates a system for media source identification and time shifted media consumption measurement.

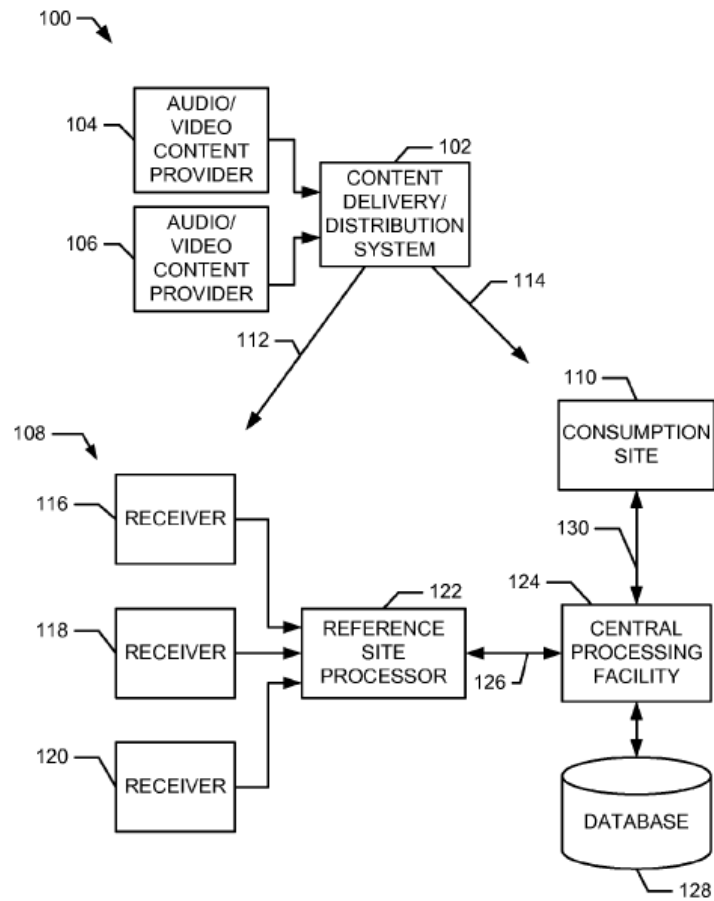


FIG. 1

EX1006, FIG. 1.

Content delivery/distribution system 102 receives video and/or audio content from audio/video content providers 104 and 106. EX1006, ¶21. Content delivery/distribution system 102 transmits “one or more signals containing digital and/or analog audio/video content information” to a reference site 108 and at least one consumption site 110 via respective communication paths or links 112 and 114. EX1006, ¶21. Content delivery/distribution system 102 may include, for example, a radio broadcast station or a television broadcast station, and audio/video content providers 104, 106 may provide, for example, audio (e.g., radio) programs or video (e.g., television) programs. *Id.*

Consumption site 110 receives media content from a remotely situated content delivery/distribution system 102 (e.g., a broadcast station) via the communication link 114. EX1006, ¶27. “[C]onsumption site 110 may alternatively or additionally receive media content from one or more local media content delivery systems or devices,” as shown in Figure 2. *Id.*

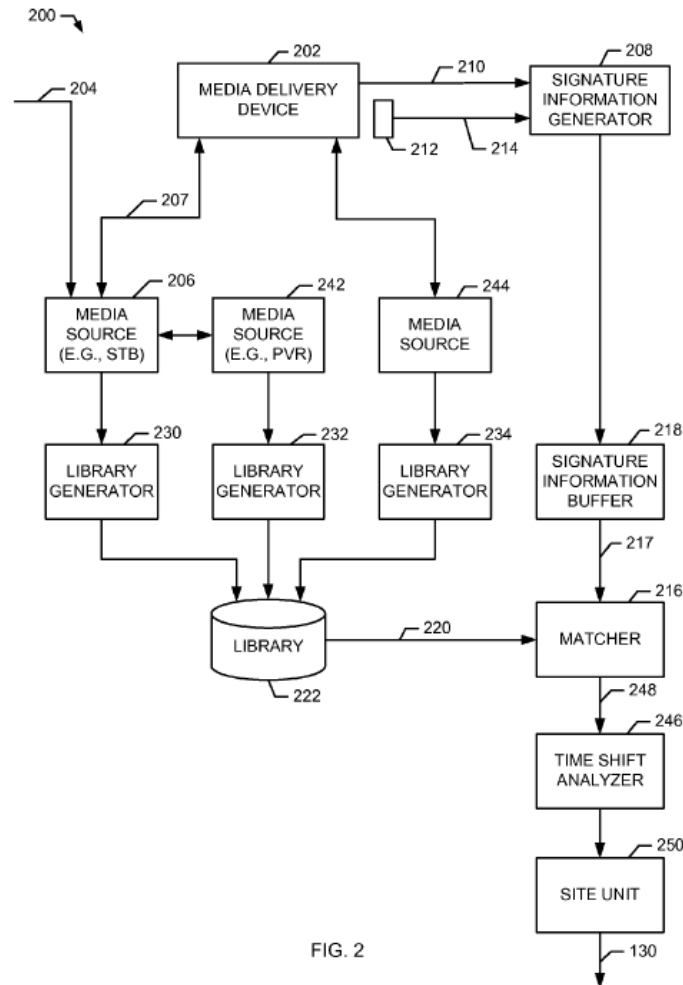


FIG. 2

EX1006, FIG. 2.

System 200 implements consumption site 110. EX1006, ¶28. Media delivery device 202, e.g., a television or radio, receives media content signal 204, for example, via the communication link 114 of Figure 1. *Id.* Media delivery device 202 is coupled to various media sources 206, 242, 244. *Id.* Set-top box 206 demodulates a broadcast signal (e.g., signal 204) and data streams and “selectively parses video and/or audio data packets associated with a desired channel and/or

program from” data stream(s). EX1006, ¶29. These selected data packets are processed to form output signal 207, which is provided to media delivery device 202. *Id.*

System 200 also includes a signature information generator 208, which performs signature generation functions using provided media signal(s). EX1006, ¶30. For instance, media delivery device 202 provides an audio output signal 210 (containing audio information associated with the media content being presented by media delivery device 202) to signature information generator 208. *Id.* Signature information generator 208 generates a unique signature, using known signature-based techniques, for audio output signal 210 based on characteristic(s) of the yet to be identified media content. EX1006, ¶32; EX1006, ¶44, FIG. 3 (block 304).

Matcher 216 obtains the unique signature (signature information 217) from signature information buffer 218 and compares signature information 217 to signature information 220 stored in a local reference library 222. EX1006, ¶33; EX1006, ¶45, FIG. 3 (block 306); *see also* EX1006, ¶¶34, 43, FIG. 3 (block 302). If the comparison yields a match, matcher 216 outputs a collection of “data that associates some or all of the signature information 220” (referred to as a matcher collection) with signature information 217. EX1006, ¶33.

Time shift analyzer 246 analyzes the data in the matcher collection for time shifted information. EX1006, ¶46, FIG. 3 (block 308). For example, time shift analyzer 246 may analyze a number of records of the matcher collection. EX1006, ¶46. “[I]f the matcher collection has two or more records with the same signature values . . . but different time stamp values . . . , the time shift analyzer . . . consider[s] these two or more records as being associated with time-shifted consumption and, thus, may determine that the matcher collection includes time shifted data.” *Id.* See also EX1003, ¶¶109-125.

**C. Conklin (EX1010)**

Conklin “track[s] a sequence of events associated with a digital recording device.” EX1010, Abstract. Conklin collects viewing behavior information in the context of “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.,” such as when a viewer uses digital video recorders (DVRs) or personal video recorders (PVRs). EX1010, ¶7.

Figure 8 is reproduced below.

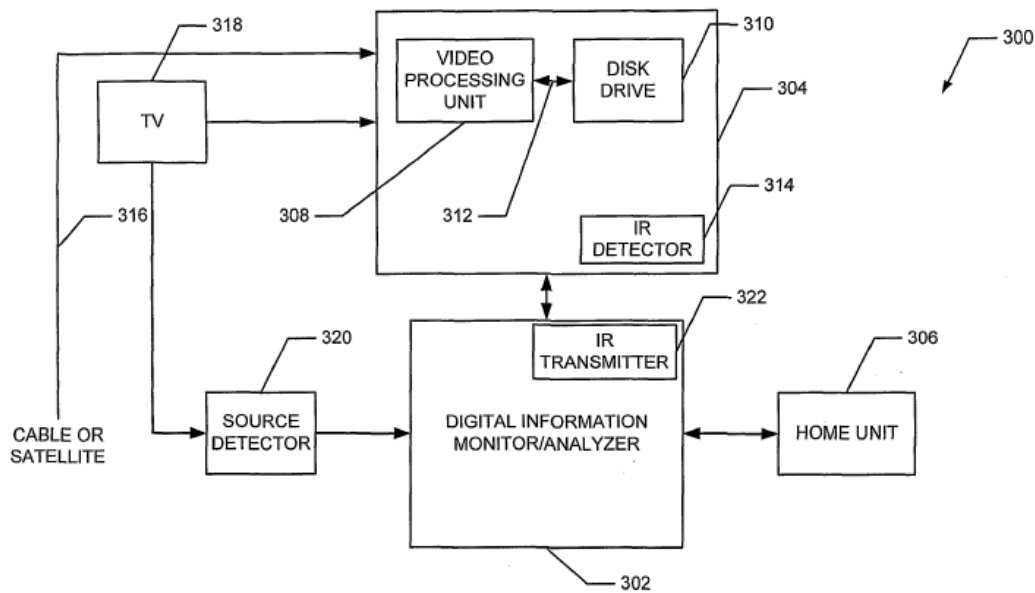


FIG. 8

EX1010, FIG. 8.

System 300 uses digital information monitor/analyzer 302 in conjunction with a DVR 304 and an audience measurement unit or home unit 306. EX1010, ¶68.

Digital information monitor/analyzer 302 generates event records containing recording times and sources for recorded media content, as well as adding playback or viewing time information to these event records when the media content is subsequently viewed. EX1010, ¶70. Conklin recognizes that, like in Ramaswamy, the source may be detected by analyzing or decoding video content, e.g., using well-known signature detection systems and methods. EX1010, ¶35.

The sequence of event records generated by the digital information monitor/analyzer 302 can be analyzed to ascertain audience viewing behaviors or habits. EX1010, ¶70. Illustrating the relationship between “view time” and “delay time” of media content consumed on, e.g., a DVR, Figures 9-12 are reproduced below. EX1010, ¶71.

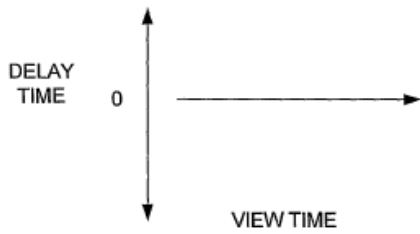


FIG. 9

EX1010, FIG. 9.

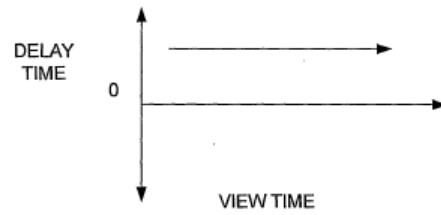


FIG. 10

EX1010, FIG. 10.

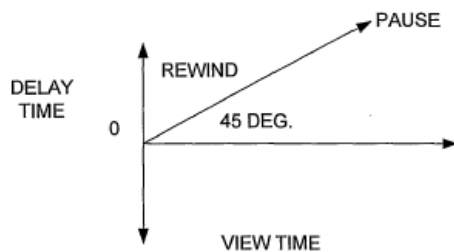


FIG. 11

EX1010, FIG. 11.

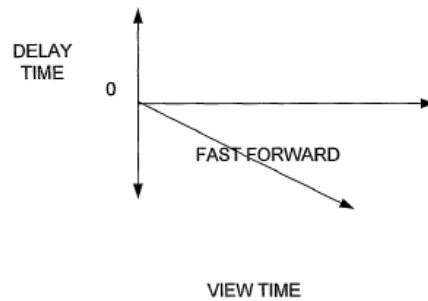


FIG. 12

EX1010, FIG. 12.

