

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

Petitioner

IPR2024-00354
U.S. Patent No. 10,419,805

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

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PETITIONER’S EXHIBIT LIST

Ex.1001	U.S. Patent No. 10,419,805 to Shoykher
Ex.1002	Prosecution History of U.S. 10,419,805
Ex.1003	Declaration of Dr. Andrew Lippman under 37 C.F.R. § 1.68
Ex.1004	<i>Curriculum Vitae</i> of Dr. Lippman
Ex.1005	U.S. Patent Publication No. 2013/0263184A1 to Melnychenko et al. (“Melnychenko”)
Ex.1006	U.S. Patent Publication No. 2012/0054794A1 to Kim et al. (“Kim”)
Ex.1007	U.S. Patent Publication No. 2007/0226268A1 to Chen (“Chen”)
Ex.1008	U.S. Patent No. 9,008,190 to Lee et al. (“Lee-1”)
Ex.1009	U.S. Patent No. 9,398,339 to Lee et al. (“Lee-2”),
Ex.1010	U.S. Patent No. 8,893,184 to Ferren et al. (“Ferren”)
Ex.1011	U.S. Patent Publication No. 2013/0057764A1 to Choi et al. (“Choi”)
Ex.1012	U.S. Patent Publication No. 2013/0031592A1 to Choi et al.
Ex.1013	U.S. Patent Publication No. 2009/0257738A1 to Park et al.
Ex.1014	U.S. Patent Publication No. 2013/0152135A1 to Hong et al.
Ex.1015	U.S. Patent Publication No. 2005/0283800A1 to Ellis et al.
Ex.1016	U.S. Patent No. 6,665,869 to Ellis et al.
Ex.1017	Claim Comparison Chart
Ex.1018	U.S. Patent Publication No. 2013/0176415 to Kim et al.

Note: Petitioner cites to exhibits’ original page numbers. Unless otherwise noted, all emphasis in any quoted material has been added.

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311, 314(a), and 37 C.F.R. § 42.100, LG Electronics, Inc., LG Electronics U.S.A., Inc. (“Petitioner”) respectfully requests that the Board review and cancel as unpatentable under (pre-AIA) 35 U.S.C. §103(a) claims 1-18 (the “Challenged Claims”) of U.S. Patent No. 10,419,805 (“the ’805 patent,” Ex.1001).

II. GROUNDS FOR STANDING

Petitioner certifies that the ’805 patent is eligible for IPR and that Petitioner is not barred or estopped from requesting IPR. 37 C.F.R. § 42.104(a).

III. SUMMARY OF THE ’805 PATENT

A. Overview of the ’805 Patent

The ’805 patent is directed to “[a] data service system in an Intelligent Television (TV)” configured to receive different types of “media and content” from a variety of sources or “subservices” and related metadata. Ex.1001, Abstract, 5:60-64, 30:26-29. In Figure 14 below, content is provided from different subservices: a video-on-demand (VOD) subservice 1420, an electronic program guide (EPG) subservice 1424, and a media subservice. Ex.1001, 30:46-48, 33:23-30, 34:49-50, Fig. 16 (step 1630). The data is organized in a uniform format and provided to content provider modules 1416. Ex.1003, ¶¶25-36.

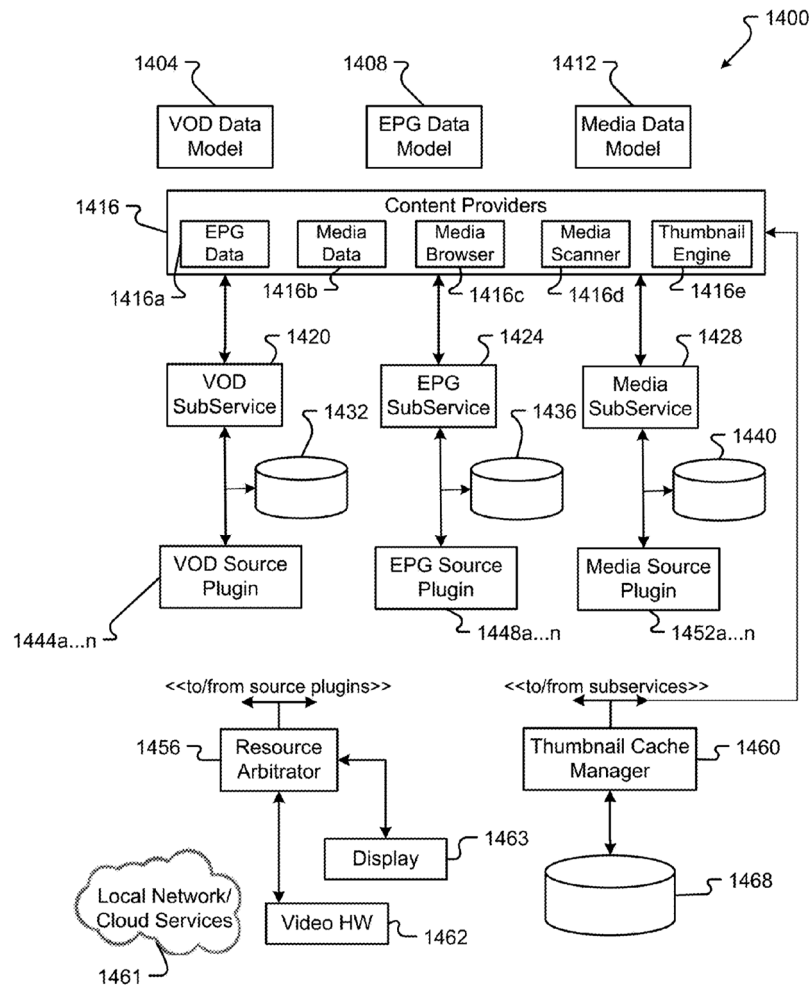


Fig. 14

Ex.1001, Fig. 14.

B. Prosecution History

The Examiner issued a Notice of Allowance indicating that the last two claim elements, directed to organizing the data and providing the organized data to a content provider module, were the reason for allowance. However, for the reasons explained below, these and all other claim elements of the '805 patent were well-known in the art. Ex.1003, ¶¶48, 38-47.

