

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC., LG ELECTRONICS U.S.A., INC.,

Petitioner

U.S. Patent No. 10,419,805

**DECLARATION OF ANDREW LIPPMAN,
UNDER 37 C.F.R. § 1.68 IN SUPPORT OF PETITION FOR
INTER PARTES REVIEW**

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I, Andrew Lippman, do hereby declare as follows:

I. INTRODUCTION

1. I am making this declaration at the request of LG Electronics, Inc. in the matter of the *Inter Partes* Review of U.S. Patent No. 10,419,805 (“the ’805 patent”) to Shoykher *et al.*

2. I am being compensated for my work in this matter at my standard hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

3. I have been asked to provide my opinions regarding whether claims 1-18 (“the Challenged Claims”) of the ’805 patent are unpatentable as they would have been obvious to a person having ordinary skill in the art (“POSITA”) at the time of the alleged invention, in light of the prior art. It is my opinion that all of the elements of the Challenged Claims would have been obvious to a POSITA.

4. In the preparation of this declaration, I have studied:

- a. the ’805 patent, Ex.1001;
- b. the prosecution history of the ’805 patent (“’805 File History”), Ex.1002;
- c. U.S. Patent Pub. No. 2013/0263184 to Melnychenko *et al.* (“Melnychenko”), Ex.1005;
- d. U.S. Patent Pub. No. 2012/0054794 to Kim *et al.* (“Kim”), Ex.1006;
- e. U.S. Patent Pub. No. 2007/0226268 to Chen (“Chen”), Ex.1007;

- f. U.S. Patent No. 9,008,190 to Lee et al. (“Lee-1”), Ex.1008;
- g. U.S. Patent No. 9,398,339 to Lee et al. (“Lee-2”), Ex.1009;
- h. U.S. Patent No. 8,893,184 to Ferren et al. (“Ferren”), Ex.1010;
- i. U.S. Patent Pub. No. 2013/0057764 to Choi et al. (“Choi”); Ex.1011;
- j. U.S. Patent Pub. No. 2013/0031592, Ex.1012;
- k. U.S. Patent Pub. No. 2009/0257738, Ex.1013;
- l. U.S. Patent Pub. No. 2013/0152135, Ex.1014;
- m. U.S. Patent Pub. No. 2005/0283800, Ex.1015;
- n. U.S. Patent No. 6,665,869, Ex.1016; and
- o. U.S. Patent Pub. No. 2013/0176415, Ex.1018.
- p. Claim comparison chart for claims 1-18 of the ’805 patent, Ex.1017.

5. In forming the opinions expressed below, I have considered: the documents listed above; the relevant legal standards, including the standard for obviousness; and my own knowledge and experience based upon my work in the field of televisions as described below, and any additional authoritative documents as cited in the body of this declaration.

6. Unless otherwise noted, all emphasis in any quoted material has been added.

II. QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

7. My qualifications and professional experience are described in my *Curriculum Vitae*, a copy of which can be found in Exhibit 1004. The following is a brief summary of my relevant qualifications and professional experience.

8. I earned my undergraduate degree in Electrical Engineering from MIT

in 1971. I earned a Master of Science degree in Computer Graphics from MIT in 1978. I earned a Ph.D. in Electrical Engineering from the École Polytechnique Fédérale de Lausanne (Switzerland) in 1995. My thesis was on scalable video, a technique for representing visual data in a fluid and variable networking and processing environment, similar to what we call streaming today.

9. I am currently a Senior Research Scientist at the Massachusetts Institute of Technology (“MIT”) and Associate Director of the MIT Media Laboratory, an approximately \$80 million per year research and teaching facility at MIT, which I helped establish in the early 1980s.

10. At MIT, I have supervised over 50 Masters and Ph.D. theses in the Media Arts and Sciences program and have taught courses such as Digital Video and MIT’s freshman physics seminar. Through the course of my career, I have directed and served as principal investigator of research projects supported by the Defense Advanced Research Projects Agency (DARPA), the Office of Naval Research (ONR), The National Science Foundation (NSF), and over 50 industrial companies. I have never precisely calculated my net research volume, but it is in excess of \$50 million.

11. I am named as an inventor on six patents in the area of video and digital processing and have served on the advisory boards for technology companies in fields ranging from video conferencing to music analysis. I have

authored or coauthored over 65 published papers in the fields of interactivity, communications, video coding, and television. I served on the editorial board of the Image Communication Journal between 1989 and 2003. I have served as an expert witness in patent cases since 2001, addressing diverse features of interactive television, electronic program guides, and user interaction.

12. I have worked generally on video interaction systems since the 1970s. In the early 1970s, I developed font representations that permitted high quality display of text on standard broadcast television receivers. In 1978, I directed a DARPA-funded project called the “Movie-Map” that used computing and optical video and image storage to create an “experiential map” that featured “surrogate travel,” the ability to recreate the visual experience of traveling through a real place, a city. This is similar to Google’s Street-View and mapping systems.

13. In the 1980s, I was principal investigator of Office of Naval Research funded programs in video and graphics computer systems for interactive learning dedicated to maintenance and repair. I also developed networked video communications systems that included scripting languages for specifying audiovisual content and representing it on various monitoring terminals.

14. In 1991, I created the “Media Bank” program at MIT, the purpose of which was to allow a diverse set of networked devices to access appropriate forms of content for which they had the bandwidth and processing power to display. This

entailed maintaining state information about terminal devices at a server and using that to determine the best representation of the audiovisual material to deliver to them. In addition, it included and developed cryptographic distribution methods that ensured secure delivery of information on the network. Related to this work, I also supervised Masters theses on networked distribution of video and coding specifically for diverse uses on the Internet. My colleagues and I created demonstrations of interactive television systems for news that combined the evening newscast with additional data from print sources so the viewer could learn more about the story than was available in the live broadcast.

15. Also in 1991, I created the Television of Tomorrow program at MIT. This program addressed the digital representation and delivery of video at diverse scales and through diverse networks. This program built on work on scalable representations of images that were standards-independent and interactive.

16. In 1993, I was invited to be a member of Robert Kahn's "Cross Industry Working Group" the goal of which was to develop the ideas for a National Information Infrastructure. At DARPA, Kahn had initiated the research to develop the Arpanet and the Internet. Throughout this period, my students and I worked on distributed interactive systems for consumer use (television, electronic newspapers, learning) including the basic technology of the network and the client-server interactions.

17. I was a member of the Motion Picture Experts Groups, an ISO standards committee effort that defined the standards for common distribution of “MP3” music and storage and distribution of “MPEG Video.” I co-wrote the paper defining the requirements for the MPEG-2 standard with Okubo and McCann in 1995. MPEG standards remain the predominant encoding for distribution of digital video to this day. I was also the principal investigator on industry-funded programs addressing digital motion pictures — the “Movies of the Future” program at MIT, and high definition television, “Television of Tomorrow.” At MIT, I created the “Digital Life” consortium, the purpose of which was to explore and develop ideas relevant to an Internet-connected society.

III. LEVEL OF ORDINARY SKILL IN THE ART

18. I understand there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems.

19. A person of ordinary skill in the art (“POSITA”) in the field of the ’805 patent, as of its earliest possible filing date of August 17, 2012, would have been someone knowledgeable and familiar with the television display technology that is pertinent to the ’805 patent. A POSITA would have had a bachelor’s degree

in Electrical Engineering, Software Engineering, or Computer Engineering, or equivalent training, and approximately two years of experience working in the field of television systems and networking, human-computer interaction, or related technologies. Lack of work experience can be remedied by additional education, and vice versa.

20. For purposes of this Declaration, in general, and unless otherwise noted, my statements and opinions, such as those regarding my experience and the understanding of a POSITA generally (and specifically related to the references I consulted herein), reflect the knowledge that existed in the field as of the priority date of the '805 patent. Unless otherwise stated, when I provide my understanding and analysis below, it is consistent with the level of a POSITA prior to the priority date of the '805 patent.

IV. RELEVANT LEGAL STANDARDS

21. I am not an attorney. In preparing and expressing my opinions and considering the subject matter of the '805 patent, I am relying on certain basic legal principles that counsel have explained to me. These principles are discussed below.

22. I understand that prior art to the '805 patent includes patents and printed publications in the relevant art that predate the priority date of the alleged invention recited in the '805 patent. For purposes of this Declaration, I am

applying August 17, 2012 as the earliest possible priority date of the '805 patent.

23. I have been informed that a claimed invention is unpatentable under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. I have also been informed by counsel that the obviousness analysis takes into account factual inquiries including the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and the claimed subject matter.

24. I have been informed by counsel that the Supreme Court has recognized several rationales for combining references or modifying a reference to show obviousness of claimed subject matter. Some of these rationales include the following: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of a known technique to improve a similar device (method, or product) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (f) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art

reference or to combine prior art reference teachings to arrive at the claimed invention.

V. THE '805 PATENT

A. Overview of the '805 Patent

1. Intelligent TV That Organizes Metadata from Different Sources into a Uniform Format

25. The '805 patent is directed to “[a] data service system in an Intelligent Television (TV).” Ex.1001, Abstract. The '805 patent explains that an Intelligent TV “refers to a television configured to provide one or more intuitive user interfaces and interactions,” where “[t]he Intelligent TV utilizes processing resources associated with the television to integrate Internet connectivity with parallel application functionality.” Ex.1001, 5:54-59. The '805 patent indicates that an Intelligent TV may receive different types of “media and content” from a variety of sources, including, for example, “Internet, over-the-top content, on-demand streaming media, over-the-air broadcast media, and/or other forms of information.” Ex.1001, 5:60-64. In addition to the content, the Intelligent TV also receives metadata associated with the corresponding content. Ex.1001, 30:26-29 (“[M]edia content and feeds from the various sources may also include metadata information embedded with these contents (i.e., close captions, subtitles, and other information).”). An objective of the '805 patent is to organize metadata from different sources (e.g., metadata for TV/EPG content, metadata for VOD content,

and metadata for media content) so that the metadata is converted to be in a uniform format for the convenience of the user of the Intelligent TV. Ex.1001, 30:46-48, 33:23-30, 34:49-50, Fig. 16 (step 1630). The organizing and converting function is described in more detail in Section IV.A.6 below.

2. Hardware Configuration of Intelligent TV

26. The '805 patent describes a hardware configuration of the Intelligent TV that includes, in part, a processor to implement the software functions of the Intelligent TV. I will first describe a hardware configuration of the Intelligent TV with respect to Figure 3 below, and then will describe software features of the Intelligent TV with respect to Figure 4 below. Figure 3 below illustrates “[h]ardware features” of the Intelligent TV 100. Ex.1001, 15:25-30. The hardware features include, in part, a primary screen 304, a processor 364, and various types of memory including “memory 308” and/or “data storage 314.” Ex.1001, 15:25-52, 16:4-16, 17:22-30. The '805 patent explains that “[t]he processor 364 generally functions to run programming code or instructions implementing various functions of the Intelligent TV 100.” Ex.1001, 16:16-19. The “memory 308 [is] for use in connection with the execution of application programming or instructions by the processor 364, and for the temporary or long term storage of program instructions and/or data.” Ex.1001, 17:22-26.

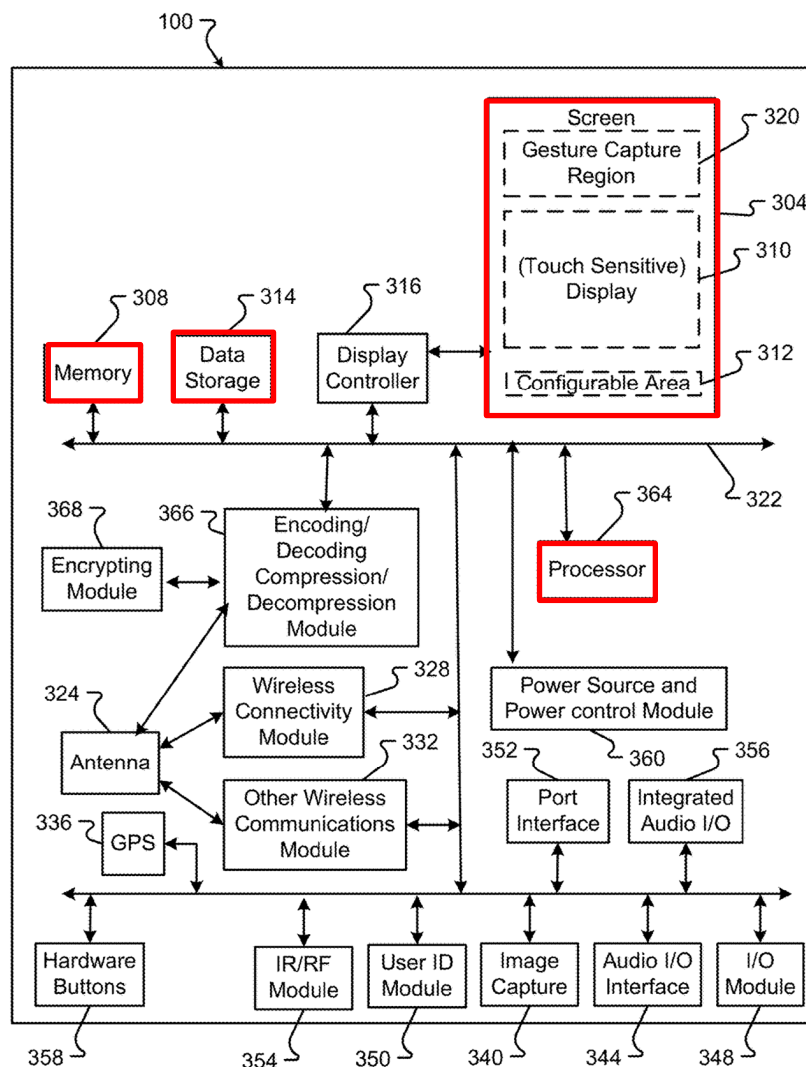


FIG. 3

Ex.1001, Fig. 3 (annotated).

3. Software Implementation of Intelligent TV

27. As shown in Figure 4 of the '805 patent below, the Intelligent TV includes a "software system 400" that "comprise[s] one or more layers including, but not limited to, an operating system kernel 404, one or more libraries 408, an application framework 412, and one or more applications 416. The one or more

layers 404-416 can communicate with each other to perform functions for the Intelligent TV 100.” Ex.1001, 17:64-18:4. The ’805 patent provides that “[l]ibrary 408 [] contain[s] code or other components that may be accessed and implemented during the operation of the software system 400,” including “a data service library 432.” Ex.1001, 18:23-28. “The data services library 432 can include the one or more components or codes to implement components for the data services function.” Ex.1001, 18:43-45. As described below, the Challenged Claims are generally directed to the functions of the “data service.” *See, e.g.*, preamble of independent claim 10 (“A data service system in a Television (TV).”).

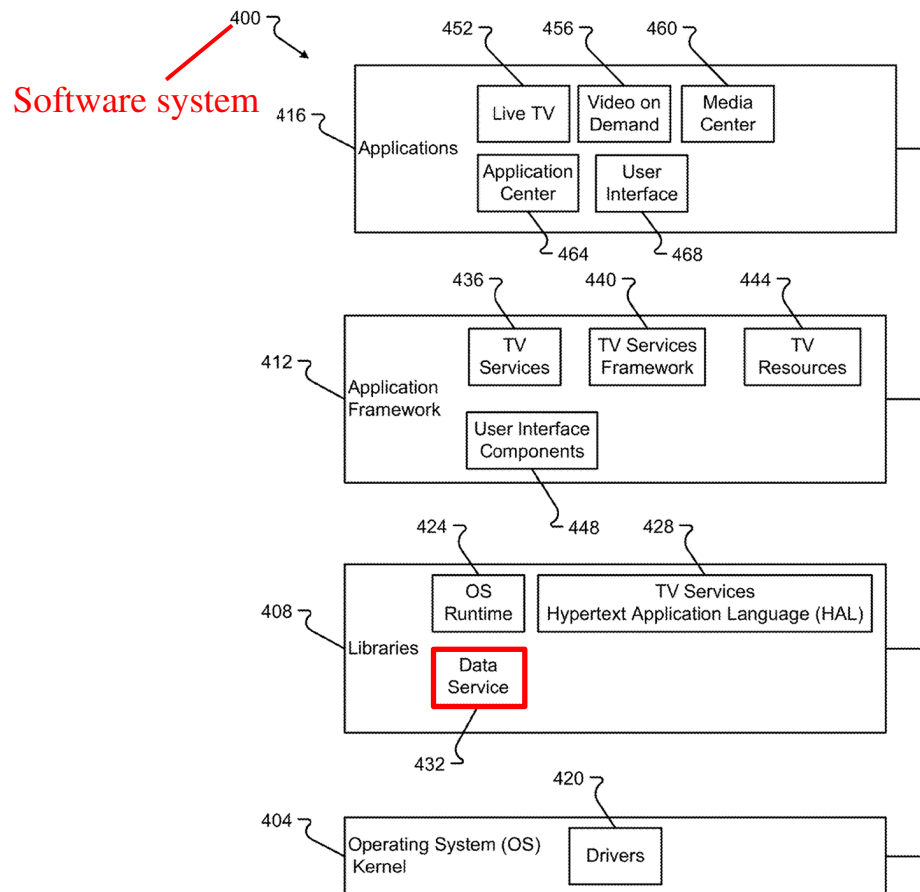


FIG. 4

Ex.1001, Fig. 4 (annotated).

4. Subservices

28. The '805 patent does not explicitly define a “subservice,” but in one embodiment, the '805 patent states that “[e]ach subservice will be able to manage media and/or [meta]data from its particular source(s) and further **aggregate media and/or data from multiple distinct sources.**” Ex.1001, 3:8-10. Figure 14 of the '805 patent below illustrates an embodiment of the data service 432 and data management performed by the data service 432. Ex.1001, 28:22-23 (“FIG. 14

shows a data service 432 and the operation of the data management 1400 according to an embodiment.”), 20:64-65 (similar description for Fig. 6). As shown in Figure 14, different types of content (e.g., EPG, VOD, media) and associated metadata are received from a plurality of subservices that include an EPG subservice 1424, a VOD subservice 1420, and a media subservice 1428.

The different types of data services (video on demand, electronic programming guide, media) each have a **data subservice component (i.e., VOD subservice 1420, EPG subservice 1424, and media subservice 1428)** that is in communication with one or more internal and/or external sources. Each data subservice component is in communication with the corresponding source plugins (i.e., VOD source plugins 1444 *a-n* for VOD subservice 1420, EPG source plugins 1448 *a-n* for EPG source subservice 1424, and media source plugins 1452 *a-n* for media source subservice 1428).

Ex.1001, 28:46-55; *see also* Ex.1001, 21:14-21 (describing corresponding VOD subservice 620, EPG subservice 624, and media subservice 628 in Fig. 6).

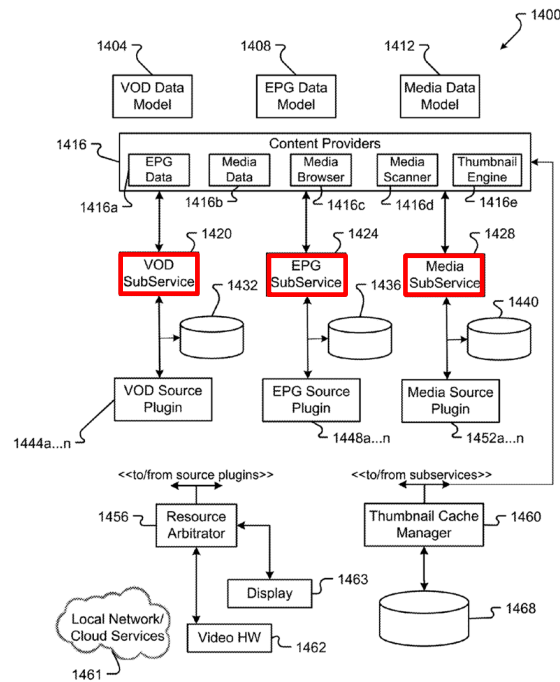


Fig. 14

Ex.1001, Fig. 14 (annotated).

29. Figure 14 above is a functional diagram of the data service described by the '805 patent. Ex.1001, 10:62-63 ("FIG. 14 is a block diagram of an embodiment of a data service."), 10:38-39 (similar description for Fig. 6). While Figure 14 illustrates a one-to-one correspondence between each "subservice" and a content source (via the source plugin), the '805 patent explains that a subservice may receive content from multiple sources. Ex.1001, 3:8-10 ("Each subservice will be able to manage media and/or data from its particular source(s) and further aggregate media and/or data from multiple distinct sources."). Thus, the subservices of the '805 patent are processing functions or pathways in the data service for receiving content and associated metadata from one or more content

and metadata sources.

30. The data management 1400 (data service) of Figure 14 receives data relevant to the content (e.g., metadata) from a corresponding subservice. The '805 patent explains that each subservice includes “media data and information” that can be used by application(s) 416 of the software system 400 running on the Intelligent TV. Ex.1001, 30:65-31:13. Specifically, the data relevant to the content includes “metadata.” Ex.1001, 31:3-10, 30:26-29 (“[M]edia content and feeds from the various sources may also include **metadata information** embedded with these contents (i.e., close captions, subtitles, and other information).”). With reference to Figure 14 above, the '805 patent explains that the metadata relates to the corresponding content and associated subservice for which the metadata was received. Ex.1001, 31:38-41.

5. Data Model

31. As shown in Figure 14 below, the '805 patent explains that each type of content (e.g., EPG, VOD, media) and its corresponding metadata have an associated data model, such as VOD data model 1404 for VOD data, EPG data model 1408 for EPG data, and media data model 1412 for media data. Ex.1001, 28:35-37.

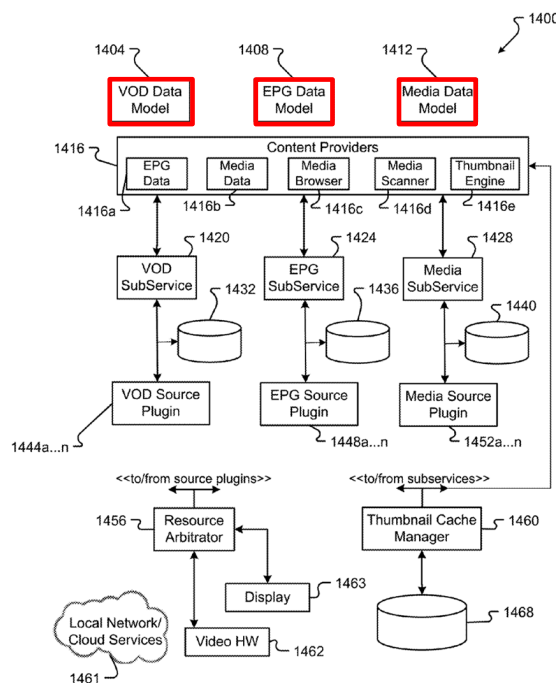


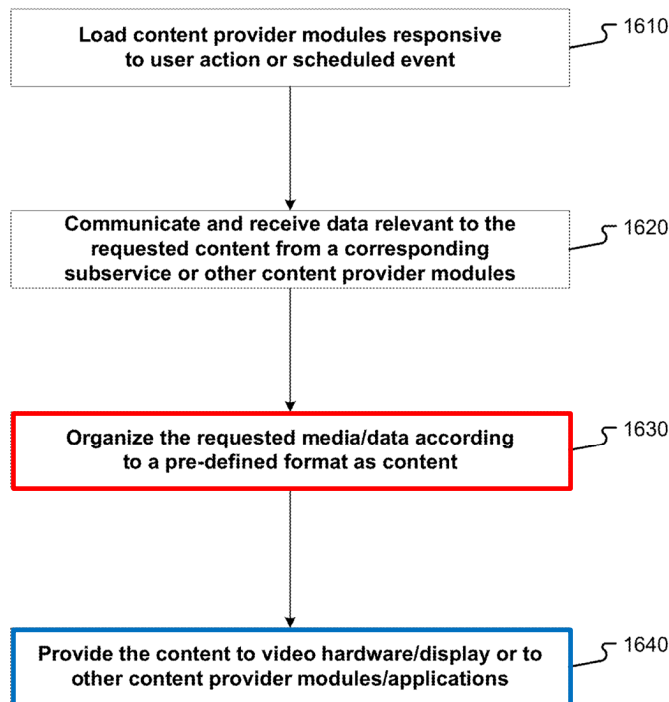
Fig. 14

Ex.1001, Fig. 14 (annotated).

32. The '805 patent explains that "[t]he data models govern what information is to be stored and how that information will be stored by the data service." Ex.1001, 21:6-8, 28:37-38 (similar). For example, with reference to Figure 14 above, the '805 patent provides that "[t]he data models provide uniform formats for the respective subservices (i.e., VOD subservice 1420, EPG subservice 1424, and media subservice 1428) and/or the internal content provider modules 1416 which interface with applications 416." Ex.1001, 33:25-29. Thus, the '805 patent provides that each data model (e.g., VOD data model 604) or a particular type of content (e.g., VOD content) provides a corresponding format for that content and associated metadata (e.g., metadata for VOD content).

6. Organizing Metadata

33. With reference to Figure 16 below, the '805 patent provides that the data service (data management process) of the Intelligent TV organizes the metadata for a particular type of content (e.g., metadata for VOD content) according to a pre-defined format specified by the corresponding data model for that type of content (e.g., the VOD data model 1404 for the VOD content and metadata in Figure 14). Ex.1001, 34:49-50 (“Process 1600 next organizes the requested media and/or data according to a pre-defined format as content [in step] 1630.”), 34:10-12 (“FIG. 16 shows a flow diagram for providing media or data to an internal content provider 1600 for data management 1400 according to an embodiment.”).

**FIG. 16****Ex.1001, Fig. 16 (annotated).**

7. Content Provider Modules

34. The '805 patent explains that the organizing function in step 1630 above includes converting the data received from a corresponding subservice (e.g., VOD subservice 1420 for VOD data) into the pre-defined format of the corresponding data model (e.g., VOD data model 1404). Ex.1001, 30:46-48 (“the VOD or media content received may be converted into a consistent format for all contents.”), 33:23-30 (“The received content from the various source plugins may be converted to the specific format handled by the respective data model. The data

models provide uniform formats for the respective subservices (i.e., VOD subservice 1420, EPG subservice 1424, and media subservice 1428) and/or the internal content provider modules 1416 which interface with applications 416.”), 35:11-14 (“In one implementation, the content provider 1416 may access and provide content directly to the video hardware 1462 and/or display 1463[.]”).

35. Then, in step 1640 of Figure 16 below, the process involves providing the content and organized metadata to a content provider module of the Intelligent TV. Ex.1001, 35:9-11.

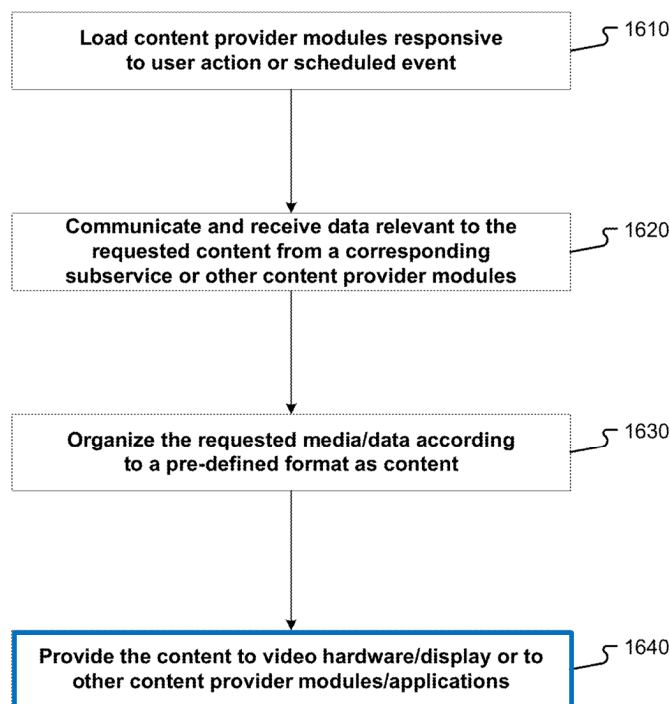


FIG. 16

Ex.1001, Fig. 16 (annotated).

36. The '850 patent explains that the Intelligent TV may include one or more "internal" content provider modules that receive content and associated metadata from a corresponding subservice (e.g., VOD subservice 1420 in Figure 14) and then provide the received content and metadata to video hardware or display of the Intelligent TV. Ex.1001, 2:47-53 ("According to the disclosure, a data service system in an Intelligent TV includes an **internal content provider module configured to provide content to video hardware or display of the [] Intelligent TV,**" where "a subservice [is] configured to **provide the intern[al] content provider module with requested data** for a pre-defined data model."). With reference to Figure 14 below, "[c]ontent provider modules 1416 works with the various data subservices (i.e., VOD subservice 1420, EPG subservice 1424, and media subservice 1428) to provide customized media data and information for applications 416 in Intelligent TV 100." Ex.1001, 30:66-31:3. Thus, the internal content provider module(s) receive content and associated metadata (e.g., VOD content and metadata for the VOD content) from a particular subservice (e.g., VOD subservice 1420) and provide the content and/or associated metadata to an application and/or video hardware of the Intelligent TV.¹

¹ As noted above, the '805 patent discloses an "internal content provider module." Alternatively, the '805 patent discloses an "external content provider module."

E.g., Ex.1001, 21:14-18 (“The different types of data services (video on demand, electronic programming guide, media) each have a data subservice 620, 624, and/or 628 that is in communication with one or more internal and/or **external content provider modules** 616.”), 29:35-38 (“**Content provider modules (i.e., over-the-air, cable, and/or satellite channels)** may have EPG information embedded with the content feed delivered to the user (i.e., as a subchannel of the main content feed).”), 34:41-45 (“As discussed with respect to process 1500, the subservices (i.e., VOD subservice 1420, EPG subservice 1424, and media subservice 1428) processes and/or stores the received media and/or data from the **external content provider modules**.”). While not explicitly recited, the Challenged Claims are directed to an “internal” content provider module because the Challenged Claims recite that the organized data is provided to “one or more of a plurality of content provider modules **of the TV**.” See limitation [1.3] of claim 1, limitation [10.5] of claim 10, and limitation [17.4] of claim 17 in Section VII.A below.

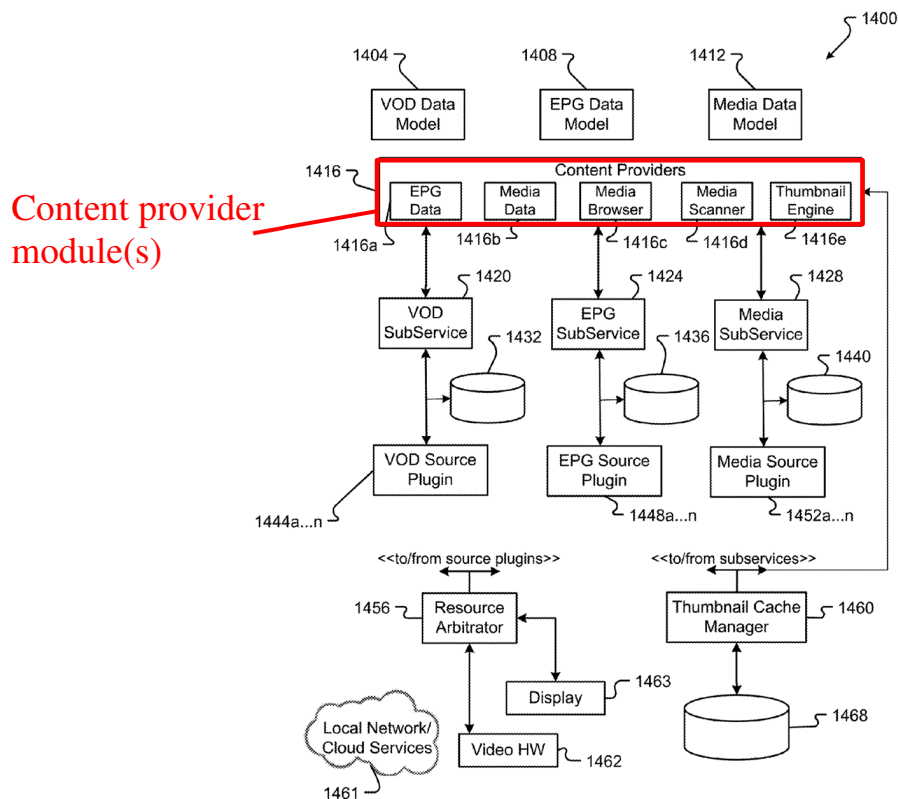


Fig. 14

Ex.1001, Fig. 14 (annotated).