Figure 9, in which the delay time equals zero for all view times, depicts an example of live viewing of a video program via DVR 304. EX1010, ¶72. Figure 10, in which the delay time is constant for all view times, indicates that the video program was previously recorded by the DVR and is now being viewed. *Id.* In Figure 11, the line having a slope of one (i.e. a one-for-one increase in delay time and view time) indicates a pause condition, and a rewind operation is indicated if the relationship between the view time and delay time falls between the forty-five degree pause line and the vertical axis. EX1010, ¶73. As shown in Figure 12, if the delay time decreases as the view time increases, a fast forward operation is indicated. EX1010, ¶74. These general operational characteristics can be used to analyze a sequence of events record generated by the digital information monitor/analyzer 302 in order to interpret the viewing behavior associated with a DVR. EX1010, ¶¶75-76, FIG. 13. *See also* EX1003, ¶¶126-130.

## **VII. GROUND 1: CLAIMS 1, 3-6, AND 9-11 ARE OBVIOUS OVER FEININGER**

Claims 1, 3-6, and 9-11 would have been obvious over Feininger. EX1003, ¶¶133-121.

### **A. Independent Claim 1**

#### **1. [1.P] “A media measurement method comprising:”**

Feininger discloses a “system to develop audience measurement statistics.” EX1005, 2:41-42. In Feininger, audience measurement includes “measuring the

demographic composition of a set of statistically selected households and the program consumption habits of the member(s) of those households” and collecting “viewing data on a selected household by monitoring the content displayed on that household’s television(s) and by identifying which household member(s) are watching that content.” EX1005, 1:25-33; EX1003, ¶¶134-135.

2. **[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 video data samples captured at a monitoring device associated with a monitored audience member”**

Feininger’s Figure 2 illustrates “an example apparatus 50 to detect portions of a recorded program that were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or rewound).” EX1005, 4:4-7.

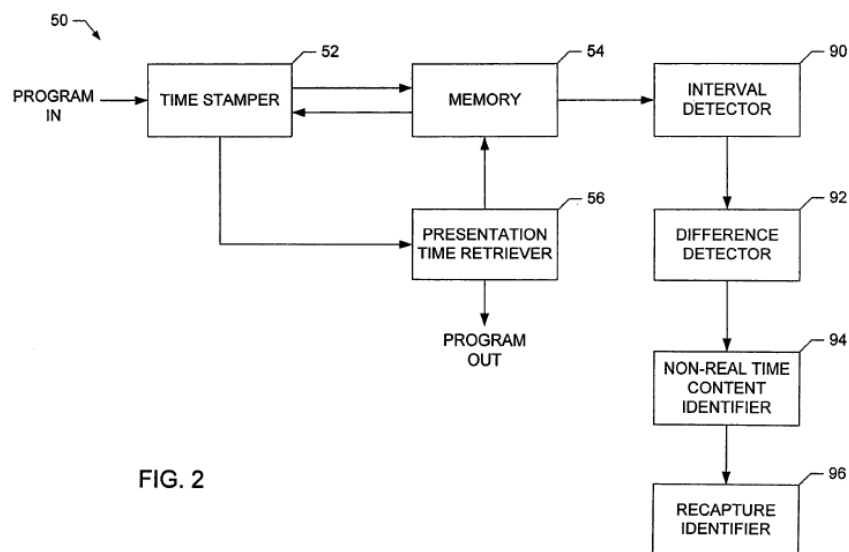


FIG. 2

EX1005, FIG. 2.

Presentation time retriever 56 “creates” (*generate[s]*) “a running list of log entry data structures 58” (*a play stream<sup>1</sup>*) which includes, among other things, a “program identifier” 68 (*content identification results*), such as a universal program identifier known in the art. EX1005, 4:61-5:2, 5:28-42, 16:56-17:2. Feininger’s program identifier is obtained by (e.g., is the result of) investigating/examining the packet data of the program being played to extract the program identifier information. *Id.*; EX1003, ¶¶137-138.

Apparatus 50 (*monitoring device*) records and analyzes data reflecting usage of, e.g., digital recording device 24 in a home site (e.g., the *monitoring device* is *associated with a monitored audience member*). EX1005, 4:12-14. Apparatus 50 may be implemented by one of more of digital recording device 24, data logging device 26, and/or central office 10. EX1005, 4:8-11, FIG. 1; EX1003, ¶139.

Digital recording device 24 receives and stores broadcast program data. EX1005, 4:27-28, 15:60-67. This broadcast may be “compressed and stored as two datastreams, namely, an audio datastream and a *video datastream*.” EX1005, 4:27-

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<sup>1</sup> The ’896 patent broadly characterizes a play stream, indicating that “the particular organization, division, and content of the data may vary considerably from that illustrated in [Figures 4 and 5] without departing from the spirit and scope of the present invention.” EX1001, 10:51-11:7.

30; EX1005, 16:1-6 (“When program data is received . . . , the digital recording device 24 packetizes the received program data into one or more datastreams . . . . [T]he received program data may be packetized into a stream of *video packets* and a stream of audio packets”). Digital recording device 24 then outputs the log entry data structures 58 (*play stream*) generated from the received broadcast program data based on a user’s viewing activity. EX1005, 14:33-39, 16:7-17:60. Log entry data structures 58 are created in response to a user’s playback of stored program data. EX1005, 16:38-17:2, FIG. 10; EX1005, 4:66-5:2 (“each log entry data structure 58 is preferably created at substantially the time that a corresponding section of the recorded program is being played”). Thus, the user’s viewing activity corresponds to the claimed *sequence of submitted data samples, corresponding to video data samples captured at a monitoring device associated with a monitored audience member*. EX1003, ¶¶140-141.

Feininger also discloses that the generation of the *play stream of content identification results* is performed by “a server, a personal computer” or “any other type of computing device.” EX1005, 21:24-32, FIG. 15; EX1003, ¶142.

**3. [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”**

Feininger’s apparatus 50 “detect[s] portions of a recorded program that were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or

rewound),” which a POSA would have understood to be *deduc[ing] play-altering actions*. EX1005, 4:4-7. The ’896 patent gives examples of *play-altering actions*, including pausing, rewinding, fast forwarding, and skipping. EX1001, 11:14-23. EX1003, ¶144.

Feininger’s interval detector 90 and difference detector 92 utilize the log entry data structures 58 to detect non-real time playback of a recorded program. EX1005, 8:53-10:8, 18:17-19:9. As explained below, log entry data structures 58 include both the claimed *sample sequence data* and the claimed *content offset data*. Sections VII.A.4 (discussing *sample sequence data*), VII.A.5 (discussing *content offset data*); EX1003, ¶145.

Feininger also discloses that the deducing of the *play altering actions* is performed by “a server, a personal computer” or “any other type of computing device.” EX1005, 21:24-32, FIG. 15; EX1003, ¶146.

**4. [1.3] “the sample sequence data corresponding to a sequence of the content identification results”**

As described for element [1.1], presentation time retriever 56 “creates a running list of log entry data structures 58” EX1005, 4:61–5:2. The running list of log entry data structures 58 are shown in Figures 3A-3C, reproduced and annotated below. EX1003, ¶¶148-149.

|                  |                    |                  |                    |             |    |
|------------------|--------------------|------------------|--------------------|-------------|----|
| 60<br>01/23/2003 | 62<br>13:12:45.500 | 64<br>01/16/2003 | 66<br>21:57:20.920 | 68<br>13252 | 58 |
| FIG. 3A          |                    |                  |                    |             |    |
| 60<br>01/23/2003 | 62<br>13:12:48.200 | 64<br>01/16/2003 | 66<br>21:59:23.420 | 68<br>13252 | 58 |
| FIG. 3B          |                    |                  |                    |             |    |
| 60<br>01/23/2003 | 62<br>13:12:50.900 | 64<br>01/16/2003 | 66<br>21:59:26.120 | 68<br>13252 | 58 |
| FIG. 3C          |                    |                  |                    |             |    |

EX1005, FIGs. 3A-3C (annotated).

Each of the log entry data structures 58 in the running list identifies content based on a program identification field 68 (annotated in blue) (*content identification result*). EX1005, 5:28-42. The log entry data structures 58 also include playback time field 62 (annotated in purple), which stores “data representative of the playback time (in this example, formatted as HH:MM:SS.mmm for hour/minute/second/millisecond) of the corresponding section of the program being played.” EX1005, 5:3-16. Log entry data structures 58 include a recording time field 66 (annotated in red), which stores “data representative of the recording time . . . of that same section of the program).” *Id.*

This running list provides a *sequence of the content identification results*. A POSA would have understood that, collectively, these data fields of Feininger’s log entry data structures 58 (e.g., the playback time, recording time, and program identification) comprise *sample sequence data*. EX1003, ¶150.

5. [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 ’896 patent describes an example of *content offsets* with reference to Figure 5. EX1003, ¶152.

| 510<br>Clean Playstream |                    |            |                |
|-------------------------|--------------------|------------|----------------|
| row                     | log time           | content ID | content offset |
| 1                       | t <sub>0</sub>     | TVprgm 27  | (0)            |
| 2                       | t <sub>0</sub> +1  | TVprgm 27  | (0)+1          |
| 3                       | t <sub>0</sub> +2  | none       | n/a            |
| 4                       | t <sub>0</sub> +3  | none       | n/a            |
| 5                       | t <sub>0</sub> +4  | none       | n/a            |
| 6                       | t <sub>0</sub> +5  | TVprgm 27  | (0)+2          |
| 7                       | t <sub>0</sub> +6  | TVprgm 27  | (0)+3          |
| 8                       | t <sub>0</sub> +7  | TVprgm27   | (0)+9          |
| 9                       | t <sub>0</sub> +8  | TVprgm27   | (0)+10         |
| 10                      | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 11                      | t <sub>0</sub> +10 | TVprgm27   | (0)+10         |
| 12                      | t <sub>0</sub> +11 | none       | n/a            |
| 13                      | t <sub>0</sub> +12 | TVprgm27   | (0)+29         |
| 14                      | t <sub>0</sub> +13 | TVprgm27   | (0)+30         |
| 15                      | t <sub>0</sub> +14 | ad23       | (0)            |
| 16                      | t <sub>0</sub> +15 | none       | n/a            |
| 17                      | t <sub>0</sub> +16 | ad25       | (0)+2          |
| 18                      | t <sub>0</sub> +17 | TVprgm28   | (0)            |
| 19                      | t <sub>0</sub> +18 | TVprgm28   | (0)+1          |
| 20                      | t <sub>0</sub> +19 | TVprgm28   | (0)+2          |

| 560<br>Clean Play List |                    |                    |            |                |
|------------------------|--------------------|--------------------|------------|----------------|
| row                    | start log time     | end log time       | content ID | content offset |
| 1                      | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27   | (0)            |
| 2                      | t <sub>0</sub> +2  | t <sub>0</sub> +5  | none       | n/a            |
| 3                      | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27   | (0)+2          |
| 4                      | t <sub>0</sub> +7  | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 5                      | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27   | (0)+9          |
| 6                      | t <sub>0</sub> +11 | t <sub>0</sub> +12 | none       | n/a            |
| 7                      | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27   | (0)+29         |
| 8                      | t <sub>0</sub> +14 | t <sub>0</sub> +15 | ad23       | (0)            |
| 9                      | t <sub>0</sub> +15 | t <sub>0</sub> +16 | none       | n/a            |
| 10                     | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad25       | (0)+2          |
| 11                     | t <sub>0</sub> +17 | t <sub>0</sub> +20 | TVprgm28   | (0)            |

| 570<br>Channel Data for TV C4 |            |          |            |
|-------------------------------|------------|----------|------------|
| row                           | start time | end time | content ID |
| 1                             | C(0)       | C(0)+31  | TVprgm27   |
| 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  | TVprgm28   |

| 590<br>Clean Play List with Deduced Actions |                    |                    |                                 |                |
|---------------------------------------------|--------------------|--------------------|---------------------------------|----------------|
| row                                         | log time           | end log time       | content ID and <deduced action> | content offset |
| 1                                           | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27                        | (0)            |
| 2                                           | t <sub>0</sub> +2  | t <sub>0</sub> +5  | <pause for 3 units>             | n/a            |
| 3                                           | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27                        | (0)+2          |
| 4                                           | t <sub>0</sub> +7  | t <sub>0</sub> +9  | <skip frwrd 5 units>            | n/a            |
| 5                                           | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27                        | (0)+9          |
| 6                                           | t <sub>0</sub> +11 | t <sub>0</sub> +12 | <skip bckwrd 2 units>           | n/a            |
| 7                                           | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27                        | (0)+9          |
| 8                                           | t <sub>0</sub> +14 | t <sub>0</sub> +15 | <fast frwrd 18 units>           | n/a            |
| 9                                           | t <sub>0</sub> +15 | t <sub>0</sub> +16 | TVprgm27                        | (0)+29         |
| 10                                          | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad23                            | (0)            |
| 11                                          | t <sub>0</sub> +17 | t <sub>0</sub> +18 | <fast frwrd 7 units>            | n/a            |
| 12                                          | t <sub>0</sub> +18 | t <sub>0</sub> +19 | ad25                            | (0)+2          |
| 13                                          | t <sub>0</sub> +19 | t <sub>0</sub> +20 | TVprgm28                        | (0)            |

FIG. 5

EX1001, FIG. 5 (annotated).