IV. LEVEL OF ORDINARY SKILL IN THE ART

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 about 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. Ex.1003, ¶¶18-20.

V. CLAIM CONSTRUCTION

Claim terms in IPR are construed according to their “ordinary and customary meaning” to those of skill in the art. 37 C.F.R. § 42.100(b). *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Petitioner submits that, for the purposes of this proceeding and the grounds presented herein, no claim term requires express construction. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). Petitioner further notes that some claim terms are provided with explicit definitions in the specification (Ex.1001, 3:49-10:3&), and example is outlined below. Ex.1003, ¶¶49-52.

A. “one or more”

Claims 1, 3, 10, 12, and 17 each recite the phrase “*one or more*.” The phrasing of “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; Ex.1003, ¶¶54-56.

VI. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute a trial for IPR and cancel the Challenged Claims in view of the analysis below. Petitioner challenges the claims of the '805 patent because they are asserted in co-pending litigation.

VII. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged Claims and Statutory Grounds for Challenge¹

Grounds	Claims	Basis
#1	1, 10, 17	35 U.S.C. § 103 over Melnychenko and Chen
#2	1-3, 6, 10-12, 16-18	35 U.S.C. § 103 over Melnychenko, Chen, Kim, and Lee-1
#3	4, 13	35 U.S.C. § 103 over Melnychenko, Chen, Kim, Lee-1, and Lee-2
#4	5	35 U.S.C. § 103 over Melnychenko, Chen, Kim, Lee-1, Lee-2, and Ferren
#5	6-8, 14, 15	35 U.S.C. § 103 over Melnychenko, Chen, Kim, Lee-1 and Choi

Melnynchenko (filed Mar. 28, 2012), Kim (filed Mar. 9, 2011), Lee-1 (filed Jan. 4, 2010), Lee-2 (filed Dec. 16, 2010), Ferren (filed Jan. 17, 2012), and Choi (filed Jan. 27, 2012) each qualify as prior art under (pre-AIA) 35 U.S.C. §102(a), (e). Chen (published Sep. 27, 2007) qualifies as prior art under (pre-AIA) 35 U.S.C. §102(b).

¹ For each combination, Petitioner relies on the teachings, and not on a physical incorporation of elements. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985).

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

1. Summary of Melnychenko

Melnychenko discloses “an interactive media guidance application.”

Ex.1005, [0031]. Like the ‘805 patent, Melnychenko’s media guidance application receives and reformats data from different sources, as shown in Fig. 1 below, including “video-on-demand (VOD) systems,” “Internet content” (media), and “an interactive television program guide” (EPG). Ex.1005, [0032]; Ex.1003, ¶¶61-67.

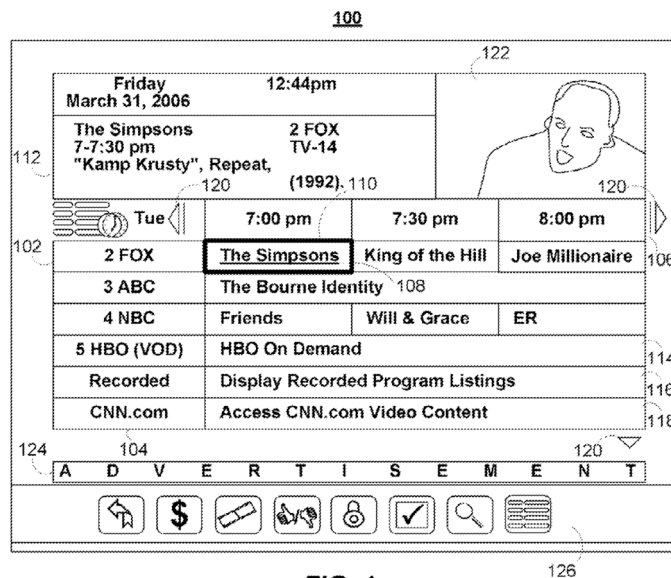


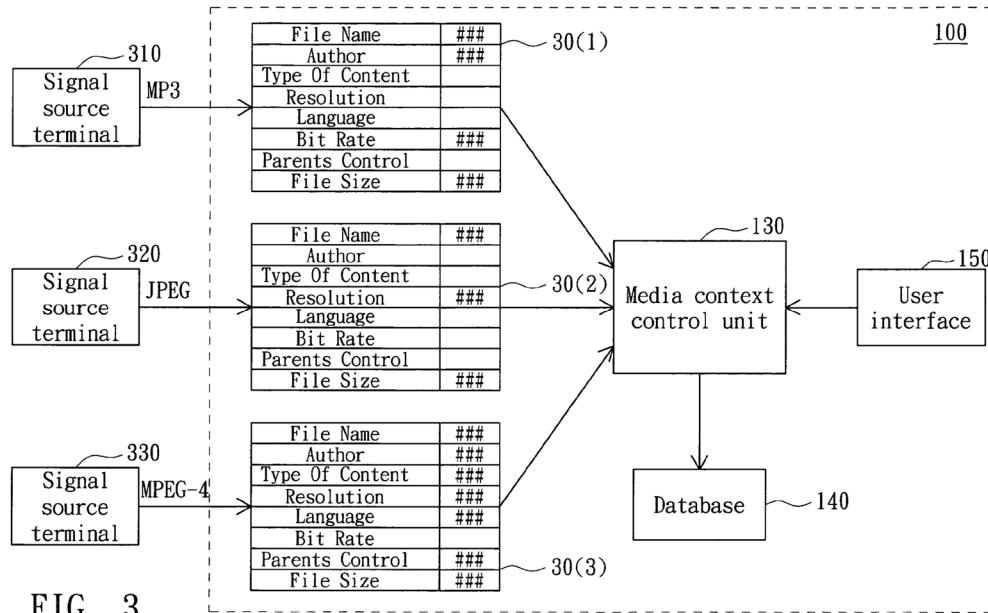
FIG. 1

Ex.1005, Fig. 1.

2. Summary of Chen

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.” Ex.1007, [0003]. Like the ’805 patent, Chen describes

organizing the metadata to be in a “uniform format.” Ex.1007, [0017], [0019];
Ex.1003, ¶¶69-76.



Ex.1007, Fig. 3.