37. The '805 patent includes independent claims 1, 10, and 17 reproduced below. Claims 1, 10, and 17 are generally similar in scope to each other, except that claim 1 recites “[a] method of providing content for a television (TV),” whereas claim 10 recites “[a] data service system in a Television (TV),” and claim 17 recites “[a] computer program product for providing content for a Television (TV).”

1. A method of providing content for a television (TV), the method comprising:

receiving, by a processor, data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices, wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, electronic programming guide (EPG) subservice, and a media subservice

organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices, wherein the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model, wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model and wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and

providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.

10. A data service system in a Television (TV), the system comprising: a processor; and

a computer-readable storage medium storing computer-readable instructions, which when executed by the processor, cause the processor to perform:

receiving data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices, wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;

organizing the data according to a pre-defined format corresponding to each of the plurality of subservices, wherein the pre-defined format

comprises one of a VOD data model, an EPG data model, and a media data model, wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and

providing the organized data to one or more of a plurality of content provider modules of the TV.

17. A computer program product for providing content for a Television (TV), the computer program product comprising a non-transitory computer-readable storage medium having computer-readable program code embodied therewith, the computer-readable program code configured when executed by a processor to:

receive data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices, wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;

organize the data according to a pre-defined format corresponding to each of the plurality of subservices, wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model, wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and

provide the organized data to one or more of a plurality of content provider modules of the TV.

B. Prosecution History of the '805 Patent

38. I have reviewed the prosecution history of the '805 patent (Ex.1002).

The '805 patent was filed as Application No. 15/801,601 ("'601 application") with original claims 1-20. Ex.1002, 233-235. The '601 application contained independent claims 1, 12, and 19 ("prosecution claims"), which correspond to issued claims 1, 10, and 17, respectively, with amendments described below.

39. The Examiner issued two Office Actions during prosecution of the '805 patent. Ex.1002, 121-138 (first Office Action), 62-84 (second Office Action). The applicant filed a response to the second Office Action (Ex. 1002, 44-56), and then the Examiner allowed the '601 application. Ex.1002, 21-30 (Notice of Allowance).

40. Original prosecution claim 1 is reproduced below. In the following discussion of prosecution claims 1, 12, and 19, I focus primarily on prosecution claim 1 (corresponding to issued claim 1) because the amendments made to prosecution claim 1 largely correspond to the amendments made to prosecution claims 12 and 19 (corresponding to issued claims 10 and 17, respectively).

1. A method of providing content for an Intelligent television (TV), comprising:
loading an internal content provider module responsive to a user action or a scheduled event on the Intelligent TV;
communicating and receiving data relevant to the requested content from a corresponding subservice or a content provider module of the Intelligent TV;
organizing the received data as the content according to a pre-defined format; and
providing the content to video hardware or display of the Intelligent TV or to a content provider module or application of the Intelligent TV.

Ex.1002, 233 (original prosecution claim 1).

41. In the first Office Action, the Examiner rejected prosecution claims 1, 12, and 19 as being obvious over U.S. Patent Pub. No. 2013/0031592 (Ex.1012) in view of U.S. Patent Pub. No. 2009/0257738 (Ex.1013). Ex.1002, 129-130. In response, the applicant amended prosecution claim 1 as follows.

1. (Currently Amended) A method of providing content for ~~a an Intelligent~~ television (TV), the method comprising:
loading, by a processor, an internal content provider module in response ~~responsive to one of~~ a user action and ~~[[or]]~~ a scheduled event on the ~~Intelligent~~ TV;
~~communicating and receiving, by the processor,~~ data relevant to the one of the ~~user action and the scheduled event requested content~~ from one of a corresponding subservice ~~[[or]]~~ and the[[a]] content provider module of the ~~Intelligent~~ TV, wherein the data comprises visual content;
organizing, by the processor, the ~~received data as the content~~ according to a pre-defined format; and
providing, by the processor, the content to ~~video hardware or display of the~~ ~~Intelligent TV or to a content provider module or~~ an application of the ~~Intelligent~~ TV.

Ex.1002, 95 (first amendment to prosecution claim 1).

42. The applicant argued that the combination of U.S. Patent Pub. No. 2013/0031592 (Ex.1012) and U.S. Patent Pub. No. 2009/0257738 (Ex.1013) did

not disclose the feature of “receiving...data relevant to one of the user action and the scheduled event from one of a corresponding subservice and the content provider module of the TV.” Ex.1002, 101.

43. In a final Office Action, the Examiner rejected prosecution claims 1, 12, and 19 as being (1) obvious over U.S. Patent Pub. No. 2013/0152135 (Ex.1014) in view of U.S. Patent Pub. No. 2009/0257738 (Ex.1013), and (2) obvious over U.S. Patent Pub. No. 2005/0283800 (Ex.1015) in view of U.S. Patent No. 6,665,869 (Ex.1016)² and U.S. Patent Pub. No. 2009/0257738 (Ex.1013). Ex.1002, 65. In response, the applicant amended prosecution claim 1 as follows.

² As noted by the Examiner (Ex.1002, 72), U.S. Patent Pub. No. 2005/0283800 (Ex.1015) incorporates by reference U.S. Patent No. 6,665,869 (Ex.1016). Ex.1015, ¶70 (incorporating by reference Application No. 09/145,232, which issued as Ellis 2 (U.S. Patent No. 6,665,869)).

1. (Currently Amended) A method of providing content for a television (TV), the method comprising:

~~loading, by a processor, an internal content provider module in response to one of a user action and a scheduled event on the TV;~~

receiving, by the processor, data relevant to ~~the one of the user action and the one~~ or more scheduled event events from one of a corresponding subservice ~~and the content provider module of the TV~~ of a plurality of subservices, wherein the ~~data comprises visual content~~ plurality of subservices comprises a VOD subservice, an EPG subservice, and a media subservice;

organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices, wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model, wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and wherein each of the VOD data model, EPC data model, and media data model provide a uniform format for the plurality of subservices; and

providing, by the processor, the ~~content to an application~~ organized data to one or more of a plurality of content provider modules of the TV.

Ex.1002, 45 (second amendment to prosecution claim 1).

44. In summary, the above amendment to prosecution claim 1 contained the following substantive revisions.

a. The data (e.g., metadata) received by the processor is relevant to “one or more scheduled events” from a corresponding subservice, as opposed to a user action or a scheduled event. The specification of the ’820 patent repeatedly describes a user action as an alternative to a scheduled event for loading content in

a content provider module.³ Thus, the amendment to claim 1 (and corresponding amendments to prosecution claims 12 and 19) explicitly removed the concept of loading content in response to a user action.

b. The data (e.g., metadata) is received from a corresponding subservice of a plurality of subservices that comprise a VOD subservice, an EPG subservice, and a media subservice (e.g., VOD subservice 1420, EPG subservice 1424, media subservice 1428 in Figure 14).

c. The organizing step was substantially redefined to require that the data (e.g., metadata) is organized according to a pre-defined format corresponding to data model of a particular subservice (e.g., pre-defined format of the VOD data

³ E.g., Ex.1001, 2:23-26 (“According to the disclosure, a method of providing content for an Intelligent TV includes loading an internal content provider module **responsive to a user action or a scheduled event** on the Intelligent TV....”), 2:53-56 (“The internal content provider module is loaded on the Intelligent TV **responsive to a user action or a schedule[d] event** on the Intelligent TV....”), 34:3-9 (“[T]he intern[al] content provider modules 1416 are configured to communicate with and access the subservices **responsive to user actions or schedule[d] event** from Intelligent TV 100 in order to generate and present information required for application 416.”), 34:13-17 (“Process 1600 [of Fig. 16] starts by loading an internal content provider module in response to user action or schedule event [in step] 1610.”).

model 1404 for the VOD subservice 1420 in Figure 14), where the data (e.g., metadata) is organized by converting the data (e.g., metadata) into the pre-defined format, and each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices.

d. The organized data (e.g., metadata) is provided to one or more of a plurality of content provider modules of the TV (i.e., an internal content provider module), as recited in the last “providing” step (“providing, by the processor, organized data...”), instead of loading an internal content provider module in response to a user action or scheduled event on the TV.

45. In response to the final Office Action, the applicant argued that U.S. Patent Pub. No. 2013/0152135 (Ex.1014), U.S. Patent Pub. No. 2009/0257738 (Ex.1013), and U.S. Patent Pub. No. 2005/0283800 (Ex.1015) did not disclose the organizing step of prosecution claim 1 and corresponding features of prosecution claims 12 and 19. Ex.1002, 50-51 (applicant argued that U.S. Patent Pub. No. 2013/0152135 and U.S. Patent Pub. No. 2009/0257738 individually did not disclose the organizing step of prosecution claim 1), 52-54 (applicant argued that U.S. Patent Pub. No. 2005/0283800, U.S. Patent No. 6,665,869, and U.S. Patent Pub. No. 2009/0257738 individually did not disclose the organizing step of prosecution claim 1).

46. The Examiner then allowed the '601 application. Ex.1002, 21-30

(Notice of Allowance).⁴ The Examiner provided the following reasons for allowance.

Reasons for Allowance

2. Claims 1, 4-20 are considered allowable since when reading the claims in light of the specification (MPEP § 2111.01) or *In re Sneed*, 710 F.2 1544, 1548, 218 USPQ 385,388 Fed. Cir. 1983), none of the references of record alone or in combination disclose or suggest the combination of limitations specified in independent claim 1, wherein the Applicant discloses organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices, wherein the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model and wherein each of the VOD data model, EPG data model and media data model provide a uniform format for the plurality of subservices; and providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.

Inter alia, independent claims 12 and 19, wherein the Applicant discloses similar limitations, are allowed for reasons similar to those cited above.

Ex.1002, 29.

47. Thus, the Examiner indicated that the “organizing” and “providing” steps of prosecution claim 1 (issued claim 1) and the corresponding features of

⁴ The Notice of Allowance included an Examiner’s Amendment that made non-substantive revisions to the claims, including to add definitions for acronyms such as “VOD” and “EPG,” and correct typographical errors. Ex.1002, 26-28.

prosecution claims 12 and 19 (issued claims 10 and 17) were not disclosed by the prior art considered during prosecution of the '805 patent.

48. However, as I explain below in Sections VII.A and VII.B, the allegedly allowable elements of claims 1, 10, and 17, as well as the remaining elements of these claims, are conventional implementation details that were already disclosed by prior art not considered by the Examiner. The concepts recited in the Challenged Claims were known as of the time the '805 patent was filed.

VI. CLAIM CONSTRUCTION

49. It is my understanding that in order to properly evaluate the '805 patent, the terms of the claims must first be interpreted. It is my understanding that for the purposes of this *inter partes* review, the claims are to be construed under the so-called *Phillips* standard, under which claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in light of the specification and prosecution history, unless the inventor has set forth a special meaning for a term. I have also been informed that claim terms only need to be construed to the extent necessary to resolve the obviousness inquiry.

50. I have reviewed the entirety of the '805 patent, as well as its prosecution history. In my opinion, for purposes of applying the prior art presented herein to evaluate patentability, the claim terms do not require express construction.

51. I have applied the so-called *Phillips* standard, which requires that claim terms are given their ordinary and customary meaning as would have been understood by a POSITA in light of the specification and prosecution history, unless the inventor has set forth a special meaning for a term.

52. In fact, the '805 patent provides explicit definitions for various terms and phrases, including various claim terms of the Challenged Claims. For example, from column 3, line 21 to column 10, line 3, the '805 patent lists certain terms and provides explicit definitions and context for these terms, which include various claim terms of the Challenged Claims. My analysis of the prior art presented herein takes into account and is consistent with the definitions and context provided in the '805 patent for terms in the Challenged Claims.

53. One example of a claim term definition is described below:

A. “one or more”

54. Claims 1, 3, 10, 12, and 17 each recite the phrase “one or more.”

55. In reviewing the '805 patent, the inventors provided a special meaning for the term “one or more”:

The phrases “at least one,” “one or more,” and “and/or” are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions “at least one of A, B and C,” “at least one of A, B, or C,” “one or more of A, B, and C,” “one or more of A, B, or C” and “A, B, and/or C” means A alone, B

alone, C alone, A and B together, A and C together, B and C together,
or A, B and C together.

Ex.1001, 3:21-28.

56. Accordingly, in view of the express definition provided in the '805 patent, a claim limitation that recites a list of "*at least one*" items is met by teaching any item in that list alone or together with any other items in that same list.

VII. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

57. I have been asked to provide my opinion as to whether the Challenged Claims of the '805 patent would have been obvious in view of the prior art. The discussion below provides a detailed analysis of how the prior art references identified below teach the elements of the Challenged Claims of the '805 patent. As part of my analysis, I have considered the scope and content of the prior art and any differences between the alleged invention and the prior art. I describe in detail below the scope and content of the prior art, as well as any differences between the alleged invention and the prior art, on an element-by-element basis for each Challenged Claims of the '805 patent.

58. As described in detail below, the alleged invention of the Challenged Claims would have been obvious in view of the teachings of the identified prior art references as well as the knowledge of a POSITA. I rely on various documents to show the background knowledge of a POSITA.

A. Ground 1: Claims 1, 10, and 17 are obvious over Melnychenko in view of Chen.

59. The subject matter of independent claims 1, 10, and 17 is an obvious combination of conventional implementation details in the field of providing an intuitive user interface for content and related metadata. As I explain below, the subject matter of claims 1, 10, and 17 would have been obvious to a POSITA in view of the conventional teachings of Melnychenko and Chen.

1. Summary of Melnychenko

60. U.S. Patent Publication No. 2013/0263184 to Melnychenko et al. (Ex.1005, “Melnychenko”) was filed on March 28, 2012, and published on October 3, 2013.

61. Like the ’805 patent, Melnychenko relates to providing “an interactive media guidance application” that provides users with “a form of media guidance through an interface that allows users to efficiently navigate content selections and easily identify content that they may desire.” Ex.1005, [0031]. Melnychenko explains that “[o]ne typical type of media guidance application is an interactive television program guide” that “allows users to navigate among and locate many types of content.” Ex.1005, [0032].

62. Melnychenko’s media guidance application receives different types of content, as shown in Fig. 1 below, such as “television programming, as well as pay-per-view programs, on-demand programs (as in video-on-demand (VOD)

systems), Internet content (e.g., streaming content, downloadable content, Webcasts, etc.), video clips, audio, content information, pictures, rotating images, documents, playlists, websites,” etc. Ex.1005, [0032]. Thus, like the ’805 patent, Melnychenko’s media guidance application receives content such as TV programming (EPG programming), VOD content, and media content such as streaming Internet content. *Id.* Melnychenko’s Figure 1 below illustrates an example of an interactive program listings display 100 that shows available content such as TV programming (EPG programming) (e.g., “FOX,” “ABC,” and “NBC” channels), VOD content (e.g., HBO), and media content (e.g., streaming Internet content available on CNN.com). Ex.1005, [0036]-[0038].

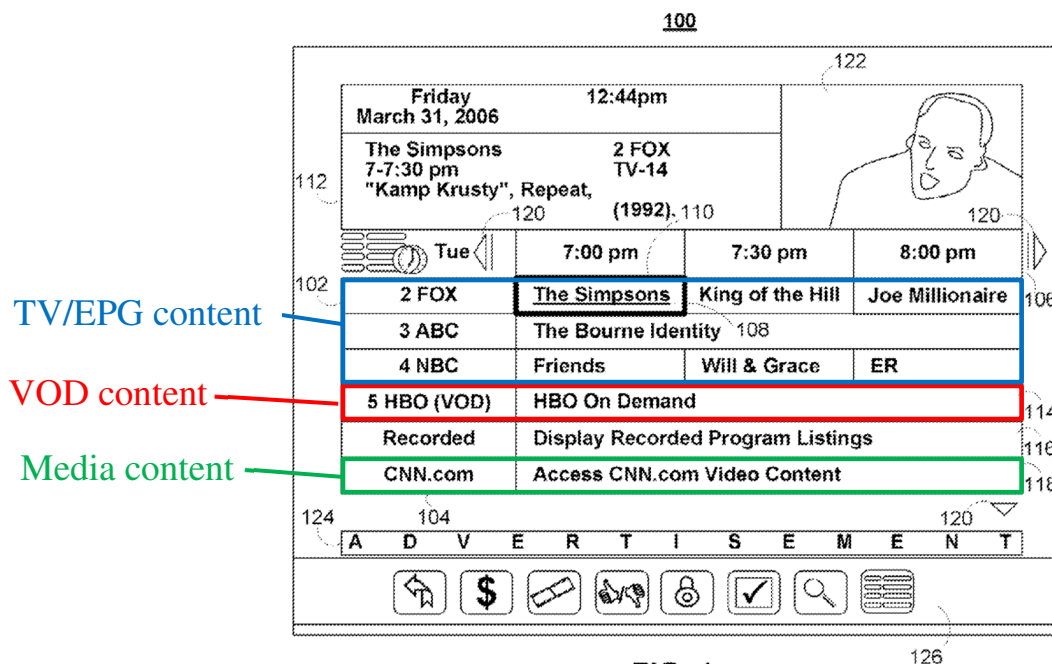


FIG. 1

Ex.1005, Fig. 1 (annotated).

63. Like the '805 patent, Melnychenko discloses that in addition to receiving different types of content (e.g., TV, VOD, media), metadata associated with the different types of content is also received, where the “metadata may contain information regarding the substance of the content, how the content was received, how it is to be displayed, or any other potentially useful information related to the content.” Ex.1005, [0001]. Melnychenko notes that “[t]he metadata is generally received in a specific metadata format, and the user equipment device may need to be aware of this format to properly utilize the metadata.” Ex.1005, [0002].

64. With reference to Figure 6 below, Melnychenko discloses a structured format for a “metadata file 600” for a certain type of content (e.g., VOD content corresponding to the movie “The Titanic”). Ex.1005, [0088] (metadata file 600 includes metadata 690 and 692 for the movie “The Titanic”). Melnychenko discloses that the metadata file 600 (e.g., for VOD content in Figures 6 and 8) “may relate to a single piece of content.” Ex.1005, [0089]; *see also* Ex.1005, Fig. 8 (describing example of metadata for VOD content the movie “The Titanic”).

600

```

602<Data_Structure>
604  <Header>
606    <Provider="InDemand"/>
608    <Data_Structure_Name="The_Titanic"/>
610    <Provider_ID="indemand.com"/>
612    <Description="The Titanic Movie InDemand"/>
614    <Content_ID="UNVA2001081701004001"/>
616    <Data_Structure_Type="Provider Content Tier" Value="InDemand1"/>
618    <Data_Structure_Format="CableLabsVOD1.1"/>
620  </Header>
622  <Metadata>
624    <Header>
626      <Metadata_Name="The Titanic Guide Listing"/>
628      <Description="The Titanic title metadata "/>
630      <Content_ID=" UNVA2001081701004001"/>
632      <Metadata_Type="content info"/>
634      <Metadata_Format="CableLabsVOD1.1"/>
636    </Header>
638    <Field_Name="Title_Brief" Value="Titanic"/>
640    <Field_Name="Title" Value="The Titanic"/>
642    <Field_Name="ISAN" Value="1881-6607-3420-000-7-913A-C2453-U"/>
644    <Field_Name="Episode_Name" Value="Collision with Destiny"/>
646    <Field_Name="Episode_ID" Value="S01E01"/>
648    <Field_Name="Summary_Short" Value="Big ship hits iceberg, guy dies"/>
650    <Field_Name="Rating" Value="R"/>
652    <Field_Name="Actors" Value="Winslet, Kate"/>
654    <Field_Name="Actors" Value="DiCaprio, Leonardo"/>
656    <Field_Name="Category" Value="InDemand/Movies A-Z"/>
658    <Field_Name="Genre" Value="Drama"/>
660    <Field_Name="Show_Type" Value="Movie"/>
662    <Field_Name="Chapter" Value="00:00:00, Opening Scene"/>
664    <Field_Name="Chapter" Value="00:15:12:00, They Meet"/>
666    <Field_Name="Chapter" Value="02:03:06:00, The Collision"/>
668    <Field_Name="Billing_ID" Value="56789"/>
670    <Field_Name="Time_Available" Value="2002-02-01, 2002-02-28, 5"/>
672  </Metadata>
674  <Header>
676    <Metadata_Name="The Titanic.mpg"/>
678    <Description="The Titanic Movie"/>
680    <Content_ID="UNVA2001081701004001"/>
682    <Metadata_Type="file info"/>
684    <Metadata_Format="CableLabsVOD1.1"/>
686  </Header>
688    <Field_Name="Encryption" Value="N"/>
690    <Field_Name="Audio_Type" Value="Dolby Digital"/>
692    <Field_Name="Screen_Format" Value="Widescreen"/>
694    <Field_Name="Content_FileSize" Value="3937840"/>
696  </Metadata>
698  <Content="The Titanic.mpg"/>
700</Data_Structure>

```

Diagram annotations on the right side of the XML code:

- 694: Brackets lines 608 to 618.
- 696: Brackets lines 624 to 632.
- 690: Brackets lines 638 to 668.
- 688: Brackets lines 638 to 670.
- 698: Brackets lines 676 to 684.
- 692: Brackets lines 676 to 684.

FIG. 6

Ex.1005, Fig. 6 (annotated).

65. In some instances, “[m]etadata may need to comply with a process specific format for the process or feature to execute correctly,” but the metadata may not be formatted correctly (e.g., it may include incomplete or incorrect information). Ex.1005, [0003]-[0004], [0093] (describing process specific format for metadata). Thus, Melnychenko is related to “methods and devices for modifying metadata associated with content that is improperly formatted.”

Ex.1005, [0005], Abstract (“Systems and methods are provided for modifying metadata associated with content that is improperly formatted.”). Melnychenko’s reformatting of metadata may include many different types of modifications to the metadata. For example, as shown in Figure 8 below, Melnychenko discloses that a user equipment device (e.g., user’s TV) may include a metadata pre-processor 804 (e.g., metadata pre-processor 958 in user equipment device 964 of Figure 9B) that “may receive improperly formatted metadata 802 as input, and modify it to generate properly formatted metadata 806.” Ex.1005, [0116]. Examples of the different types of modifications that the metadata pre-processor 804 may make to the improperly formatted metadata include “modify[ing] any component of metadata 802 to conform it to a format” (Ex.1005, [0117]), “modify[ing] the content of a particular field [of the metadata 802]” (Ex.1005, [0118]), “correct[ing] for information placed in the wrong field [in the metadata 802]” (Ex.1005, [0119]), “add[ing] new fields to metadata 802” (Ex.1005, [0120]), and “alter[ing] the formatting of the information within fields 820, 824 and 826 to comply with a format” (Ex.1005, [0121]).



FIG. 8
Ex.1005, Fig. 8 (annotated)

66. Accordingly, like the '805 patent, Melnychenko is directed to re-formatting metadata that is associated with corresponding content (e.g., TV, VOD or media content), and outputting the re-formatted metadata to the user equipment device (e.g., TV) so that media guidance data is organized and displayed to a user based on the re-formatted metadata. Ex.1005, [0068] (metadata provided to user equipment device), [0082] (metadata aggregator collects metadata before sending it to user equipment device).

67. Thus, like the '805 patent, Melnychenko describes an interactive user interface that displays information about various types of content (TV/EPG, VOD,

media), receives metadata associated with different types of content, re-formats the metadata according to each type of content, and provides the re-formatted metadata to a user equipment device (e.g., TV) which displays the interactive user interface using the reformatted metadata.

2. Summary of Chen

68. U.S. Patent Publication No. 2007/0226268 to Chen (Ex.1007, “Chen”) was filed on March 6, 2007, and published on September 27, 2007.

69. Like the '805 patent and Melnychenko, Chen relates to “a method of managing metadata and a set top box device therefor, and more particularly to a method of managing metadata operable to plural types of media data and a set top box device therefor.” Ex.1007, [0003]. Like the '805 patent and Melnychenko, Chen discloses that the set-top box receives various different types of content such as TV content, VOD content, and media content, as well as corresponding metadata for each different type of content. Ex.1007, [0006] (set-top box may “receive media data from various sources including **TV programs** transmitted by a cabled TV, **a video on demand (VoD)** movie program transmitted by the Internet, an audio video (AV) data transmitted by a personal computer, or **media data** stored in other storage devices such as a universal serial bus (USB) storage unit.”). Chen notes, however, that the metadata may be different for the different types of content. Ex.1007, [0006] (“However, in terms of different types of media data, the

columns of the metadata are also different.”). An objective of Chen is therefore to “provide a method of managing metadata operable to plural types of media data and a set top box device therefor, such that the design of user interface program is more versatile, diversified functions are provided and the required storage space for the databases is reduced.” Ex.1007, [0008].

70. As shown in Figures 1 and 3 below, Chen discloses that its set-top box receives metadata for different types of content (e.g., metadata for VOD content, metadata for media content, etc.) in a predefined format based on a data model for that metadata (e.g., a format specifying the information included in the metadata for the VOD content), and then organizes the corresponding metadata for the different types of content to be in a uniform format so that the metadata for the different types of content may be stored in a single database and displayed conveniently for the user in a single user interface. Ex.1007, [0017] (“Since the media data tables corresponding to plural types of media data have the same format, that is, the media data is stored in the same database, the invention is able to design a user interface operable to plural types of media data instead of designing various user interface according to the types of the media data. By doing so, not only the design of the user interface is simplified, but also the functions of the user interface are more diversified and the operation of the user interface is made more convenient.”).

71. An embodiment of Chen's set-top box 100 is shown in Figure 1 below. Ex.1007, [0016]. The set-top box 100 includes a "first importer 110 [that] receives a first media data transmitted by a first signal source terminal 10 and then obtains a first metadata from the first media data," and a "second importer 120 [that] receives a second media data transmitted by a second signal source terminal 20 and then obtains a second metadata from [the] second media data." Ex.1007, [0016].

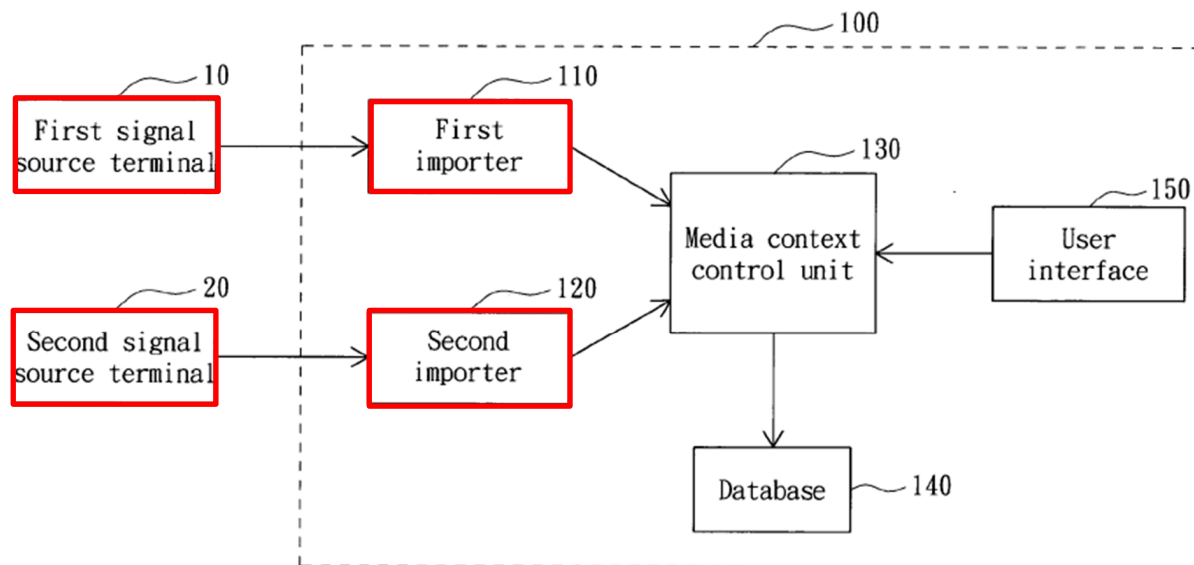
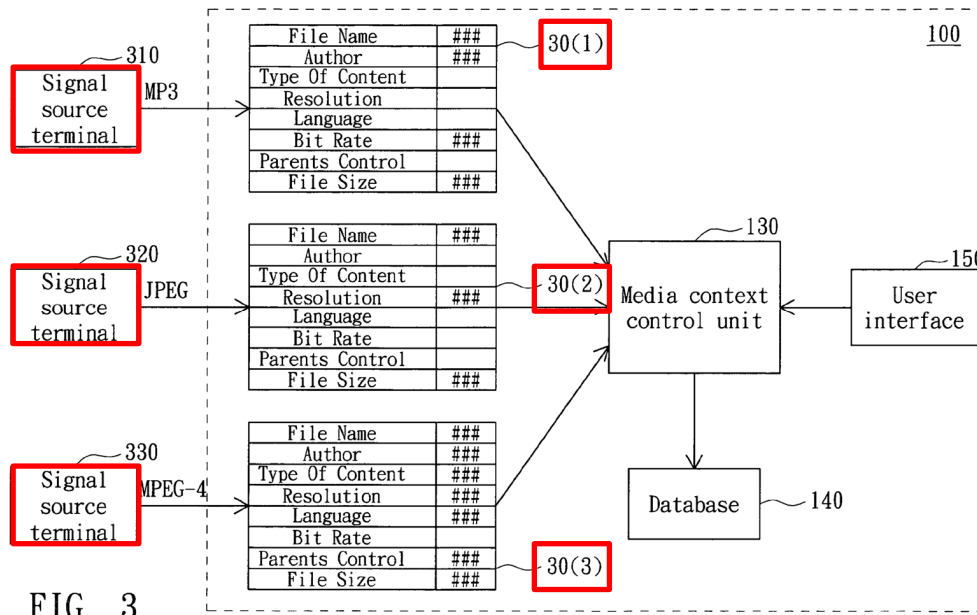


FIG. 1

Ex.1007, Fig. 1 (annotated)

72. In addition, with reference to Figure 3 below, Chen discloses that the set-top box 100 receives different types of metadata from different sources (sources 310, 320, 330) and then converts each type of metadata into a uniform

format represented by the same table format (i.e., a “specific table”) for each type of metadata, as shown by metadata tables 30(1) to 30(3) in Figure 3. Ex.1007, [0020] (“Importers (not illustrated [in Figure 3]) are used by the set top box 100 to respectively generate **three metadata tables 30(1), 30(2) and 30(3) complying with a specific table**....The metadata tables 30(1), 30(2) and 30(2) include columns such as file name, author, file size and so on. **The columns correspond to the columns of the metadata of the MP3 file, JPEG file and MPEG-4 file.**”). Chen discloses that the metadata tables for different types of content have a “uniform format.” Ex.1007, [0017] (“The set top box 100 further includes a user interface 150 [Fig. 3 above] to access all **the media data operable to the set top box 100 by the specific table of uniform format.**”).