In this example, “[e]ach content offset value represents a time offset from the

beginning of a particular piece of content.” EX1001, 11:41-43. “[R]ow 8 of Play Stream 510 corresponds to a sample whose beginning is located 9 time units from the beginning of TV program 27, thus the content offset is referenced as (0)+9.” EX1001, 11:43-46. In other words, a *content offset* is determined in relation to the beginning time of reference content (as opposed to the consumed content). The *content offset* is characterized broadly, and may be determined relative to an “arbitrary start time value ‘C(0)’” or from the “absolute time” for a broadcast channel. EX1001, 10:10-19; EX1003, ¶153.

Log entry data structures 58 include recording time 66, which is the time at which the program was originally broadcast and stored on the digital recording device 24. EX1005, 4:15-48, 5:3-27, 5:13-19, FIG. 3. Thus, recording time 66 corresponds to the reference content (as opposed to the consumed content, which is Feininger’s playback time 62). As discussed in more detail below, interval detector 90 and difference detector 92 use the recording times 66 and playback times 62 of successive log entries 58 to detect non-real time playback of the recorded program. EX1005, 8:53-9:60; Section VII.A.6. The recording time 66 thus teaches, or at least renders obvious, the claimed *content offset* because it *indicat[es] a time position of a content identification result within identified content*. In other words, the recording time 66 for a particular log entry 58 indicates the time at which that particular section of the recorded program was stored on the device 24. When

considering the recording time 66 for that particular log entry 58 relative to all of the recording times 66 in all of the log entries 58 for the recorded program, the *time position* of that section (*content identification result*) within the content as a whole (*identified content*) can be determined. EX1003, ¶154.

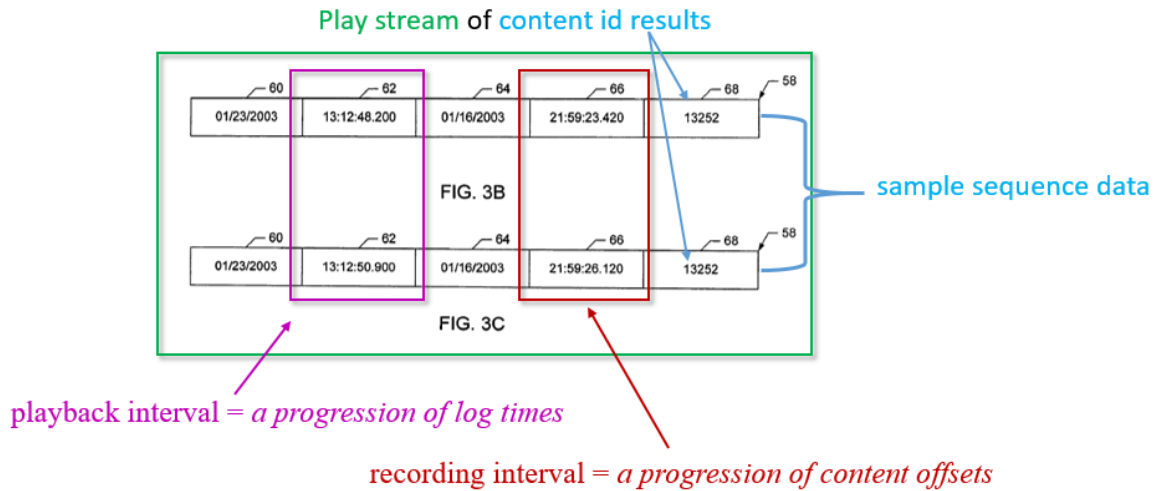
To the extent Patent Owner argues the *content offset* must be relative to a zero start value at the beginning of the program as in the exemplary embodiments (it does not), Feininger teaches that using “normalized” times in place of actual recording times can be beneficial (e.g., setting the start time of a program to zero). EX1005, 10:27-33, FIG. 5. This is because “different home sites 12, 14, 16 may receive the same broadcast program at slightly different times” but “all of the relative lengths of the broadcast segments . . . will be the same from site to site.” EX1005, 10:34-52. The recording times can be normalized by “subtracting the start time of the recorded program as recorded in the log entry data structures 58 . . . from the recording times retrieved from the log entry data structures 58.” EX1005, 19:32-36. These normalized recording times explicitly teach the claimed *content offset* because they *indicat[e] a time position of a content identification result within identified content* in the same way as in the ’896 patent. Based on Feininger’s teachings of using recording times or normalized times, it would have been obvious for interval detector 90 and difference detector 92 to use normalized start times (*content offsets*) instead of the absolute recording times in detecting

non-real time playback of the recorded program. EX1003, ¶155.

In any event, once the comparison of recording times 66 in successive log entries 58 is complete, the distinction between using an arbitrary start time value (e.g., zero) or from the absolute time becomes irrelevant. EX1003, ¶156.

6. [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”**

Feininger discloses that interval detector 90 “computes recording intervals between the recording times appearing in successive ones of the log entry data structures 58.” EX1005, 8:56-60. The recording interval is computed by “finding the difference between the recording times appearing in successive log entries 58.” EX1005, 8:60-62. Interval detector 90 also calculates the difference between “playback times stored in successive log entries 58” to “determine a playback interval corresponding to each pair of successive log entry data structures 58.” EX1005, 9:13-18. These intervals are illustrated in an annotated version of Figures 3B and 3C. EX1003, ¶158.



EX1005, FIGs. 3B, 3C (annotated).

A POSA would have understood that Feininger's recording interval corresponds to *a progression of content offsets of the corresponding content identification results*. Recording times 66 teach or at least render obvious the claimed *content offsets*, and Feininger's recording interval, e.g., the difference between recording time 66 in Figure 3C and that in Figure 3B is a numerical representation of a *progression* thereof.<sup>2</sup> Section VII.A.5; EX1003, ¶159.

As discussed, Feininger's log entry data structures 58 are created at

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<sup>2</sup> Whether an arbitrary start time value (e.g., zero) or the absolute time is used, the interval calculated between successive recording times will be the same. EX1003, ¶159.

substantially the same time that a corresponding section of the recorded program is being played. EX1005, 4:67-5:2. Thus the playback time (*log time*) is *associated with* the data structure creation time (*capture timing*) of each section of the program being played (*submitted data sample*). A POSA would have understood that Feininger's playback intervals correspond to *a progression of log times associated with capture timing of each of the particular plurality of submitted data samples*. In other words, the difference between playback time 62 in Figure 3C and that in Figure 3B is a numerical representation of a *progression of log times*. EX1003, ¶160.

Difference detector 92 determines a difference (*comparing*) between the playback interval (*a progression of log times associated with capture timing of each of the particular plurality of submitted data samples*) and recording interval (*a progression of content offsets of the corresponding content identification results*) to detect a play-altering action. EX1005, 18:17-24, 18:44-45, 18:54-63, Claim 10. EX1003, ¶161.

In particular, difference detector 92 determines if the recording interval (the presentation time difference) between the pair of log entry data structures is zero. EX1005, 18:17-21, 18:30-33. "If so, the recorded program was paused for the entire playback interval between the data structures." EX1005, 18:21-24; EX1003, ¶¶162-164.

If the recording interval is less than the “playback interval (i.e., the real time interval),” the presentation time difference is analyzed to detect a pause event/slow motion event or a rewind event. EX1005, 18:34-40. If the presentation time difference is a positive value, then a brief pause or slow motion event occurred. EX1005, 18:40-43. If the presentation time difference is a negative value, then a rewind event has occurred. EX1005, 18:44-46; EX1003, ¶¶165-166.

If the recording interval is not less than the playback interval, difference detector 92 “determines if the recording interval is equal to the playback interval.” EX1005, 18:56-68. If the intervals are not equal, then the “corresponding portion of the recorded program has been skipped and/or fast forwarded.” EX1005, 18:58-62. Finally, if the recording interval is equal to the playback interval, then the “corresponding portion of the recorded program has not been skipped and/or fast forwarded.” EX1005, 19:4-9; EX1003, ¶¶167-169.

**7. [1.6] “using one or more computers to utilize deduced play altering actions of the monitored audience member to generate a media measurement report”**

The '896 patent's discussion of *media measurement report* is limited. EX1001, 6:35-37 (“Results of the media measurement analysis can be obtained via report generator 130”); EX1003, ¶171.

Feininger teaches generally that “audience measurement companies may collect [household] viewing data.” EX1005, 1:25-32. Feininger also recognizes

that the ability to time-shift viewing allows consumers to “consume only selected portions of broadcast programs by, for example, skipping or fast-forwarding through portions of recorded content.” EX1005, 1:49-55. As discussed above, Feininger teaches methods to “develop audience measurement statistics” in such a scenario. EX1005, 2:41-42; EX1003, ¶172.

After difference detector 92 deduces play altering actions (elements [1.2]-[1.5]) this information is used by recapture identifier 96 to determine a list of portions of a recorded program that were viewed by the user in real time. EX1005, 12:49-13:48. This information is “periodically exported to the central office via the network 18 for compilation with data from other home sites 12, 14, 16 and/or further analysis.” EX1005, 13:61-14:1, 3:31-34. The household viewing data collected, analyzed, and exported to the central office (e.g., “[r]esults of the media measurement analysis,” EX1001, 6:35-37) is *a media measurement report*. The ’896 patent does not provide any details about, nor do the claims require, any specific information to be included in a report. To the extent Patent Owner argues that Feininger does not include express disclosure of a report, it was within the general knowledge of a POSA to organize information into a report form, and it would have been obvious to a POSA to put the information exported to Feininger’s central office into a report. *See, e.g.*, EX1018, Abstract, ¶262 (“Timeshifting Reports”); EX1019, 450 (“Report”). EX1003, ¶¶173-176

As discussed for elements [1.1] and [1.2], Feininger's apparatus and methods are implemented *using one or more computers*. EX1005, 21:24-32, FIG. 15; EX1003, ¶177.

**B. Independent Claim 9**

**1. [9.P]**

Feininger teaches the preamble for the same reasons as claim 1's preamble. Section VII.A.1; EX1003, ¶178.

**2. [9.1]**

Element [9.1] corresponds to element [1.1]. Feininger teaches this element for the same reasons as element [1.1]. Section VII.A.2; EX1003, ¶179.

**3. [9.2]**

Element [9.2] corresponds to element [1.2]. Feininger teaches, or at least renders obvious, this element for the same reasons as element [1.2]. Section VII.A.3; EX1003, ¶180.

**4. [9.3]**

Element [9.3] corresponds to element [1.3]. Feininger teaches this element for the same reasons as element [1.3]. Section VII.A.4; EX1003, ¶181.