3. Reasons to Combine Chen and Melnychenko

A POSITA would have been motivated to combine Melnychenko and Chen to arrive at the features of claims, 1, 10, and 17 for numerous reasons presented below. Ex.1003, ¶77.

a) Analogous Art

Melnychenko and Chen are each in the same field of endeavor and therefore analogous art to the '805 patent. Ex.1001, 2:16-33; Ex.1005, [0005], [0030]-[0032]; Ex.1007, [0016]-[0017]; Ex.1003, ¶¶78, 80.

In addition, Melnychenko and Chen are each reasonably pertinent to a

problem the inventors of the '805 patent attempted to solve. The '805 patent addresses 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]; Ex.1003, ¶79.

b) Motivation to Combine Melnychenko and Chen

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 each. Ex.1006, [0001], [0032]; Ex.1003, ¶¶81-82.

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 metadata for different types of content 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 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. Ex.1003, ¶83.

Once such reference is Chen, which provides implementation details regarding processing metadata so that it may be stored in a single database. Chen provides details of how to organize metadata corresponding to plural types of content so that it has a “**uniform format.**” Ex.1007, [0017]. Chen’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, claim 6, 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, but only certain fields have input data values. Ex.1007, [0019]-[0020], Fig. 3. 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]. Ex.1003, ¶¶84-85.

It would have been obvious to a POSITA, when implementing Melnychenko’s system, to apply Chen’s metadata organizing teachings because

they provide implementation details applicable to Melnychenko's metadata (which may be a variety of metadata formats corresponding to different types 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. Ex.1003, ¶86.

One benefit is that 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. Ex.1003, ¶87.

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 (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, as taught by Chen) to yield predictable results (storing the organized metadata in a database). Ex.1003, ¶88.

These reasons are sufficient to explain why a POSITA would have sought and combined the identified disclosures of Melnychenko and Chen. Nevertheless, additional reasons for combining the relevant teachings are provided in the analysis below. Ex.1003, ¶89.

c) Reasonable Expectation of Success

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.”). Chen’s teachings are generally applicable to devices “operable to receive plural types of media data.” Ex.1007, Abstract, [0015] (“...metadata of plural types of media data operable to a set top box.”), claim 6 (“VoD” and “a digital TV program , or a cabled TV program”). Thus, a POISTA would have expected to have success in applying Chen’s teachings to Melnychenko. Ex.1003, ¶90.

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. Ex.1003, ¶¶91-92.

4. Claim 1

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

Melnychenko teaches “[s]ystems and **methods**...for modifying metadata associated with **content**.” Ex.1005, Abstract, [0030]. The content is provided to a user equipment device 300 (Figure 3), which may be a TV (user television equipment 402 in Figure 4). Ex.1005, [0047], [0055]; Ex.1003, ¶¶93-99.

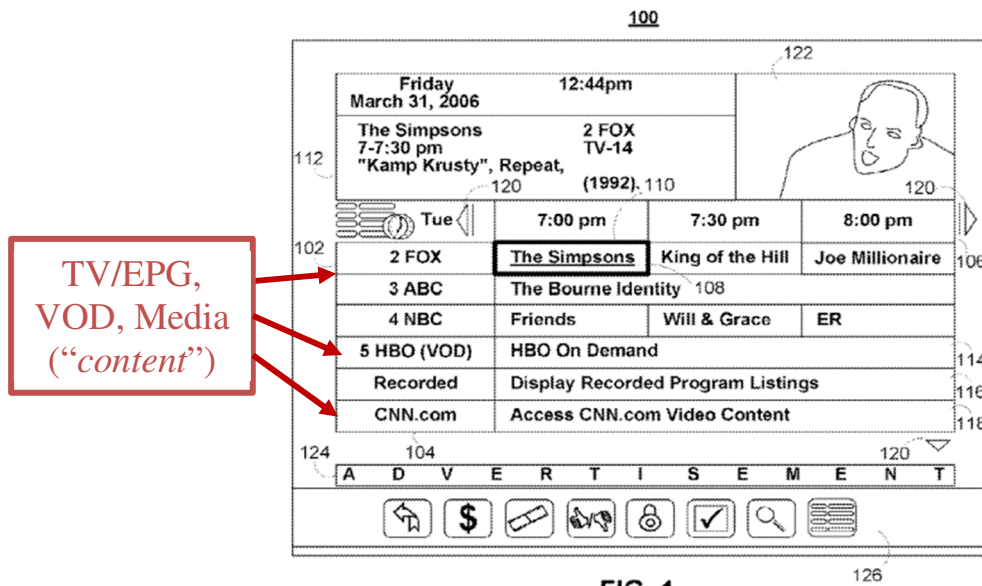


FIG. 1

Ex.1005, Fig. 1 (annotated).