Metadata tables 30(1)-30(3) have a uniform format.

Ex.1007, Fig. 3 (annotated).

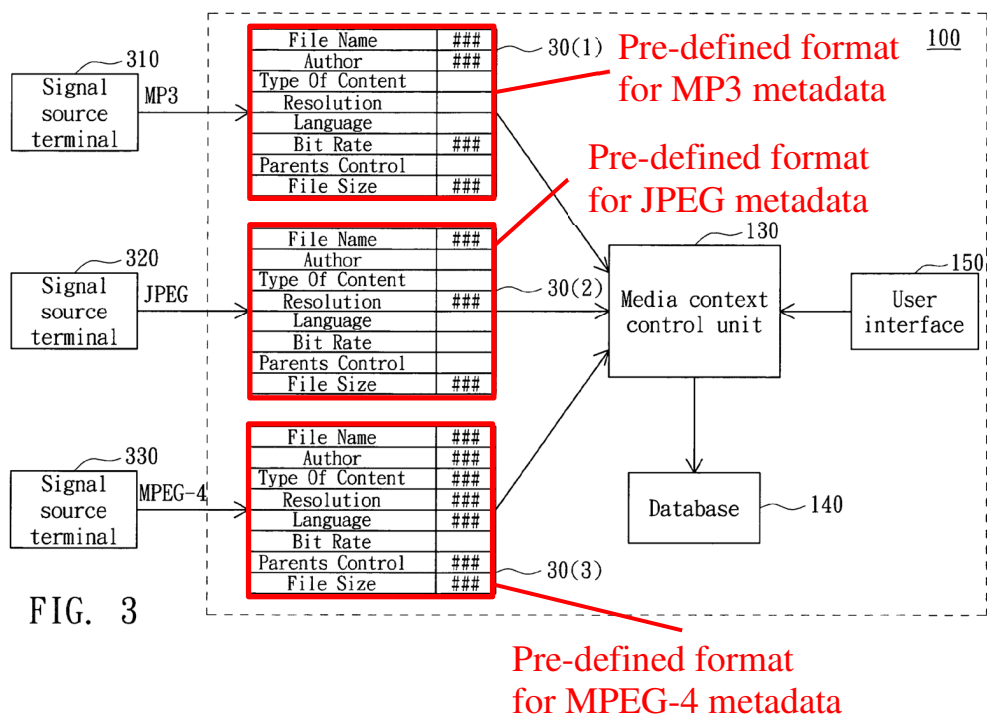
The importers use the metadata to **generate a metadata table complying with a specific table**. Preferably, the specific table according to the embodiment of the invention is of extensible markup language (XML) file format. **The XML file format includes all of the columns of metadata of media data operable to the set top box device**. Take the above embodiment for example, **the columns of the XML file format include columns corresponding to the first metadata, columns corresponding to the second metadata and partial columns of the XML file format corresponding to the first metadata and the second metadata at the same time**.

Ex.1007, [0019].

73. Chen discloses that the metadata for the different types of content is converted (edited) by generating the metadata tables 30(1)-30(3) having a uniform format. Ex.1007, [0021] (“The set top box of the invention **edits** the metadata of

the received media data to generate a metadata table complying with a specific table, such that the media context control unit is enabled to effectively process plural types of media data and that the design in the function of the user interface is more diversified.”).

74. In addition, Chen discloses that the metadata for each different type of content (e.g., TV content, VOD content, etc.) has a predefined format for the corresponding type of content, as shown in Figure 3 below. Specifically, the metadata for each different type of content has different types of information (described with respect to “columns” in metadata tables in Ex.1007, [0020]) depending on the type of content, and the data or column for that type of metadata is populated in the tables if the pre-defined format for that type of metadata has that information (e.g., MP3 metadata has data values in “Bit Rate” column while JPEG and MPEG-4 metadata do not, and MPEG-4 metadata has data values in “Type of Content” column while MP3 and JPEG metadata do not). Ex.1007, [0020].



Ex.1007, Fig. 3 (annotated).

The specific table (not illustrated) is the table before the context of metadata is inputted to the columns of the metadata tables 30(1), 30(2) and 30(2). The metadata tables 30(1), 30(2) and 30(2) include columns such as file name, author, file size and so on. The columns correspond to the columns of the metadata of the MP3 file, JPEG file and MPEG-4 file. However, the metadata tables 30(1), 30(2) and 30(3) still include partial columns. **Examples of partial columns include the bit rate column corresponding to the metadata of MP3 file only, the parent control column corresponding to the metadata of MPEG-4 file only, and the resolution column corresponding to the metadata of JPEG file. In the metadata table 30(1), only the metadata columns corresponding to MP3 file are inputted with data. In the metadata table 30(2), only the metadata columns corresponding to JPEG file are inputted with data. In the metadata table 30(3), only the metadata columns corresponding to MPEG-4 file are inputted with data. The metadata tables 30(1), 30(2) and 30(3) are illustrated in FIG. 3. The symbol ### in FIG. 3 denotes that the table is inputted**

with data. The set top box 100 stores the media data of the MP3 file, the JPEG file and the MPEG-4 file in the database 140 according to the context of the metadata tables 30(1), 30(2) and 30(3). The user can promptly and correctly retrieve the media data stored in the database via the user interface 150.

Ex.1007, [0020].

75. Thus, as shown in Figure 3 above, the pre-defined formats for the metadata of each different type of content provide different data models for the corresponding metadata. For example, as shown in Figure 3:

- the data model for MP3 metadata includes information (data values) for the “file name,” “author,” “bit rate,” and “file size” fields;
- the data model for JPEG metadata includes information (data values) for the “file name,” “resolution,” and “file size” fields; and
- the data model for VOD (MPEG-4) metadata includes information (data values) for the “file name,” “author,” “type of content,” “resolution,” “language,” “parents control,” and “file size” fields.

Ex.1007, [0018] (“Examples of the VoD programs include a moving picture experts group-4 (MPEG-4) file having metadata to record relevant information of the MPEG-4 file such as file name, author and so on.”).

76. In addition, Chen discloses that its “specific table” comprises a corresponding data model for the metadata of each different type of content

because the specific table of uniform format for each type of metadata is in the XML file format, which includes all the columns of metadata of different types of content that may be received by the user's set-top box device. Ex.1007, [0019] (“[T]he specific table according to the embodiment of the invention is of extensible markup language (XML) file format. The XML file format includes all of the columns of metadata of media data operable to the set top box device.”).

3. Reasons to Combine Chen and Melnychenko

77. A POSITA would have been motivated to combine Melnychenko and Chen for numerous reasons as discussed below.

a) Analogous Art

78. Melnychenko and Chen are each analogous art to the '805 patent. For instance, Melnychenko and Chen are each in the same field of endeavor as the '805 patent, including providing content and associated metadata in a user interface on a TV. Ex.1001, 2:16-33; Ex.1005, [0005], [0030]-[0032]; Ex.1007, [0016]-[0017].

79. In addition, Melnychenko and Chen are each reasonably pertinent to a problem that the inventors of the '805 patent attempted to solve. The inventors of the '805 patent address the problem of organizing metadata. Ex.1001, 34:49-50, Fig. 16 (step 1630). Similarly, the techniques disclosed in Melnychenko and Chen are each reasonably pertinent to organizing metadata. Ex.1005, [0005], [0030]-

[0032]; Ex.1007, [0016]-[0017]. Accordingly, Melnychenko and Chen are each analogous art to the '805 patent because they are each in the same field of endeavor and are each reasonably pertinent to a problem that the inventors of the '805 patent attempted to solve.

80. Thus, given the similar subject matter, a POSITA considering Melnychenko would have looked to the analogous teachings of Chen.

b) Motivation to Combine Melnychenko and Chen

81. A POSITA would have been motivated to apply Chen's teachings to Melnychenko to obtain predictable and beneficial results.

82. As discussed in the above summary, Melnychenko discloses a user equipment device (e.g., smart TV) that receives various types of content including TV, VOD, and media content (e.g., streaming content from the Internet), as well as metadata respectively associated with the different types of content. Ex.1006, [0032] (disclosing an "interactive media guidance application[]" for a TV that "allows users to navigate among and locate may types of content" such as "television programming, as well as pay-per-view programs, on-demand programs (as in video-on-demand (VOD) systems), Internet content (e.g., streaming content, downloadable content, Webcasts, etc.)."), [0001] (metadata "associated with the content" is received, where the "metadata may contain information regarding the substance of the content, how the content was received, how it is to be displayed,

or any other potentially useful information related to the content.”).

83. According to Melnychenko, “[m]etadata may come in a **variety of metadata formats,**” with one exemplary metadata format “**relat[ing] to a single piece of content.**” Ex.1005, [0088]-[0089], Fig. 6. In one example, Melnychenko provides that different types of metadata have different fields, such that “broadcast content metadata may include a field for the content’s timeslot, on-demand content metadata may include a field for conveying a time frame the content will be available for, and Internet content metadata may contain a link to a website the content is to be retrieved from.” Ex.1005, [0065]. Melnychenko, however, does not expressly disclose how its user equipment device would process metadata having different formats for different types of content. That is, Melnychenko provides limited details pertaining to how metadata would be processed (when received in a variety of metadata formats that relate to a plurality types of content) so that all of the metadata may be stored in a metadata database (e.g., metadata database 956 of Fig. 9B). A POSITA would have looked to other references that provide additional implementation details.

84. Once such reference is Chen, which provides implementation details regarding processing metadata so that it may be stored in a single database. That is, Chen provides details of how to organize metadata that corresponds to a plural type of content so that it has a “**uniform format.**” Ex.1007, [0017]. Chen user’s set-top

box 100 receives, like Melnychenko's user equipment device, metadata from different sources corresponding to different type of content. Ex.1007, [0006], Abstract, Fig. 3. Chen organizes the received metadata in different metadata tables that comply with a predefined "**specific table of uniform format.**" Ex.1007, [0017], [0020]. That is, each metadata table (regardless of the type of content) is of "uniform format" because it has the same fields (e.g., File Name, Author, Type of Content, Resolution, Language, Bit Rate, Parents Control, File Size) but only certain fields have input data values. Ex.1007, [0019]-[0020], Fig. 3. Chen further discloses that "the specific table [of uniform format] according to the embodiment of the invention is of extensible markup language (XML) file format...include[ing] all of the columns of metadata of media data operable to the set top box device." Ex.1007, [0019].

85. Additionally, Chen discloses that the organized metadata (i.e., different metadata tables of uniform format) are provided to a media context control unit which facilitates storage in a database 140. Ex.1007, [0016]-[0017].

86. It would have been obvious to a POSITA, when implementing Melnychenko's system, to apply the metadata organizing teachings of Chen because they provide implementation details applicable to Melnychenko's metadata (which may be from a variety of metadata formats and correspond to different type of content) and storing the organized metadata in a database. These

implementation details would have allowed a POSITA to successfully implement Melnychenko's system and method.

87. Furthermore, Chen's technique of organizing metadata in tables (that comply with a pre-defined "specific table of uniform format") provides numerous benefits. For example, Chen's organizing technique allows for the "design [of] a user interface operable to plural types of media data instead of designing various user interface according to the types of the media data. By doing so, not only the design of the user interface is simplified, but also the functions of the user interface are more diversified and the operation of the user interface is made more convenient." Ex.1007, [0017]. As an additional benefit, applying Chen's organizing technique to Melnychenko's metadata would enable "cross-retrieving different types of media data efficiently" from a database. Ex.1007, [0007]. Chen's teachings would also facilitate the "prompt[] and correct[] retrieve[al] [of] the media data stored in the database." Ex.1007, [0020]. Thus, a POSITA considering how to organize Melnychenko's metadata (which may come in a variety of metadata formats), would have applied Chen's organizing teachings (which provide a uniform format) to obtain one or more of the noted benefits.

88. The combination of Melnychenko and Chen is merely combining prior art elements (organizing metadata in a uniform format and a media context control unit, per Chen, with Melnychenko's system) according to known methods

(Chen describes exemplary methods of organizing received metadata in metadata tables that comply with a specific table of uniform format of an XML file and providing the organized metadata to a media context control unit) to yield predictable results (storing the organized metadata in a database).

89. These reasons are sufficient to explain why a POSITA would have sought and combined the identified disclosures of Chen and Melnychenko. Nevertheless, additional reasons for combining the relevant teachings are provided in the analysis below.

c) Reasonable Expectation of Success

90. Although Chen provides examples in the context of metadata related to MP3, JPEG, and MPEG-4, Chen's teachings represent a general technological principle that is readily applicable to metadata in general without limitation to media content. Ex.1007, [0011] ("...non-limiting embodiments"), [0019] ("The types of media operable to the set top box of the invention is not limited."). In fact, Chen's teachings are generally applicable to devices "operable to receive plural types of media data." Ex.1007, Abstract; *see also* Ex.1007, [0015] ("...metadata of plural types of media data operable to a set top box."). Thus, a POISTA would have expected to have success in applying Chen's teachings to Melnychenko.

91. That the results would have been predictable and there would have been a reasonable expectation of success in the combination is supported by the

fact that the systems of Chen and Melnychenko are similar. Any modification needed to the system of Melnychenko, including implementing software and/or hardware to accommodate the teachings of Chen, would have been within the level of ordinary skill in the art. A POSITA would have understood how to add to Melnychenko's system the functionality of organizing received metadata in metadata tables (including any other implementation details such as using XML) and providing the organized metadata to a media context control unit that stores the organized metadata in a database.

92. Lastly, I note that the proposed combination relies on the teachings of the references, and I do not suggest that physical incorporation of Chen's elements (e.g., metadata table, XLM file, or media context control unit, etc.) into Melnychenko's system is required.

4. Claim 1

[1.0] A method of providing content for a television (TV), the method comprising:

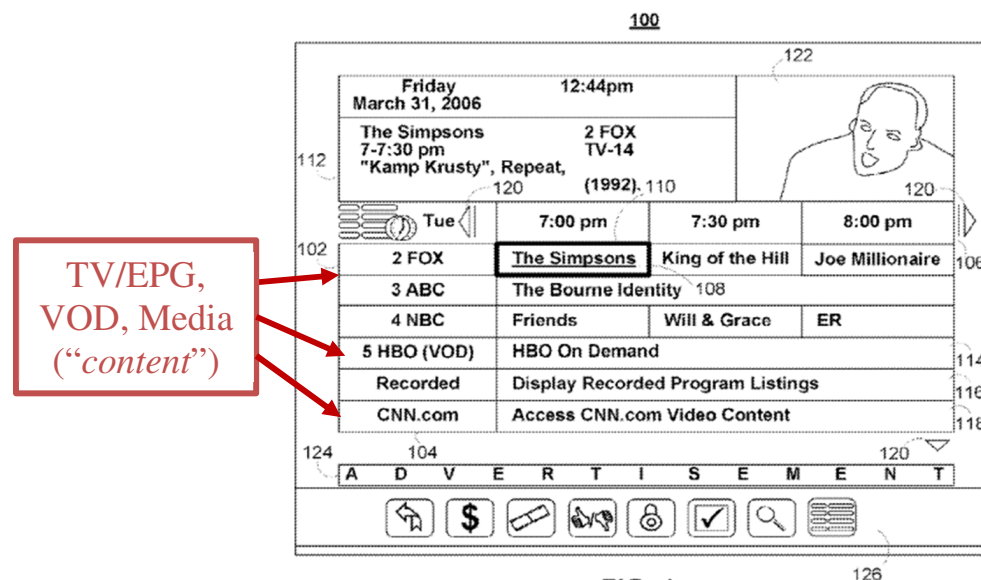
93. To the extent the preamble is limiting, Melnychenko renders obvious the preamble.

94. Melnychenko discloses "[s]ystems and methods ... for modifying metadata associated with content." Ex.1005, Abstract; *see also* Ex.1005, [0030] ("The application, in various implementations, provides systems, methods and devices for modifying metadata associated with content that is improperly

formatted.”).

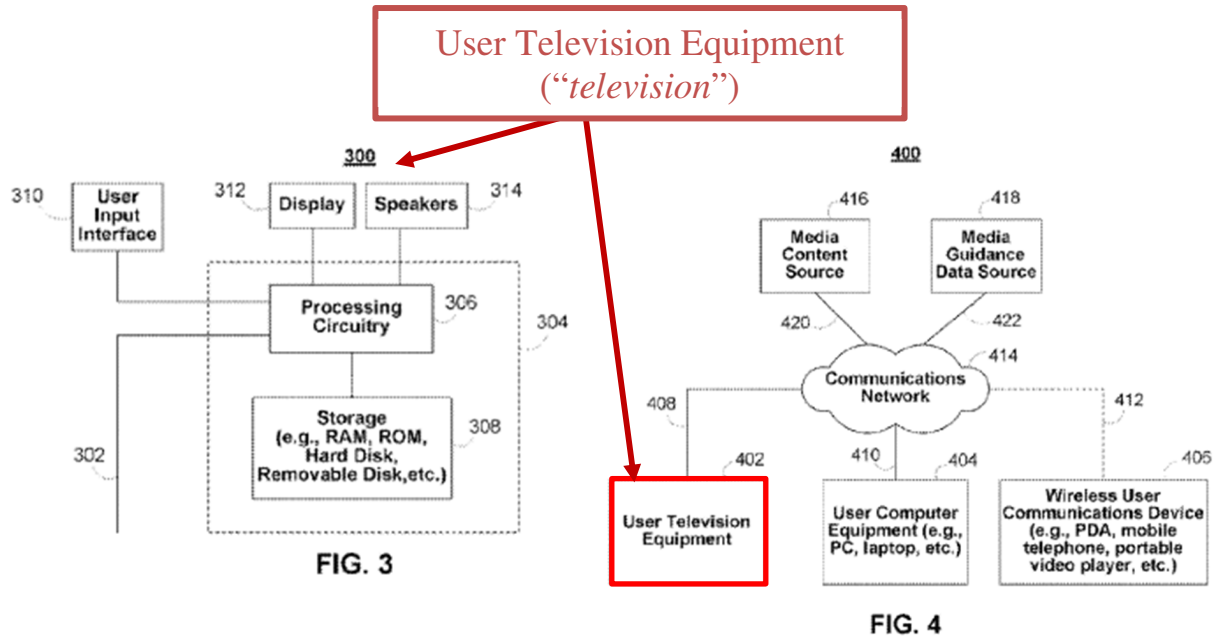
95. Melnychenko uses an “interactive television program guide” to provide content such as “television programming, as well as pay-per-view programs, on-demand programs (as in video-on-demand (VOD) systems), Internet content (e.g., streaming content, downloadable content, Webcasts, etc.).” Ex.1005, [0032]; *see also* Ex.1005, [0072] (content includes streaming media content from “over-the-top (OTT) content...providers includ[ing] YOUTUBE, NETFLIX, and HULU.”).

96. As illustrated below at Figure 1, Melnychenko’s content includes television programs such as the Simpsons and corresponding electronic program guide (EPG), video-on-demand (VOD) content such as HBO, and media content such as CNN.com, among other content.



Ex.1005, Fig. 1 (annotated).

97. The content is provided to a user equipment device 300 (Figure 3), which may be a TV (user television equipment 402 in Figure 4), as shown below.



Ex.1005, Figs. 3 & 4 (annotated).

Users may access content and the media guidance application (and its display screens described above and below) from one or more of their user equipment devices. FIG. 3 shows a generalized embodiment of illustrative user equipment device 300. More specific implementations of user equipment devices are discussed below in connection with FIG. 4.

Ex.1005, [0047].

User equipment device 300 of FIG. 3 can be implemented in system 400 of FIG. 4 as user television equipment 402, user computer equipment 404, wireless user communications device 406, or any other type of user equipment suitable for accessing content, such as a non-portable gaming machine.

Ex.1005, [0055]

98. With reference to Figures 3 and 4 above, Melnychenko discloses that the user equipment device 300 (user television equipment 402 in Figure 4) may be a TV, a “smart TV,” or connected to a TV (e.g., as a set-top box). Ex.1005, [0033] (“As referred to herein, the phrase “user equipment device,” “user equipment,” “user device,” “electronic device,” “electronic equipment,” “media equipment device,” or “media device” should be understood to mean any device for accessing the content described above, such as a television, a Smart TV, a set-top box, [etc.].”); *see also* Ex.1005, [0052].

99. Thus, Melnychenko discloses a method for providing content (e.g., TV/EPG, VOD, media, etc.) for a user television equipment 402, which renders obvious “[a] method for providing content for a television (TV),” as recited in the preamble.

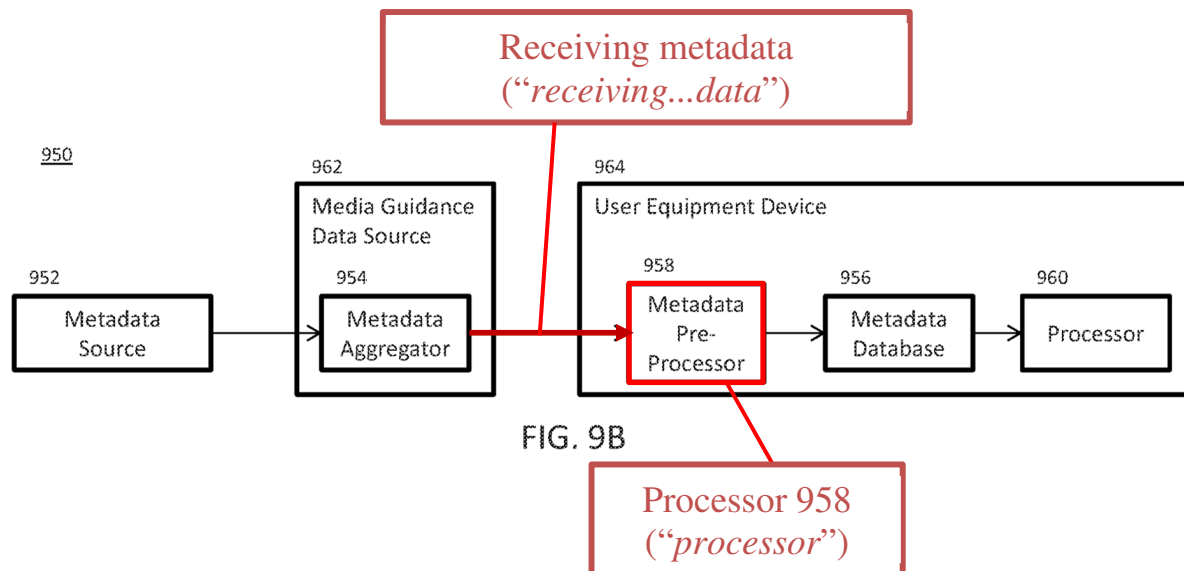
[1.1.1] *receiving, by a processor, data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*

100. Melnychenko renders obvious this element.

101. Consistent with the discussion in the claim construction of “*one or more,*” I understand that a prior art showing of only one scheduled event satisfies the claim. Ex.1001, 3:21-28.

102. First, Melnychenko discloses “*receiving, by a processor, data*” by disclosing that a metadata pre-processor 958 receives metadata.

103. As shown in Figure 9B below, the metadata pre-processor 958 of the user equipment device 964 receives metadata from the metadata aggregator 954 of the media guidance data source 962.



Ex.1005, Fig. 9B (annotated).

As previously mentioned, the metadata pre-processor 958 may take as input any metadata, check whether any components do not comply with a metadata format or a process specific format, and modify the received metadata to comply with the metadata format or process specific format. These steps may be referred to as pre-processing the metadata.

Ex.1005, [0123].

In system 950 of FIG. 9B, metadata aggregator 954 of media guidance data source 962 receives metadata from metadata source 952 and forwards it to user equipment device 964. In user equipment device 964, the metadata is passed through metadata pre-processor 958 [958]

upon receipt, and properly formatted metadata is stored in metadata database 956. When processor 960 is about to utilize metadata, it may access metadata database 956 directly.

Ex.1005, [0126].

Every piece of metadata may be passed through metadata pre-processor 958 immediately upon receipt, or the metadata may first be stored in metadata database 956 or another database within the user equipment device, before being **loaded by metadata pre-processor 958** for modification. This allows metadata pre-processor 958 to operate on metadata stored in metadata database 956 when metadata does not urgently need to be pre-processed or when computational resources are readily available.

Ex.1005, [0127].

104. The metadata pre-processor 958 of Melnychenko's Figure 9B corresponds to the metadata pre-processor 804 in Figure 8 and the processor circuitry 306 in Figure 3 of Melnychenko.

To correct improperly formatted metadata, media guidance data source 418, user equipment device 516, or any other device in the system may include metadata pre-processor 804 of FIG. 8. **Metadata pre-processor 804 may receive improperly formatted metadata 802 as input, and modify it to generate properly formatted metadata 806. Metadata pre-processor 804, and all other metadata pre-processor 958s discussed in this application, may be implemented using processor circuitry 306.** In this example, metadata pre-processor 804 may pre-process improperly formatted fields 808-826 to conform to a

format, regardless whether this is a metadata format or a process specific format, which results in fields 828-846.

Ex.1005, [0116].

105. As shown in Figure 3 below, user equipment device 300 includes processing circuitry 306 which receives content (e.g., TV/EPG content, VOD content, media content, etc.) and metadata.

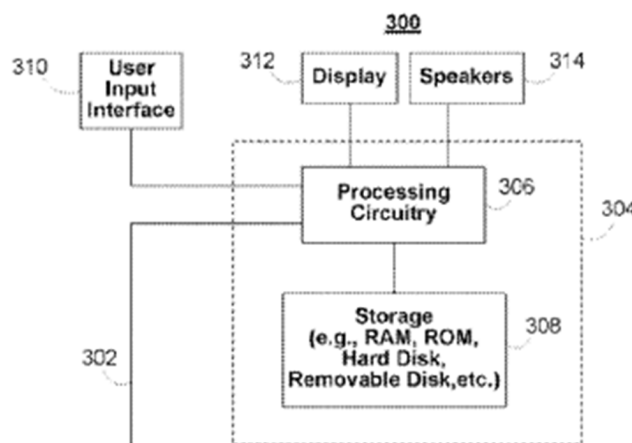


FIG. 3

Ex.1005, Fig. 3.

User equipment device 300 may receive content and data [metadata] via input/output (hereinafter “I/O”) path 302. I/O path 302 may provide content (e.g., broadcast programming, on-demand programming, Internet content, content available over a local area network (LAN) or wide area network (WAN), and/or other content) and data to control circuitry 304, which includes **processing circuitry 306** and storage 308. Control circuitry 304 may be used to send and receive commands, requests, and other suitable data using I/O path 302. I/O path 302 may connect control circuitry 304 (and specifically processing circuitry 306)

to one or more communications paths (described below). I/O functions may be provided by one or more of these communications paths, but are shown as a single path in FIG. 3 to avoid overcomplicating the drawing.

Ex.1005, [0047]; *see also* Ex.1005, [0048] (“As referred to herein, processing circuitry should be understood to mean circuitry based on one or more microprocessors, microcontrollers, digital signal processors, [etc.].”), [0116] (“Metadata pre-processor 804, and all other metadata pre-processors [958] discussed in this application, may be implemented using processor circuitry 306.”).

106. The metadata pre-processor 958 in Figure 9B thus corresponds to the metadata pre-processor 804 in Figure 8 and the processor circuitry 306 in Figure 3.

107. I further note that although the above Figure 9B illustrates a single metadata pre-processor 958 in the user equipment device, Melnychenko contemplates that “[a] metadata pre-processor 958 may be found in a number of locations, both physically and functionally” and that “[m]ultiple metadata pre-processor 958s may exist, or a single metadata pre-processor 958 may receive metadata.” Ex.1005, [0124], [0133]. Based on this disclosure, it would have been obvious to a POSITA that Figure 9B may include multiple metadata pre-processors 958. For the purpose of this declaration, I will refer to pre-processor 958, with the understanding that this may include one or more pre-processors, consistent with the ’805 patent’s “*processor*,” which “may include multiple processor cores,

and/or implement multiple virtual processors.” Ex.1001, 16:6-9.

108. Thus, metadata pre-processor 958⁵ corresponds to the claimed “*processor*” and the received metadata corresponds to the claimed “*data*.”

109. Second, Melnychenko discloses that the received metadata (“*data*”) is “*relevant to one or more scheduled events*” in two different ways: **(1)** the metadata is relevant to a system-specified time or a user-specified time to update data; and **(2)** the metadata is relevant to scheduled programming event.

(1) *the metadata is relevant to a system-specified time or a user-specified time to update data*

110. Melnychenko discloses receiving metadata at regular intervals (e.g., at a “system-specified time”), before the metadata (media guidance data) is to be displayed on the TV. As shown in Figure 4 below, the user television equipment (e.g., user equipment device 300 in Figure 3) receives metadata (media guidance data) from media guidance data source 418 at “**a system-specified period of time**” or a “**user-specified period of time**,” which, separately and together, correspond to “*one or more scheduled events*.” Ex.1005, [0070].

⁵ I note that in the context of Ground 2, the claimed “*processor*” additionally corresponds to Melnychenko’s processor 960.

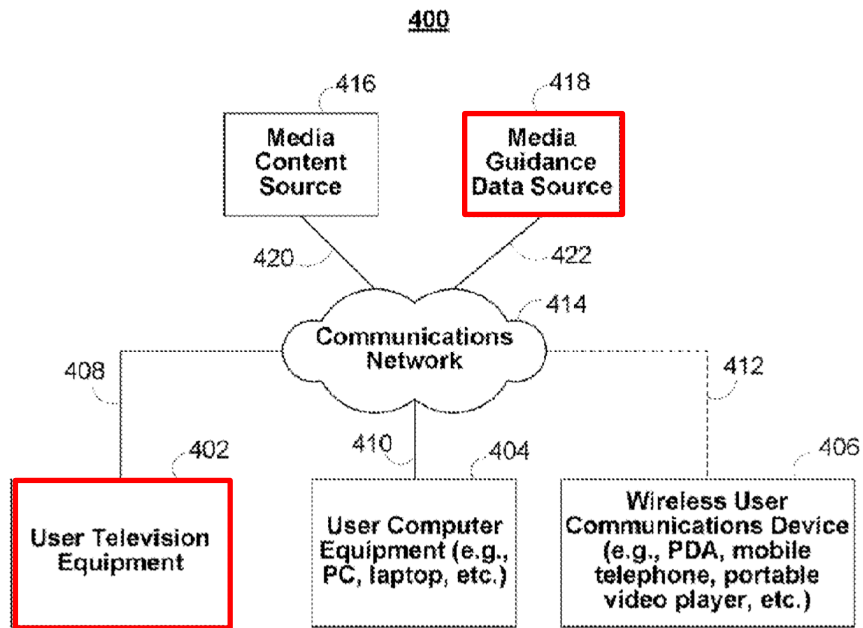


FIG. 4

Ex.1005, Fig. 4 (annotated).

In some embodiments, metadata from media guidance data source 418 may be provided to users' equipment using a client-server approach. For example, a user equipment device may pull metadata from a server, or a server may push media guidance data to a user equipment device. In some embodiments, a guidance application client residing on the user's equipment may initiate sessions with source 418 to obtain metadata when needed, e.g., when metadata is out of date or when the user equipment device receives a request from the user to receive data. **Media guidance may be provided to the user equipment with any suitable frequency (e.g., continuously, daily, a user-specified period of time, a system-specified period of time, in response to a request from user equipment, etc.).** Media guidance data source 418 may provide user equipment devices 402, 404, and 406 the media guidance

application itself or software updates for the media guidance application.

Ex.1005, [0070]; *see also* Ex.1005, [0064] (“Media guidance data may be received and transmitted by media guidance data source 418 as metadata.”), [0034] (explaining that “‘media guidance data’ or ‘guidance data’ should be understood to mean any data related to content, such as media listings, media-related information..., and any other type of guidance data that is helpful for a user to navigate among and locate desired content selections.”).