**5. [9.4] wherein play-altering actions include actions that alter at least one of a pace and a sequence of a media stream**

Feininger teaches, or at least renders obvious, element [9.4]. EX1003, ¶182. As discussed for element [1.2], apparatus 50 “detect[s] portions of a recorded

program that were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or rewound).” Section VII.A.3; EX1005, 4:4-7, 8:53-10:8, 18:17-19:9. A POSA would have understood that at least rewinding and fast forwarding *alter a pace of a media stream* and that at least skipping (forward or backward) *alter[s] a sequence of a media stream* as recited. EX1003, ¶182; *see* EX1001, 11:14-23 (identifying pausing, rewinding, fast forwarding, and skipping as examples of *play-altering actions*).

**6. [9.5]**

Element [9.5] corresponds to element [1.4]. Feininger teaches, or at least renders obvious, this element for the same reasons as element [1.4]. Section VII.A.5; EX1003, ¶183.

**7. [9.6]**

Element [9.6] corresponds to element [1.5]. Feininger teaches, or at least renders obvious, this element for the same reasons as element [1.5]. Section VII.A.6; EX1003, ¶184.

**8. [9.7]**

Element [9.7] corresponds to element [1.6]. Feininger teaches, or at least renders obvious, this element for the same reasons as element [1.6]. Section VII.A.7; EX1003, ¶185.

**C. Claim 3 (“utilizing sample sequence data together with corresponding channel data to deduce play-altering actions of a monitored audience member”)**

Feininger teaches that the program identifier 68 included as part of the log entry data structures 58 (*sample sequence data*) that is used *to deduce play-altering actions* may additionally include “information that identifies . . . the station that broadcast the program (e.g., a broadcast channel number, a station name, or a standardized station identifier)” (*channel data*). EX1005, 5:28-42; EX1005, 6:38-47, FIG. 4 (including, e.g., channel number in log entry data structure 70); EX1003, ¶187.

In Feininger, the channel number can be used to identify a media program schedule downloaded from schedule warehouse 28, to discern additional information about the broadcast programming on that channel. EX1005, 3:37-59, 8:16-35. For example, the program schedule may be used to identify a particular program. *Id.* A program table associated with the program includes information about segments of that program, as shown in Figure 5. EX1005, 10:15-32; EX1003, ¶¶188-189.

FIG. 5

| NAME         | START TIME   | END TIME     |
|--------------|--------------|--------------|
| INTRODUCTION | 00:00:00.000 | 00:03:30.003 |
| COMMERCIAL 1 | 00:03:30.003 | 00:06:01.015 |
| CONTENT 1    | 00:06:01.015 | 00:13:35.920 |
| COMMERCIAL 2 | 00:13:35.920 | 00:15:55.723 |
| CONTENT 2    | 00:15:55.723 | 00:20:43.513 |
| COMMERCIAL 3 | 00:20:43.513 | 00:23:53.819 |
| CONTENT 3    | 00:23:53.819 | 00:28:09.875 |
| ...          | ...          | ...          |
| COMMERCIAL N | 00:57:20.920 | 00:59:18.562 |
| ...          | ...          | ...          |

EX1005, FIG. 5.

In this example, the program table includes normalized start and end times for several segments of a broadcast program and commercials, and is identified based on the “identity of the recorded program [retrieved] from one of the corresponding log entry data structures 58.” EX1005, 10:15-32, 19:23-29. The program table is used by the non-real time content identifier 94 to determine particular segment(s) of a program that were affected by a play-altering action. EX1005, 9:61-10:8, 11:29-34, 19:19-20:25, FIGs. 2, 12A-C, 13A-B; EX1003, ¶¶190-192.

**D. Claim 4 (“wherein a clean play list is generated including deduced play-altering actions”)**

As noted above, the ’896 patent broadly characterizes a play list. EX1001, 10:51-11:7; EX1003, ¶194.

In Feininger, in response to detection of non-zero differences by the

difference detector 92 (discussed above), non-real time content identifier 94 determines identities of particular segment(s) of a program that were affected by a play-altering action. EX1005, 9:61-10:8, 11:29-34. The non-real time content identifier 94 “records the determined identities of the segments in a recapture table,” such as that shown in Figure 6, which identifies which segment(s) were fast-forwarded and which segment(s) were rewound. EX1005, 12:32-38; EX1003, ¶195.

FIG. 6

| ADVANCED SEGMENT NAME(S) | REWOUND SEGMENT NAME(S) |
|--------------------------|-------------------------|
| 1                        | 4                       |
| 5                        | 5                       |
| 8                        | 6                       |
| 8                        | 7                       |
| 9                        | 8                       |
|                          | 9                       |

EX1005, FIG. 6.

The “first column stores the identities (in this example, represented by segment numbers), of any segments that the non-real time content identifier 94 identifies as having been skipped and/or fast forwarded.” EX1005, 12:42-46. The “second column of the recapture table of FIG. 6 is used to store the identities of all segments of the recorded program that were rewound.” EX1005, 12:46-48. Accordingly, Feininger’s recapture table corresponds to a *clean play list* that includes *deduced play-altering actions* performed for different segment(s) of a

program. EX1003, ¶¶196-197.

**E. Claim 5 (“wherein the play stream is a raw play stream”)**

The ’896 patent describes a “raw play stream” as “indicating a series of samples and corresponding identification results” and as being “not scrubbed.” EX1001, 8:13-15, 8:54-56. The ’896 patent further describes “scrubbing” as “reviewing for missing or incorrect data.” EX1001, 8:44-47; EX1003, ¶199.

As discussed for element [1.1], Feininger’s running list of log entry data structures 58 corresponds to a *play stream*. Section VII.A.2; EX1005, FIG. 3. Each log entry data structure 58 in the running list corresponds to a particular section of a particular program (e.g., corresponds to a sample), and each log entry data structure 58 includes the program identifier 68 (e.g., an identification result). EX1005, 4:66–5:2, 5:29-42; EX1003, ¶200.

Moreover, Feininger does not describe that the running log entry data structures 58 are scrubbed (e.g., reviewed for missing or incorrect data as described in the ’896 patent). Thus, a POSA would understand Feininger’s running list of log entry data structures 58 teaches, or at least renders obvious, a *raw play stream* as recited in claim 5 because it includes all of the log entry data structures 58 created during playback of a program. EX1003, ¶201.

**F. Claim 6 (“wherein the play stream is a clean play stream”)**

The ’896 patent implies that a *clean play stream* is a play stream that

contains no missing or incorrect data, as the clean play stream in the exemplary embodiment of the '896 patent is generated as a result of scrubbing. EX1001, 8:15-18, 8:44-47; EX1003, ¶204.

As discussed for element [1.1], Feininger's running list of log entry data structures 58 corresponds to a *play stream*. Section VII.A.2; EX1005, FIG. 3. Feininger also discloses an embodiment in which the log entry data structures may include a sequence number field 72, as shown in log entry data structure 70 of Figure 4. EX1003, ¶205.

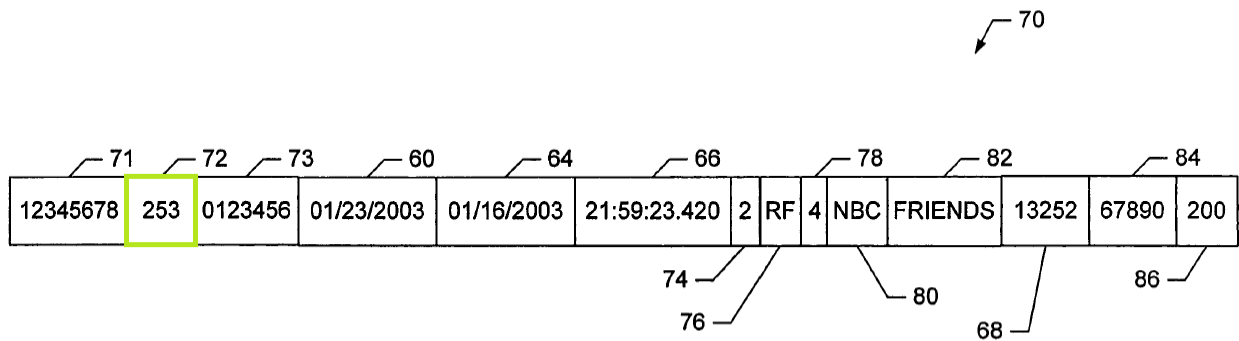


FIG. 4

EX1005, FIG. 4 (annotated).

Sequence number field 72 “ensure[s] that [the log entry data structures 58, 70] are transmitted, analyzed, and/or processed in the correct order.” EX1005, 6:59-61. Given this disclosure of Feininger, 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.

EX1003, ¶206.

Further, scrubbing (or cleaning) data and the benefits thereof was within the general knowledge of a POSA, and it would have, at a minimum, been obvious to scrub the data in Feininger’s running list of log entry data structures 58 in order to ensure accurate results. EX1003, ¶¶207-215; *see* EX1012, EX1013, EX1014, EX1016, EX1017; *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 13371338 (Fed. Cir. 2020) (holding it is appropriate to rely on “general knowledge” of a POSA in determining obviousness).

**G. Claim 10 (“wherein play-altering actions include at least one of fast forwarding, rewinding, and pausing a media stream”)**

As discussed for elements [1.2] and [9.4], Feininger’s apparatus 50 “detect[s] portions of a recorded program that were not played back in real time (e.g., that were skipped, *fast forwarded*, *paused*, and/or *rewound*).” EX1005, 4:4-7<sup>3</sup>; EX1005, 18:34-40, 18:54-63; Sections VII.A.3, VII.B.5; EX1003, ¶¶217-218.

**H. Claim 11 (“wherein play-altering actions include at least one of skipping forward and skipping backward in a media stream”)**

As discussed for elements [1.2] and [9.4], Feininger’s apparatus 50 “detect[s] portions of a recorded program that were not played back in real time (e.g., that were *skipped*, fast forwarded, paused, and/or rewound).” EX1005, 4:4-7;

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<sup>3</sup> Emphasis added throughout unless otherwise indicated.

EX1005, 18:54-63; Sections VII.A.3, VII.B.5. A POSA would have understood that Feininger's teaching of detecting *skipped* portions includes *at least one of skipping forward and skipping backward*. EX1003, ¶¶220-221.

**VIII. GROUND 2: CLAIMS 1-4 AND 7-13 ARE OBVIOUS OVER RAMASWAMY IN VIEW OF CONKLIN**

Claims 1-4 and 7-13 would have been obvious over Ramaswamy in view of Conklin. EX1003, ¶¶222-325-.

**A. A POSA would have combined Ramaswamy and Conklin.**

A POSA would have been motivated to combine Ramaswamy and Conklin for multiple reasons. EX1003, ¶223.

Both Ramaswamy and Conklin relate to monitoring media consumption, and in particular to solving the problem of monitoring consumption when the media is viewed in a time shifted manner, such as when content is recorded and viewed later and/or is delivered by a DVR or other such local audio/video content delivery system. EX1006, ¶7; EX1010, ¶6; EX1003, ¶224.

Ramaswamy teaches a method of “measur[ing] time shifted consumption (e.g., viewing, listening, etc.) of media content.” EX1006, ¶18. Like Ramaswamy, Conklin teaches identifying time-shifted media consumption activities. EX1010, ¶72, FIG. 10. In particular, Conklin's Figure 10 “is a graph that depicts an example of delayed viewing of video program via the DVR 304. As shown in Fig. 10, the delay time is constant for all view times, indicating that a part of or the entire video

program currently being viewed was previously recorded by the DVR 304 and is now being viewed.” EX1010, ¶72; EX1003, ¶¶225-226.

Conklin recognizes that the use of DVRs, for example, “further complicates collection of viewing behavior information because viewers in households with these types of recording devices can rapidly change between live viewing of a program, a somewhat delayed viewing of a program, fast forwarding and rewinding a program, pausing a program, and recording a program for later viewing while watching another program live.” EX1010, ¶7; EX1003, ¶227.

Conklin provides a solution to this problem. Digital information monitor/analyzer 302 generates event records (e.g., data records for segments of media content) that include at least source information, recording time information, and playback time (e.g., viewing time) information. EX1010, ¶70; EX1010, ¶¶42-46 (describing exemplary event records). A sequence of events record may then be further analyzed. EX1010, ¶70. Based on the relationship between “the view time or playback time associated with the event record” and “the delay time (i.e., the difference between the playback or viewing time and the record time),” Conklin’s system determines viewing behavior associated with the DVR 304, such as pausing, rewinding, fast forwarding, etc. EX1010, ¶¶71-76, FIGs. 9-13; EX1003, ¶228.