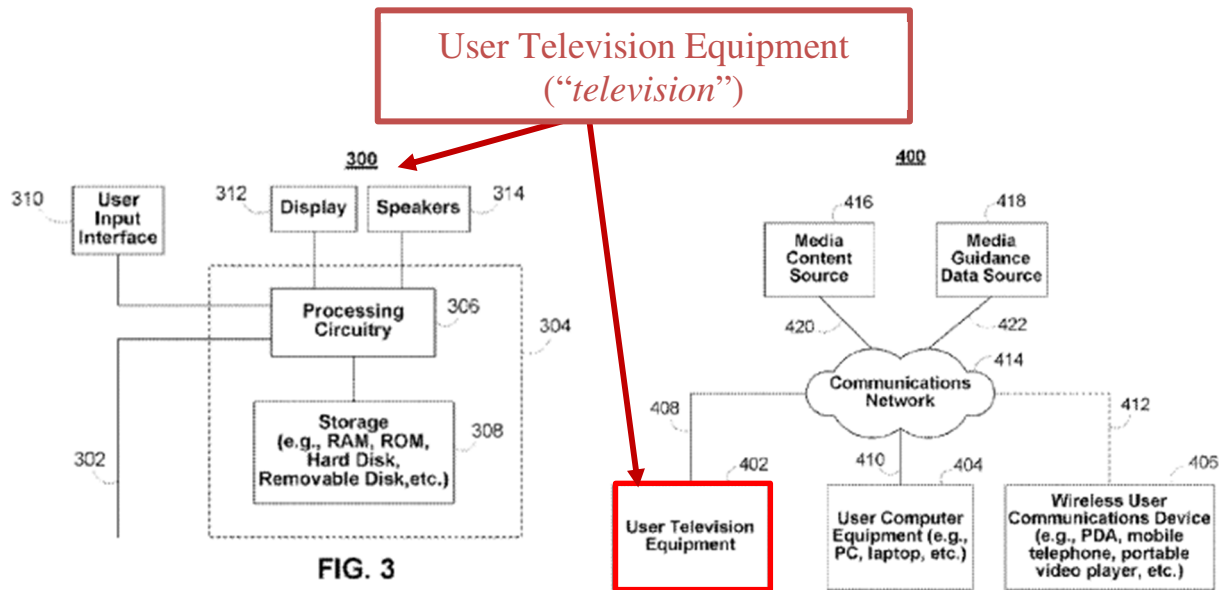


FIG. 3

FIG. 4

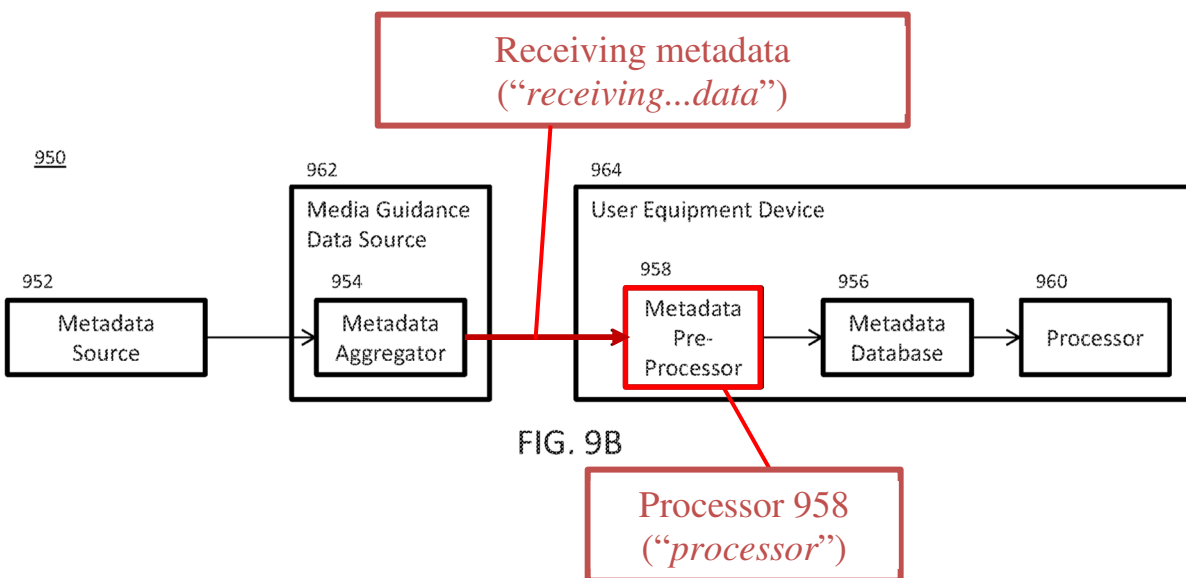
Ex.1005, Figs. 3 & 4 (annotated).

[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,

The '805 patent's phrase "one or more" includes "at least one of A, B, or

C.” Ex.1001, 3:21-28; Ex.1003, ¶101.

First, Melnychenko teaches “*receiving, by a processor, data*” by disclosing that metadata pre-processor 958 receives metadata from the media guidance data source 962. Ex.1005, [0126]-[0127]. Melnychenko’s Figure 9B corresponds to the metadata pre-processor 804 in Figure 8 and the processor circuitry 306 in Figure 3. Ex.1005, [0116], [0047]-[0048]; Ex.1003, ¶¶100, 102-106, 108.



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

The Petition will primarily refer to metadata pre-processor 958 as the “*processor*,” with the understanding that it may include one or more pre-processors Ex.1005, [0124] (“A metadata pre-processor 958 may be found in a number of locations, both physically and functionally”), [0133] (“Multiple metadata pre-

processor 958s may exist.”); *see also*, Ex.1001, 16:6-8; Ex.1003, ¶107.

Second, Melnychenko teaches that the received metadata (“*data*”) is “*relevant to one or more scheduled events*” in two different ways Ex.1003, ¶109.

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

Melnynchenko 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 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, [0034], [0064], [0070]; Ex.1003, ¶¶110-111.