111. Thus, Melnychenko discloses that the received metadata is relevant to “a system-specified time” or “a user-specified period of time” for scheduling a frequency of updating media guidance data, which separately and together, render obvious that the data is “*relevant to one or more scheduled events.*”

(2) *the metadata is relevant to scheduled programming event*

112. In addition, to the extent it is argued that the “*data relevant to one or more scheduled events*” corresponds to data associated with content that is scheduled to be displayed at a particular time, Melnychenko discloses this implementation.

113. Melnychenko’s Figure 1 below “shows illustrative grid program listings display 100 arranged by time and channel that also enables access to different types of content in a single display,” where the display 100 includes a grid 102 with channel/content type identifiers 104, time identifiers 106, program

listings 108, among other features. Ex.1005, [0036].

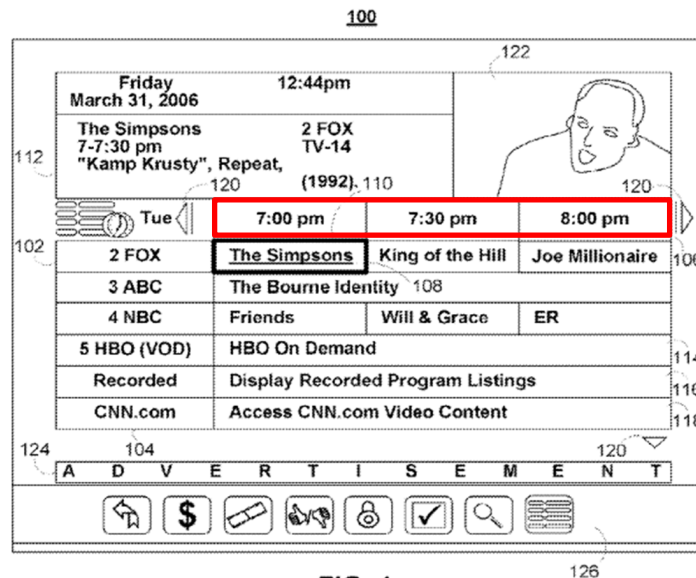


FIG. 1

Ex.1005, Fig. 1 (annotated).

FIG. 1 shows illustrative grid **program listings display 100 arranged by time and channel** that also enables access to different types of content in a single display. Display 100 may include grid 102 with: (1) a column of channel/content type identifiers 104, where each channel/content type identifier (which is a cell in the column) identifies a different channel or content type available; and (2) a row of time identifiers 106, where **each time identifier** (which is a cell in the row) identifies a time block of programming. Grid 102 also includes cells of program listings, such as program listing 108, where each listing provides the title of the program provided on the listing's **associated channel and time**. With a user input device, a user can select program listings by moving highlight region 110. Information relating to the program listing selected by highlight region 110 may be provided in program information region 112. Region 112 may include, for example,

the program title, the program description, the time the program is provided (if applicable), the channel the program is on (if applicable), the program's rating, and other desired information.

Ex.1006, [0036].

114. As described above, Melnychenko discloses that metadata is received in association with its corresponding content (e.g., TV/EPG, VOD, media content). Ex.1005, [0062] (user television equipment 402 receives media guidance data (e.g., metadata) from media guidance data source 418, as shown in Figure 4 below), [0064] (“Media guidance data may be received and transmitted by media guidance data source 418 as metadata. Metadata is data on content or on other types of data,” and “may include information on files, such as metadata for a specific file accessible via on-demand, information on content, such as program guide listings and other media guidance data, or even information on metadata, such as metadata describing how program guide listings are to be displayed.”).

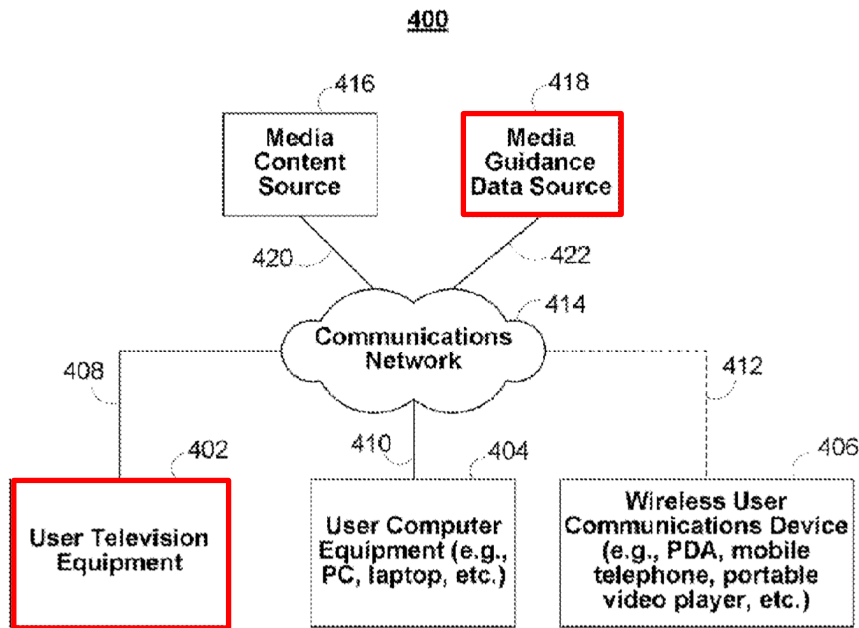
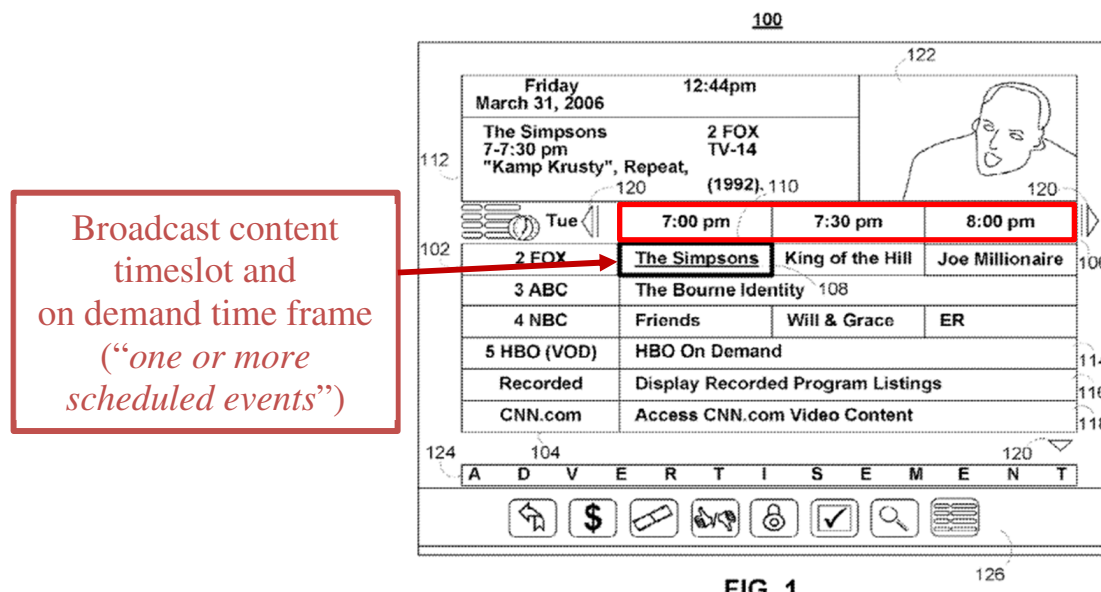


FIG. 4

Ex.1005, Fig. 4 (annotated).

115. Melnychenko further explains that the “**broadcast content metadata may include a field for the contents timeslot**” and also that “**on-demand content metadata may include a field for conveying a time frame the content will be available**.” Ex.1005, [0065]. The broadcast “content timeslot” is relevant to scheduled programs and the “time frame the content will be available” is relevant to scheduling of on-demand content, which separately and together disclose that the metadata is relevant to “*relevant to one or more scheduled events.*”

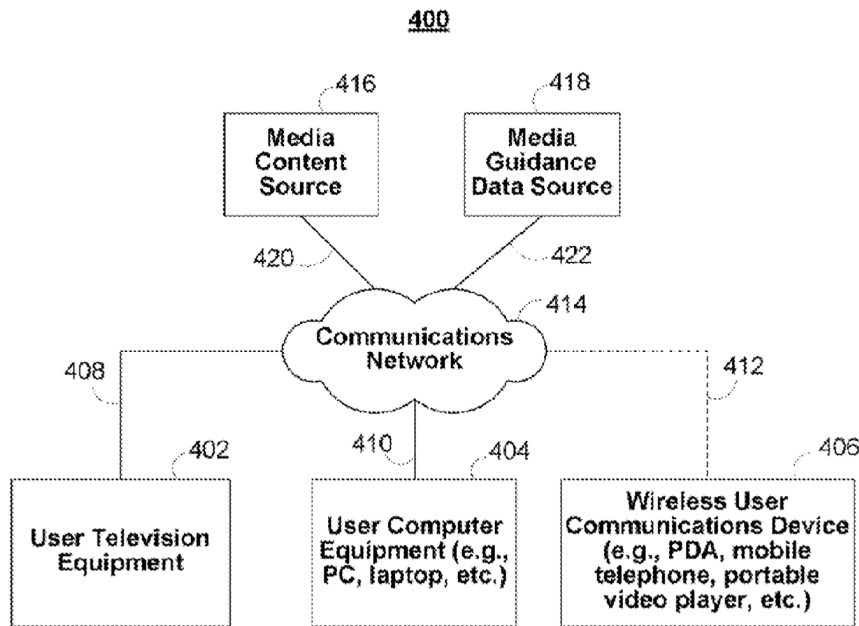
116. As shown in Figure 1 below, one or more of the contents provided to the user are “*scheduled events*” (e.g., 7:00 pm, 7:30 pm, 8:00 pm). In the example, the user has selected “The Simpsons” at 7:00 pm (highlight region 110). [0064]-[0065], [0036].



Ex.1005, Fig. 1 (annotated).

117. Thus, Melnychenko discloses that the received metadata is associated with content that is scheduled at a specific time (e.g., broadcast content timeslot or on demand time frame), which renders obvious that the data is “*relevant to one or more scheduled events.*”

118. **Third**, Melnychenko discloses that the received metadata is “*from one of a corresponding subservice.*” In more detail, Melnychenko at Figure 4 below illustrates that the user television equipment 402 receives data from cloud resources, such as a media content source 416 and a media guidance data source 418.

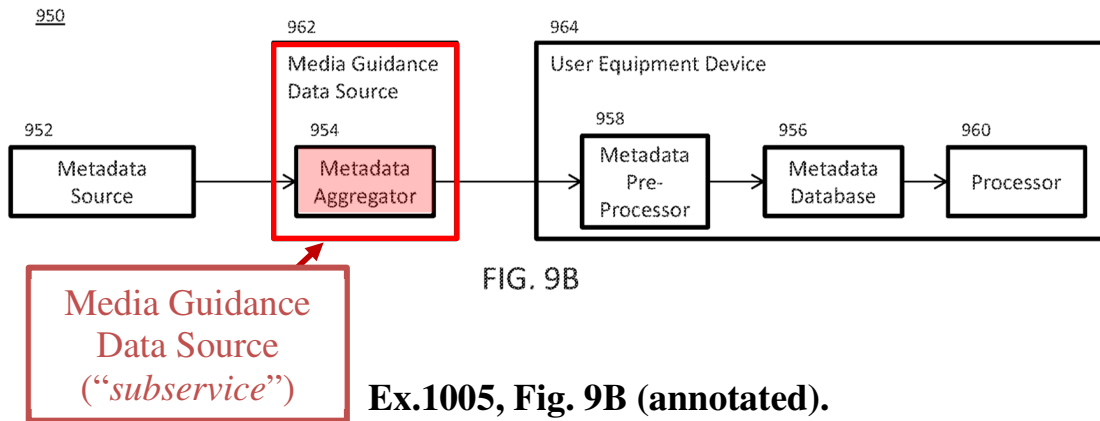
**FIG. 4****Ex.1005, Fig. 4.**

119. While shown as separate devices in Figure 4, the “[media] content source 416 and media guidance data source 418 may be integrated as one source device.” Ex.1005, [0062].

120. Melnychenko’s media guidance data source 418 includes an **“aggregator”** that aggregates metadata from various sources and manages the aggregated metadata. In one example, “[d]ue to the broad nature of metadata, metadata aggregator 512 may collect metadata from a number of sources before packing it and sending it to user equipment device.” Ex.1005, [0082], Fig. 5; *see also* Ex.1005, [0081]-[0084].

121. As illustrated at Figure 9B below, the media guidance data source 962 (which would be understood to correspond to media guidance data source 418, of

Figure 4 above) includes a metadata aggregator 954 that aggregates metadata and forwards the metadata to the metadata pre-processor 958.



In system 950 of FIG. 9B, metadata aggregator 954 of media guidance data source 962 receives metadata from metadata source 952 and forwards it to user equipment device 964. In user equipment device 964, the metadata is passed through metadata pre-processor 958 upon receipt, and properly formatted metadata is stored in metadata database 956. When processor 960 is about to utilize metadata, it may access metadata database 956 directly.

Ex.1005, [0126].

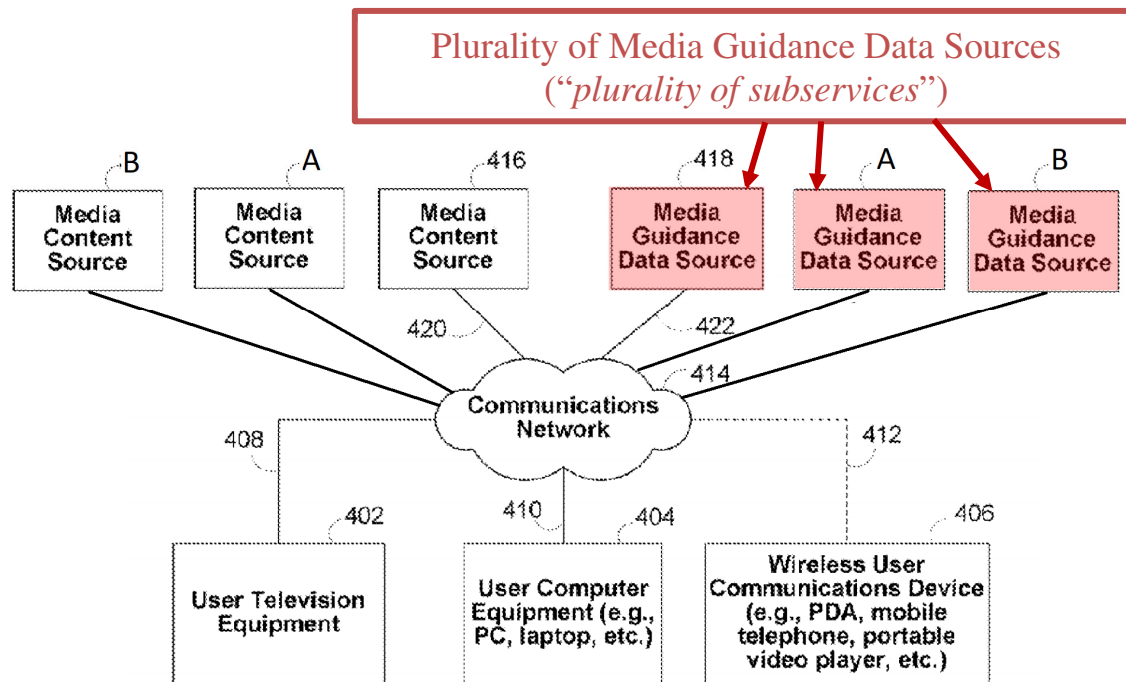
122. Melnychenko’s media guidance data source 418/962 (illustrated at Figures 4, 5, and 9B), which manages and aggregates metadata from different sources, corresponds to the claimed “*subservice*.”

123. This is consistent with the ’805 patent, which describes that the exemplary “*subservice*” “will be able to manage media and/or [meta]data from its particular source(s) and further aggregate media and/or data from multiple distinct

sources.” Ex.1001, 3:8-10; *see also* analysis immediately below and *infra* [1.1.2].

124. Thus, Melnychenko discloses that the received metadata is from a media guidance data source, which renders obvious that the received metadata is “*from one of a corresponding subservice.*”

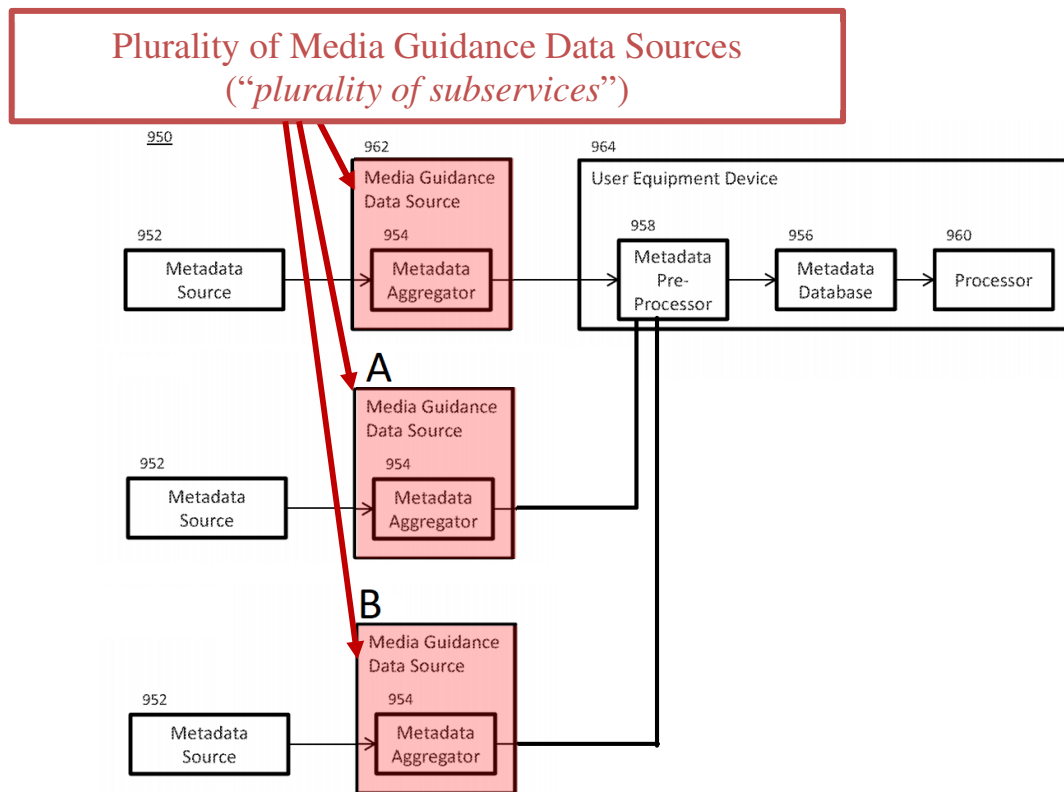
125. Fourth, Melnychenko discloses “*a plurality of subservices*” because the “**cloud resources may include one or more content sources 416 and one or more media guidance data sources 418.**” Ex.1005, [0077]; *see also* Ex.1005, [0062] (“[T]here may be more than one of each of content source 416 and media guidance data source 418, but only one of each is shown in FIG. 4 to avoid overcomplicating the drawing.”). In view of this express teaching, it would have been obvious to a POSITA to utilize a plurality of content sources 416 and a corresponding plurality of media guidance data sources 418 in Melnychenko’s system, as shown below at modified Figure 4.



Ex.1005, Fig. 4 (modified and annotated).

126. It would have been obvious to a POSITA to utilize a plurality of content sources and a plurality of media guidance data sources in view of Melnychenko's express teaching and also because such an implementation, as a matter of technology, lends itself to support different types of content. *See also, infra* [1.1.2] (explaining that different types of content would be provided by different sources, as was known in the art).

127. Accordingly, it would have been obvious to a POSITA that there would be a plurality of media guidance data sources used in the system of Figure 9B, as I have illustrated below in modified Figure 9B.



Ex.1005, Fig. 9B (modified annotated).

Melnychenko's plurality of media guidance data sources renders obvious "*a plurality of subservices.*"

128. Thus, Melnychenko discloses receiving, by pre-processor 958, metadata relevant to one or more scheduled events from one of a corresponding media guidance data source of a plurality of media guidance data sources, which renders obvious "*receiving, by a processor, data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*" as claimed.

[1.1.2] wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, electronic programming guide (EPG) subservice, and a media subservice

129. Melnychenko in combination with Chen renders obvious this element.

130. First, as discussed in connection with element [1.1.1], Melnychenko discloses a plurality of media guidance data sources (*“the plurality of subservices”*).

131. Second, as already noted above, Melnychenko’s “content source 416 and media guidance data source 418 may be integrated as one source device.” Ex.1005, [0062]. Melnychenko’s content sources 416 provide various types of content (e.g., VOD, television EPG, and media).

Interactive media guidance applications may take various forms depending on the content for which they provide guidance. One typical type of media guidance application is an **interactive television program guide. Interactive television program guides (sometimes referred to as electronic program guides)** are well-known guidance applications that, among other things, allow users to navigate among and locate many types of content. As referred to herein, the term “content” should be understood to mean an electronically consumable user asset, such as television programming, as well as pay-per-view programs, on-demand programs (as in **Video-on-demand (VOD) systems**), **Internet content (e.g., streaming content, downloadable content, Webcasts, etc.)**, **Video clips, audio, content information, pictures, rotating images, documents, playlists, websites, articles,**

books, electronic books, blogs, advertisements, chat sessions, Social media, applications, games, and/or any other media or multimedia and/or combination of the same. Guidance applications also allow users to navigate among and locate content. As referred to herein, the term “multimedia” should be understood to mean content that utilizes at least two different content forms described above, for example, text, audio, images, video, or interactivity content forms. Content may be recorded, played, displayed or accessed by user equipment devices, but can also be part of a live performance.

Ex.1005, [0032].

Content source 416 may include one or more types of content distribution equipment including **a television distribution facility, cable system headend, satellite distribution facility, programming sources (e.g., television broadcasters, such as NBC, ABC, HBO, etc.), intermediate distribution facilities and/or servers, Internet providers, on-demand media servers, and other content providers.**...Content source 416 may be the originator of content (e.g., a television broadcaster, a Webcast provider, etc.) or may not be the originator of content (e.g., an on-demand content provider, an Internet provider of content of broadcast programs for downloading, etc.). Content source 416 may include cable sources, satellite providers, on-demand providers, Internet providers, over-the-top content providers, or other providers of content. Content source 416 may also include a remote media server used to store different types of content (including video content selected by a user), in a location remote from any of the user equipment devices.

Ex.1005, [0063]; *see also* Ex. 1005, [0072] (content includes streaming media

content from “over-the-top (OTT) content...providers includ[ing] YOUTUBE, NETFLIX, and HULU.”).

132. Melnychenko’s media guidance data source provides metadata corresponding to the content provided by the content source.

In system 950 of FIG. 9B, metadata aggregator 954 of media guidance data source 962 receives metadata from metadata source 952 and forwards it to user equipment device 964. In user equipment device 964, the metadata is passed through metadata pre-processor 958 [958] upon receipt, and properly formatted metadata is stored in metadata database 956. When processor 960 is about to utilize metadata, it may access metadata database 956 directly.

Ex.1005, [0126].

Metadata is data on content or on other types of data. Metadata may include information on files, such as metadata for a specific file accessible via on-demand, information on content, such as program guide listings and other media guidance data, or even information on metadata, such as metadata describing how program guide listings are to be displayed. Metadata may serve to inform the user about content, may instruct the user equipment device how to display or process content or other metadata, and may even be used to monitor data transmitted and received, such as metadata on the size of transferred files or the rate of the transfer.

Ex.1005, [0064]

133. Accordingly, Melnychenko discloses providing (1) EPG content and

related metadata, (2) VOD content and related metadata, and (3) media content and related metadata to the user television equipment 402.

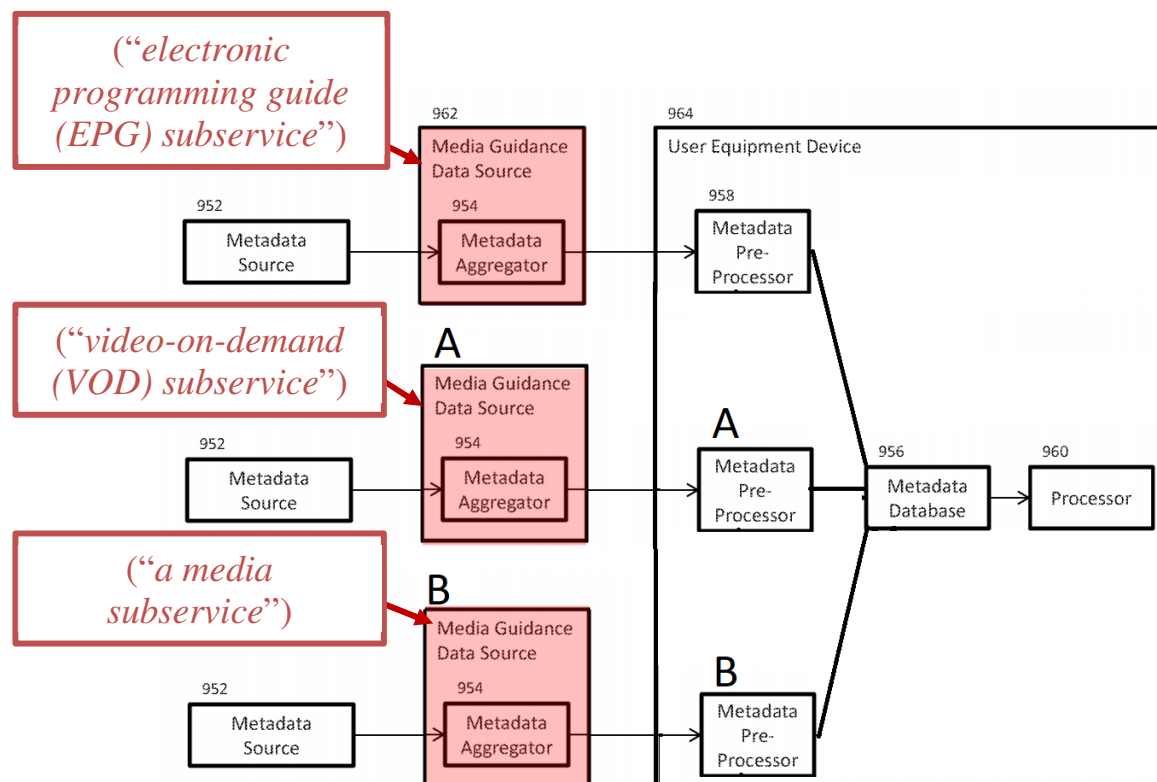
134. It would have been obvious to a POSITA that in the implementation where Melnychenko's system includes a plurality of media guidance data sources (see [1.1.1]), for each media guidance data source to aggregate metadata corresponding to different types of content. That is, it would have been obvious to a POSITA for a first media guidance source to aggregate metadata (e.g., EPG metadata) corresponding to content from a television distribution facility, cable system headend, satellite distribution facility, and/or programming sources (e.g., television broadcasters, such as NBC, ABC, HBO, etc.). Ex.1005, [0063]. The media guidance data source that aggregates EPG metadata corresponds to a "*electronic programming guide (EPG) subservice*."

135. It also would have been obvious to a POSITA for a second media guidance source to aggregate metadata corresponding to VOD content from on-demand media servers. Ex.1005, [0063]. The media guidance data source that aggregates VOD metadata corresponds to a "*video-on-demand (VOD) subservice*."

136. Lastly, it would have been obvious to a POSITA for a third media guidance source to aggregate metadata corresponding to content from Internet providers or other media sources. Ex.1005, [0063]. The media guidance data source that aggregates Internet and other multimedia metadata corresponds to a

“media subservice.”

137. As I have illustrated below at modified Figure 9B, it would have been obvious for Melnychenko’s plurality of media guidance data sources (see [1.1.1]) to correspond to VOD, TV/EPG, and media sources that aggregate respective metadata.



Ex.1005, Fig. 9B (modified annotated).

138. Third, I note that an implementation where each of Melnychenko’s media guidance data sources receive different types of metadata would be consistent with knowledge in the art, as demonstrated by Chen. Chen’s Figure 1, reproduced below, illustrates a one-to-one correspondence between (1) a first

signal source terminal 10 and a corresponding first importer 110 in a user's set-top box 100, and (2) a second signal source terminal 20 and a corresponding second importer 120 in the user's set-top box 100. Ex.1007, [0016].

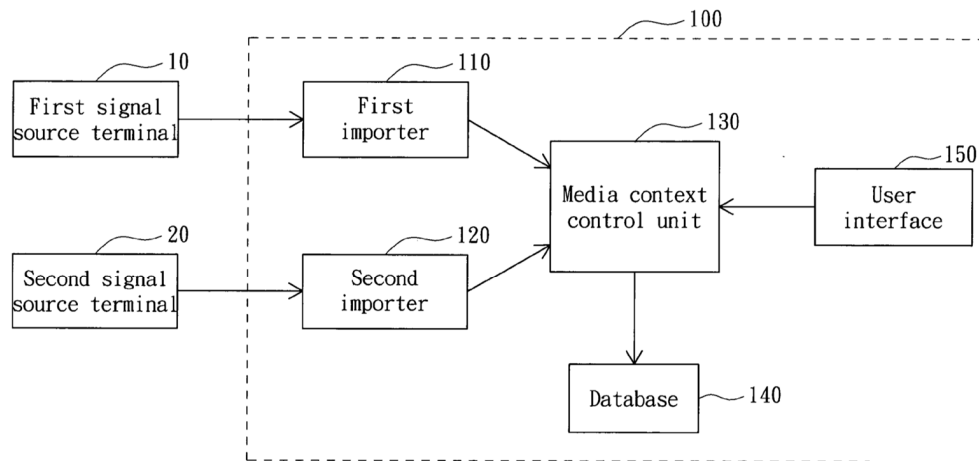


FIG. 1

Ex.1007, Fig. 1.

The set top box 100 includes a first importer 110, a second importer 120, a media context control unit 130 and a database 140. The first importer 110 receives a first media data transmitted by a first signal source terminal 10 and then obtains a first metadata from the first media data. The first importer 110 is further used for generating a first metadata table complying with a specific table. The second importer 120 receives a second media data transmitted by a second signal source terminal 20 and then obtains a second metadata from a second media data. The second importer 120 is further used for generating a second metadata table complying with the specific table. The media context control unit 130 is used for analyzing the context of the first metadata

table and the context of the second metadata table. The database 140 is used for respectively storing the first media data and the second media data according to the context of the first metadata table and the context of the second metadata table. **The first media data and the second media data are of different types.**

Ex.1007, [0016]. Chen's "non-limiting" example sources include VoD ("a video on demand (VoD)"), television broadcast ("a digital TV program, or a cabled TV program"), and media ("MPEG file, an MP3 file,...a WMA file, a JPEG file").

Ex.1007, claim 6; *see also* Ex.1007, [0009], [0011], [0018]-[0019], [0022].

139. It thus would have been obvious to a POSITA, when implementing Melnychenko with a plurality of content sources 416 and a corresponding plurality of media guidance data sources 418/952 (see [1.1.1]), for the media guidance data sources 418/952 to correspond to different types of metadata in view of Chen's teachings. *See also* Reasons to Combine Chen and Melnychenko.

140. Thus, Melnychenko in combination with Chen discloses that the plurality of media guidance data sources comprises a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source, which renders obvious that "*the plurality of subservices comprises a video-on-demand (VOD) subservice, electronic programming guide (EPG) subservice, and a media subservice,*" as claimed.