A POSA would have been motivated to implement Conklin’s additional

analysis functionality (i.e., the ability to determine more complex time shifting viewing behaviors) in Ramaswamy's media measurement method in order to provide the enhanced media consumption monitoring capabilities discussed in Conklin. The combination would have merely been the application of known techniques (Conklin's sequence of events analysis) to a known system/method ready for improvement (Ramaswamy's media measurement system/method) to yield the predictable result of providing enhanced media consumption monitoring capabilities. EX1003, ¶229.

A POSA would have had a reasonable expectation of success in combining these references because they both relate to processing data collected from media viewing records. Both Ramaswamy and Conklin teach that data can be stored in well-known data structure formats and then analyzed. *See, e.g.*, EX1006, ¶¶25, 34, 49, 57; EX1010, ¶¶31, 44, 46, 53. Various database processing techniques would have been well known to a POSA, and using and combining these techniques would have been well within the level of ordinary skill. EX1003, ¶230.

## **B. Independent Claim 1**

### **1. [1.P]**

Ramaswamy discloses a method “for media source identification and time shifted *media* consumption [(e.g., viewing)] *measurements*,” including measuring video. EX1006, Abstract, ¶¶18, 21, 31; EX1003, ¶¶231-232.

2. [1.1]

Ramaswamy's Figure 2 illustrates a "system 200 that may be used to implement" a consumption site, e.g., a "monitored household" (*monitored audience member*). EX1006, ¶¶28, 34; EX1003, ¶234.

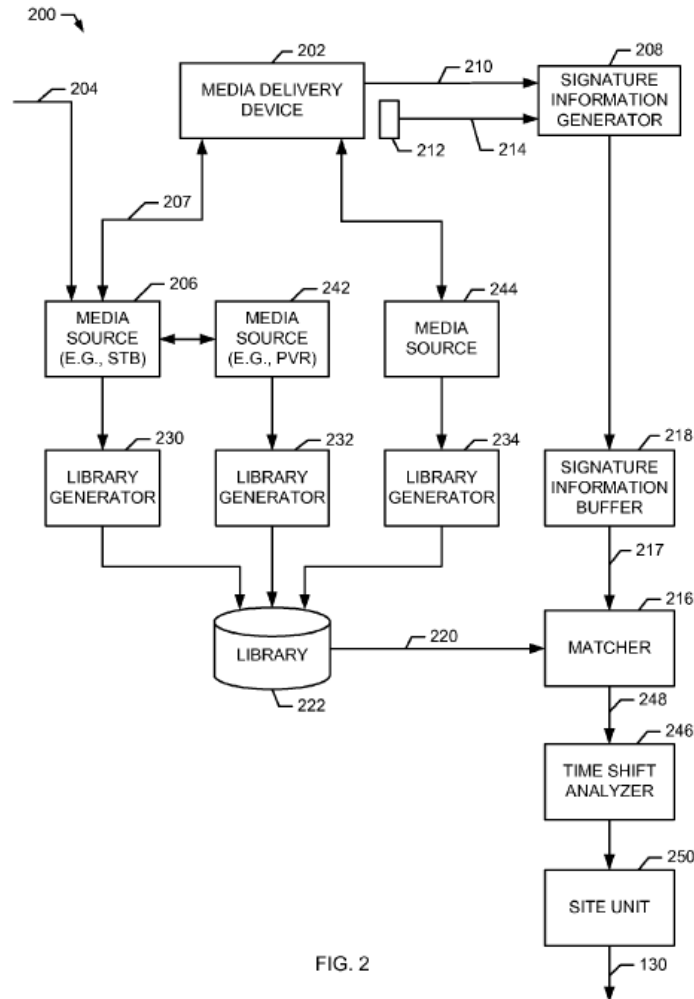


FIG. 2

EX1006, FIG. 2.

Media delivery device 202 receives a media content signal 204 (e.g., an audio/video signal), and provides an output signal 210 to signature information

generator 208 (*monitoring device*). EX1006, ¶¶28, 30. Output signal 210 contains “information associated with the media content currently being presented by the media delivery device 202.” EX1006, ¶30. Output signal 210 corresponds to the claimed *video data samples*.<sup>4</sup> EX1003, ¶235

Using “well-known signature-based media . . . content identification techniques,” “signature information generator 208 generates signature information corresponding to media content presented by the media delivery device.” EX1006, ¶¶31, 33. In particular, “signature information generator 208 sequentially generates reference signatures for . . . any and all media content extracted or otherwise derived from the media content signal 204 and presented via the media delivery device 202.” EX1006, ¶33. This *sequence of* signature information 217 (generated from the *submitted data samples*) is submitted (via signature information buffer 218) to matcher 216. EX1006, ¶¶32-33; EX1003, ¶236.

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<sup>4</sup> Ramaswamy describes signal 210 as an “audio output signal.” EX1006, ¶30. A POSA would have understood, however, that this output signal also teaches a video output signal. EX1003, ¶235. In fact, the very next paragraph describes that signature information generator 208, into which output signal 210 is input, may use any known “audio or video signature-based techniques” to generate a signature. EX1006, ¶31, FIG. 2.

Matcher 216 compares signature information 217 to signature information 220 stored in a local reference library 222, which stores reference signatures uniquely representative of media content received by media sources 206, 242, and 244. EX1006, ¶¶24, 33-34. If there is a match, matcher 216 outputs a collection (referred to as a “matcher collection”) of “data that associates some or all of the signature information 220 . . . with the signature information 217. EX1006, ¶33. A POSA would have understood each match in the matcher collection to be a *content identification result* because, as Ramaswamy recognizes, matching of reference signature information and signature information associated with consumed media can be used to identify the particular programming contained in the consumed media. EX1003, ¶237; EX1006, ¶24; EX1006, ¶55 (“the match signature information process 600 obtains signature information (e.g., the signature information 220 of FIG. 2) from a library (e.g., the local reference library 222 of FIG. 2) that matches the signature information retrieved/received from the signature information buffer 218 (block 610)”).

Matcher 216 “periodically or continuously sends matcher collections associated with media content presented via the media delivery device 202 to the time shift analyzer 246.” EX1006, ¶40. The continuous stream of matcher collections, containing signature information that uniquely identifies particular pieces of media content being played back by media delivery device 202,

corresponds to a *play stream of content identification results*. EX1006, ¶46 (the time shift analyzer 246 analyzes the matcher collection to create a consumption record, which may include e.g., content identification (¶4)). Each identified match in the stream of matcher collections is a *content identification result*. EX1006, ¶¶33, 55, 59. Notably, the '896 patent broadly characterizes what is a “play stream,” indicating that “the particular organization, division, and content of the data may vary considerably from that illustrated in FIG. 4 [(and FIG. 5)] without departing from the spirit and scope of the present invention,” and “the illustrated data sets might not be collected in the same table, but . . . might be spread out in different tables and/or relational structures.” EX1001, 10:51-11:7; EX1003, ¶238.

Ramaswamy also teaches that the apparatus and methods disclosed therein may be performed by computer system 1000, which may be “a server, a personal computer” or “any other computing device.” EX1006, ¶67, FIG. 10; EX1003, ¶¶239-240.

### 3. [1.2]

Ramaswamy teaches a method of “measur[ing] time shifted consumption (e.g., viewing, listening, etc.) of media content.” EX1006, ¶18. Ramaswamy describes:

time shifted media consumption occurs when an individual consumer causes one or more media sources (e.g., a PVR, a DVD player, a DVR, . . . ) to present or deliver media content at a time convenient to the

consumer (e.g., viewing broadcast or pre-recorded content at a time that is subsequent to the time at which the content was recorded and/or broadcast).

*Id.* Ramaswamy’s method “use[s] signature information (e.g., a signature, a source identifier, a time stamp, etc.)” “to measure time shifted media consumption activities.” *Id.*; EX1003, ¶¶241-243.

The ’896 patent recognizes that “the traditional time shifting activity of, for example, recording a television broadcast and playing it at a later time,” is part of the broader category of “play-altering activities,” further specifying additional play-altering activities that “may be undertaken by an audience member,” such as pausing, reversing, fast forwarding, and skipping. EX1001, 11:14-23. The language of independent claim 1, however, is broad enough to cover both these narrower examples and the broader category of play-altering activities more generally, including “time shifting” as taught by Ramaswamy. Thus, a POSA would have understood that “to measure time shifted media consumption activities” corresponds to the claimed *to deduce play-altering actions of the monitored audience member*. EX1003, ¶244.

Ramaswamy’s time shift analyzer 246 receives the matcher collections from matcher 216. EX1006, ¶40. The data in the matcher collections is analyzed to determine (*deduce*) if there is time shifted information. EX1006, ¶46, FIG. 3 (step 308). As explained in more detail below, the data in Ramaswamy’s matcher

collections includes both the claimed *sample sequence data* and the claimed *content offset data*. Sections VIII.B.4 (discussing *sample sequence data*), VIII.B.5 (discussing *content offset data*); EX1003, ¶¶245-246.

Ramaswamy also teaches that the apparatus and methods disclosed therein may be performed by computer system 1000, which may be “a server, a personal computer” or “any other computing device.” EX1006, ¶67, FIG. 10; EX1003, ¶247.

To the extent Patent Owner argues that claim 1 is limited to the narrower examples of play-altering activities discussed in the specification of the ’896 patent, e.g., pausing, reversing, fast forwarding, and skipping (it is not), this element would have nonetheless been obvious in view of the Ramaswamy-Conklin combination. EX1003, ¶248.

Ramaswamy teaches a method of “measur[ing] time shifted consumption (e.g., viewing, listening, etc.) of media content.” EX1006, ¶18. Conklin, likewise, teaches identifying time shifted media consumption activities. EX1010, ¶72, FIG. 10. Conklin’s method additionally identifies pause and rewind operations, fast forward operations, and skipping (e.g., a “‘go back’ command”). EX1010, ¶¶73-76, FIGs. 11-13. These are the same activities identified in the ’896 patent as examples of *play-altering actions*. EX1001, 11:14-23; EX1003, ¶249.

A POSA would have been motivated to implement Conklin’s additional

analysis functionality in Ramaswamy's method in order to provide the enhanced media consumption monitoring capabilities discussed in Conklin. *See* Section VIII.A; EX1003, ¶¶250-252.

4. [1.3]

As discussed, in Ramaswamy, each identified match in the stream of matcher collections is a *content identification result*. EX1006, ¶¶33, 55, 59; EX1003, ¶254. The matcher collection includes “data that associates . . . signature information 220 from the local reference library 222 with the signature information 217 received from the signature information generator 208.” EX1006, ¶33; EX1003, ¶255.

This data from signature information 217, 220, included in a matcher collection for a particular *content identification result*, includes at least a source identifier and a time stamp for the unique signature associated with a particular consumed signature information 217, as well as for any matching reference signature information 220. EX1006, ¶¶18, 48, 53, 59, FIG. 7 (an example of a matcher collection). Thus, a POSA would have understood Ramaswamy's collection of associated signature information included in the stream of matcher collections includes *sample sequence data* (e.g., at least, a signature, a source identifier, time stamp(s) of reference signature information 220, and the time stamp of consumed signature information 217) *corresponding to a sequence of the*

*content identification results* as recited in element [1.3]. EX1003, ¶¶256-257; EX1006, ¶33 (describing that signature information generator 208 “sequentially generates” signatures, which are then processed through matcher 216); EX1001, 10:51-11:7 (broadly characterizing how the data making up the play stream, and thus the sample sequence data, may be collected and stored).