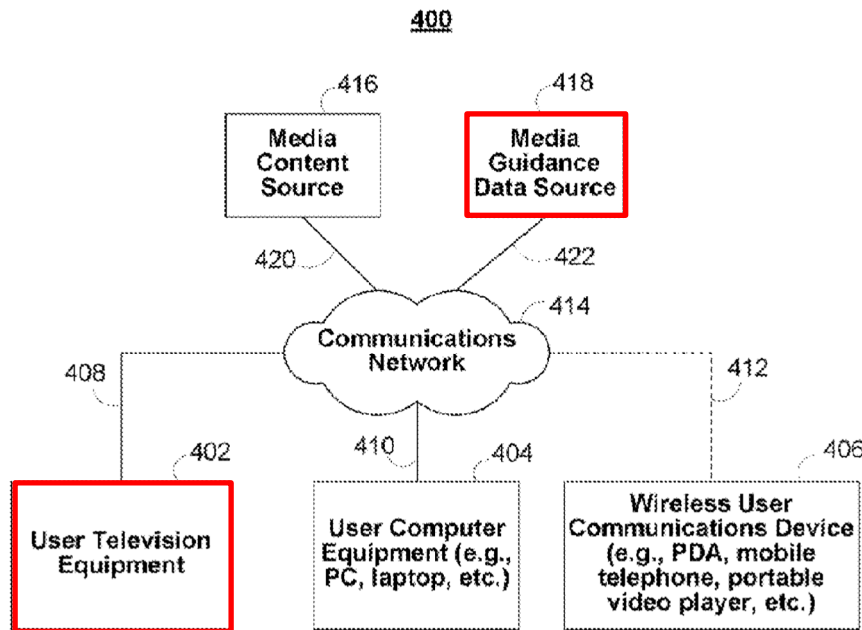


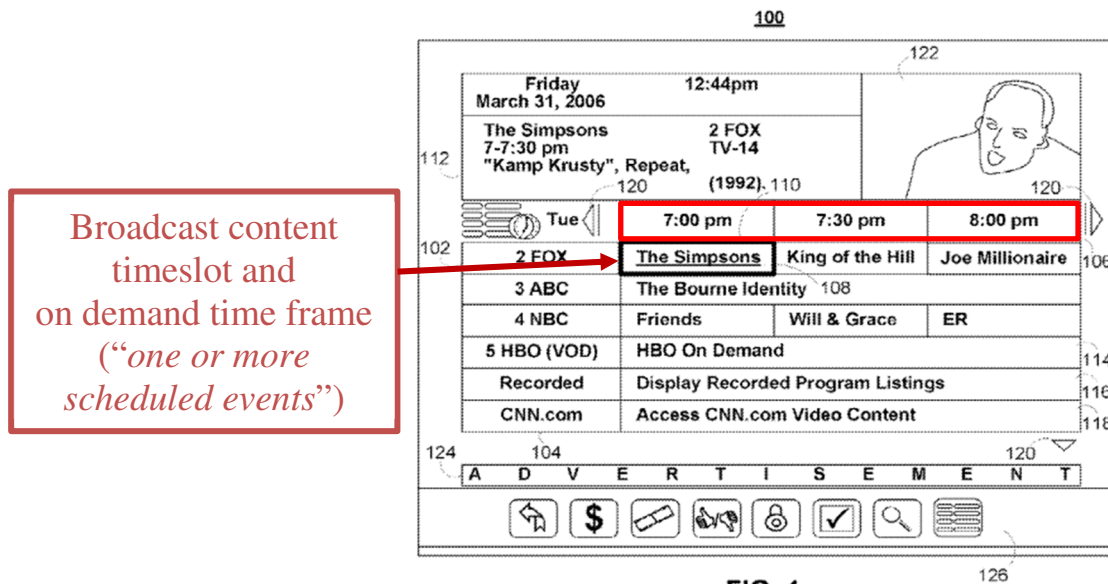
FIG. 4

Ex.1005, Fig. 4 (annotated).

(2) the metadata is relevant to scheduled programming event

To the extent argued that this element corresponds to data associated with content that is scheduled to be displayed at a particular time, Melnychenko discloses this. Ex.1003, ¶112.

Melnynchenko’s Figure 1 illustrates a grid 102 with channel/content type identifiers 104, time identifiers 106, program listings 108, among other features. Ex.1005, [0036]. “[T]he program listings display 100 [is] arranged by time and channel” including a “time identifier.” Ex.1005, [0036]; Ex.1003, ¶113.



Ex.1005, Fig. 1 (annotated).

Metadata is received in association with its corresponding content (e.g., TV/EPG, VOD, media content). Ex.1005, [0036], [0062], [0064]-[0065] (“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[.]”). The broadcast “content timeslot” and VOD “time frame” are relevant to scheduled programs and separately and together disclose that the metadata is relevant to “*relevant to one or more scheduled events.*” Ex.1003, ¶¶114-117.

Third, the received metadata is “*from one of a corresponding subservice.*” Melnychenko’s Figure 4 below illustrates that the user television equipment 402 receives data from a media content source 416 and media guidance data source

418. 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]; Ex.1003, ¶¶118-119.

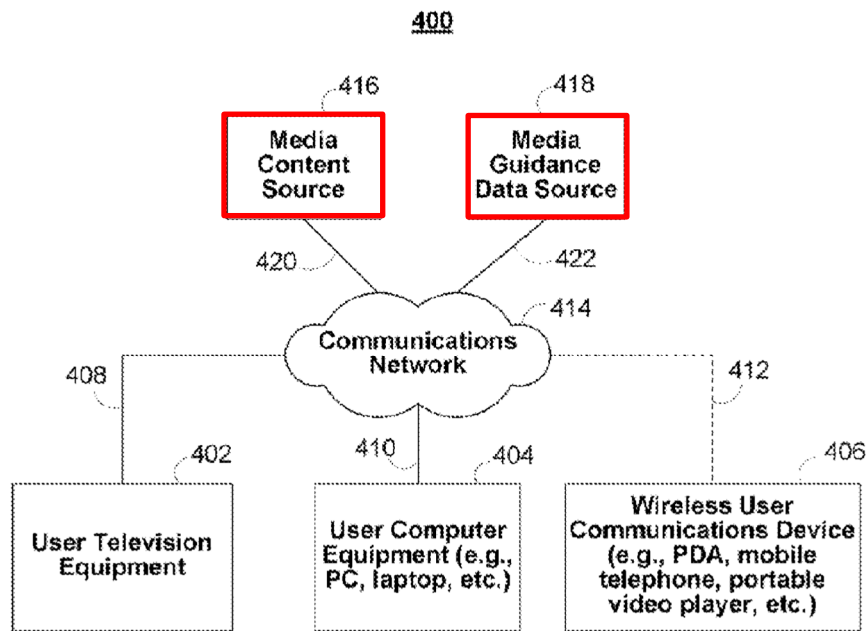
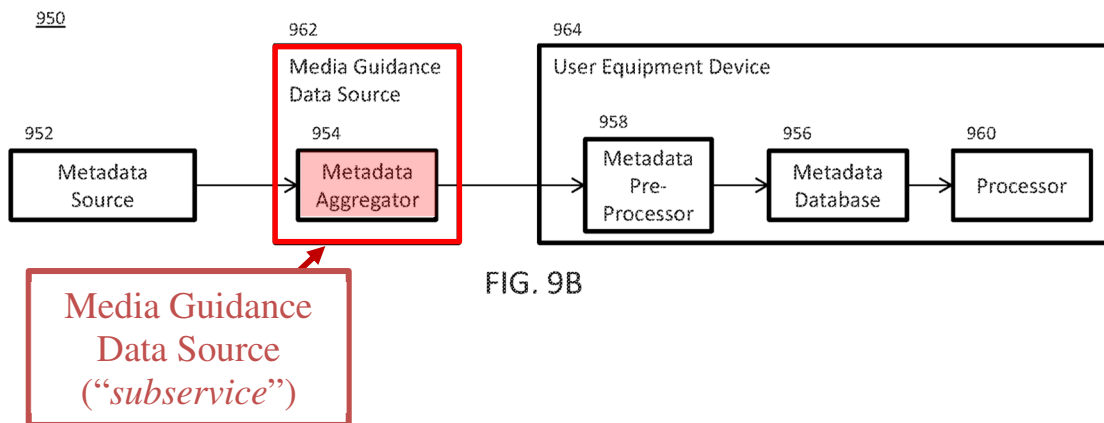


FIG. 4

Ex.1005, Fig. 4 (annotated).