[1.2.1] organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices,

141. Melnychenko in combination with Chen renders obvious this element.

142. First, as discussed in connection with element [1.1.1], Melnychenko discloses that the system of Figure 9B includes pre-processor 958 (“*the processor*”) that receives metadata (“*the data*”).

143. Second, Melnychenko’s metadata may be received in a data structure. [0088]-[0089], Fig. 6 (metadata file 600 having data structure 688). The metadata pre-processor 958 modifies the received metadata if it is improperly formatted, including modifying punctuations, adding, and moving information. Ex.1005, [0116] (“Metadata pre-processor 804 may receive improperly formatted metadata 802 as input, and **modify** it to generate properly formatted metadata 806.”); *see also* Ex.1005, [0117]-[0123]. Examples of the different types of modifications that the metadata pre-processor 958 may make to the improperly formatted metadata include “modify[ing] any component of metadata 802 to conform it to a format” (Ex.1005, [0117]), “modify[ing] the content of a particular field [of the metadata]” (Ex.1005, [0118]), “correct[ing] for information placed in the wrong field [in the metadata]” (Ex.1005, [0119]), “add[ing] new fields to metadata 802” (Ex.1005, [0120]), and “alter[ing] the formatting of the information within fields 820, 824 and 826 to comply with a format” (Ex.1005, [0121]), where metadata may be modified according to a “rule []specify[ing] that this content is to be **moved** to the

correct field.” (Ex.1005, [0161]).

144. Therefore, because Melnychenko discloses that received metadata is modified, moved, or otherwise altered, by the metadata pre-processor 958, Melnychenko renders obvious “*organizing, by the processor, the data.*”

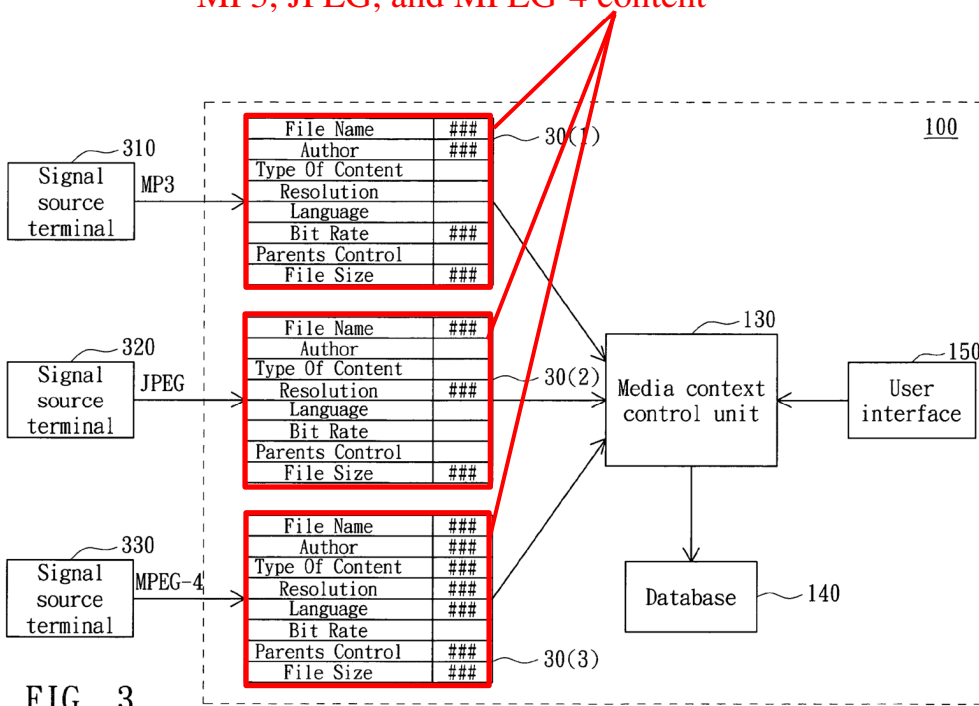
145. Third, I note that Melnychenko’s “[m]etadadata may come in a variety of metadata formats,” with one metadata format “relat[ing] to a single piece of content” (e.g., metadata file 600 for VOD content corresponding to the movie “The Titanic”). Ex.1005, [0088]-[0089], Figs. 6 and 8. A POSITA would have understood that other types of content such as TV/EPG (e.g., broadcast) or media content (e.g., Internet content) disclosed in Melnychenko may have different metadata variety of metadata formats. *See, e.g.* Ex.1005, [0065] (“[B]roadcast content metadata may include a field for the content’s timeslot, on-demand content metadata may include a field for conveying a time frame the content will be available for, and Internet content metadata may contain a link to a website the content is to be retrieved from.”). Melnychenko, however, does not provide implementation details how such metadata is formatted or how the pre-processor 958 organizes metadata with a variety of formats for storage in database 956.

146. In that regard, Chen discloses that received metadata is organized in a “metadata table” corresponding to each different type of content (e.g., MP3 content, JPEG content, MPEG-4 content). In more detail, Chen discloses that the

user's set-top box 100 receives media content and associated metadata from different sources (e.g., sources 310, 320, 330 in Figure 3). Ex.1007, [0006], [0009], [0015]-[0018]. Chen's metadata for different content types (e.g., MP3 metadata, JPEG metadata, and MPEG-4 metadata in Figure 3) is organized into three metadata tables 30(1)-30(3) "**of uniform format.**" Ex.1007, [0017], Fig. 3.

147. As shown below at Chen's Figure 3, the metadata tables are organized in a uniform format that includes the same fields (e.g., File Name, Author, Type of Content, Resolution, Language, Bit Rate, Parents Control, File Size) but only certain fields have input data values corresponding to each content type. For example, the MP3 metadata table 30(1) only includes values (indicated by symbol ###) for File Name, Author, Bit Rate, and File Size, although it has the same fields as the other metadata tables 30(2) and 30(3). The respective metadata for JPEG and MPEG-4 is likewise organized in tables 30(2) and 30(3), respectively, with all the same fields but only certain fields have input values (indicated by symbol ###).

Metadata is organized in metadata tables corresponding to MP3, JPEG, and MPEG-4 content



Ex.1007, Fig. 3 (annotated).

The specific table (not illustrated [in Fig. 3]) is the table before the context of metadata is inputted to the columns of the metadata tables 30(1), 30(2) and 30(2). **The metadata tables 30(1), 30(2) and 30(2) include columns such as file name, author, file size and so on.** The columns correspond to the columns of the metadata of the MP3 file, JPEG file and MPEG-4 file. However, the metadata tables 30(1), 30(2) and 30(3) still include partial columns. Examples of partial columns include the bit rate column corresponding to the metadata of MP3 file only, the parent control column corresponding to the metadata of MPEG-4 file only, and the resolution column corresponding to the metadata of JPEG file. In the metadata table 30(1), only the metadata columns corresponding to MP3 file are inputted with data. In the

metadata table 30(2), only the metadata columns corresponding to JPEG file are inputted with data. In the metadata table 30(3), only the metadata columns corresponding to MPEG-4 file are inputted with data. The metadata tables 30(1), 30(2) and 30(3) are illustrated in FIG. 3. **The symbol ### in FIG. 3 denotes that the table is inputted with data.** The set top box 100 stores the media data of the MP3 file, the JPEG file and the MPEG-4 file in the database 140 according to the context of the metadata tables 30(1), 30(2) and 30(3). The user can promptly and correctly retrieve the media data stored in the database via the user interface 150.

Ex.1007, [0020].

148. Accordingly, Chen renders obvious “*organizing...the data*” in a “*format corresponding to each of the plurality of subservices*” by teaching that the received metadata is organized in a metadata table corresponding to each different type of content.

149. Fourth, Chen discloses that the metadata is organized “*according to a pre-defined format*” because each metadata table complies with a pre-defined “**specific table of uniform format,**” for example, in an extensible markup language (XML) file.

The importers use the metadata to **generate a metadata table [e.g., 30(1), 30(2), 30(3)] complying with a specific table. Preferably, the specific table according to the embodiment of the invention is of extensible markup language (XML) file format. The XML file**

format includes all of the columns of metadata of media data operable to the set top box device. Take the above embodiment for example, the columns of the XML file format include columns corresponding to the first metadata, columns corresponding to the second metadata and partial columns of the XML file format corresponding to the first metadata and the second metadata at the same time. In the first metadata table, only the columns corresponding to the first metadata are inputted with data, and in the second metadata table, only the columns corresponding to the second metadata are inputted with data.

Ex.1007, [0019]; *see also* Ex.1007, [0009] (“a first metadata table and a second metadata table respectively **complying with a specific table** are generated.”), [0017] (set-top box 100 accesses all the metadata “by the **specific table of uniform format.**”), [0020] (“Importers...**generate three metadata tables 30(1), 30(2) and 30(3) complying with a specific table.**”), Fig. 2 (step 220). A POSITA would understand that the “specific table” pre-defines how each metadata table (e.g., three metadata tables 30(1), 30(2) and 30(3)) is to be formatted.

150. Accordingly, a POSITA would have understood that Chen’s “specific table of uniform format” pre-defines metadata tables 30(1), 30(2) and 30(3) illustrated at Figure 3. In this way, Chen’s organizing of received metadata in metadata tables 30(1), 30(2) and 30(3) is “*according to a pre-defined format,*” as claimed. *See also, infra*, [1.2.2].

151. A POSITA would have understood that Chen’s teachings represent a

general technological principle and are not limited to the specific exemplary content of MP3, JPEG, and MPEG-4. Ex.1007, [0009] (generally applying the teachings to “**plural types of media data.**”), [0011] (“...**non-limiting** embodiments”), [0019] (“**The types of media** operable to the set top box of the invention **is not limited.**”), [0022] (“While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the invention is **not limited thereto.** On the contrary, it is intended to cover various modifications and similar arrangements and procedures.”).

152. Chen also discloses applying its technique to organize metadata of a broader nature, including “MPEG file, an MP3 file, a VoD program, a WMA file, a JPEG file, a digital TV program, or a cabled TV program.” Ex.1007, claim 6; *see also* Ex.1007, [0018], [0016] (content includes, “for example, TV programs transmitted by a cabled TV, a video on demand (VoD) movie program transmitted by the Internet, an AV data transmitted by a personal computer, or media data stored in other storage devices such as a universal serial bus (USB) storage unit.”). Chen’s general technological teachings of organizing metadata (which is “not limited” by provided examples) would be understood to apply to Melnychenko’s metadata, which corresponds to content from “a television distribution facility, cable system headend, satellite distribution” “on-demand programs (as in Video-on-demand (VOD) systems), Internet content (e.g., streaming content,

downloadable content, Webcasts, etc.), Video clips, audio, content information, pictures, rotating images, documents, playlists, websites, articles, books, electronic books, blogs, advertisements, chat sessions, social media, applications, games, and/or any other media or multimedia and/or combination of the same.” Ex.1005, [0032], [0063]; *see also* Ex.1005, [0033].

153. Accordingly, it would have been obvious to a POSITA for additional fields to be included in a “specific table of uniform format,” described by Chen, to account for different types of content, including those provided by Melnychenko’s media guidance data sources (*see* [1.1.2]). Ex.1005, [0032]-[0034]. In such an implementation, Melnychenko’s metadata tables (implemented per Chen) would include additional fields for metadata corresponding to the noted content, including VOD content, TV/EPG content, and media content. Ex.1005, [0032]-[0034] (Melnychenko’s interactive media guidance application receives various different types of content including VOD content, TV/EPG content, and media content).

154. Chen’s technique of organizing metadata (which complies with a “specific table of uniform format” that is pre-defined) provides numerous benefits. For example, “the invention is able to design a user interface operable to plural types of media data instead of designing various user interface according to the types of the media data. By doing so, not only the design of the user interface is simplified, but also the functions of the user interface are more diversified and the

operation of the user interface is made more convenient.” Ex.1007, [0017].

155. Accordingly, it would have been obvious to a POSITA to modify Melnychenko to organize received metadata (which “may come in a variety of metadata formats” Ex.1005, [0088]) in a metadata table format (complying with a specific table of uniform format as taught by Chen (Ex.1007, [0017])). Each metadata table would have a format (e.g., same fields) corresponding to Melnychenko’s VOD content, TV/EPG content, and Internet media content (see [1.1.2]). In implementing the proposed combination, it would have been obvious to a POSITA for Melnychenko’s metadata pre-processor 958, which organizes the received VOD metadata, TV/EPG metadata, and Internet/media metadata, to organize each different type of metadata in a predefined metadata table format corresponding to each media guidance data source (e.g., a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source).

156. A POSITA would be motivated to make such an implementation to obtain one or more benefits (e.g., “user interface is simplified,” “functions of the user interface are more diversified” and the operation is “more convenient,” as taught by Chen). Ex.1007, [0017]. Also, a POSITA would have been motivated to modify Melnychenko in view of Chen, because it would allow for the metadata (e.g., TV/EPG content and related metadata, VOD content and related metadata,

and media content and related metadata) to be promptly and correctly retrieved from the database and displayed to the user. Ex.1007, [0020] (“The user can promptly and correctly retrieve the media data stored in the database via the user interface 150.”). These noted distinct benefits, separately and together, would have motivated a POSITA to implement Melnychenko per Chen. *See also* Reasons to Combine Chen and Melnychenko.

157. Thus, Melnychenko in combination with Chen discloses organizing, by pre-processor 958, the received metadata in a metadata table according to a pre-defined format (e.g., a specific table of uniform format) corresponding to each of the three media guidance data sources (see [1.1.2]), which renders obvious “*organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices,*” as claimed.

[1.2.2] wherein the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model;

158. Melnychenko in combination with Chen renders obvious this element.

159. As an initial matter, I note that in the ’805 patent’s example, “data models define what and how information is to be stored.” Ex.1001, 28:35-45 (describing data models for Figure 14), 21:6-13 (similar explanation for Figure 6).

160. First, as discussed in connection with element [1.2.1], Melnychenko in combination with Chen discloses organizing, by the metadata pre-processor 958, the received metadata in a metadata table according to a pre-defined format (e.g., a

specific table of uniform format) corresponding to each media guidance data source (e.g., a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source) (“*the pre-defined format*”).

161. Second, in one embodiment, Chen’s disclosed specific table of uniform format corresponds to an XML file corresponding to all of the media data operable to the user’s device (e.g., set-top box).

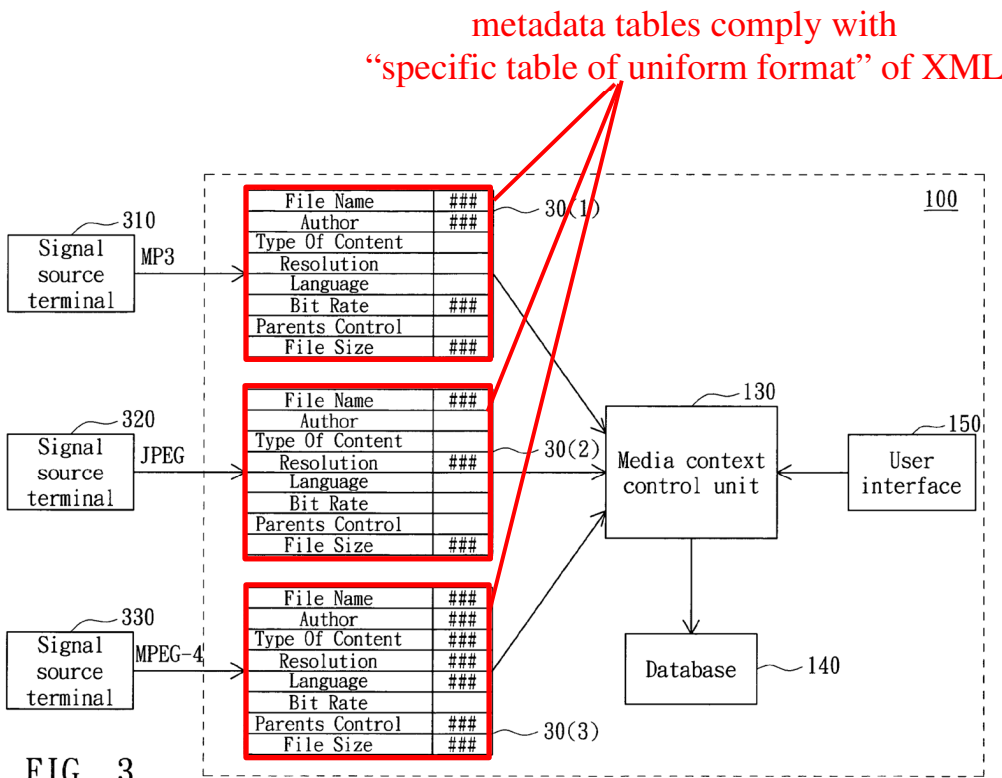
The importers use the metadata to generate a metadata table complying with a specific table. Preferably, **the specific table according to the embodiment of the invention is of extensible markup language (XML) file format. The XML file format includes all of the columns of metadata of media data operable to the set top box device.** Take the above embodiment for example, the columns of the XML file format include columns corresponding to the first metadata, columns corresponding to the second metadata and partial columns of the XML file format corresponding to the first metadata and the second metadata at the same time. In the first metadata table, only the columns corresponding to the first metadata are inputted with data, and in the second metadata table, only the columns corresponding to the second metadata are inputted with data.

Ex.1007, [0019].

162. A POSITA would have understood that Chen’s XML file includes XML code that defines the fields and what information is to be stored (e.g., which

fields will have data symbol ###) and how information is to be stored (e.g., the order of the given fields in the column) in the metadata tables for each type of content.

163. This is demonstrated by Chen's Figure 3, reproduced below, where the metadata tables (which are generated to comply with the "specific table of uniform format" of XML file) use symbol "###" to denote what field will have metadata inputted and the order of the fields in the columns specify how the metadata is to be stored.



Ex.1007, Fig. 3 (annotated).

164. It would have been obvious to a POSITA, in view of the MP3

metadata table 30(1), for the XML code in the XML file to define all of the fields in a column (e.g., File Name, Author, Type of Content, etc. as shown in Chen's Fig. 3) and which corresponding fields will have input metadata (e.g., using symbol ###) if the metadata has data for the corresponding fields (e.g., data for "Bit Rate" field for MP3 metadata, as shown in Chen's Fig. 3) and which will be left empty if the metadata does not have data for the corresponding fields (e.g., no data for "Resolution" field for MP3 metadata, as shown in Chen's Fig. 3). Also, it would have been obvious to a POSITA for the XML file to likewise include corresponding XML code for JPEG metadata table 30(2) and MPEG-4 metadata table 30(3). Again, this is confirmed by Chen's Figure 3, where metadata tables (which comply with the specific table of uniform format) have the same fields but different input metadata. Ex.1007, [0020].

165. As already discussed in connection with element [1.2.1], a POSITA would have understood that Chen's teachings represent a general technological principle and are not limited to the specific media examples of MP3, JPEG, and MPEG-4. Ex.1007, [0019] ("**The types of media** operable to the set top box of the invention **is not limited.**"); *see also* Ex.1007, [0009] (generally applying the teachings to "**plural types of media data.**").

166. As discussed at [1.2.1], it would have been obvious to apply Chen's teachings to Melnychenko. A POSITA would have been motivated to modify

Melnychenko, in view of Chen, to organize metadata in a metadata table according to a pre-defined format (e.g., a specific table of uniform format) corresponding to each media guidance data source (e.g., a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source). In the combination, a specific table of uniform format corresponds to an XML file that would include corresponding XML code for generating metadata tables for VOD, TV/EPG, and Internet media. Applying Chen's XML file teachings to Melnychenko represent implementation details.

167. The combination of Melnychenko and Chen is merely combining prior art elements (XML file, per Chen, with Melnychenko's system) according to known methods (Chen describes organizing metadata in metadata tables that comply with a specific table of uniform format of an XML file) to yield predictable results (organizing metadata in a uniform format). *See also* Reasons to Combine Chen and Melnychenko.

168. In the combination, the XML code of the XML file that defines the fields (e.g., File Name, Author, etc..) and which fields have input data (e.g., symbol ###) for organizing metadata from the VOD media guidance data source corresponds to "*a VOD data model.*" Similarly, in the combination, the XML code of the XML file that defines the fields (e.g., File Name, Author, etc..) and which fields have input data (e.g., symbol ###) for organizing metadata from the TV/EPG

media guidance data source corresponds to “*an EPG data model.*” Lastly, in the combination, the XML code of the XML file that defines the fields (e.g., File Name, Author, etc..) and which fields have input data (e.g., symbol ###) for organizing metadata from the Internet or other media guidance data source corresponds to “*a media data model.*”

169. To the extent it is argued that the claim requires that each “*data mode*” be separate, it would have been obvious to a POSITA to have separate XML files as a matter of well-known computer programming principles. In such an implementation, each XML file would include XML code that pre-defines a specific metadata table.

170. Therefore, Melnychenko in combination with Chen renders obvious that “*the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model,*” as claimed.

[1.2.3] wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model and

171. Melnychenko in combination with Chen renders obvious this element.

172. First, as discussed in connection with element [1.2.1], Melnychenko in combination with Chen discloses organizing, by the metadata pre-processor 958, the received metadata in a metadata table according to a pre-defined format (e.g., a specific table of uniform format) (“*organizing the data according to the pre-*

defined format”). Further, as discussed in connection with element [1.2.2], in the combination of Melnychenko and Chen, the specific table of uniform format that defines the metadata tables corresponds to an XML file with XML code for VOD, TV/EPG, and Internet media (*“the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model”*).

173. Second, the proposed combination renders obvious that organizing *“comprises converting the data received from the subservice into the pre-defined format of the corresponding data model.”* As already noted, Melnychenko’s “[m]etadata may come in a **variety of metadata formats**” corresponding to different content (e.g., VOD, TV/EPG, Internet media) Ex.1005, [0032], [0088]. It would have been obvious to a POSITA that in the proposed combination with Chen (*see* [1.2.1]-[1.2.2]), organizing includes converting Melnychenko’s metadata, which may come in a variety of metadata formats from the VOD, TV/EPG, and Internet or other media guidance data source (which may be initially received in an a format as shown at Figure 5) to be in a **uniform format.** Ex.1007, [0017]. For example, it would have been obvious for the metadata file 600 (which represents one format for a single piece of content, Ex.1005, [0089]) to be converted into a metadata table of uniform format, i.e., has fields that relate to all of the content that may be received by Melnychenko’s television.

174. This is consistent with Chen’s disclosure that the set-top box 100

receives different types of metadata from different sources (sources 310, 320, 330) and then converts each type of metadata into a uniform format represented by the same table format for each type of metadata, as shown by metadata tables 30(1) to 30(3) in Figure 3 below. Ex.1007, [0020] (“Importers (not illustrated) are used by the set top box 100 to respectively generate three metadata tables 30(1), 30(2) and 30(3) complying with a specific table.”), [0019] (reproduced below).

The importers use the metadata to generate a metadata table complying with a specific table. Preferably, the specific table according to the embodiment of the invention is of extensible markup language (XML) file format. **The XML file format includes all of the columns of metadata of media data operable to the set top box device.** Take the above embodiment for example, the columns of the XML file format include columns corresponding to the first metadata, columns corresponding to the second metadata and partial columns of the XML file format corresponding to the first metadata and the second metadata at the same time.

Ex.1007, [0019].

175. Consistent with the analysis above, a POSITA would have been motivated to combine the prior art teachings, such that Melnychenko’s received metadata (which may come in a variety of metadata formats) is converted into the pre-defined uniform table format of the corresponding data model in the XML file, per Chen. *See also* Reasons to Combine Chen and Melnychenko.

176. Thus, Melnychenko in combination with Chen discloses that organizing the metadata according to the pre-defined uniform format (*see* [1.2.1]) comprises converting the metadata received from the each media guidance data source (e.g., a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source) into the pre-defined uniform table format of the corresponding data model in the XML file, which renders obvious “*organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model,*” as claimed.

[1.2.4] wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and

177. Melnychenko in combination with Chen renders obvious this element.

178. First, as discussed in connection with element [1.1.2], Melnychenko in view of Chen discloses a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source (“*the plurality of subservices*”).

179. Second, as discussed in connection with elements [1.2.1]-[1.2.2], Melnychenko in view of Chen discloses that metadata tables corresponding to each media data sources are generated according to a “specific table of **uniform format**” (Ex.1007, [0017]) and that the specific table is of an XML file (Ex.1007, [0019]) with data models for VOD, EPG, and Internet and media (“*the VOD data*

model, EPG data model, and media data model”). Thus, the combination of Melnychenko and Chen renders obvious that each of the media data models “provide a uniform format for the plurality of subservices.”

180. This principle is illustrated at Chen’s Figure 3, where the metadata tables 30(1)-30(3) (which were generated by to confirm with the “specific table of uniform format” of the XML file) includes the same fields (e.g., File Name, Author, Type of Content, Resolution, Language, Bit Rate, Parents Control, File Size) even though not all of the fields have input metadata. Ex.1007, [0020].

The tables have the same fields

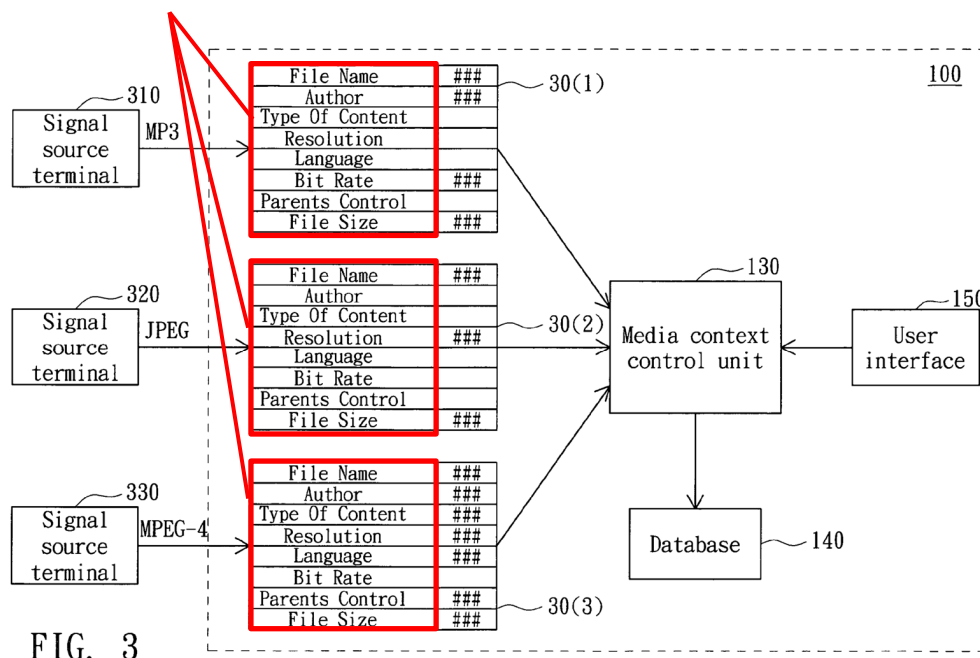


FIG. 3

Metadata tables 30(1)-30(3) have uniform format.

Ex.1007, Fig. 3 (annotated).

181. Consistent with the analysis above, a POSITA would have been

motivated to modify Melnychenko, in view of Chen such that the metadata tables have a uniform format for the plurality of media guidance data sources. *See also* Reasons to Combine Chen and Melnychenko.

182. Thus, Melnychenko in combination with Chen render obvious that “each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices.”

[1.3] providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.

183. Melnychenko in combination with Chen renders obvious this element.

184. Consistent with the discussion in the claim construction of “one or more,” I understand that a prior art showing even only one content provider module that receives the organized data satisfies the claim. Ex.1001, 3:21-28.

185. Additionally, I note that in the '805 patent, “[t]he term ‘module,’ as used herein, refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software.” Ex.1001, 30:65-31:3. In one example, the '805 patent’s “content provider module” is “configured to provide content to video hardware or display of the in Intelligent TV or to a content provider module or application of the Intelligent TV.” Ex. 1001, 2:47-51.

186. First, as discussed in connection with element [1.2.1], Melnychenko in combination with Chen discloses that pre-processor 958 (“the processor”)

organizes received metadata into a metadata table corresponding to each media guidance data source (e.g., a VOD media guidance data source, a TV/EPG media guidance data source, and an Internet or other media guidance data source) (“*the organized data*”).

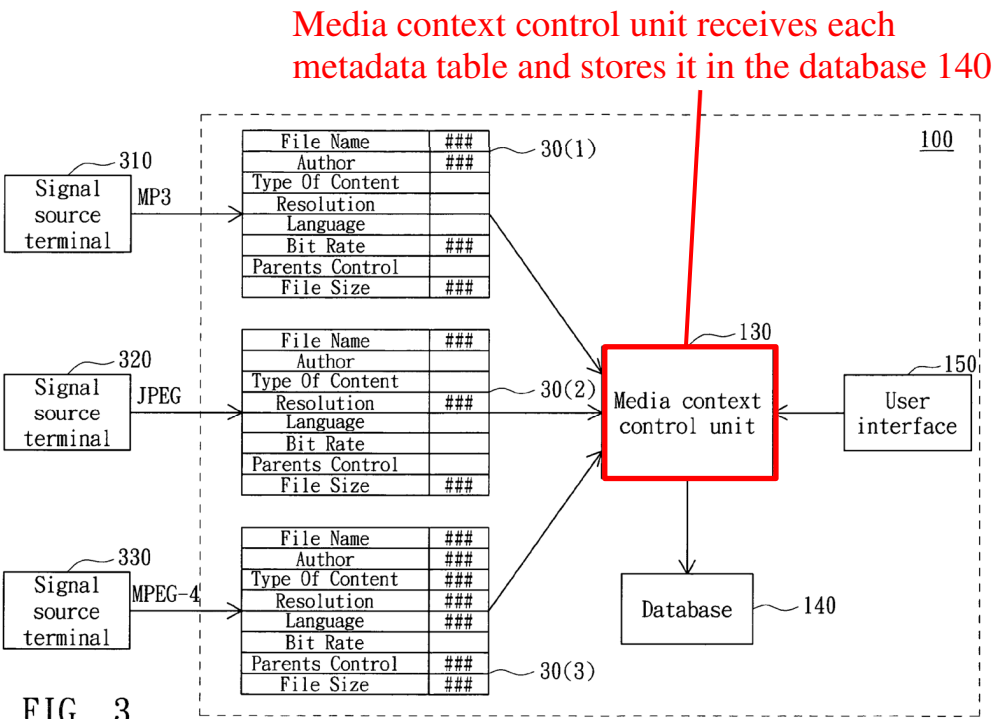
187. Second, Chen discloses that the organized metadata tables are provided to a media context control unit 130 which facilitates storage in a database 140.

The set top box 100 includes a first importer 110, a second importer 120, **a media context control unit 130 and a database 140**. The first importer 110 receives a first media data transmitted by a first signal Source terminal 10 and then obtains a first metadata from the first media data. The first importer 110 is further used for generating a first metadata table complying with a specific table. The second importer 120 receives a second media data transmitted by a second signal Source terminal 20 and then obtains a second metadata from a second media data. The second importer 120 is further used for generating a second metadata table complying with the specific table. **The media context control unit 130 is used for analyzing the context of the first metadata table and the context of the second metadata table. The database 140 is used for respectively storing** the first media data and the second media data according to the context of the first metadata table and the context of the second metadata table. The first media data and the second media data are of different types.

Ex.1007, [0016].

Then, proceed to step 230, a media context control unit is used to analyze the context of metadata table. Then, proceed to step 240, the media context control unit stores the MPEG-4 file in a database according to the context of metadata table.

Ex.1007, [0017].



Ex.1007, Fig. 3 (annotated).