## 5. [1.4]

The '896 patent describes an example of *content offsets* with reference to Figure 5. EX1001, 11:41-46; Section VII.A.5.

| 510<br>Clean Playstream |                    |            |                |
|-------------------------|--------------------|------------|----------------|
| row                     | log time           | content ID | content offset |
| 1                       | t <sub>0</sub>     | TVprgm 27  | (0)            |
| 2                       | t <sub>0</sub> +1  | TVprgm 27  | (0)+1          |
| 3                       | t <sub>0</sub> +2  | none       | n/a            |
| 4                       | t <sub>0</sub> +3  | none       | n/a            |
| 5                       | t <sub>0</sub> +4  | none       | n/a            |
| 6                       | t <sub>0</sub> +5  | TVprgm 27  | (0)+2          |
| 7                       | t <sub>0</sub> +6  | TVprgm 27  | (0)+3          |
| 8                       | t <sub>0</sub> +7  | TVprgm27   | (0)+9          |
| 9                       | t <sub>0</sub> +8  | TVprgm27   | (0)+10         |
| 10                      | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 11                      | t <sub>0</sub> +10 | TVprgm27   | (0)+10         |
| 12                      | t <sub>0</sub> +11 | none       | n/a            |
| 13                      | t <sub>0</sub> +12 | TVprgm27   | (0)+29         |
| 14                      | t <sub>0</sub> +13 | TVprgm27   | (0)+30         |
| 15                      | t <sub>0</sub> +14 | ad23       | (0)            |
| 16                      | t <sub>0</sub> +15 | none       | n/a            |
| 17                      | t <sub>0</sub> +16 | ad25       | (0)+2          |
| 18                      | t <sub>0</sub> +17 | TVprgm28   | (0)            |
| 19                      | t <sub>0</sub> +18 | TVprgm28   | (0)+1          |
| 20                      | t <sub>0</sub> +19 | TVprgm28   | (0)+2          |

| 560<br>Clean Play List |                    |                    |            |                |
|------------------------|--------------------|--------------------|------------|----------------|
| row                    | start log time     | end log time       | content ID | content offset |
| 1                      | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27   | (0)            |
| 2                      | t <sub>0</sub> +2  | t <sub>0</sub> +5  | none       | n/a            |
| 3                      | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27   | (0)+2          |
| 4                      | t <sub>0</sub> +7  | t <sub>0</sub> +9  | TVprgm27   | (0)+9          |
| 5                      | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27   | (0)+9          |
| 6                      | t <sub>0</sub> +11 | t <sub>0</sub> +12 | none       | n/a            |
| 7                      | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27   | (0)+29         |
| 8                      | t <sub>0</sub> +14 | t <sub>0</sub> +15 | ad23       | (0)            |
| 9                      | t <sub>0</sub> +15 | t <sub>0</sub> +16 | none       | n/a            |
| 10                     | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad25       | (0)+2          |
| 11                     | t <sub>0</sub> +17 | t <sub>0</sub> +20 | TVprgm28   | (0)            |

| 570<br>Channel Data for TV C4 |            |          |            |
|-------------------------------|------------|----------|------------|
| row                           | start time | end time | content ID |
| 1                             | C(0)       | C(0)+31  | TVprgm27   |
| 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  | TVprgm28   |

| 590<br>Clean Play List with Deduced Actions |                    |                    |                                 |                |
|---------------------------------------------|--------------------|--------------------|---------------------------------|----------------|
| row                                         | log time           | end log time       | content ID and <deduced action> | content offset |
| 1                                           | t <sub>0</sub>     | t <sub>0</sub> +2  | TVprgm27                        | (0)            |
| 2                                           | t <sub>0</sub> +2  | t <sub>0</sub> +5  | <pause for 3 units>             | n/a            |
| 3                                           | t <sub>0</sub> +5  | t <sub>0</sub> +7  | TVprgm27                        | (0)+2          |
| 4                                           | t <sub>0</sub> +7  | t <sub>0</sub> +7  | <skip frwrd 5 units>            | n/a            |
| 5                                           | t <sub>0</sub> +7  | t <sub>0</sub> +9  | TVprgm27                        | (0)+9          |
| 6                                           | t <sub>0</sub> +9  | t <sub>0</sub> +9  | <skip bckwrd 2 units>           | n/a            |
| 7                                           | t <sub>0</sub> +9  | t <sub>0</sub> +11 | TVprgm27                        | (0)+9          |
| 8                                           | t <sub>0</sub> +11 | t <sub>0</sub> +12 | <fast frwrd 18 units>           | n/a            |
| 9                                           | t <sub>0</sub> +12 | t <sub>0</sub> +14 | TVprgm27                        | (0)+29         |
| 10                                          | t <sub>0</sub> +14 | t <sub>0</sub> +15 | ad23                            | (0)            |
| 11                                          | t <sub>0</sub> +15 | t <sub>0</sub> +16 | <fast frwrd 7 units>            | n/a            |
| 12                                          | t <sub>0</sub> +16 | t <sub>0</sub> +17 | ad25                            | (0)+2          |
| 13                                          | t <sub>0</sub> +17 | t <sub>0</sub> +20 | TVprgm28                        | (0)            |

FIG. 5

EX1001, FIG. 5 (annotated).

A *content offset* is determined in relation to the beginning time of reference content

(as opposed to the consumed content), and is characterized broadly in the '896 patent, such that it may be determined relative to an “arbitrary start time value ‘C(0)’” or from the “absolute time” for a broadcast channel. EX1003, ¶¶259-260; EX1001, 10:10-19.

Ramaswamy's signature information 220 corresponds to the reference content. EX1006, ¶33 (“signature information 220 stored in a local reference library 222.”); EX1003, ¶261.

Ramaswamy describes that media source 206 may be a set-top box that receives a broadcast signal. EX1006, ¶29, FIG. 2. Library generator 230 generates signature information for the content received from set-top box 206, and this signature information is stored in reference library 222. EX1006, ¶¶34, 36, 50-52, FIG. 5. At least in this instance, time stamps in the signature information 220 stored in local reference library 222 that originate from library generator 230 would be the absolute time of the broadcast data. EX1003, ¶262; EX1006, ¶¶36-38; EX1006, ¶50 (“The time stamp is a well-known technique for representing a time (e.g., *a current time*) at which an event occurs.”).

As the '896 patent recognizes, for some channels “(e.g., broadcasts, concerts, etc.), absolute time might be both available and useful.” EX1001, 10:15-17. A POSA would have, thus, understood that the claimed *content offset* would encompass at least using absolute times, as opposed to arbitrary reference times,

for broadcast channels. A POSA would have further understood that the difference between the time stamp of an identified segment of the broadcast (e.g., a match included in a matcher collection) and the time stamp of the beginning of that broadcast corresponds to the claimed *content offset indicating a time position of a content identification result within identified content* for that particular identified segment. The time stamp of an identified segment of the broadcast *indicat[es] a time position of a content identification result within identified content* because the time stamp for a piece of reference signature information 220 indicates the time at which that particular section of the recorded program was broadcasted. When considering the broadcast time for that particular piece of reference signature information 220 relative to the broadcast of the recorded program as a whole, the *time position* of that section (*content identification result*) within the content as a whole (*identified content*) can be determined. The claim language does not require the *content offset* to be relative to any specific start time, such as zero. EX1001, 10:10-19; EX1003, ¶263.

Ramaswamy renders obvious using *content offset data* in its media measurement method. EX1003, ¶¶264-265.

## 6. [1.5]

As Ramaswamy recognizes, in time shifted content, the time stamp in reference signature information 220 and the time stamp in consumed signature

information 217 will be different. EX1006, ¶56. Ramaswamy, thus, teaches comparing the two time stamps (from reference signature information 220 and consumed signature information 217) in order to detect a difference, and, thus, time shifted content. Time shift analyzer 246 analyzes the data in a matcher collection for time shifted information. EX1006, ¶¶46, 61-66, FIG. 3 (block 308), FIGs. 8, 9. For example, time shift analyzer 246 may analyze a number of records of the matcher collection, and if time stamps associated with substantially or identically matching signatures are different, then these records are considered as being associated with time-shifted content. EX1006, ¶¶46, 56; EX1003, ¶¶267-272.

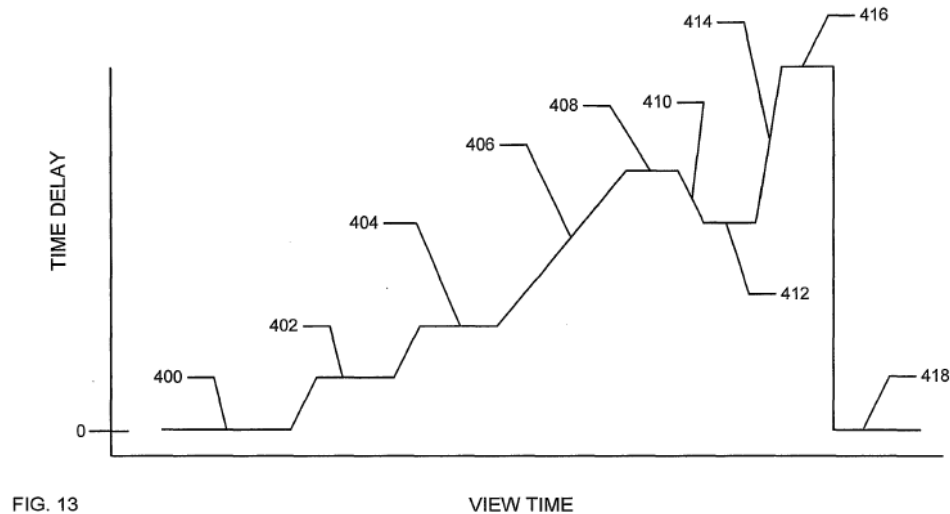
As discussed for element [1.1], signature information 217 corresponds to the *submitted data samples*. The “time stamp is a well-known technique for representing a time (e.g., a current time) at which an event occurs.” EX1006, ¶50. Thus, a POSA would have recognized that the time stamps in the consumed signature information 217 correspond to the claimed *log times associated with capture timing of each of the particular plurality of submitted data samples*. As discussed for element [1.4], the claimed *content offsets of the corresponding content identification results* are determined based on the time stamps in the reference signature information 220. In Ramaswamy’s stream of matcher collections discussed with respect to element [1.1], 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. It was well known that 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. EX1003, ¶273.

Because Ramaswamy teaches comparing time stamps of consumed signature information 217 (*log times*) and time stamps in the reference signature information 220 (which correlate to *content offsets*), it would have been obvious to compare the *log times* to the *content offsets* as recited in element [1.5]. The difference is merely comparing the collected data in a slightly different way. As the '896 patent recognizes, "the particular organization, division, and content of the data may vary considerably . . . without departing from the spirit and scope of the present invention." EX1001, 10:51-58; EX1003, ¶274.

To the extent Patent Owner argues that element [1.5] is not met by Ramaswamy alone, Ramaswamy in combination with Conklin renders obvious element [1.5]. EX1003, ¶275.

Conklin's Figure 13 is reproduced below.



EX1010, FIG. 13.

In Figure 13, the “horizontal axis represents the view time or playback time” associated with the event records. EX1010, ¶71. The playback time “is preferably a current local time” associated with an event record. EX1010, ¶33; EX1010, ¶36 (“time stamp generator 52 . . . generate[s] a time stamp including current local date information and time of day information”). Similarly, the ’896 patent describes that “in many instances, a log time will in fact indicate the actual time the sample started to be captured.” EX1001, 9:40-45. Thus, a POSA would have understood Conklin’s view/playback times to correspond to the claimed *a progression of log times associated with capture timing of each of the particular plurality of submitted data samples*. EX1003, ¶¶276-277.

Also in Figure 13, the “vertical axis represents the delay time (i.e., the difference between the playback or viewing time and the record time).” EX1010, ¶71. The record time is the time at which a segment of content was recorded. EX1010, ¶¶46, 70; EX1010, ¶44 (Table 4). The record time, thus, corresponds to the broadcast time of the content. A POSA would have understood that the claimed *content offsets of the corresponding content identification results* are a function of Conklin’s record time. 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, e.g., the amount of time the segment is located from the beginning of the full program. This is consistent with how the ’896 patent describes a “content offset,” with respect to Figure 5. A POSA, thus, would have understood Conklin’s record times to render obvious the claimed *a progression of content offsets of the corresponding content identification results*. EX1003, ¶278.