Melnychenko’s media guidance data source 418 includes an “**aggregator**” that manages and aggregates metadata from one or more sources. Ex.1005, [0081]-[0084], Fig. 5. In Figure 9B below, the media guidance data source 962 (which corresponds to media guidance data source 418 of Figure 4 above) includes a metadata aggregator 954 that aggregates and forwards the metadata to metadata pre-processor 958. Ex.1005, [0126]; Ex.1003, ¶¶120-121.



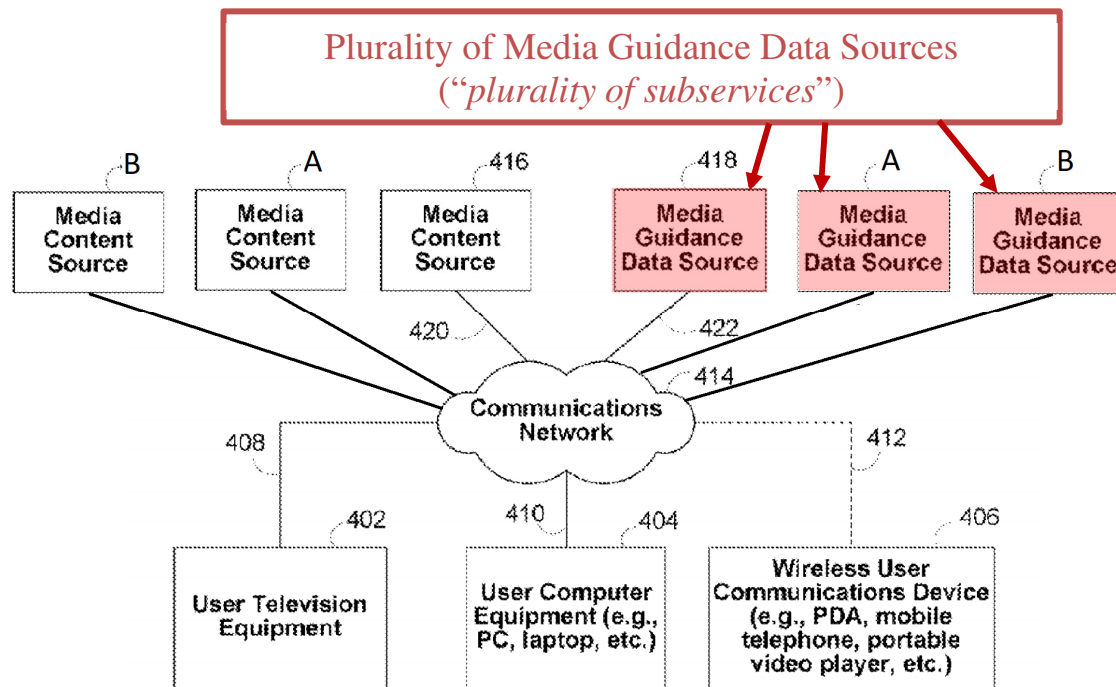
Ex.1005, Fig. 9B (annotated).

Melnychenko’s media guidance data source 418/962 (illustrated at Figures 4, 5, and 9B), which manages and aggregates metadata from one or more metadata sources, corresponds to the claimed “*subservice*.” See Ex.1001, 3:8-10; *see also* analysis *infra* [1.1.2]; Ex.1003, ¶¶122-123.

Thus, Melnychenko discloses that received metadata is from a media guidance data source, which renders obvious that the received data is “*from one of a corresponding subservice*.” Ex.1003, ¶124.

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], [0062]. 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 Dr. Lippman’s modification of

Figure 4. Ex.1003, ¶125.