188. It would have been obvious to a POSITA, when implementing Melnychenko such that pre-processor 958 organizes received metadata into a plurality of metadata tables (*see* [1.1.1]-[1.2.1]), to also apply Chen’s media context control unit teachings, such that each respective metadata table may be received and properly stored in Melnychenko’s database. Because the metadata is

organized and properly stored, it “can promptly and correctly [be] retrieve[d] [from] the database.” Ex.1007, [0020]; *see also* Reasons to Combine Chen and Melnychenko.

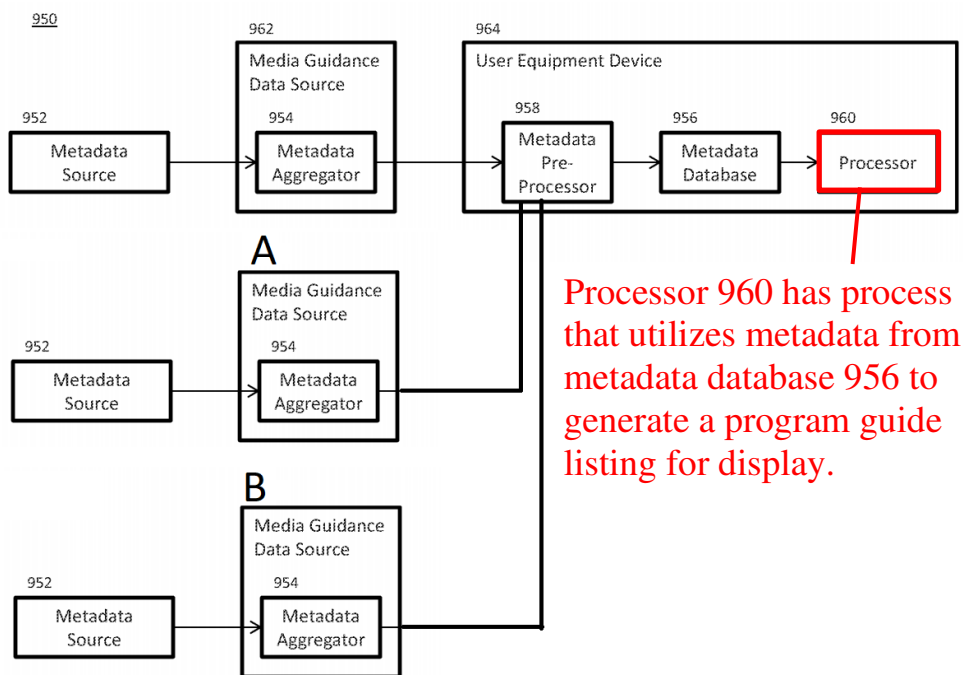
189. In the proposed combination, Melnychenko’s system would utilize a media context control unit positioned between pre-processor 958 and the database 956. During operation, the media context control unit would receive the organized metadata tables from pre-processor 958 and provide the metadata tables to database 956. Accordingly, in the proposed combination, the media context control unit corresponds to “*one...content provider modules of the TV,*” as claimed.

190. Thus, the combination of Melnychenko and Chen discloses that pre-processor 958 provides the organized metadata tables to a media context control, which renders obvious renders obvious “*providing, by the processor, the organized data to one...content provider module[] of the TV.*”

191. Third, the combination of Melnychenko and Chen renders obvious “*a plurality of content provider modules.*” Melnychenko discloses that when the “**processor 960 is about to utilize metadata, it may access metadata database 956 directly.**” Ex.1005, [0126]. In one example, the “**metadata is used to generate a program guide listing for display.**” Ex.1005, [0067]; *see also* Ex.1005, [0106]. Melnychenko explains that “**a process utilizing metadata** may also have a process specific format that metadata may need to conform to in order

for the process to execute correctly.” Ex.1005, [0093]; *see also* Ex.1005, [0182] (“methods involved in the present application may be embodied in a computer program product... having a computer readable program code stored thereon.”); *see also* Ex.1005, [0071].

192. As illustrated below at Melnychenko’s Figure 9B, the processor 960 receives metadata from the metadata database 956 and (although not illustrated) it would be understood that the processor 960 has a process (or program code) that uses the metadata to generate the program guide listing for display (*see* Fig. 1).



Ex.1005, Fig. 9B (modified annotated).

193. Accordingly, a POISTA would have understood that Melnychenko’s process (or program code) executed by processor 960 to receive organized

metadata from the metadata database 956 and use that metadata to generate a program guide listing for display, corresponds to a “*content provider modules of the TV.*” This is consistent with the ’805 patent’s example, where the content provider module is “configured to provide content to video hardware or display of the in Intelligent TV.” Ex. 1001, 2:47-51; *see also infra*, Claim 2 (“*wherein the plurality of content provider modules comprises an EPG data provider.*”).

194. Thus, because in the proposed combination of Melnychenko and Chen there are two different content providers, the prior art combination renders obvious “*a plurality of content provider modules of the TV.*”

5. Claim 10

195. Initially, I note independent claims 10 and 17 are substantially similar in scope to claim 1, except that claim 1 recites “[a] method of providing content for a television (TV),” whereas claim 10 recites “[a] data service system in a Television (TV),” and claim 17 recites “[a] computer program product for providing content for a Television (TV).” Ex.1017 is a Claim Comparison Chart for claims 1-18 of the ’805 patent. My analysis of claims 10 and 17 below focuses on features of claims 10 and 17 not expressly recited in claim 1. Where there are identical or substantially identical elements with claim 1, I refer to my analysis of the corresponding elements of claim 1 for simplicity.

[10.0] *A data service system in a Television (TV), the system comprising:*

196. Melnychenko renders obvious “[a] data service in a Television (TV).”

197. Element [10.0] is similar to element [1.0], except that [10.0] recites “[a] data service system...,” whereas [1.0] recites a method. Claim 10 corresponds to claim 1.

198. Melnychenko discloses “[s]ystems and methods” for a TV. Ex.1005, Abstract, Fig. 1; *see also* Ex.1005, [0030] (“The application, in various implementations, provides systems, methods and devices for modifying metadata associated with content that is improperly formatted.”).

199. Melnychenko’s system of providing content and related metadata to a TV (e.g., display 312 in user equipment device 300 of Figure 3 and/or user television equipment 402 in Figure 4) is “a data service in a Television (TV),” because as described for claim 1 above, Melnychenko’s user equipment device receives different types of content including TV/EPG content, VOD content, media content, and corresponding metadata for each type of content, to a user’s TV in the form of the program guide listing 100. *See, e.g.*, elements [1.0] and [1.1.1] above. Thus, Melnychenko’s user equipment device performs a “data service” in the TV.

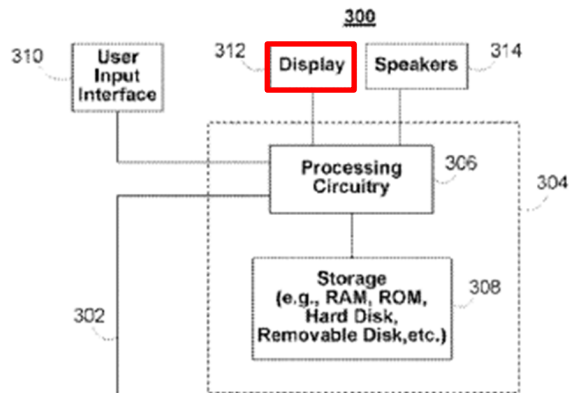


FIG. 3

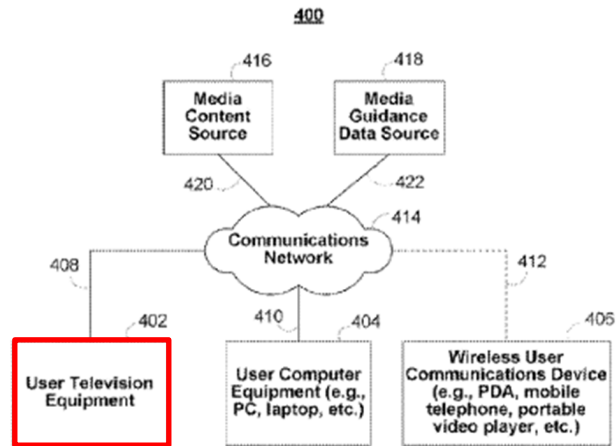


FIG. 4

Ex.1005, Figs. 3 & 4 (annotated).

Users may access content and the media guidance application (and its display screens described above and below) from one or more of their **user equipment devices**. FIG. 3 shows a generalized embodiment of illustrative user equipment device 300. More specific implementations of user equipment devices are discussed below in connection with FIG. 4.

Ex.1005, [0047].

User equipment device 300 of FIG. 3 can be implemented in system 400 of FIG. 4 as user television equipment 402, user computer equipment 404, wireless user communications device 406, or any other type of user equipment suitable for accessing content, such as a non-portable gaming machine.

Ex.1005, [0055].

[10.1] a processor; and

200. See [1.1.1].

[10.2] a computer-readable storage medium storing computer-readable instructions, which when executed by the processor, cause the processor to perform:

201. Melnychenko's "**memory (i.e., storage) 308**" in the user equipment device 300 renders obvious the claimed "*computer-readable storage medium storing computer-readable instructions,*" because the memory 308 stores "**computer software**" that, when executed, provides the "media guidance applications" of Melnychenko. Ex.1005, [0048]-[0051], [0071].

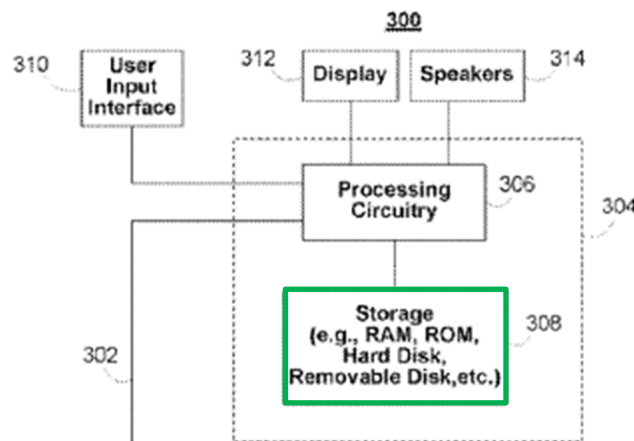


FIG. 3

Ex.1005, Fig. 3 (annotated).

Memory may be an electronic storage device provided as storage 308 that is part of control circuitry 304. As referred to herein, the phrase "electronic storage device" or "storage device" should be understood to mean any device for storing electronic data, **computer software**, or firmware, such as **random-access memory**, read-only memory, **hard drives**, optical drives, digital video disc (DVD) recorders, compact disc (CD) recorders, BLU-RAY disc (BD) recorders, BLU-RAY 3D disc

recorders, digital video recorders (DVR, sometimes called a personal video recorder, or PVR), solid state devices, quantum storage devices, gaming consoles, gaming media, or any other suitable fixed **or removable storage devices**, and/or any combination of the same. Storage 308 may be used to store various types of content described herein as well as media guidance information, described above, and guidance application data, described above. Nonvolatile memory may also be used (e.g., to launch a boot-up routine and other instructions). Cloud-based storage, described in relation to FIG. 4, may be used to supplement storage 308 or instead of storage 308.

Ex.1005, [0050].

202. Melnychenko discloses that the functions of the control circuitry 304 (embodied by metadata pre-processor 958 in Figure 9B) are performed by executing software.

Control circuitry 304 may include video generating circuitry and tuning circuitry, such as one or more analog tuners, one or more MPEG-2 decoders or other digital decoding circuitry, high-definition tuners, or any other suitable tuning or video circuits or combinations of such circuits. Encoding circuitry (e.g., for converting over-the-air, analog, or digital signals to MPEG signals for storage) may also be provided. Control circuitry 304 may also include scaler circuitry for upconverting and downconverting content into the preferred output format of the user equipment 300. Circuitry 304 may also include digital-to-analog converter circuitry and analog-to-digital converter circuitry for converting between digital and analog signals. The tuning and encoding circuitry may be used by the user equipment device to receive and to

display, to play, or to record content. The tuning and encoding circuitry may also be used to receive guidance data. **The circuitry described herein, including for example, the tuning, video generating, encoding, decoding, encrypting, decrypting, scaler, and analog/digital circuitry, may be implemented using software running on one or more general purpose or specialized processors.**

Multiple tuners may be provided to handle simultaneous tuning functions (e.g., watch and record functions, picture-in-picture (PIP) functions, multiple-tuner recording, etc.). If storage 308 is provided as a separate device from user equipment 300, the tuning and encoding circuitry (including multiple tuners) may be associated with storage 308.

Ex.1005, [0051].

Media guidance applications may be, for example, stand-alone applications implemented on user equipment devices. For example, **the media guidance application may be implemented as software or a set of executable instructions which may be stored in storage 308, and executed by control circuitry 304 of a user equipment device 300.**

Ex.1005, [0071]; *see also* Ex.1005, [0182].

203. Thus, Melnychenko discloses *a computer-readable storage medium storing computer-readable instructions, which when executed by the processor, cause the processor to....*

[10.3.1] *receiving data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*

204. *See* [1.1.1].

[10.3.2] *wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;*

205. *See* [1.1.2].

[10.4.1] *organizing the data according to a pre-defined format corresponding to each of the plurality of subservices,*

206. *See* [1.2.1].

[10.4.2] *wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model,*

207. *See* [1.2.2].

[10.4.3] *wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and*

208. *See* [1.2.3].

[10.4.4] *wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and*

209. *See* [1.2.4].

[10.5] *providing the organized data to one or more of a plurality of content provider modules of the TV.*

210. *See* [1.3].

6. Claim 17

[17.0] *A computer program product for providing content for a Television (TV),*

211. As discussed in connection with element [1.0], Melnychenko renders obvious “[a] method for providing content for a television (TV).”

212. Melnychenko also discloses “[a] *computer program product*.”

Melnychenko expressly discloses that its system and method may be embodied in a “computer program product.”

It will be apparent to those of ordinary skill in the art that the systems and methods involved in the present application may be embodied in a **computer program product that includes a computer usable, non-transitory, and/or readable medium**. For example, such a computer usable medium may consist of a read only memory device, such as a CD ROM disk or conventional ROM devices, or a random access memory, such as a hard drive device or a computer diskette, or flash memory device having a computer readable program code stored thereon.

Ex.1005, [0182].

213. Thus, Melnychenko renders obvious “[a] *computer program product for providing content for a Television (TV)*.”

[17.1.1] *the computer program product comprising a non-transitory computer-readable storage medium having computer-readable program code embodied therewith,*

214. As discussed in connection with element [10.2], Melnychenko’s computer program product comprises “*computer-readable storage medium having computer-readable program code embodied therewith*.” Melnychenko’s electronic storage device provided as storage 308 includes “**read-only memory, hard drives, optical drives, digital video disc (DVD) recorders**” which are “*non-transitory*.”

Ex.1005, [0050].

[17.1.2] *the computer-readable program code configured when executed by a processor to:*

215. As discussed in connection with element [10.2], the prior art discloses that “*the computer-readable program code configured when executed by a processor to*” preform the claimed steps.

[17.2.1] *receive data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*

216. See [1.1.1].

[17.2.2] *wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;*

217. See [1.1.2].

[17.3.1] *organize the data according to a pre-defined format corresponding to each of the plurality of subservices,*

218. See [1.2.1].

[17.3.2] *wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model,*

219. See [1.2.2].

[17.3.3] *wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and*

220. See [1.2.3].

[17.3.4] *wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and*

221. See [1.2.4].

[17.4] *provide the organized data to one or more of a plurality of content provider modules of the TV.*

222. See [1.3].

B. Ground 2: Claims 1-3, 6, 10-12, and 16-18 are obvious over Melnychenko in view of Chen, Kim, and Lee-1.

1. Overview of Kim

223. U.S. Patent Publication No. 2012/0054794 to Kim et al. (Ex.1006, “Kim”) was filed on March 9, 2011, and published on March 1, 2012.

224. Like the ’805 patent, Kim relates to “[a] multifunctional display device and a method of controlling the same” for providing “an interactive content service” from various content providers (CPs). Ex.1006, Abstract, [0031]-[0032], [0037]. Kim describes controlling the content of an image display apparatus, such as a smart TV.

The image display apparatus 100 may be, for example, a network TV, a smart TV, an HbbTV, or another appropriate multifunctional display device. The image display apparatus 100 may include, for example, a broadcast interface 101, a section filter 102, an Application Information Table (AIT) filter 103, an application data processor 104, a broadcast data processor 111, a media player 106, an IP processor 107, an Internet interface 108, and a runtime module 109. The image display apparatus 100 may receive AIT data, real-time broadcast content, application data, and stream events through the broadcast interface 101. The

realtime broadcast content may be referred to as a linear Audio/Video (A/V) content.

Ex.1006, [0038].

225. Kim's image display apparatus 100 (smart TV) displays "a Graphical User Interface (GUI) in the form of an OSD [On Screen Display]." Ex.1006, [0060]. A variety of information and content can be displayed on this OSD:

The OSD generator 340 may generate an OSD signal autonomously or based on to user input. For example, the OSD generator 340 may generate signals by which a variety of information is displayed as images or text on the display 180, according to control signals received from the user input interface 150. The OSD signal may include various data such as a UI, a variety of menu screens, widgets, icons, etc. For example, the OSD generator 340 may generate a signal by which subtitles are displayed with a broadcast image or Electronic Program Guide (EPG)-based broadcasting information.

Ex.1006, [0137].

226. Kim discloses that the user may operate a remote control to send commands to the user interface 150. Ex.1006, [0112] ("The remote controller 200 may transmit a user input to the user input interface 150."). The remote control 200 may interact with the OSD by transmitting "various user input signals such as a power-on/off signal, a channel selection signal, and a screen setting signal from [the] remote controller 200" to a "user input interface 150." Ex.1006, [0086]. For example, Kim's remote control may be used to select and display various "card

objects” that are generated by the OSD generator 340 to provide access to different types of content in a “home screen” of the smart TV. Ex.1006, [0094] (“The home screen may include a plurality of card objects classified according to content sources.”).

The image display apparatus according to the embodiment of the present disclosure may include a card object generator that generates and displays the card object. In one embodiment, the card object generator may be an OSD generator 340 or a functional part included in the controller or another component.

Ex.1006, [0095].

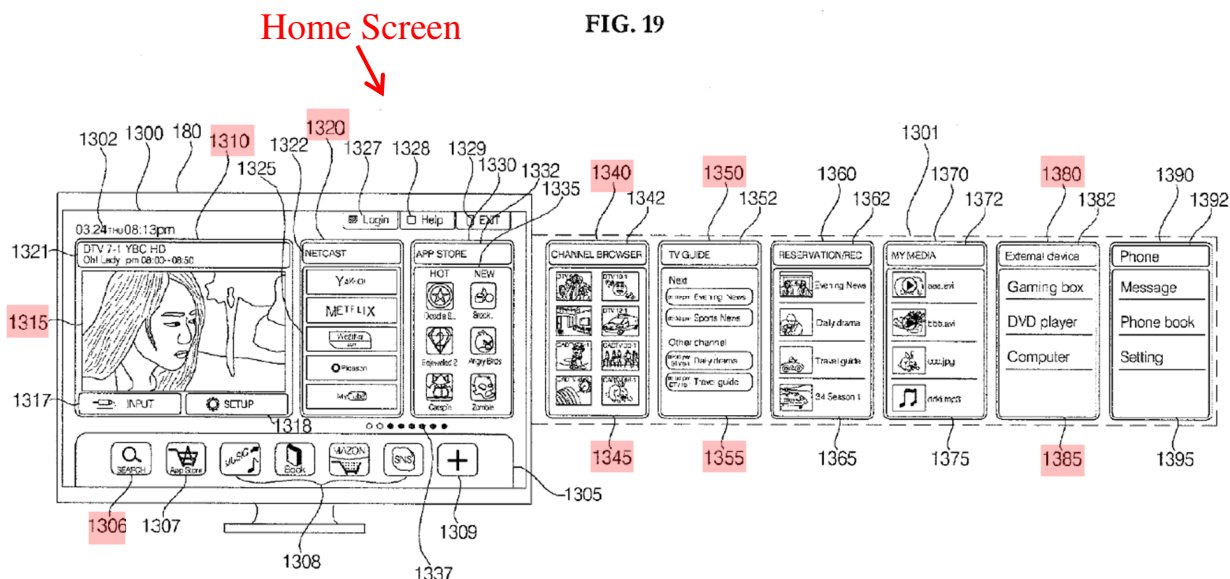
Referring to FIG. 19, a card object area may be defined in a home screen 1300. The card object area may include a plurality of card objects 1310, 1320 and 1330 which may be classified based on the source or a type of content. The image display apparatus may include a card object generator which generates and displays the card object. In certain embodiments, the card object generator may be an OSD generator 340 or a functional module included in the controller or another component of the display apparatus 100.

Ex.1006, [0193].

227. As shown in Figure 19 below, Kim describes a number of different types of card objects that may be generated by the OSD generator 340 of the image display apparatus 100 and presented on the home screen to provide the user with different types of content and user actions. For example, the card objects that may be provided in Kim’s home screen include.

- a broadcast card object 1310 for “display[ing] a broadcast image 1315 received through the tuner 110 or the network interface 130 [of the client’s image display apparatus 100]” (Ex.1006, [0195], [0197]);⁶
- a card object 1320 (“NetCast”) that “provide[s] a list of CPs, e.g., a list of CPs available through NetCast” (media providers such as Yakoo, Metflix, weather.com, Picason, MyTube, etc.) (Ex.1006, [0195], [0201]);
- a card object 1340 (“Channel Browser”) that provides “a list of broadcast channels,” including “a thumbnail list of broadcast channels 1345” (Ex.1006, [0205]);
- a card object 1350 that provides “a program list [] contain[ing] a card object name 1352 (TV GUIDE) and a program list 1355” (Ex.1006, [0207]);
- a card object 1370 (“External Device”) that displays “a device list 1385 of external devices connected to the image display apparatus 100” (Ex.1006, [0210]); and
- an application menu item 1306 that allows the user to search for specific content using “a search function based on an input search keyword” (Ex.1006, [0215]-[0216]).

⁶ Kim’s Fig. 6 shows “a block diagram of the image display apparatus of FIG. 1 or Fig. 2” with an internal tuner 110 and network interface. Ex.1006, [0065]-[0068].



Ex.1006, Fig. 19 (annotated).

228. As shown in Figure 19 above, Kim explains that the “card objects are classified according to content sources,” and the card objects are generated by the OSD generator 340 of the image display apparatus 100 and displayed on the home screen to provide the user with access to the different types of content on the home screen and/or utilize application functions such as a search query. Ex.1006, [0094]-[0095], [0215]-[0216]. Further, Kim discloses that the user may scroll (e.g., using the remote control 200) through the various card objects on the home screen to access desired content or application functions. Ex.1006, [0096], [0213], [0223].

2. Summary of Lee-1

229. U.S. Patent No. 9,008,190 to Lee et al. (Ex.1008, “Lee-1”) was filed on January 4, 2010, and issued on April 14, 2015.

230. Kim cites to and incorporates by reference “application Ser. No. 127651,730,” which is Lee-1. Ex.1006, [0106]. In particular Kim incorporates Lee-1’s “[e]xamples of thumbnails and methods_of using the same.” Ex.1006, [0106]. Lee-1 discloses a “thumbnail generator 250 [that] includes a scaler 220, and an image compression circuit 230.” Ex.1008, 7:48-49. “The thumbnail generator 250 generates a thumbnail by scaling and compressing pictures” so that it has an “appropriate size when it is displayed on the display 180 with a thumbnail view.” Ex.1008, 8:31-40. Lee-1 also discloses that a “displayed thumbnail image may be...a previously stored image.” Ex.1008, 12:65-67.

3. Reasons to Combine Kim with Melnychenko

231. A POSITA would have been motivated to combine Kim with Melnychenko (as modified per Chen) for numerous reasons as discussed below.

a) Analogous Art

232. Kim, like Melnychenko and Chen, is analogous art because it is in the same field of endeavor as the ’805 patent. Ex.1006, [0086], Abstract; Ex.1001, 2:16-33; Ex.1005, [0005], [0030]-[0032]; Ex.1007, [0016]-[0017]. Additionally, Kim is reasonably pertinent to a problem that the inventors of the ’805 patent attempted to solve, including displaying content such as electronic program guide content. Ex.1001, 12:46-52, claim 2; Ex.1006, [0137], Fig. 19.

b) Motivation to Combine Kim with Melnychenko

233. A POSITA would have been motivated to modify apply Kim's teachings to Melnychenko (as modified per Chen) to obtain predictable and beneficial results.

234. Melnychenko's Figure 1 below illustrates "grid program listings display 100" with metadata displayed on the user's TV of Melnychenko for different types of content including, e.g., television EPG, VOD, and other media such as the Internet and recorded videos. Ex.1005, [0036]-[0039].

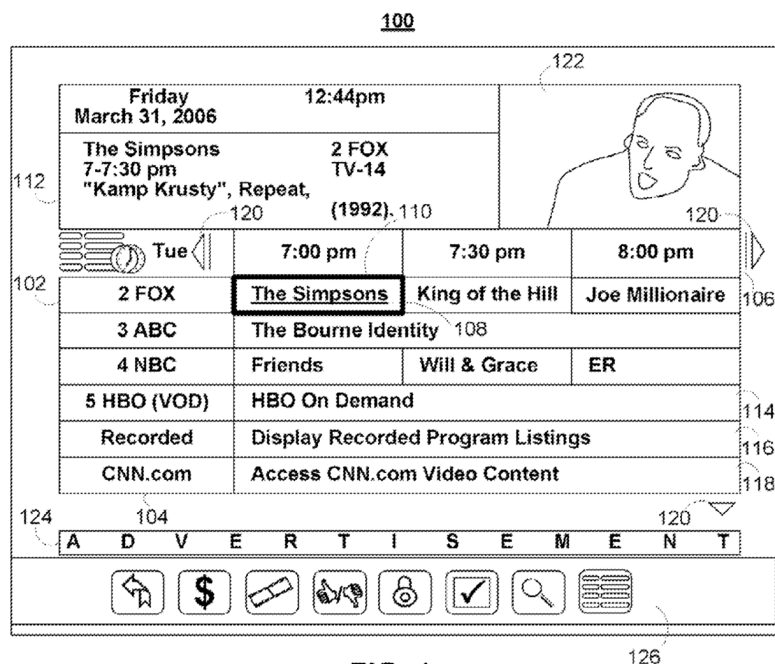


FIG. 1

Ex.1005, Fig. 1.

235. Kim also discloses a "multifunctional display device" (e.g., an image display apparatus or Smart TV 100) with a "home screen" that "provid[es] a more

intuitive graphical interface.” Ex.1006, [0038], [0094], [0282], Abstract. Kim’s home screen comprises “card objects are classified according to content sources.” Ex.1006, [0094]. The content sources overlap with Melnychenko’s content sources, including EPG, VOD, and media, among others. Ex.1006, [0082], [0094], [0138], [0142], [0196]; Ex.1005, [0032].

236. Kim discloses that a controller 170 has an “OSD generator” that generates and displays the card objects in the home screen of the display. Ex.1006, [0038], [0094], [0095]; *see also* Ex.1006 [0193], [0133], [0137]. The contents displayed in the card objects include content and information stored in memory 140. Ex.1006, [0081], [0084]-[0085], [0089], [0092]-[0093], Fig. 19. The OSD generator, for example, may use content stored in memory to generate and provide signals to display the following card objects that are illustrated at Figure 19: an electronic program guide (EPG), TV GUIDE card object 1350, a MY MEDIA card object 1370, an EXTERNAL DEVICE card object 1280, a CHANNEL BROWSER card object 1340 and RESERVATION/REC card object 1360, among others. *See* Ex.1006, [0193]-[0214].

237. Kim contemplates that “[f]unctional programs, code, and code segments needed to realize the embodiments herein may be construed by one of ordinary skill in the art.” Ex.1006, [0299]. It would have been obvious to a POSITA to realize the “OSD generator” with functional programs, code, and code

segments,⁷ where one functional program generates one card object (see Fig. 19).

238. In view of the increasing availability of different types of content that may be presented on a user's TV, a POSITA would have been motivated to implement Melnychenko's processor (e.g., processor 960 which is analogous to Kim's controller 170) with an OSD generator's functional programs to generate signals to display a plurality of card objects on a home screen, per Kim (see Fig. 19), to thereby "provid[e] a more intuitive graphical interface." Ex.1006, [0282].

239. The combination is nothing more than applying a known technique (e.g., using OSD generator functional programs to generate and display card objects in a home screen, per Kim) to improve the similar user television equipment 402 of Melnychenko (e.g., provide a more intuitive graphical interface that has a home screen with card objects classified according to different content sources). Ex.1006, [0094], [0282].

240. Additionally, the combination of Kim with Melnychenko (as modified per Chen) is merely combining prior art elements (e.g., OSD generator functional programs, per Kim, with Melnychenko's processor 960) according to known

⁷ For brevity, in the following analysis I will refer to "functional programs," which would be understood to comprise "code, and code segments." Ex.1006, [0299].

methods (e.g., a processor utilizing OSD generator functional programs to generate card objects, as evidenced by Kim) to yield predictable results (Melnychenko's user television equipment 402 providing a home screen with card objects that are "classified according to content sources," as taught by Kim). Ex.1006, [0094].

c) Reasonable Expectation of Success

241. The results would have been predictable and there would have been a reasonable expectation of success in the combination given that both Melnychenko and Kim illustrate similar televisions that receive content from a plurality of sources and display the content to the user. Additionally, Melnychenko's program guide listings 100 are generated by control circuitry 304 (including processing circuitry 306 in Figure 3) executing program instructions. Ex.1005, [0048]. Likewise, Kim's controller 170 (a processor) utilizes OSD generator functional programs to generate and display card objects and associated content and metadata on the home screen of the television. Ex.1006 [0038], [0133], [0137].

242. A POSITA would have been able to successfully implement Melnychenko (as modified per Chen) with an OSD generator (realized with functional programs) that generates card objects and provides corresponding signals to display on a home screen, per Kim, as a matter of routine software programming. *See* Ex.1006, [0299] ("**Functional programs, code, and code segments needed to realize the embodiments herein may be construed by one**

of ordinary skill in the art.”), [0300] (“[W]hen a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted **that it is within the purview of one skilled in the art to effect such feature.**”).

243. I note that the proposed combination relies on the teachings of the references, and I do not suggest that physical incorporation of Kim’s elements (e.g., OSD generator functional programs) into components of Melnychenko’s user television equipment 402 is required; however, it is permitted in the proposed combination.

4. Reasons to Combine Lee-1 with Melnychenko

244. A POSITA when considering the combination of Melnychenko Chen, and Kim would have also considered the analogous teachings of Lee-1, which are incorporated by reference in Kim. Ex.1006, [0106]. In so doing, a POSITA would have applied Lee-1’s thumbnail generator teachings to successfully implement Melnychenko’s system and method (as modified per Kim), which would display card objects that include thumbnails. It would have been obvious to a POSITA to apply the thumbnail generator teachings of Lee-1 because they provide implementation details directly applicable to successfully implementing the proposed combination of Kim and Melnychenko (as modified per Chen). This reason is sufficient to explain why a POSITA would have sought and combined the identified disclosures of Lee-1. Nevertheless, additional reasons for combining the

relevant teachings are provided in the claim analysis below.

245. The proposed combination relies on the teachings of the references, and I do not suggest that physical incorporation of Lee-1's elements (e.g., thumbnail generator) into Melnychenko's user television equipment 402 required; however, it is permitted in the proposed combination.

5. Claim 1

246. To the extent Patent Owner argues that claim 1 element [1.3] (*"providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV"*) is not rendered obvious by Melnychenko in combination with Chen, the further combination with Kim and Lee-1 renders it obvious.