Conklin teaches relating the playback time (*log times associated with capture timing of each of the particular plurality of submitted data samples*) to the record time (of which the *content offsets of the corresponding content identification results* are a function) in order to *deduce play altering actions* (element [1.2]). EX1010, ¶¶71-76, FIGs. 9-13. In particular, Conklin’s Figure 13 is “a graph of an example viewing behavior” associated with a DVR. EX1010, ¶75.

The graph “may be generated based on a sequence of events record.” EX1010, ¶75. Conklin teaches that the viewing behavior can be interpreted based on the relationship between the view time and delay time. EX1010, ¶¶71-76, FIGs. 9-13. For example, in region 406 of Figure 13, the slope equals one, indicating the DVR is paused, and in region 410, the slope is negative, indicating a fast forward operation. EX1010, ¶76, FIG. 13; EX1010, ¶¶73, 74, FIGs. 11, 12. In this way, Conklin teaches *comparing a progression of log times and a progression of content offsets*; EX1003, ¶¶279-280.

**7. [1.6]**

Ramaswamy teaches “send[ing] a collection of consumption records (i.e., a *consumption report*, viewing records, etc.) to a central processing facility [124].” EX1006, ¶41. The ’896 patent’s discussion of *media measurement report* is limited. *See* EX1001, 6:35-37 (“Results of the media measurement analysis can be obtained via report generator 130”). A POSA would have understood Ramaswamy’s consumption report to teach the claimed *media measurement report*. EX1003, ¶282.

**C. Claim 2 (“generating a play list including content offset data as part of deducing media play-altering actions of a monitored audience member”)**

As noted above, the ’896 patent broadly characterizes a play list. EX1001, 10:51-11:7.

Conklin's event record generator 56 maintains a sequence of events record (*play list*) such as that in Table 4. EX1010, ¶45; EX1003, ¶¶284-285.

**TABLE 4**

| Storage location<br>(LBA) | Event Record Generated<br>(date, time of day, source) | Playback Time<br>(Read Time) |
|---------------------------|-------------------------------------------------------|------------------------------|
| 11EF240H                  | 7/30/02 16:05:31 011                                  | 7/30/02 16:30:00             |
| 11EF340H                  | 7/30/02 16:05:32 011                                  | 7/30/02 16:30:01             |

EX1010, ¶44 (Table 4).

Each event record in the sequence of events record (*play list*) includes at least source information, recording time information, and playback time information. EX1010, ¶¶42-46, 70. As discussed for element [1.5], the claimed *content offsets* are a function of Conklin's record time, and render obvious using the *content offsets* in the sequence of events analysis. It would further have been obvious to include *content offset data* in the sequence of events record (*play list*) in place of or in addition to the record time information. This sequence of events record is analyzed to determine viewing behavior associated with the DVR (*deducing media play-altering actions of a monitored audience member*). EX1010, ¶¶70-76, FIGs. 9-13; EX1003, ¶¶286-287.

#### **D. Claim 3**

As discussed for element [1.3], a POSA would have understood Ramaswamy's collection of associated signature information included in the

stream of matcher collections includes *sample sequence data* (e.g., at least, a signature, a source identifier, time stamp(s) of reference signature information 220, and the time stamp of consumed signature information 217). EX1006, ¶33.

Ramaswamy teaches using *channel data* to efficiently identify time-shifted content. EX1006, ¶60 (“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. . . . In this manner, behaviors and characteristics associated with time-shifted media consumption (e.g., viewing) can be accurately and efficiently captured and analyzed.”). EX1003, ¶289-290.

**E. Claim 4**

As noted above, the ’896 patent broadly characterizes a clean play list. EX1001, 10:51-58.

Ramaswamy teaches that a “collection of consumption records (i.e., a consumption report, viewing records, etc.)” may be sent to a central processing facility. EX1006, ¶41. These consumption reports include consumption records of viewed content (*a clean play list*), created by time shift analyzer 246 based on the analysis of the matcher collection. EX1006, ¶46. The time shift analysis data structure for identified time-shifted content data is represented as below. EX1006,

¶65.

---

```
{  
  TimeShift = true;  
  TimeShiftSource = ID1;  
  TimeShiftTime = TS1;  
  TuningSource = ID2;  
  TuningTime = TS2;  
}
```

---

EX1006, ¶65.

The variable “TimeShift = true” indicates that the content has been time-shifted (*includ[es] deduced play-altering actions*). EX1006, ¶62; EX1003, ¶¶292-295.

**F. Claim 7 (“wherein utilizing further comprises determining if one or more discontinuities exist in the progression of content offsets”)**

The ’896 patent describes *discontinuities*, with reference to Figure 5. *See* EX1001, 11:49-12:10.

| 510<br>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                      | $t_0+12$ | TVprgm27   | (0)+29         |
| 14                      | $t_0+13$ | TVprgm27   | (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                      | $t_0+19$ | TVprgm28   | (0)+2          |

| 560<br>Clean Play List |                |              |            |                |
|------------------------|----------------|--------------|------------|----------------|
| row                    | start log time | end log time | content ID | content offset |
| 1                      | $t_0$          | $t_0+2$      | TVprgm27   | (0)            |
| 2                      | $t_0+2$        | $t_0+5$      | none       | n/a            |
| 3                      | $t_0+5$        | $t_0+7$      | TVprgm27   | (0)+2          |
| 4                      | $t_0+7$        | $t_0+9$      | TVprgm27   | (0)+9          |
| 5                      | $t_0+9$        | $t_0+11$     | TVprgm27   | (0)+9          |
| 6                      | $t_0+11$       | $t_0+12$     | none       | n/a            |
| 7                      | $t_0+12$       | $t_0+14$     | TVprgm27   | (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                     | $t_0+17$       | $t_0+20$     | TVprgm28   | (0)            |

| 570<br>Channel Data for TV C4 |            |          |            |
|-------------------------------|------------|----------|------------|
| row                           | start time | end time | content ID |
| 1                             | C(0)       | C(0)+31  | TVprgm27   |
| 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  | TVprgm28   |

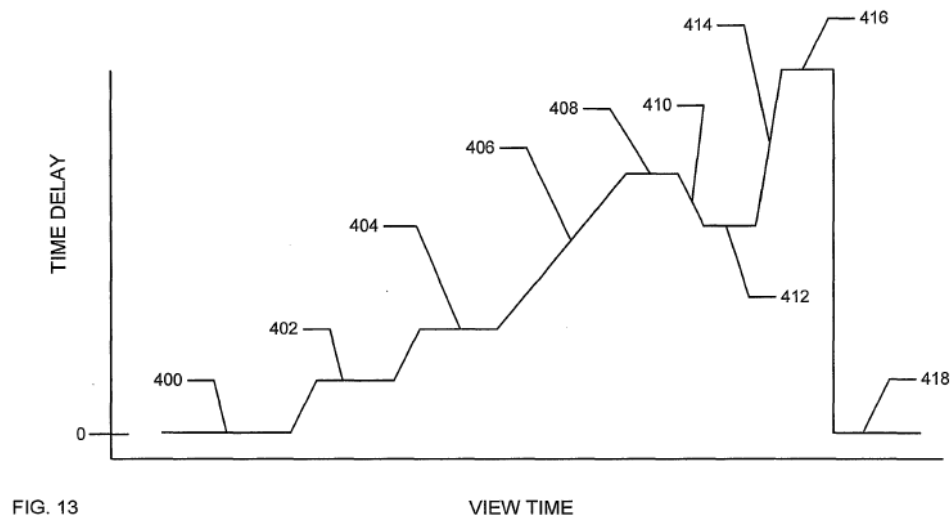
| 590<br>Clean Play List with Deduced Actions |          |              |                                 |                |
|---------------------------------------------|----------|--------------|---------------------------------|----------------|
| row                                         | log time | end log time | content ID and <deduced action> | content offset |
| 1                                           | $t_0$    | $t_0+2$      | TVprgm27                        | (0)            |
| 2                                           | $t_0+2$  | $t_0+5$      | <pause for 3 units>             | n/a            |
| 3                                           | $t_0+5$  | $t_0+7$      | TVprgm27                        | (0)+2          |
| 4                                           | $t_0+7$  | $t_0+7$      | <skip frwrd 5 units>            | n/a            |
| 5                                           | $t_0+7$  | $t_0+9$      | TVprgm27                        | (0)+9          |
| 6                                           | $t_0+9$  | $t_0+9$      | <skip bckwrd 2 units>           | n/a            |
| 7                                           | $t_0+9$  | $t_0+11$     | TVprgm27                        | (0)+9          |
| 8                                           | $t_0+11$ | $t_0+12$     | <fast frwrd 18 units>           | n/a            |
| 9                                           | $t_0+12$ | $t_0+14$     | TVprgm27                        | (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                                          | $t_0+17$ | $t_0+20$     | TVprgm28                        | (0)            |

FIG. 5

EX1001, FIG. 5.

A POSA would have understood from this disclosure that a *discontinuity* may identify non-continuous values in the progression of content offsets. EX1003, ¶297.

Conklin's Figure 13 is reproduced below.



EX1010, FIG. 13.

As discussed for element [1.5], the “vertical axis represents the delay time (i.e., the difference between the playback or viewing time and the record time),” EX1010, ¶71, and a POSA would have understood that the claimed *content offsets* are a function of Conklin’s record time. Section VIII.B.6. A POSA would have understood that the transition point between each identified region of Figure 13 (i.e., regions 400, 402, 404, 406, etc.) would correspond to a *discontinuity* as described in the ’896 patent. For example, between first region 400 and second region 402, “a time shift occurs, indicating . . . a ‘go back’ command . . . causing the DVR to rewind and then resume delayed playback.” EX1010, ¶76. At the transition from fourth region 406 to fifth region 408, the DVR transitions from a

paused state to resuming playback. EX1010, ¶76. And, at the transition from eighth region 414 to ninth region 416, the DVR transitions from rewinding to resuming playback. EX1010, ¶76. These are similar to the examples of discontinuities illustrated in Figure 5 of the '896 patent, e.g., the pause event indicated by the progression of content offsets from rows 2 to 5 of playstream 510, the fast forward/skip ahead event indicated by the progression of content offsets between rows 7 and 8, or the rewind/skip back event indicated by the progression of content offsets between rows 9 and 10. EX1001, FIG. 5; EX1003, ¶¶298-299.

**G. Claim 8 (“wherein the content offset data is derived from a comparison conducted by a computerized content identification system comparing the submitted data samples against known content such that content offset data is obtainable without using time codes accompanying the captured video data samples”)**

As discussed for element [1.1], Ramaswamy’s consumed signature information 217 (*submitted data samples*) is compared to reference signature information 220 (*known content*) stored in a local reference library 222. Section VIII.B.2; EX1006, ¶¶24, 32-34, 55. As discussed for element [1.4], the *content offset data* of Ramaswamy is determined based on the reference signature information 220 (*known content*). Section VIII.B.5. Thus, Ramaswamy teaches obtaining the content offset data *without using time codes* (time stamps) *accompanying the captured video data samples* (consumed signature information 217). EX1003, ¶¶301-302.

## **H. Independent Claim 9**

### **1. [9.P]**

Ramaswamy teaches the preamble for the same reasons set forth for claim 1's preamble. Section VIII.B.1; EX1003, ¶303.

### **1. [9.1]**

Element [9.1] corresponds to element [1.1]. Ramaswamy teaches, or at least renders obvious, this element for the same reasons as element [1.1]. Section VIII.B.2; EX1003, ¶304.

### **2. [9.2]**

Element [9.2] corresponds to element [1.2]. The Ramaswamy-Conklin combination renders obvious this element for the same reasons as element [1.2]. Section VIII.B.3; EX1003, ¶305.

### **3. [9.3]**

Element [9.3] corresponds to element [1.3]. Ramaswamy teaches, or at least renders obvious, this element for the same reasons as element [1.3]. Section VIII.B.4; EX1003, ¶306.