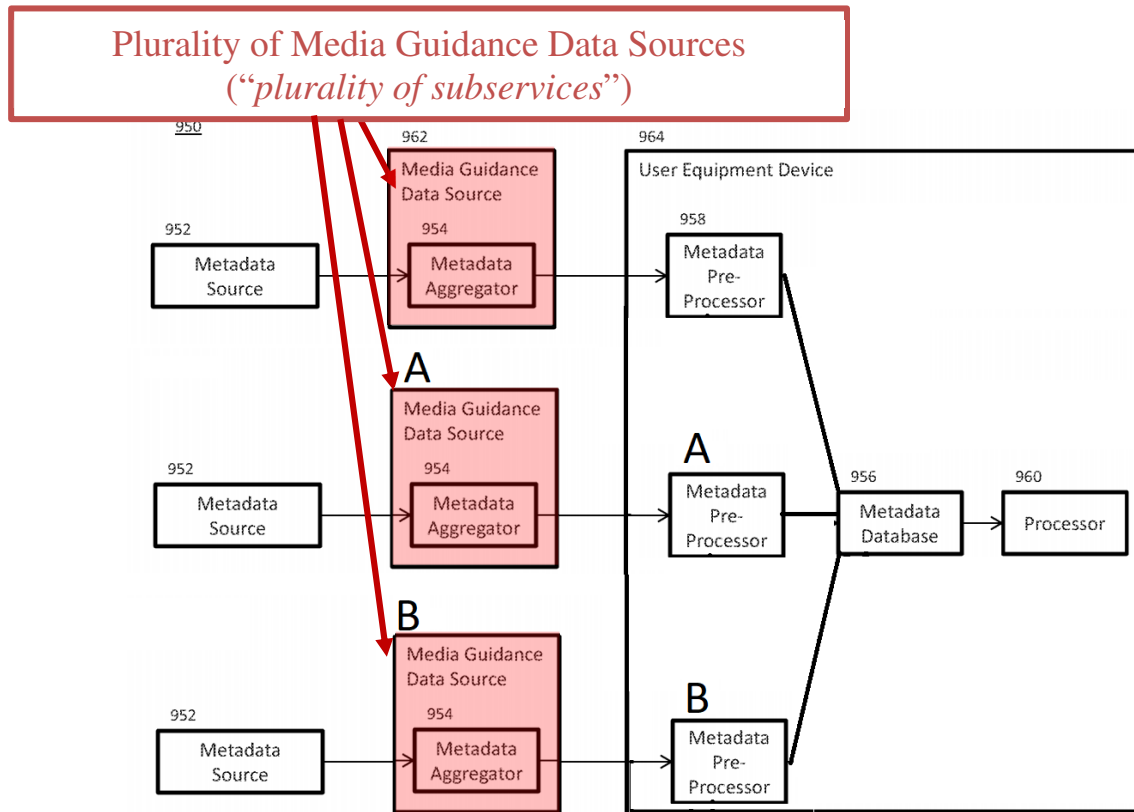


Ex.1005, Fig. 4 (modified and annotated).

It would have been obvious to a POSITA, when implementing Melnychenko's teachings, to utilize a plurality of content sources and a plurality of media guidance data sources in view of this 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). Ex.1003, ¶126.

In such an implementation, 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. Dr. Lippman provided a modified Figure 9B below, consistent with the

modified Figure 4 above and Melnychenko's specification. Ex.1005, [0077], [0124], [0133]; Ex.1003, ¶127.



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

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 this element. Ex.1003, ¶¶127-128.

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

As 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 including VOD, television EPG, and media. Ex.1005, [0063]-[0064], [0072]. Melnychenko's media guidance data source 418/962 provides metadata corresponding to the content provided by the content source. Ex.1005, [0064], [0126]; Ex.1003, ¶¶12-132.

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. Ex.1003, ¶133.

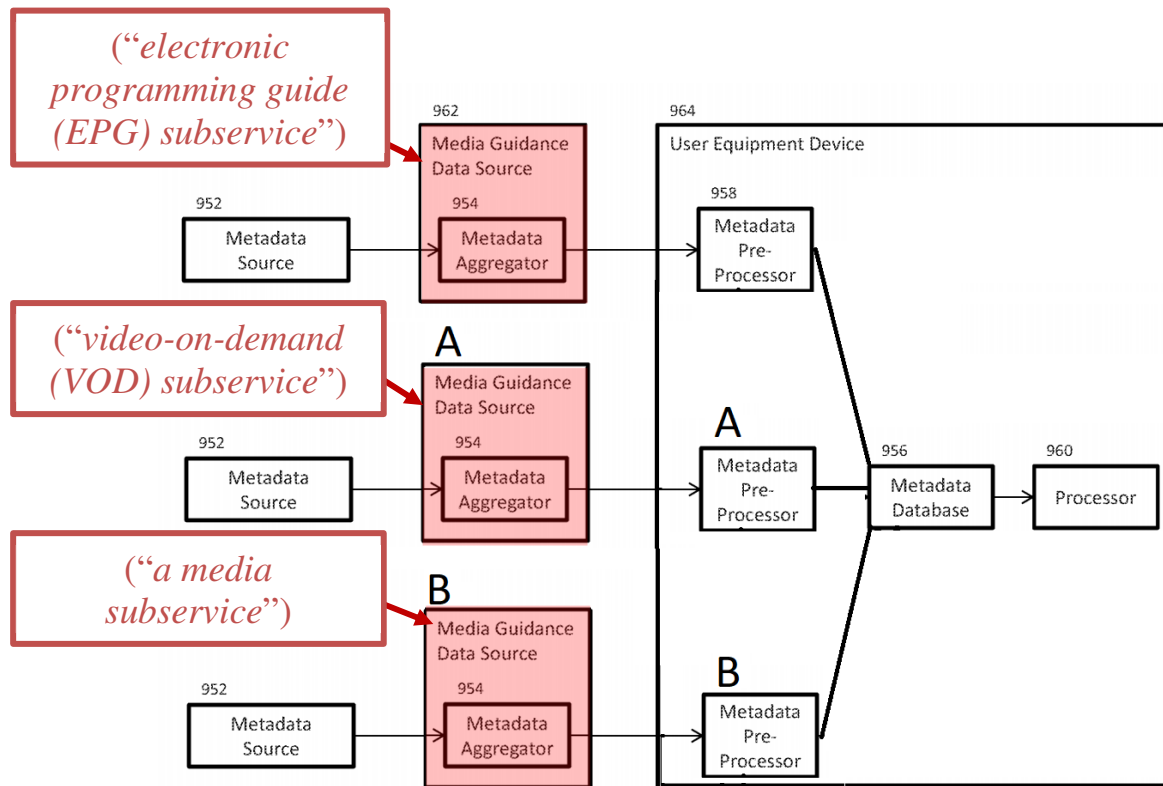
It would have been obvious to a POSITA that, in the implementation where Melnychenko's system includes a plurality of media guidance data sources, for each media guidance data source to aggregate metadata corresponding to a different type of content. For example, it would have been obvious for a first media guidance source to aggregate metadata (e.g., EPG metadata) corresponding to content from a television distribution facility and/or programming sources (e.g., television or cable 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.*” Ex.1003, ¶134.

It 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.*” Ex.1003, ¶135.

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.*” Ex.1003, ¶136.

As illustrated at Dr. Lippman’s modified Figure 9B below, 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.1003, ¶137.



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

This discussion of how Melnychenko’s media guidance data source receives different types of metadata is consistent with knowledge in the art, as demonstrated by Chen. Chen’s Figure 1 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]; Ex.1003, ¶138.