[1.3] *providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.*

247. Consistent with the discussion in the claim construction of *"one or more,"* I understand that a prior art showing even only one content provider module that receives the organized data satisfies the claim. Ex.1001, 3:21-28.

248. First, as discussed in connection with element [1.2.1], Melnychenko in combination with Chen discloses pre-processor 958 (*"the processor"*) and organized metadata of uniform format (*"the organized data"*). In the context of this ground, the claimed *"processor"* additionally corresponds to Melnychenko's processor 960. This is consistent with the '805 patent's *"processor,"* which **may**

include multiple processor cores, and/ or implement multiple virtual processors.”

Ex.1001, 16:6-8.

249. Second, Melnychenko in combination with Chen and Kim renders obvious “*providing, by the processor, the organized data to one ... content provider module[] of the TV.*”

250. As discussed in connection with element [1.3] in Ground 1, Melnychenko in combination with Chen discloses that the pre-processor 958 (“*the processor*”) provides the organized metadata to a media context control unit so that it is stored in a metadata database 956. *See also* Ex.1005, [0126]. Then, “[w]hen processor 960 is about to utilize metadata” (e.g., when “metadata is used to generate a program guide listing for display”) the processor 960 “access[s] metadata database 956 directly.” Ex.1005, [0067], [0126].

251. In the same vein, Kim discloses that the television controller 170 has an “**OSD generator**” that generates and displays card objects in a home screen of the display. Ex.1006, [0038], [0065], [0094], [0095]; *see also* Ex.1006 [0193], [0133], [0137] (explaining that the OSD generator is a functional component of the controller that generates a plurality of card object signals to be displayed). Kim’s “controller 170 may provide overall control,” including controlling the display of content stored in memory 140. Ex.1006, [0081], [0089], [0092]-[0093]. Kim’s Figure 10 illustrates the smart TV 100, which includes the controller 170 and

associated memory 140 used to generate card objects for the home screen illustrated at Figure 19. Ex.1006, [0133].

252. Kim contemplates that “[f]unctional programs, code, and code segments needed to realize the embodiments herein may be construed by one of ordinary skill in the art.” Ex.1006, [0299]. Accordingly, it would have been obvious to a POSITA to realize the “OSD generator” with a plurality of functional programs, where one functional program generates one card object (*see* Fig. 19). Each OSD generator functional program for generating a card object corresponds to a “*content provider module[]*” and one or more of the OSD Generator functional programs correspond to “*a plurality of content provider modules.*”

253. It would have been obvious to a POSITA to implement an OSD generator in Melnychenko’s system, such that Melnychenko’s processor 960 (which is analogous to Kim’s controller 170) has functional programs to generate and display card objects in a home screen. The home screen would provide Melnychenko’s user television equipment 402 additional functionality corresponding to each generated card object (*see* Ex.1006, Fig. 19), which would not otherwise be available. *See* Reasons to Combine Kim with Melnychenko.

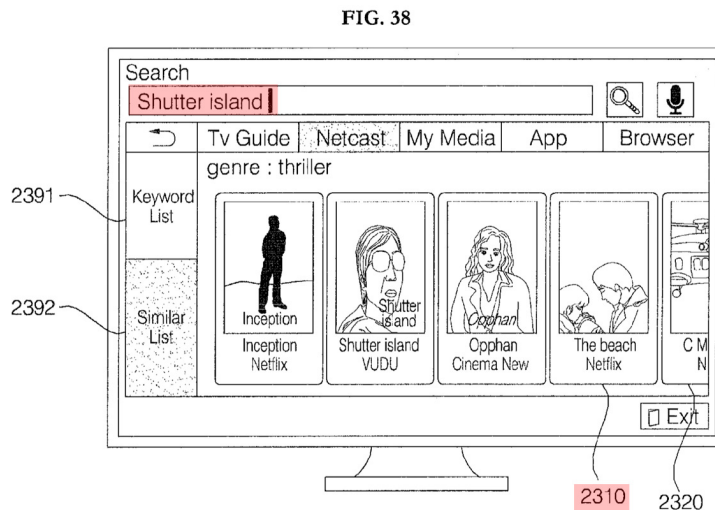
254. In the proposed combination, Melnychenko’s processor 960 would access the organized metadata in metadata database 956 (Ex.1005, [0067], [0126]), and provide the metadata to an OSD generator (realized with functional programs)

to generate card objects. This implementation would be consistent with Kim's disclosure that the controller 170 (which implements an OSD generator) provides overall control, including controlling the display of content stored in memory 140 (Ex.1006, [0081], [0089], [0092]-[0093]) and also with Melnychenko's disclosure that processor 960 "access[es] metadata database 956 directly." Ex.1005, [0126].

255. For example, it would have been obvious for an OSD generator functional program (used by Melnychenko's processor 960) to utilize the organized metadata to generate a signal for an Electronic Program Guide. *See* Ex.1006, [0137] ("For example, the OSD generator 340 may generate a signal [for an] Electronic Program Guide (EPG)-based broadcasting information."); *see also* Ex.1006, Fig. 19 (illustrating TV Guide card object 1350) Kim's teaching facilitates one of Melnychenko's objectives; namely, that "metadata is used to generate a program guide listing for display." Ex.1005, [0067]. The Electronic Program Guide (EPG) implementation is within the scope of the '805 patent, which describes that the content provider module is "configured to provide content to video hardware or display of the in Intelligent TV." Ex. 1001, 2:47-51; *see also infra*, [2.0] ("wherein the plurality of content provider modules comprises an EPG data provider.").

256. In addition, Kim discloses a scan application function 1306 displayed on the home screen allows a user to search for (scan) media and other content.

Ex.1006, [0216] (“The search application menu item 1306 may provide a search function based on an input search keyword.”). For example, as shown in Figure 38 below, Kim discloses that the controller 170 outputs a “search results object 2310” identifying search results of media content that match a keyword search (“Shutter island”). Ex.1006, [0269]-[0271].



257. Consistent with Kim’s statement of realizing its embodiments with **“[f]unctional programs, code, and code segments”** (Ex.1006, [0299]), it would have been obvious to a POSITA to realize the functionality of searching for content with a functional program, where one functional program provides search result content to the search application for display as illustrated at Figure 38. The search functional program corresponds to a claimed “*content provider module[]*,” as confirmed by claim 2. *See* Ex.1001, Claim 2 (“*the plurality of content provider modules comprises...a media scanner*”).

258. It would have been obvious to a POSITA to implement a search functional program in Melnychenko's system to facilitate the search for content, per Kim. The search functional program would give Melnychenko's user television equipment 402 additional functionality of searching for specific terms across multiple categories so that the user would be able identify a desired program or content in search result page. *See* Ex.1006, [0266]-[0275], Figs. 37-41; *see also* Reasons to Combine Kim with Melnychenko.

259. Thus, Melnychenko in view of Chen and Kim discloses providing, by the processor 960, the organized metadata to an OSD generator (realized with functional programs) to generate and Electronic Program Guide (EPG) and also that the processor 960 utilizes a search functional program, which renders obvious *"providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV,"* as claimed. *See also infra*, claim 2 (analyzing how the OSD generator functional programs correspond to *"a media data provider"* and *"a media browser"*).

260. Third, and additionally, the further combination with Lee-1 discloses a *"content provider module[]"* as a "thumbnail generator." Ex.1008, Abstract.

261. Kim discloses that its processor is **"configured to generate thumbnail images"** corresponding to channel signals or external input signals." Ex.1006, [0104]. Kim explains that "[t]he thumbnail list 1345 may include

information related to the channels as well as the thumbnail images for the channels such that the broadcast programs of the channels may be readily identified.” Ex.1006, [0205]. Kim discloses “thumbnails may include a representation of the corresponding content (e.g., an image of the content).” Ex.1006, [0186]; *see also* Ex.1006, [0206]. While Kim discloses that its image display apparatus “generate[s] thumbnail images,” Kim does not expressly disclose how thumbnails are generated. Kim, however, incorporates by reference Lee-1’s “[e]xamples of thumbnails and methods of using the same.” Ex.1006, [0106].

262. In that regard, Lee-1 discloses a “**thumbnail generator** 250 [that] includes a scaler 220, and an image compression circuit 230.” Ex.1008, 7:48-49. “The thumbnail generator 250 generates a thumbnail by scaling and compressing pictures” so that it has an “appropriate size when it is displayed on the display 180 with a thumbnail view.” Ex.1008, 8:31-40. Lee-1 further discloses that a “displayed thumbnail image may be...a previously stored image.” Ex.1008, 12:65-67.

263. It would have been obvious to a POSITA, when applying Kim’s teachings to Melnychenko (as modified by Chen), to also utilize a “thumbnail generator” as Lee-1 discloses, at least because Kim utilizes Lee-1’s thumbnail teachings and because the combination would facilitate generating thumbnails that would be utilized by an OSD generator when generating card objects. *See also*

Reasons to Combine Lee-1 with Melnychenko.

264. In the proposed combination, Melnychenko's pre-processor 958 or processor 960 would implement a thumbnail generator (as taught by Lee-1) to generate thumbnails. Lee-1's teachings would provide benefits to Melnychenko. For example, because Lee-1's thumbnails may be stored (Ex.1008, 12:65-67), it would have been obvious to a POSITA for the thumbnails to be organized as metadata in the metadata table (per Chen) and stored in a metadata database 956 (Ex.1005, [0041] ("...images... may be stored...in a database connected to the user equipment")). During operation, the thumbnails would be retrieved by the processor 960 from database 956 (Ex.1005, [0126]; Ex.1008, 12:65-67) and provided to an OSD generator to generate various card objects (Ex.1006, Fig. 19 (illustrating thumbnails in the card objects)). As another example, the stored thumbnails may be retrieved by the processor 960 from database 956 (Ex.1005, [0126]; Ex.1008, 12:65-67) and provided to the thumbnail generator so that a "size change is performed to display a thumbnail with an appropriate size when it is displayed on the display 180 with thumbnail view" (Ex.1008, 8:38-40).

265. Thus, the proposed combination of Melnychenko, Chen, Kim, and Lee-1 also renders obvious "*a plurality of content provider modules of the TV.*"

6. Claim 2

[2.0] *The method of claim 1, wherein the plurality of content provider modules comprises an EPG data provider, a media data provider, a media browser, a media scanner, and a thumbnail engine.*

266. Melnychenko in combination with Chen, Kim, and Lee-1 renders obvious this element.

267. As discussed in connection with element [1.3], the prior art discloses OSD generator functional programs (“*content provider modules*”), a search functional program (“*content provider module[]*”), and a thumbnail generator (“*content provider module[]*”).

“an EPG data provider”

268. Consistent with the discussion in connection with element [1.3], it would have been obvious for Melnychenko’s processor 960 to use an OSD generator functional program to generate a signal for an Electronic Program Guide, which renders obvious “*an EPG data provider*,” as claimed.

“a media data provider”

269. Consistent with the discussion in connection with element [1.3], Kim discloses that the OSD generator (realized with a functional program) generates Channel Browser card object 1340. Ex.1006, [0193]-[0196] (“The image display apparatus may include a card object generator which generates and displays the card object” including “a CHANNEL BROWSER card object 1340 which may

provide a thumbnail list of broadcast channels.”). Also, Kim’s channels may be represented by “thumbnail images [that] may correspond to pre-stored user channels (e.g., favorite list) or to channel numbers relative to the channel being displayed.” Ex.1005, [0206]. The OSD generator functional program that generates a channel browser card object 1380 (which may comprise pre-stored user channels) corresponds to a “*media data provider*,” as claimed.

270. Additionally, Kim discloses that the OSD generator (realized with a functional program) generates Reservation/Rec card object 1360, and My Media card object 1370. Ex.1006, [0196] (“[A] RESERVATION/REC card object 1360 which may provide a reserved or recorded program list, a MY MEDIA card object 1370 which may provide a list of multimedia files which are available on the image display apparatus 100 or on a device connected to the image display apparatus 100.”). The OSD generator (realized with a functional programs) that generates Reservation/Rec card object 1360, and My Media card object 1370 also corresponds to a “*media data provider*,” as claimed.

271. It would have been obvious to a POSITA, when implementing Melnychenko to utilize OSD generator functional programs (*see* [1.3], Ground 2), for functional programs to generate Channel Browser card object 1340, Reservation/Rec card object 1360, and My Media card object 1370, so that the user has additional information and is able to access different content. *See* Reasons to

Combine Kim with Melnychenko.

272. Thus, Melnychenko in view of Chen and Kim in numerous ways renders obvious a “*media data provider*,” as claimed.

“a media browser”

273. Consistent with the discussion in connection with element [1.3], Kim discloses that the OSD generator (realized with a functional program) generates an External Device card object 1380. Ex.1006, [0193], [0196] (“The image display apparatus may include a card object generator which generates and displays the card object” including “an EXTERNAL DEVICE card object 1380 which may provide a list of external devices which may be connected to the image display apparatus 100.”). External Device card object 1380 “may display a list of connected external devices...includ[ing] a gaming box, a DVD player, a computer, or another appropriate device.” Ex.1006, [0210].

274. OSD generator (realized with a functional program) generates an External Device card object 1380 corresponds to a “*media browser*,” as claimed. This is consistent with the ’805 patent, where the “media browser 1416c may maintain a list of the connected devices 168” which are external devices such as “DVD players 168a, BluRay players 1686, portable digital media devices 168c, smart phones 168d, tablet devices 168e, personal computers 168f,” etc. Ex.1001, 13:5-16.

275. It would have been obvious to a POSITA, when implementing Melnychenko to utilize OSD generator functional programs (*see* [1.3], Ground 2), for one of the functional programs to generate External Device card object 1380 so that the user is informed about external devices that may be connected.

276. Melnychenko in view of Chen and Kim discloses that an OSD generator functional program generates External Device card object 1380, which renders obvious a “*media browser*,” as claimed.

“a media scanner”

277. Consistent with the discussion in connection with element [1.3], it would have been obvious for Melnychenko’s processor 960 to implement a search functional program, which renders obvious “*a media scanner*,” as claimed.

“a thumbnail engine”

278. Consistent with the discussion in connection with element [1.3], it would have been obvious for Melnychenko’s pre-processor 958 or processor 960 to implement a thumbnail generator, which renders obvious “*a thumbnail engine*,” as claimed.

7. Claim 3

[3.0] *The method of claim 2, wherein the EPG data provider is configured to serve one or more applications of the TV with EPG information in a read-only format.*

279. Melnychenko in combination with Chen, Kim, and Lee-1 renders

obvious this element.

280. Consistent with the discussion in connection with element [1.3], Melnychenko and Kim discloses an OSD generator (realized with functional programs) to generate and Electronic Program Guide (EPG) (*“the EPG data provider”*). The OSD generator functional program EPG *“is configured to serve one or more applications of the TV”* (e.g., serves the home screen on which a broadcast card object 1310 is displayed). Ex.1006, [0137] (*“[T]he OSD generator 340 may generate signals by which a variety of information is displayed as images or text on the display 180, according to control signals received from the user input interface 150....For example, the OSD generator 340 may generate a signal by which subtitles are displayed with a broadcast image or Electronic Program Guide (EPG)-based broadcasting information.”*), [0193] (card objects generated by “OSD generator 340 or a functional module included in the controller or another component of the display apparatus 100.”).

281. Further, Kim renders obvious that the *“EPG information [is] in a read-only format.”* For example, Kim discloses that “[t]he information object 1321 [in the broadcast card object 1310] that displays information related to the broadcast image 1315 may include a channel number (DTV7-1), a channel name (YBC HD), the title of a broadcast program (‘Oh! Lady’), and an airtime (8:00-8:50 PM) for the broadcast program.” Ex.1006, [0199]. This information is served

in a read-only format because “the user may readily obtain information regarding the displayed broadcast image 1315 through the information object 1321,” and “EPG information” about the broadcast program is displayed “if the user selects the information object 1321.” Ex.1006, [0199]. A POSITA would have understood that this EPG information is served in a read-only format because its purpose is to provide information to the user about the broadcast program currently displayed and therefore may not be edited. *See, e.g.*, Ex.1006, [0142] (controller 170 receives “encoded signal such as an EPG which includes broadcasting information specifying the start time, end time, etc. of scheduled broadcast TV or radio programs.”).

282. Thus, Melnychenko in combination with Chen, Kim, and Lee-1 obvious that “*the EPG data provider is configured to serve one or more applications of the TV with EPG information in a read-only format,*” as claimed.

8. Claim 9

[9.0] *The method of claim 2, wherein the thumbnail engine is configured to provide thumbnails for media, applications, or other contents.*

283. Melnychenko in combination with Chen, Kim, and Lee-1 renders obvious this element.

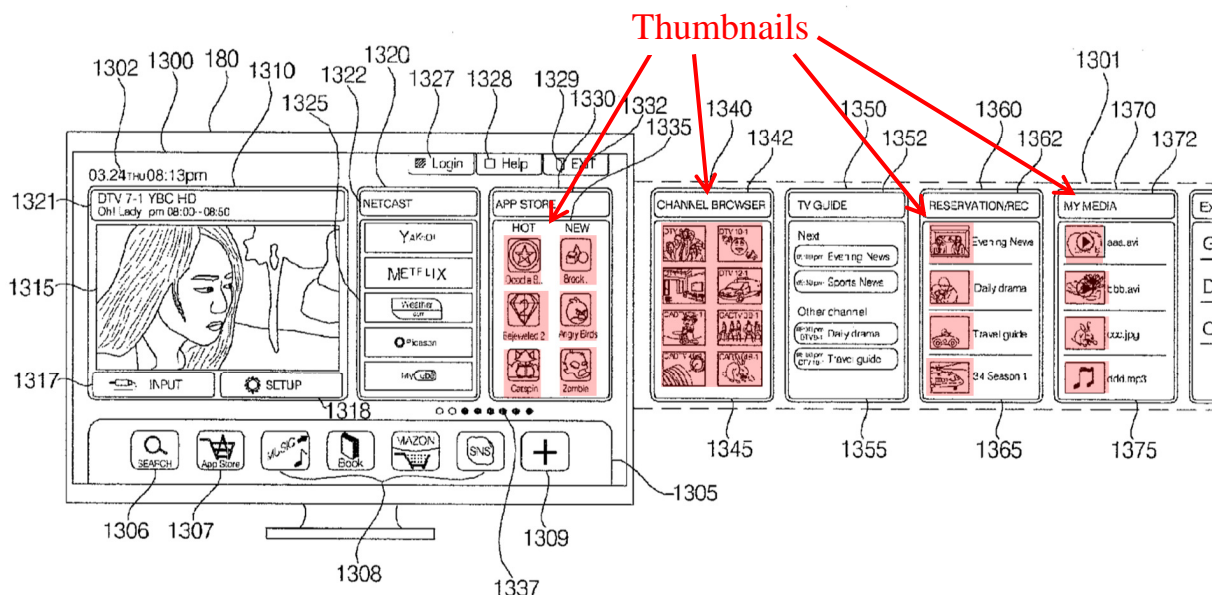
284. Initially, I note that element [9.0] recites features in the alternative: *wherein the thumbnail engine is configured to provide thumbnails for media, applications, or other contents.* Thus, element [9.0] does not require each of

*“media,” applications,” **and** “other contents.”*

285. Consistent with the discussion in connection with element [1.3], the prior art discloses a thumbnail generator (*“the thumbnail engine”*). As also noted above, Lee-1 discloses that “[t]he thumbnail generator 250 generates a thumbnail by scaling and compressing pictures” so that it has an “appropriate size when it is displayed on the display 180 with a thumbnail view.” Ex.1008, 8:31-40. Also, a “displayed thumbnail image may be...a previously stored image.” Ex.1008, 12:65-67.

286. As shown in the annotated excerpt of Figure 19 below, Kim discloses that thumbnails (highlighted in **red**) are provided in numerous different card objects 1330, 1340, 1360, and 1370. For example, card object 1330 (App Store) contains thumbnails (“application icon”) for applications that the user may download. Ex.1006, [0202]. Card object 1340 (Channel Browser) contains “a thumbnail list of broadcast channels.” Ex.1006, [0196]. Card object 1360 (Reservation/Rec[orded]) contains thumbnails for “a reserved (e.g., a scheduled recording) or recorded program list may include a card object name 1362 (RESERVATION/REC) and a scheduled or recorded program list 1365.” Ex.1006, [0208], [0196]. Card object 1370 (My Media) contains thumbnails for “multimedia files which are available on the image display apparatus 100 or on a device connected to the image display apparatus 100.” Ex.1006, [0196].

FIG. 19



Ex.1006, Fig. 19 (annotated excerpt).

287. In the above figure, thumbnails are provided for media (e.g., thumbnails for media in channel browser card object 1340 and/or thumbnails for reserved and/or recorded media in Reservation/Rec card object 1360), applications (thumbnails in App Store card object 1330 showing applications available for download from the App Store), or other contents (thumbnails in My Media card object 1370).

288. Thus, Melnychenko in view of Kim and Lee-1 renders obvious “*the thumbnail engine is configured to provide thumbnails for media, applications, or other contents,*” as claimed.

9. Claim 10

289. Initially, I note independent claims 10 and 17 are substantially similar in scope to claim 1, except that claim 1 recites “[a] method of providing content for a television (TV),” whereas claim 10 recites “[a] data service system in a Television (TV),” and claim 17 recites “[a] computer program product for providing content for a Television (TV).” Ex.1017 is a Claim Comparison Chart for claims 1-18 of the ’805 patent. My analysis of claims 10 and 17 below focuses on features of claims 10 and 17 not expressly recited in claim 1. Where there are identical or substantially identical elements with claim 1, I refer to my analysis of the corresponding elements of claim 1 for simplicity.

[10.0] *A data service system in a Television (TV), the system comprising:*

290. See [10.0], Ground 1.

291. **[10.1] *a processor; and***

292. See [1.1.1], Ground 1.

[10.2] *a computer-readable storage medium storing computer-readable instructions, which when executed by the processor, cause the processor to perform:*

293. See [10.2], Ground 1.

[10.3.1] *receiving data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*

294. See [1.1.1], Ground 1.

[10.3.2] *wherein the plurality of subservices comprises a video-on-demand*

(VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;

295. See [1.1.2], Ground 1.

[10.4.1] organizing the data according to a pre-defined format corresponding to each of the plurality of subservices,

296. See [1.2.1], Ground 1.

[10.4.2] wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model,

297. See [1.2.2], Ground 1.

[10.4.3] wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and

298. See [1.2.3], Ground 1.

[10.4.4] wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and

299. See [1.2.4], Ground 1.

[10.5] providing the organized data to one or more of a plurality of content provider modules of the TV.

300. See [1.3], Ground 2.

10. Claim 11

[11.0] The data service system of claim 10, wherein the plurality of content provider modules comprises an EPG data provider, a media data provider, a media browser, a media scanner, and/or thumbnail engine.

301. See [10.0]-[10.5] and [2.0].

11. Claim 12

[12.0] *The data service system of claim 11, wherein the EPG data provider is configured to serve one or more applications of the TV with EPG information in a read-only format.*

302. See [11.0] and [3.0].

12. Claim 16

[16.0] *The data service system of claim 11, wherein the thumbnail engine is configured to provide thumbnails for media, applications, or other contents.*

303. See [11.0] and [9.0].

13. Claim 17

[17.0] *A computer program product for providing content for a Television (TV),*

304. See [17.0], Ground 1.

[17.1.1] *the computer program product comprising a non-transitory computer-readable storage medium having computer-readable program code embodied therewith,*

305. See [17.1.1], Ground 1.

[17.1.2] *the computer-readable program code configured when executed by a processor to:*

306. See [17.1.2], Ground 1.

[17.2.1] *receive data relevant to one or more scheduled events from one of a corresponding subservice of a plurality of subservices,*

307. See [1.1.1], Ground 1.

[17.2.2] *wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, an electronic programming guide (EPG) subservice, and a media subservice;*

308. See [1.1.2], Ground 1.

[17.3.1] *organize the data according to a pre-defined format corresponding to each of the plurality of subservices,*

309. See [1.2.1], Ground 1.

[17.3.2] *wherein the pre-defined format comprises one of a VOD data model, an EPG data model, and a media data model,*

310. See [1.2.2], Ground 1.

[17.3.3] *wherein organizing the data according to the pre-defined format comprises converting the data received from the subservice into the pre-defined format of the corresponding data model, and*

311. See [1.2.3], Ground 1.

[17.3.4] *wherein each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices; and*

312. See [1.2.4], Ground 1.

[17.4] *provide the organized data to one or more of a plurality of content provider modules of the TV.*

313. See [1.3], Ground 2.

14. Claim 18

[18.0] *The intelligent TV of claim 17, wherein the plurality of content provider modules comprises an EPG data provider, a media data provider, a media browser, a media scanner, and/or thumbnail engine.*

314. See [17.0], Ground 2 and [2.0], Ground 2.

C. Ground 3: Claims 4 and 3 are obvious over Melnychenko in view of Chen, Kim, Lee-1, and Lee-2.

1. Summary of Lee-2

315. U.S. Patent No. 9,398,339 to Lee et al. (Ex.1009, “Lee-2”) was filed on December 16, 2010, claims priority to Provisional application Nos. 61/379,363, 61/379,367, and 61/379,372, filed on September 1, and issued on July 19, 2016.

316. Lee-2 discloses that a user (e.g., “B user”) has a specific favorite channel list in a channel list area 3910 (Ex.1009, 41:47-57) as shown below at Figure 39B.

FIG. 39B



Ex.1009, Fig. 39B (annotated).

317. Lee-2 also discloses that the favorite channel list settings are configured by the user using a setup menu 3930, shown above at Figure 39B.

Ex.1009, 41:61-67.

318. Additionally, Lee-2 discloses that upon a user input of a local key or favorite channel key on the remote controller, a FAVORITE CH card object 2060 is displayed to the user to make the user instantly aware of favorite channels:

Referring to FIG. 32A, an image 3210 is displayed full screen on the display 180. **Upon input of a local key (not shown) or a favorite channel key (not shown) of the remote controller, the FAVORITE CH card object 2060 may be displayed on the display 180 as illustrated in FIG. 32B.** The FAVORITE CH card object 2060 may be displayed together with the image 3210 on the same screen. Therefore, the user can instantly be aware of the FAVORITE CH card object 2060 including the favorite channel list 2065.

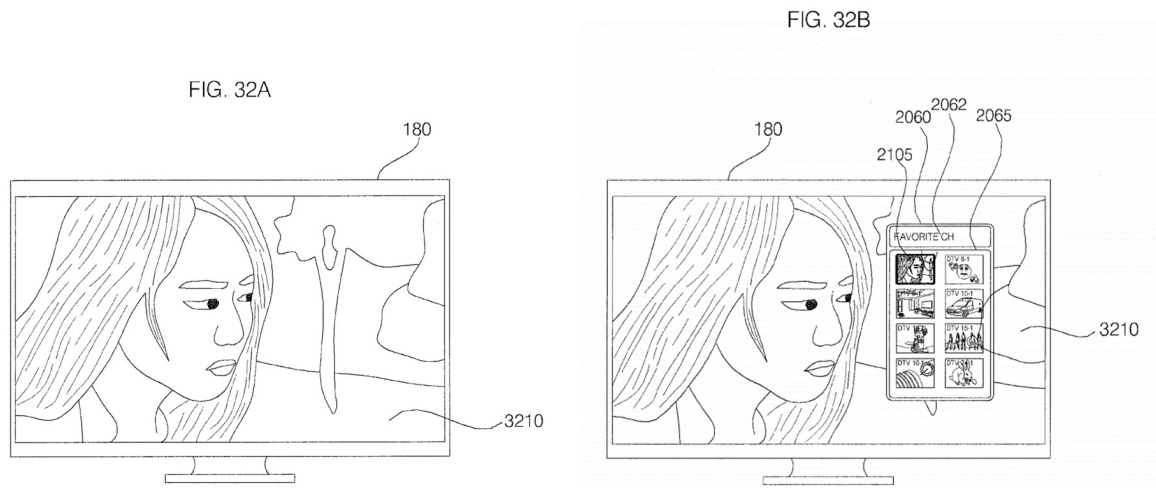
Ex.1009, 37:61-38:2, Figs. 32A, 32B.

319. The FAVORITE CH card object 2060 includes the currently watched channel:

[T]he card object generator 345 may generate the FAVORITE CH card object using a list of favorite channels pre-stored in the memory 140. **A channel that the user is watching may be included in the FAVORITE CH card object.**

Ex.1009, 33:63-67.

320. As shown below, the television (Fig. 32A) changes to display a FAVORITE CH card object 2060 (Fig. 32B) with a highlighted thumbnail of the currently watched channel.



Ex.1009, Figs. 32A and 32B.

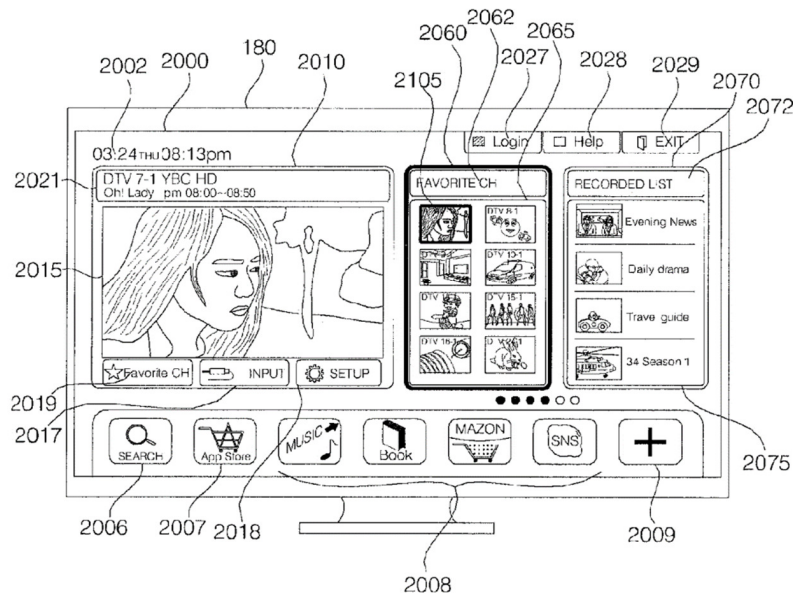
321. Lee-2 further discloses the FAVORITE CH card object may be displayed in the home screen:

Upon input of a local key (not shown) or a favorite channel key (not shown) of the remote controller, the home screen 2000 may be displayed as illustrated in FIG. 33B. **The home screen 2000 may include the FAVORITE CH card object 2060. Particularly, the FAVORITE CH card object 2060 may be highlighted.** Therefore, the user can readily view the FAVORITE CH card object 2060 including the favorite channel list 2065.

Ex.1009, 38:4-11; *see also infra* [6.4].

322. As shown below at Figure 33B, Lee-2 displays, via the television, the retrieved favorite channel list thumbnails 2065 in the FAVORITE CH card object 2060 in the global panel:

FIG. 33B



Ex.1009, Figs. 33B.