### **4. [9.4]**

The Ramaswamy-Conklin combination renders obvious element [9.4]. As discussed for element [1.2], Conklin's method teaches the same activities identified in the '896 patent as examples of *play-altering actions*, e.g., pause, rewind, fast forward, and skipping. Section VIII.B.3; EX1010, ¶¶73-76, FIGs. 11-

13; EX1001, 11:14-23. A POSA would have also understood that at least rewinding and fast forwarding *alter a pace of a media stream* and that at least skipping (forward or backward) *alter[s] a sequence of a media stream* as recited. EX1003, ¶¶307-308.

**5. [9.5]**

Element [9.5] corresponds to element [1.4]. Ramaswamy renders obvious this element for the same reasons as element [1.4]. Section VIII.B.5; EX1003, ¶309.

**6. [9.6]**

Element [9.6] corresponds to element [1.5]. The Ramaswamy-Conklin combination renders obvious element [9.6] for the same reasons as for element [1.5]. Section VIII.B.6; EX1003, ¶310.

**7. [9.7]**

Element [9.7] corresponds to element [1.6]. Ramaswamy teaches, or at least renders obvious, this element for the same reasons as element [1.6]. Section VIII.B.7; EX1003, ¶311.

**I. Claim 10**

As discussed for elements [1.2] and [9.4], Conklin's method identifies *pause* and *rewind* operations, *fast forward* operations, and skipping (e.g., a “go back” command”). EX1010, ¶¶73-76, FIGs. 11-13; Sections VIII.B.3, VIII.H.4. As also discussed, a POSA would have been motivated to implement Conklin's additional

analysis functionality in Ramaswamy's method in order to provide the enhanced media consumption monitoring capabilities discussed in Conklin. Section VIII.A. Thus, the Ramaswamy-Conklin combination renders obvious claim 10. EX1003, ¶¶313-314.

**J. Claim 11**

As discussed for elements [1.2] and [9.4], Conklin's method identifies pause and rewind operations, fast forward operations, and *skipping (e.g., a "go back" command)*. EX1010, ¶¶73-76, FIGs. 11-13; Sections VIII.B.3, VIII.H.4. A POSA would have been motivated to implement Conklin's additional analysis functionality in Ramaswamy's method in order to provide the enhanced media consumption monitoring capabilities discussed in Conklin. *See* Section VIII.A. Thus, the Ramaswamy-Conklin combination renders obvious claim 11. EX1003, ¶¶316-317.

**K. Claim 12 ("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")**

As discussed for claim 2, Conklin teaches a *play list generated including content offset data as part of deducing media play-altering actions of a monitored audience member*. Section VIII.C; EX1003, ¶319.

The '896 patent teaches that its process 300 can be applied in the same way to a "play stream" input and a "play list" input, making no real distinction between

the two. EX1001, 6:30-35, 8:42-9:16. Referring to Figure 5, the apparent difference is a combination of rows of data having the same contentID. EX1001, FIG. 5 (compare 510 with 560). But the '896 patent also makes clear that “the particular organization, division, and content of the data may vary considerably from that illustrated in” Figures 4 and 5. EX1001, 10:51-11:7; EX1003, ¶320.

Thus, Conkin’s sequence of events record (see discussion for claim 2) renders obvious either a play stream or a play list, as recited in claims 2, 12 and 13. EX1003, ¶¶321-322.

**L. Claim 13 (“wherein the at least one of a play stream and play list including content offset data comprises the play stream of content identification results”)**

As discussed for claim 12, Conklin similarly teaches a *play stream including content offset data*. Section VIII.K; EX1003, ¶¶323-325.

**IX. GROUND 3: CLAIMS 2, 7, 12, AND 13 WOULD HAVE BEEN OBVIOUS OVER FEININGER IN VIEW OF CONKLIN.**

Claims 2, 7, 12, and 13 would have been obvious over Feininger in view of Conklin. EX1003, ¶¶326-338.

**A. A POSA would have combined Feininger and Conklin**

A POSA would have been motivated to combine Feininger and Conklin for multiple reasons. EX1003, ¶327.

Both Feininger and Conklin relate to monitoring media consumption, and in particular to solving the problem of monitoring consumption when the media is

viewed in a time shifted manner. EX1005, 1:14-17; EX1010, ¶6. Feininger teaches detecting “portions of a recorded program that were not played back in real time (e.g., that were skipped, fast forwarded, paused, and/or rewound).” EX1005, 4:4-7. Like Feininger, Conklin teaches identifying time shifted media consumption activities, including pause and rewind operations, fast forward operations, and skipping. EX1010, ¶¶72-76, FIGs. 10-13; EX1003, ¶328.

Both rely on comparing a progression of log entries/event records in identifying time-shifted media consumption. EX1005, 18:1-19:9; EX1010, ¶¶44 (Table 4), 72-76. A POSA would have been motivated to implement details of Conklin’s analysis functionality in Feininger’s method because it would simply have been the use of a known technique (Conklin’s sequence of events analysis) to improve a similar method (Feininger’s method of detecting time-shifted content) in the same way. EX1003, ¶329.

A POSA would have had a reasonable expectation of success in combining these references because they both relate to processing data collected from media viewing records. Both Feininger and Conklin teach that data can be stored in well-known data structure formats and then analyzed. *See, e.g.*, EX1005, 4:49-5:27, 18:1-19:9; EX1010, ¶¶31, 44, 46, 53. Various database processing techniques would have been well known to a POSA, and using and combining these techniques would have been well within the level of ordinary skill. EX1003, ¶330.

**B. Claims 2, 7, 12, and 13**

Claims 2, 7, 12, and 13 would have been obvious over the Feininger-Conklin combination. Conklin teaches or at least renders obvious the elements of each of these claims. Sections VIII.C, VIII.F, VIII.K, VIII.L; EX1003, ¶¶331-338.

**X. PETITIONER IS UNAWARE OF ANY SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS**

Petitioner is unaware of any alleged evidence of secondary considerations, or that Patent Owner has made any non-conclusory assertions of any secondary considerations of non-obviousness.

**XI. DISCRETIONARY DENIAL IS NOT APPROPRIATE.**

**A. *Fintiv* does not support discretionary denial.**

*Fintiv* does not support discretionary denial. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 6 (P.T.A.B. Mar. 20, 2020) (precedential) (“*Fintiv*”). If the Board institutes trial, Roku will not pursue, in a parallel district court proceeding, the same grounds as in the petition or any grounds that could have reasonably been raised in the IPR. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, at 18-19 (P.T.A.B. Dec. 1, 2020) (precedential as to § II.A). Under the Interim Procedure, “the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a [*Sotera*] stipulation,” as Roku presents here. EX1015, 3, 7.

**B. Denial under §325(d) is not appropriate.**

Denial under §325(d) and *Advanced Bionics* is not appropriate. Under *Advanced Bionics* part one, Feininger, Ramaswamy, and Conklin were not before the Examiner during prosecution. *See* EX1001, (56). Thus, the Examiner during original prosecution did not consider the combinations or arguments presented in the Petition and *Advanced Bionics* part one is not met.

Even if part one were met (which it is not), *Advanced Bionics* part two requires a consideration of whether the Office erred. Here, the Examiner clearly erred by not considering or applying Feininger, Ramaswamy, and Conklin in rejecting the claims. *See* Sections VII-IX; EX1003, ¶¶133-338.

**XII. CERTIFICATION THAT THE PATENT MAY BE CONTESTED VIA *INTER PARTES* REVIEW BY THE PETITIONER AND STANDING (37 C.F.R. § 42.104(A))**

Roku certifies that the '896 patent is available for IPR and Roku is not barred or estopped from requesting IPR of any '896 patent claim.

**XIII. MANDATORY NOTICES (37 C.F.R. § 42.8(A)(1))**

**Real Party-in-Interest** (37 C.F.R. § 42.8(b)(1)): The real party-in-interest is Roku, Inc.

**Related Matters** (37 C.F.R. § 42.8(b)(2)): The '896 patent is the subject of the following pending civil actions:

- *Anonymous Media Research Holdings LLC v. Samsung Electronics*

*Co., Ltd. et al.*, Case No. 2:23-cv-00439 (E.D. Tex.), filed September 22, 2023; and

- *Anonymous Media Research Holdings LLC v. Roku, Inc.*, Case No. 1:23-cv-01143 (W.D. Tex.), filed September 22, 2023.

Petitioner is concurrently filing Petitions for *Inter Partes* Review of the following U.S. Patents, which are also the subject of the above-listed civil actions:

- 8,296,791 (IPR2024-01053);
- 8,510,768 (IPR2024-01054); and
- 10,719,848 (IPR2024-01057).

**Lead and Back-up Counsel** (37 C.F.R. § 42.8(b)(3)) for Roku are:

| Lead Counsel                                                                                                                                                                                                                                                                                  | Back-Up Counsel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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**Service Information** (37 C.F.R. § 42.8(b)(4)): Please direct all

correspondence regarding this Petition to counsel at the above addresses and [PTAB@sternekessler.com](mailto:PTAB@sternekessler.com). Roku consents to service by email at the addresses above.

**Procedural Statements:** This Petition is filed in accordance with 37 C.F.R. § 42.106(a). Concurrently filed herewith are a Power of Attorney and Exhibit List under 37 C.F.R. §§ 42.10(b) and 42.63(e), respectively. The required fee is paid through Deposit Acct. No. 19-0036 (Customer ID No. 45324). The Office is authorized to charge any fee deficiency, or credit any overpayment, to Deposit Acct. No. 19-0036 (Customer ID No. 45324).

#### **XIV. CONCLUSION**

The challenged claims are unpatentable as obvious and IPR is warranted.

Respectfully submitted,

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**CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))**

1. This Petition for *Inter Partes* Review complies with the type-volume limitation of 14,000 words, comprising 13,998 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Petition for *Inter Partes* Review complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

Respectfully submitted,

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**CERTIFICATE OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))**

I certify that the above-captioned **PETITION FOR *INTER PARTES***  
**REVIEW FOR U.S. PATENT NO. 10,572,896** and associated Exhibits 1001-  
1019 were served in their entireties upon the Patent Owner on July 15, 2024, via  
FedEx® Express at the following addresses:

MASCHOFF BRENNAN GILMORE ISRAELSEN & MAURIEL LLP  
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*Patent Owner's Correspondence Address of Record for U.S. Patent No.*  
*10,572,896*

Respectfully submitted,

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**APPENDIX A: CHALLENGED CLAIMS**

| <b>Limitation</b> | <b>Claim</b>                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.P               | 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 video data 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                                                                                                                                                                                                            |
| 1.3               | 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                                                                                                                                                  |
| 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 |
| 1.6               | using one or more computers to utilize deduced play altering actions of the monitored audience member to generate a media measurement report.                                                                                                                                                                                                                   |
| 2                 | The 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.                                                                                                                                                                                  |

|     |                                                                                                                                                                                                                                                                                                                            |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3   | The 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.                                                                                                                                          |
| 4   | The media measurement method of claim 1 wherein a clean play list is generated including deduced play-altering actions.                                                                                                                                                                                                    |
| 5   | The media measurement method of claim 1 wherein the play stream is a raw play stream.                                                                                                                                                                                                                                      |
| 6   | The media measurement method of claim 1 wherein the play stream is a clean play stream.                                                                                                                                                                                                                                    |
| 7   | The method of claim 1 wherein to utilize further comprises determining if one or more discontinuities exist in the progression of content offsets.                                                                                                                                                                         |
| 8   | The method of claim 1 wherein the content offset data is derived from a comparison conducted by a computerized content identification system comparing the submitted data samples against known content such that content offset data is obtainable without using time codes accompanying the captured video data samples. |
| 9.P | 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 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                                                                                                                                                                       |
| 9.3 | 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                                                                                                                                                                                                                                                |
| 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                                                                                                                                                  |
| 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 |
| 9.7 | using one or more computers to utilize deduced play altering actions of the monitored audience member to generate a media measurement report.                                                                                                                                                                                                                   |
| 10  | The method of claim 9 wherein play-altering actions include at least one of fast forwarding, rewinding, and pausing a media stream.                                                                                                                                                                                                                             |
| 11  | The method of claim 9 wherein play-altering actions include at least one of skipping forward and skipping backward in a media stream.                                                                                                                                                                                                                           |
| 12  | The 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.                                                                                                                               |
| 13  | The 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.                                                                                                                                                                                       |