2. Claim 4

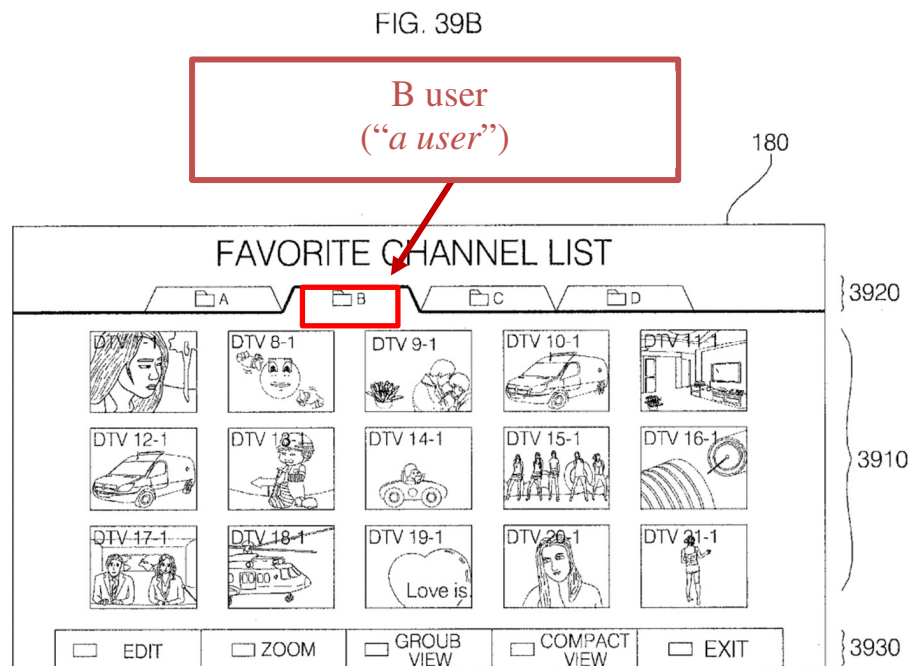
[4.0] *The method of claim 2, wherein the media data provider is configured to provide media metadata personalized for a user.*

323. Melnychenko in combination with Chen, Kim, Lee-1, and Lee-2 renders obvious this element.

324. **First**, as discussed in connection with element [1.3], Ground 2, the prior art discloses OSD generator functional programs that generate different card objects (“*content provider modules*”).

325. **Second**, Kim discloses “pre-stored user channels (e.g., favorite list),” but provides limited implementation details on this feature. Ex.1006, [0206]. Lee-2 supplements by teaching a favorite channel list that is personalized for a user

(e.g., B user).



Ex.1009, Fig. 39B (annotated).

In FIG. 39B, a group area 3920 includes tabbed menus including the plurality of groups, for example. A group, B group, C group, and D group. Each group favorite channel list may correspond to the favorite channel list of each user.

Since the channel list screen is displayed upon selection of the **favorite channel object 2019 in the BROADCAST card object 2010 by a B user**, the B group tabbed menu may be selected by default. The selected B group tabbed menu may be focused on or highlighted, as illustrated in FIG. 39B.

Ex.1009, 41:47-55; *see also* Ex.1009, 39:57-63 (“The favorite channel list 2065

may provide channel information. **Channel information about a favorite**

channel may include at least one of the channel number of the favorite channel, or

the airing time, rating or viewed rank of a program airing on the favorite channel.”).

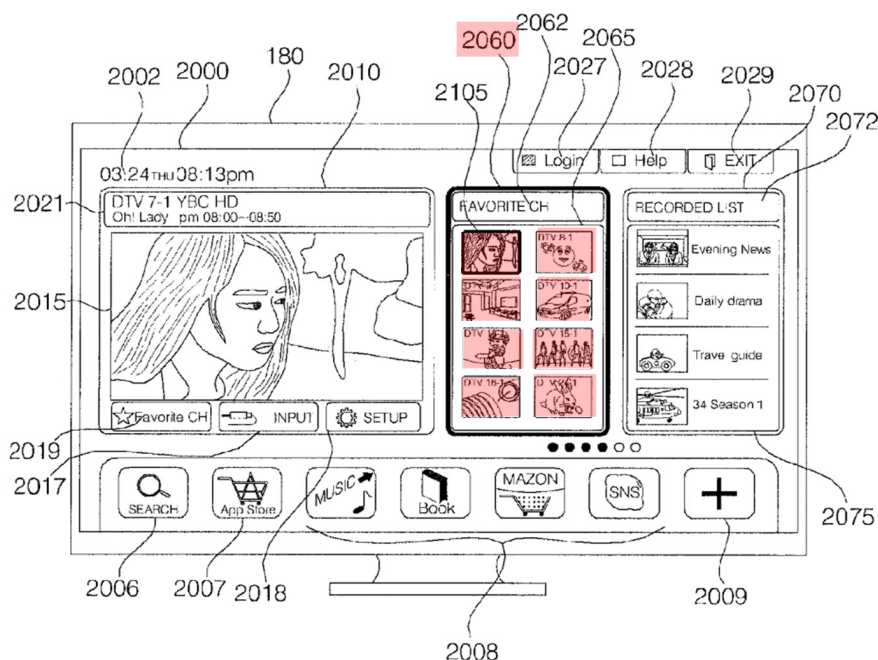
326. Lee-2’s favorite channel list settings are configured by the user.

The favorite channel list screen may further include a channel setup menu 3930. For example, the channel setup menu 3930 may include menu items, EDIT for editing channels, ZOOM for changing the number of displayed thumbnail images, GROUP VIEW for viewing thumbnail images by group, COMPACTVIEW for displaying a broadcast image in a part and a channel list in another part, and EXIT.

Ex.1009, 41:61-67.

327. As shown below at Figure 33B, Lee-2’s OSD generator functional program (Ex.1009, 17:56-64, 42:59-61) generates a Favorite Channel card object 2060 that includes personalized metadata (e.g., user-set thumbnails) for a user.

FIG. 33B

**Ex.1009, Fig. 33B (annotated).**

328. Consistent with the discussion in connection with elements [1.3] and [2.1], Ground 2, it would have been obvious to a POSITA, when implementing OSD generator functional programs, in Melnychenko, to also apply Lee-2's favorite channel teachings. This would beneficially provide Melnychenko with an OSD generator functional program that generates a Favorite Channel card object 2060 that includes personalized metadata to make the user instantly aware of "the favorite channel list." Ex.1009, 37:67-38:2; *see also* Reasons to Combine Lee-2 and Melnychenko.

329. Thus, Melnychenko in combination with Chen, Kim, and Lee-1, Lee-2 discloses an OSD generator functional program that is configured to provide

user-set favorite channel list to generate a user a Favorite Channel card object 2060, which renders obvious that “*the media data provider is configured to provide media metadata personalized for a user,*” as claimed.

3. Claim 13

[13.0] *The data service system of claim 11, wherein the media data provider is configured to provide media metadata personalized for a user.*

330. See [11.0] and [4.0].

D. Ground 4: Claim 5 is obvious over Melnychenko in view of Chen, Kim, Lee-1, Lee-2, and Ferren.

1. Summary of Ferren

331. U.S. Patent 8,893,184 to Ferren et al. (Ex.1010, “Ferren”) was filed on June 29, 2012, and issued on November 18, 2014.

332. Like the ’805 patent, Ferren “relate[s] to a mechanism for facilitating multiple multimedia viewing planes in media display systems,” including in a user interface (UI) displayed on a TV. Ex.1001, 2:16-33; Ex.1010, 1:14-16, 9:24-29 (describing a user navigating an integrated UI while watching television), 10:48-58 (integrated UI displayed on the TV). Ferren discloses “a relational database management system or an embedded database (e.g., Structured Query Language Lite (SQLite®)) that is used...to store datasets relating to the integrated UI, including (1) menus content, (2) sub-menus content, (3) metadata for media, (4) icons (for menu items), and (5) lists of current media selections, etc.” Ex.1010,

10:4-37.

2. Claim 5

[5.0] *The method of claim 4, wherein the media data provider is further configured to store the media metadata in an SQLite database.*

333. Melnychenko in view of Chen, Kim, Lee-1, and Ferren renders obvious this element.

334. Frist, as discussed in connection with element [4.0], the prior art discloses an OSD generator functional program that generates a Favorite Channel card object (“*media data provider*”).

335. Second, as explained above for element [4.0], the favorite channel list is set by the user via a setup menu. Ex.1009, 41:61-67 (“The favorite channel list screen may further include a channel setup menu 3930. For example, the channel setup menu 3930 may include menu items, EDIT for editing channels, ZOOM for changing the number of displayed thumbnail images.”); *see also* Ex.1009, 41:47-55.

336. It would have been obvious to a POSITA to for the user-setting (e.g., selected favorite channels, number of thumbnails, etc.) provided via the setup menu to be stored in memory, in view of both Lee-2’s and Kim’s disclosure that its memory “**may store user-specific information.**” Ex.1009, 11:1-5; Ex.1006, [0084]. A POSITA would have been motivated to apply Lee-2’s user-setting teachings to Melnychenko so that the user can set which specific channels should

be displayed and made readily accessible in the favorite channel list.

337. Further, as discussed in connection with element [1.3], Ground 2, Melnychenko's metadata is stored in the metadata database 956 of the user equipment device 964 in Figure 9B. Ferren shows that it was well-known to store metadata "*in an SQLite database.*" Ferren "relate[s] to a mechanism for facilitating multiple multimedia viewing planes in media display systems." Ex.1010, 1:14-17. For example, with reference to Figure 3A below, Ferren discloses "a layout 300 of integrated multimedia viewing planes 302-308." Ex.1010, 5:24-25.

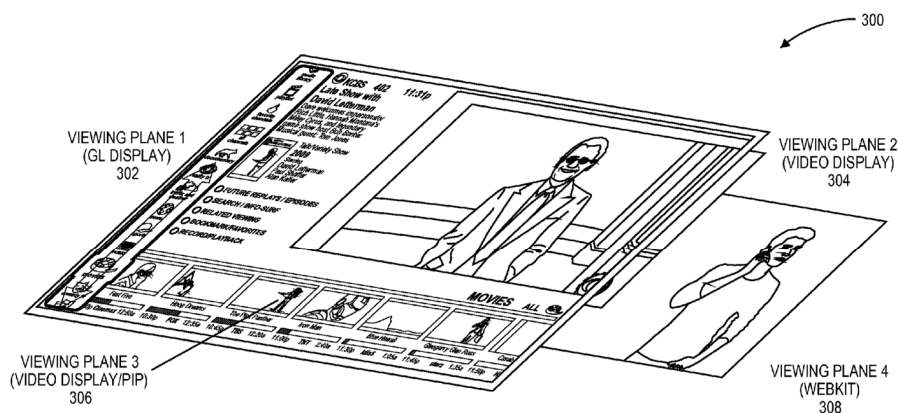


FIG. 3A

Ex.1010, Fig. 3A.

338. Like Melnychenko, Ferren discloses that metadata related to multimedia data is stored in an SQLite database. Ex.1010, 10:4-36.

FIG. 7 illustrates a database architecture 700 for facilitating an integrated navigation system. In one embodiment, database logic 208 of FIG. 2 may facilitate the implementation of the illustrated

database architecture 700 and its use with regard to **storing contents of and for the integrated UI** (such as the integrated UI 420 of FIG. 4) and **any multimedia metadata**. In one embodiment, **a relational database management system or an embedded database (e.g., Structured Query Language Lite (SQLite®)) that is used for local/client storage in application software (e.g., web browsers) may be used as the database architecture 700 for facilitating the integrated navigation system.** For example and in one embodiment, **an SQLite-based database 710 may be used to store and preserve fat content for the integrated UI as binary (or basic) large objects (BLOBs), while Uniform Resource Identifiers (URIs)/Uniform Resource Locators (URLs) of the content may be stored in tables.** For example, database 710 may be used to store datasets relating to the integrated UI, including (1) menus content, (2) sub-menus content, (3) **metadata for media**, (4) icons (for menu items), and (5) lists of current media selections, etc. As illustrated, database 710 is in communication with processes 502, 506-510 via their corresponding SQL links 712A-712D. SQLite-based database 710 and database architecture 700 may be used because **SQLite is regarded as relatively small and fast for embedded systems and might not have any need for any external protocol processes**, such as in case of MySQL.

Ex.1010, 10:4-36.

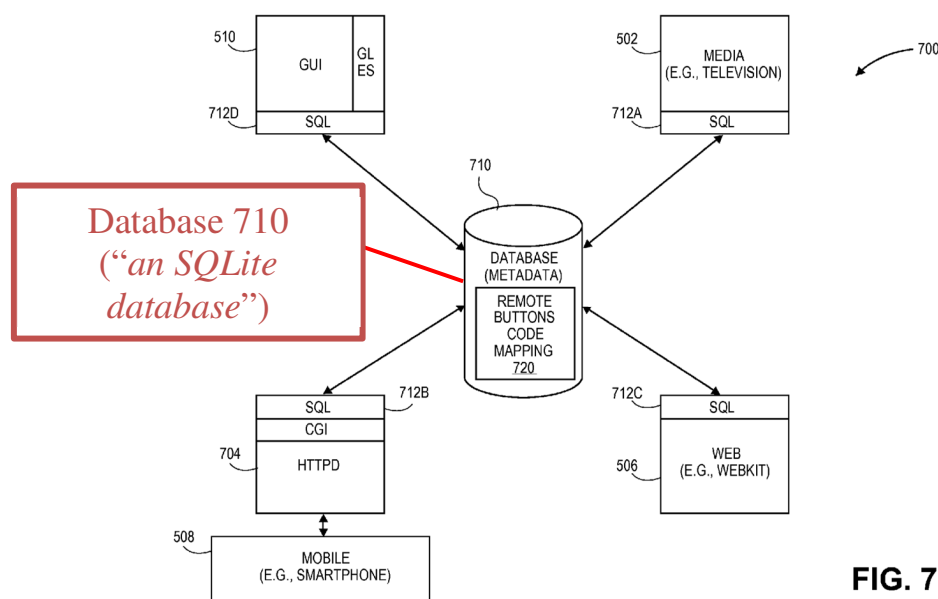


FIG. 7

Ex.1010, Fig. 7 (annotated)

339. A POSITA would have been motivated to modify Melnychenko so that its database (e.g., metadata database 956 in Melnychenko’s Figure 9B) stores the metadata (including user-set favorite channel settings, per Lee-2) is an SQLite database, as taught by Ferren. A POSITA would have been motivated to make this modification because Ferren discloses the advantages of utilizing an SQLite database for media content and its corresponding metadata. For example, Ferren discloses that a “relational database management system or an embedded database (e.g., Structured Query Language Lite (SQLite®)) [] is used...as the database architecture 700 for facilitating the integrated navigation system,” because “SQLite is regarded as relatively small and fast for embedded systems and might not have any need for any external protocol processes.” Ex.1010, 10:4-36.

340. This would have been the combination of prior art elements (metadata database 956 in Melnychenko's Figure 9B configured as an SQLite database, as taught by Ferren) according to known methods (using an SQLite database to store metadata, as taught by Ferren) to yield the predictable result of operating Melnychenko's metadata database as an SQLite database because it is small and fast for embedded systems such as Melnychenko's user equipment device. Further, a POSITA would have had a reasonable expectation of success in modifying Melnychenko's metadata database to configure it as an SQLite database because Ferren discloses that an SQLite database may store "datasets relating [an] the integrated UI" as well as "any multimedia metadata." Ex.1010, 10:4-11.

341. Thus, Melnychenko in view of Chen, Kim, Lee-1, Lee-2, and Ferren renders obvious that "*the media data provider is further configured to store the media metadata in an SQLite database,*" as claimed.

E. Ground 5: Claims 6-8, 14, and 15 are obvious over Melnychenko in view of Chen, Kim, Lee-1, and Choi.

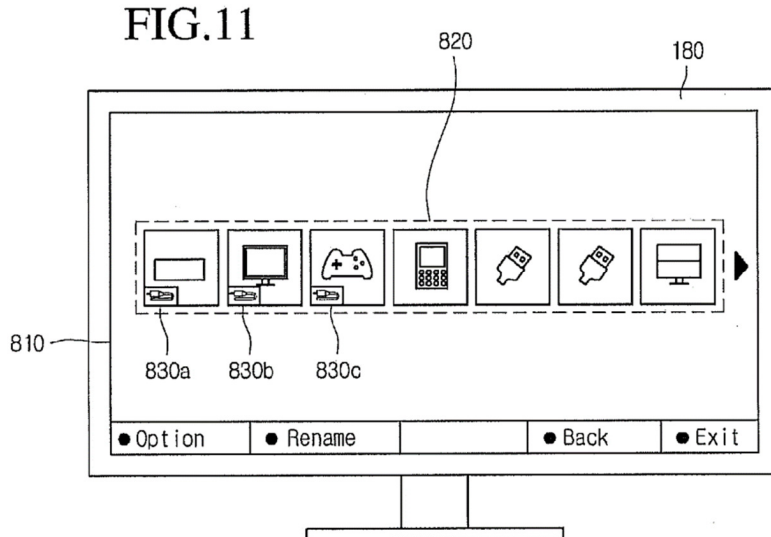
1. Summary of Choi

342. U.S. Patent Publication No. 2013/0057764A1 to Choi et al. (Ex.1011, "Choi") was filed on June 28, 2012, and was published on March 7, 2013.

343. Choi generally discloses methods and systems of displaying content on a television. Ex.1011, [0002]-[0004]. In this context, Choi discloses that devices externally connected to an input port of the television may be represented by icons

with specific symbols to distinguish connected devices. Ex.1011, [0250] (“As shown in FIG. 11, a plurality of external device icons 820 representing a plurality of external devices are displayed[, and]... the control unit 170 determines which external device icons 820 are connected to the image display device 100 in order to display specific symbols 830a, 830b and 830c on the external device icons that are being connected to the image display device 100.”).

344. Choi at Figure 11 illustrates that external devices are represented by icons 820 with specific symbols (e.g., 830a, 830b and 830c) indicating that a given device is connected to an input port of the image display device 100, as shown below.



2. Claim 6

[6.0] *The method of claim 2, wherein the media browser is configured to provide a real-time view of media sources of the TV and maintain a list of connected*

media sources of the TV.

345. First, as discussed in connection with element [2.0], the prior art discloses an OSD generator functional program that generates External Device card object 1380 (“*media browser*”).

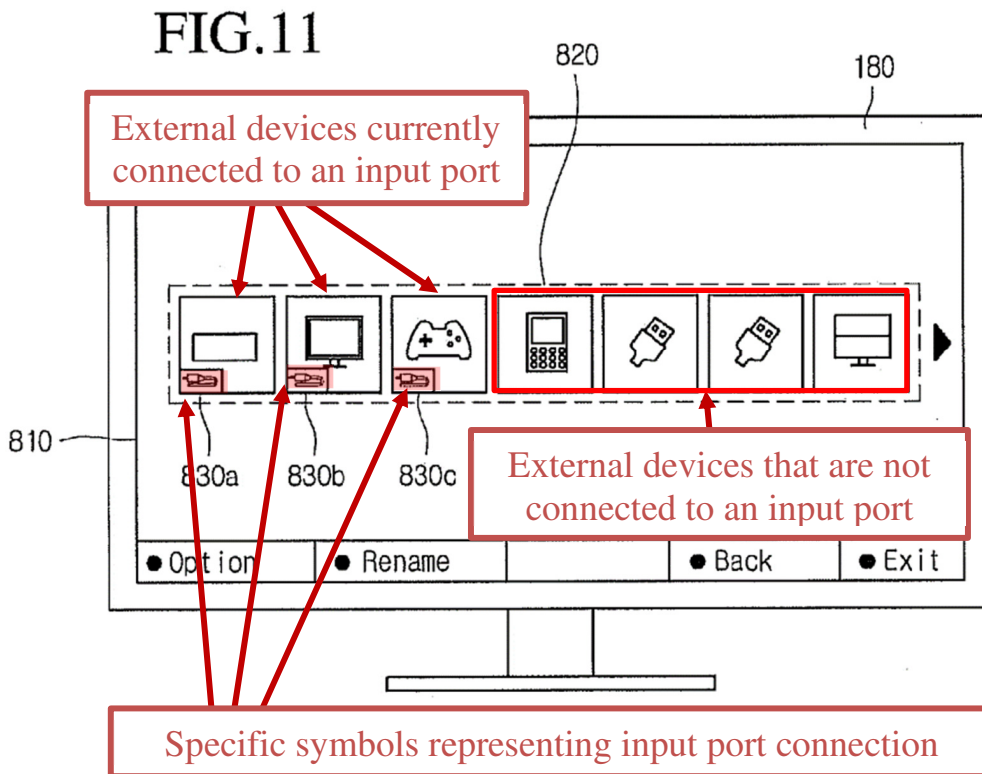
346. Second, Kim discloses that the External Device card object 1380 includes “a list of external devices which may be connected” to the smart TV 100 via an input port such as HDMI port, USB port, etc. Ex.1006, [0077], [0196], [0205]-[0210], Fig. 19. The list of external devices may include “Gaming box,” “DVD player,” “Computer,” among others. Ex.1006, [0210], Fig. 19.

347. Choi discloses that external devices may be represented by icons with specific symbols to distinguish connected devices. Ex.1011, [0250] (“As shown in FIG. 11, a plurality of external device icons 820 **representing a plurality of external devices are displayed... the control unit 170 determines which external device icons 820 are connected to the image display device 100 in order to display specific symbols 830a, 830b and 830c** on the external device icons that are being connected to the image display device 100.”). It would have been obvious to a POISTA for the specific symbols 830a, 830b and 830c to correspond to the different types of ports being used.

348. Furthermore, Choi discloses that the “**method of providing an external device list**” according to the present invention may be programmed to be

executed in a computer and may be **stored on a computer readable recording medium**. Examples of the computer read able recording medium include read-only memory (ROM), random-access memory (RAM), CD-ROMs, magnetic tapes, floppy disks, and optical data storage devices.” Ex.1011, [0264]; *see also* Ex.1011, [0111] (“...the storage unit 140 may perform a function for temporarily storing image...signals...”), [0079] (“[T]he SI&Metadata DB 121 may store setup data on a system, and for example, may be implemented using NonVolatile RAM (NVRAM) or flash memory.”).

349. Choi’s Figure 11, reproduced below, provides a real-time view of external devices that are determined to be currently connected to the smart TV, represented in a list of icons with specific symbols indicating input port connections, while other devices that are not connected have no specific symbol.



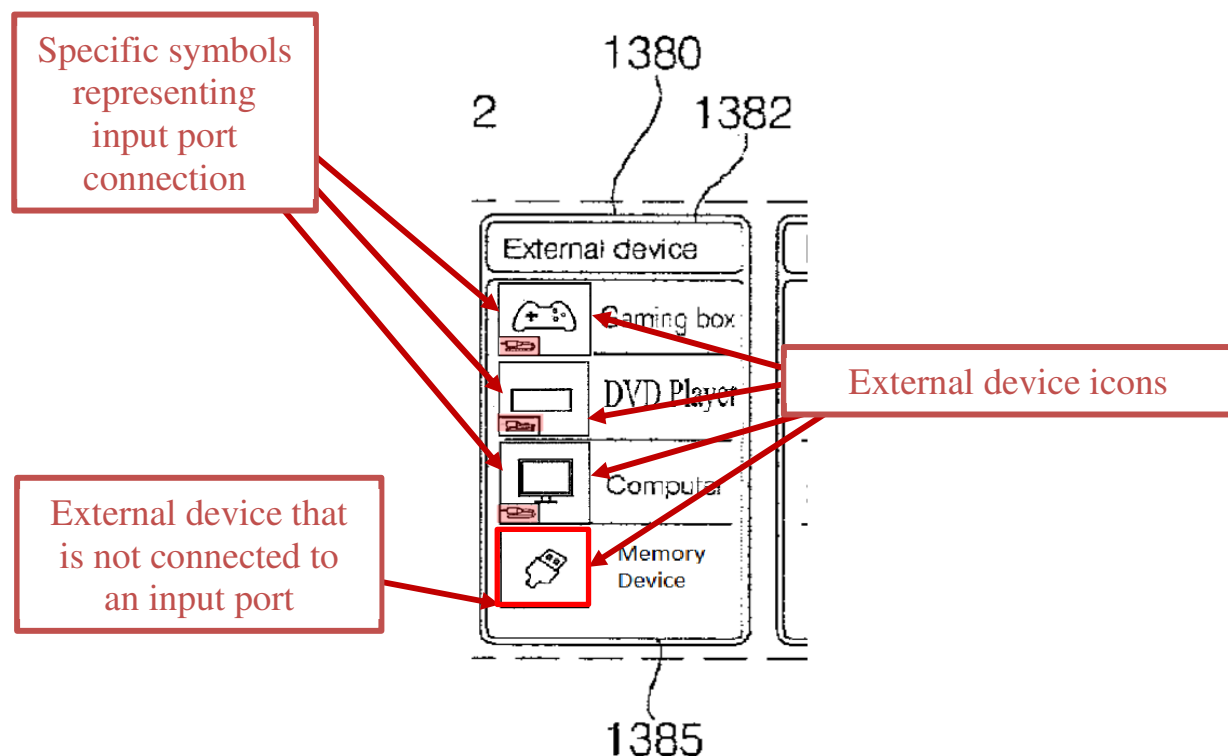
Ex.10011, Fig. 11 (annotated).

350. Like Kim, Choi's external devices may correspond to a DVD player, a Blue Ray player, a game console, a personal computer (PC), a camera, a camcorder, a memory device, or any other appropriate device. Ex.1006, [0076], [0131]; Ex.1011, [0249]. Also, like Kim, Choi's external devices may be connected to an input port of the image display device 100, including a USB port, a CVBS port, a component port, an S-video port, a DVI port, a HDMI port, an RGB port, and a D-SUB port. Ex.1006, [0077], Ex.1011, [0099].

351. It would have been obvious to a POSITA to implement External Device card object 1380 ("which may provide a list of external devices which

may be connected to the image display apparatus 100”, Ex.1006, [0196]), to include icons representing external devices with specific symbols for input port connected devices and to store this list in memory. This would inform the user as to which external device is currently connected to an input port of the smart TV 100 and which external device is not connected.

352. In the proposed combination of Choi with Melnychenko (modified in view of Chen and Kim), a POSITA would have implemented the External Device card object 1380 (see [2.0]) such that external devices that are determined to be currently connected to an input port are represented by an icon with “specific symbols” as I have shown below in Kim’s modified Figure 19.



Ex.1006, Fig. 19 (partial, modified in view of Choi).

353. It would have been obvious for the External Device card object 1380 to include both icons and descriptive text of the connected device, consistent with Kim's other card objects (e.g., 1360 and 1370), so that the user can readily discern the connected device. Also, it would have been obvious to include only icons (as Choi illustrates), so that more or larger icons for external devices can be shown on the External Device card object 1380. It further would have been obvious to utilize only letters to identify input port connected devices. *See, e.g.,* Ex.1011, [0250] ("Here, displaying a specific symbol on an external device icon is used as one example of a method of distinguishing icons from each other, but the present invention is not limited thereto. That is, any one of letters, symbols, colors, and flashing lights may be used for distinction."). For example, when using letters, it was known in the art to present a specific input port description next to an external device connected thereto, e.g., "HDMI-DVD Player." *See, Ex.1018, Fig. 17(d).* In an implementation with letters, therefore, it would have been obvious to a POSITA to distinguish input port connected devices shown on the External Device card object 1380 by identifying a corresponding input port, e.g., HDMI port, USB port, a CVBS port, etc., so that the user would understand which device is presently connected to which port.

354. The proposed combination is merely combining prior art elements (an external device icon with a specific symbol representing an input port (or letters),

per Choi, with the External Device card object 1380, used in Melnychenko per Kim) according to known methods (generating an icon list that is stored in memory) to yield predictable results of informing the user which external device is connected to an input port.

355. Thus, Melnychenko in view of Chen, Kim, Lee-1, and Choi discloses that the OSD generator function program is configured to provide a real-time view of media sources of the TV (e.g., External Device card object 1380 with external devices and ports that are currently connected) and that a list of connected external devices is maintained in memory, which renders obvious that “*the media browser is configured to provide a real-time view of media sources of the TV and maintain a list of connected media sources of the TV,*” as claimed.

3. Claim 7

[7.0] *The method of claim 6, wherein the media browser maintains a non-permanent storage.*

356. As discussed in connection with element [6.0], the prior art teaches that the OSD generator functional program is configured to store a list of connected external devices in memory, such as RAM. Ex.1011, [0111], [0113], [0264]. Thus, the prior art renders obvious “*the media browser maintains a non-permanent storage,*” as claimed.

4. Claim 8

[8.0] *The method of claim 6, wherein the media scanner is configured to*

populate a media table using data retrieved by the media browser and rescan for new media periodically.

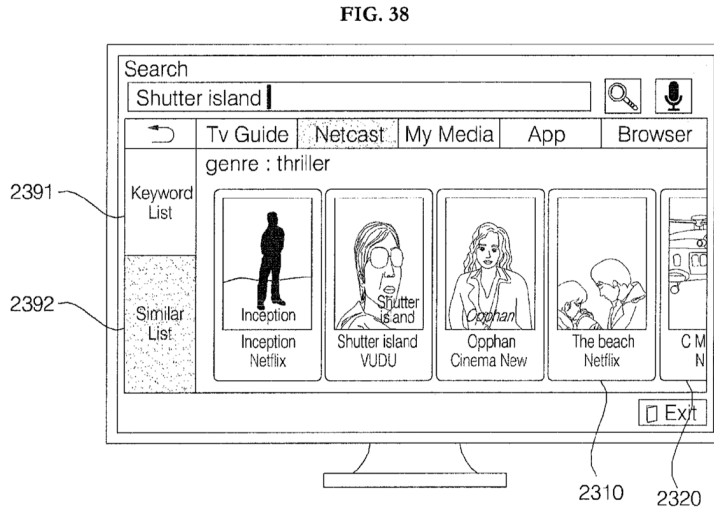
357. First, as discussed in connection with element [2.0], the prior art discloses a search function program (“*media scanner*”) and card object 1380 (External Device) (“*media browser*”).

358. Second, Kim discloses that “*the media scanner is configured to populate a media table using data retrieved by the media browser*” because it teaches that “the search may be performed in ... an external device connected to the image display apparatus 100” and that the “controller 17 may perform the search when the contents [that] are located locally (e.g., on an external device connected locally at the display apparatus 100).” Ex.1006, [0270]. It would have been obvious to a POSITA, for the search to be based using data (e.g., which external devices are connected to a port, see [6.0]) retrieved by External Device card object 1380. Thus, the prior art combination renders obvious that “*the media scanner is configured to populate a media table using data retrieved by the media browser,*” as claimed.

359. Third, Melnychenko discloses that metadata corresponding to newly received content may be “may be provided to the user equipment with any suitable frequency (e.g., continuously, daily, a user-specified period of time, a system specified period of time, in response to a request from user equipment, etc.).” Ex.1005, [0070]. As shown in Kim’s Figure 38 below, “search results

object 2310” identifies search results of media content that is presently available.

Ex.1006, [0269]-[0271].



360. It would have been obvious to a POSITA, in the combination with Melnychenko to execute the search functional program at a “system specified period of time” that corresponds when new content is received, so that the user would be presented the latest content in the results. Thus, Melnychenko in view of Chen, Kim, Lee-1, and Choi renders obvious that “*the media scanner is configured to...rescan for new media periodically,*” as claimed.

5. Claim 14

[14.0] *The data service system of claim 11, wherein the media browser is configured to provide a real-time view of media sources of the TV and maintain a list of connected media sources of the TV.*

361. See [11.0] and [6.0].

6. Claim 15

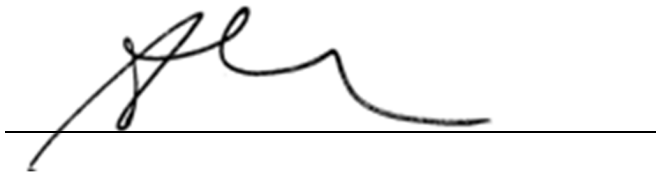
[15.0] *The data service system of claim 11, wherein the media scanner is configured to populate a media table using data retrieved by the media browser and rescan for new media periodically.*

362. See [11.0] and [8.0].

VIII. CONCLUSION

363. This declaration and my opinions herein are made to the best of my knowledge and understanding, and based on the material available to me, at the time of signing this declaration. I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 or Title 18 of the United States Code.

Date: 21 December, 2023

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke, positioned above a solid horizontal line.