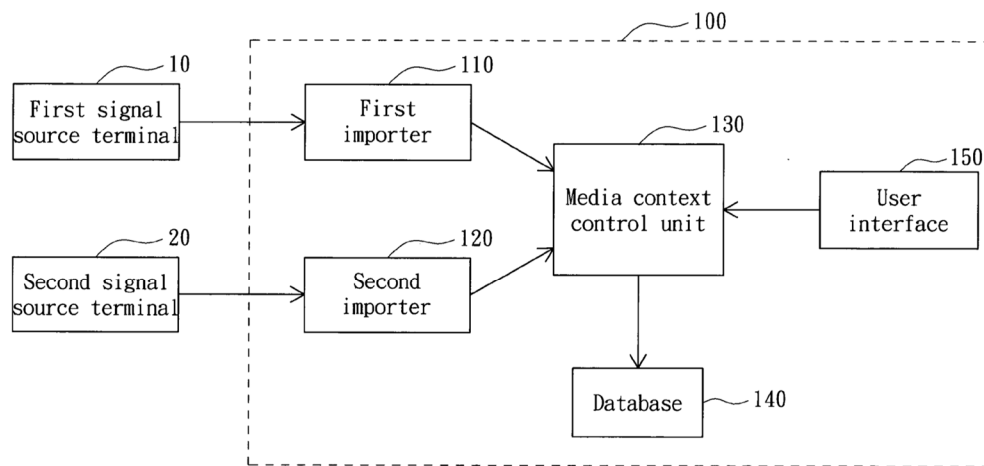


FIG. 1

Ex.1007, Fig. 1.

Similar to Melnychenko, Chen’s provides “non-limiting” example sources, including 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].

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. *See also* Reasons to Combine Chen and Melnychenko. Ex.1003, ¶139.

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 this element. Ex.1003, ¶140.

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

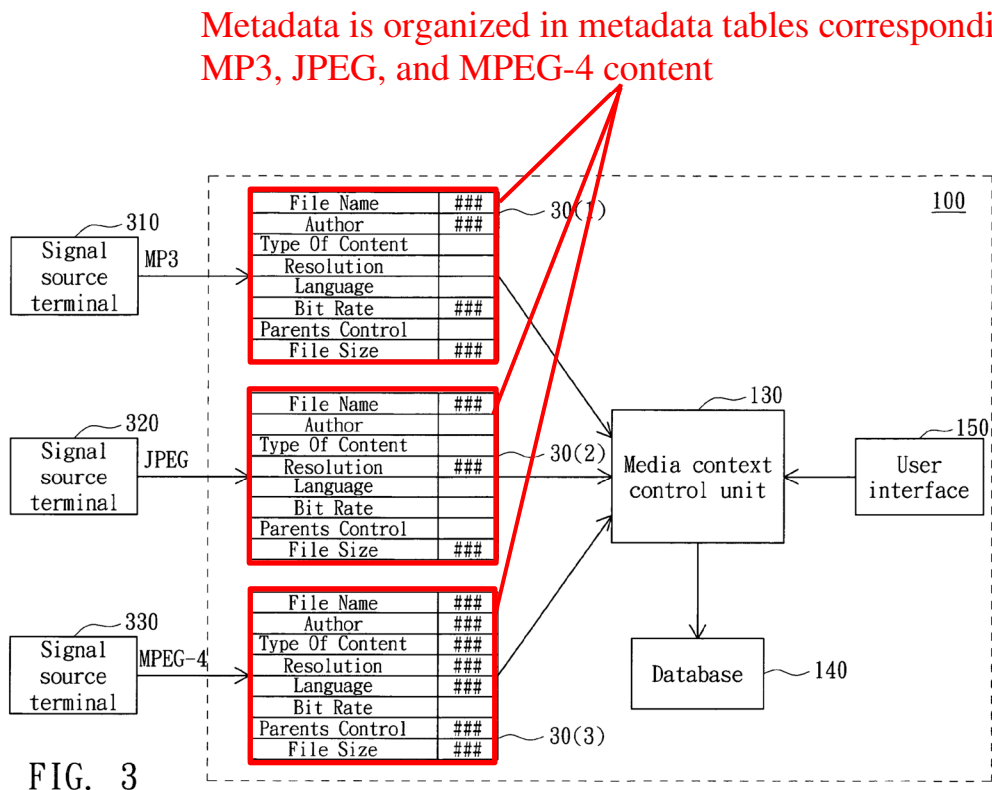
First, Melnychenko’s metadata pre-processor 958 modifies received metadata, including modifying punctuations, adding, and moving information. Ex.1005, [0116]-[0123], [0161]. Therefore, Melnychenko renders obvious “*organizing, by the processor, the data.*” Ex.1003, ¶¶141-142.

Second, Melnychenko teaches that “[m]etadata 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 content types such as TV/EPG (e.g., broadcast) or media content (e.g., Internet content) disclosed in Melnychenko may have a variety of metadata formats. Ex.1005, [0065]. 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. Ex.1003, ¶¶143-145.

Chen discloses that received metadata is organized in a “metadata table”

corresponding to each different types of content, where 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 gives an example of three different content types, MP3, JPEG, and MPEG-4, which is organized into three metadata tables 30(1)-30(3) “of **uniform format.**” Ex.1007, [0017], Fig. 3; Ex.1003, ¶146.

Chen's Figure 3 below illustrates that the metadata tables are organized in a uniform format with the same fields (e.g., File Name, Author, Type of Content, Resolution, etc.) 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 ###). Ex.1007, [0020]; Ex.1003, ¶147.



Ex.1007, Fig. 3 (annotated).

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. Ex.1003, ¶148.

Third, 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.**” Ex.1007, [0009] (“a first metadata table and a second metadata table respectively **complying with a specific table** are generated.”),

[0017], [0019]-[0020], Fig. 2 (step 220). A POSITA would understand that the “specific table” pre-defines how each metadata table (e.g., the three metadata tables 30(1), 30(2) and 30(3)) is to be formatted. Ex.1003, ¶¶149-150.

A POSITA would have understood that Chen’s teachings represent a general technological principle and are not limited to the 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...the invention is **not limited thereto**.”). Ex.1003, ¶151.

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.”). 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,” etc. Ex.1005, [0032]-[0034], [0063]; Ex.1003, ¶152.

Accordingly, it would have been obvious to a POSITA that additional fields may 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 Melnychenko’s content, including VOD content, TV/EPG content, and media content. Ex.1005, [0032]-[0034]; Ex.1003, ¶¶153; *see also* Ex.1003, ¶154 (citing Ex.1007, [0017] and describing Chen’s benefits using metadata tables of uniform format).

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). *See* Reasons to Combine Chen and Melnychenko; Ex.1003, ¶¶155-156.

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 this element. Ex.1003, ¶157.

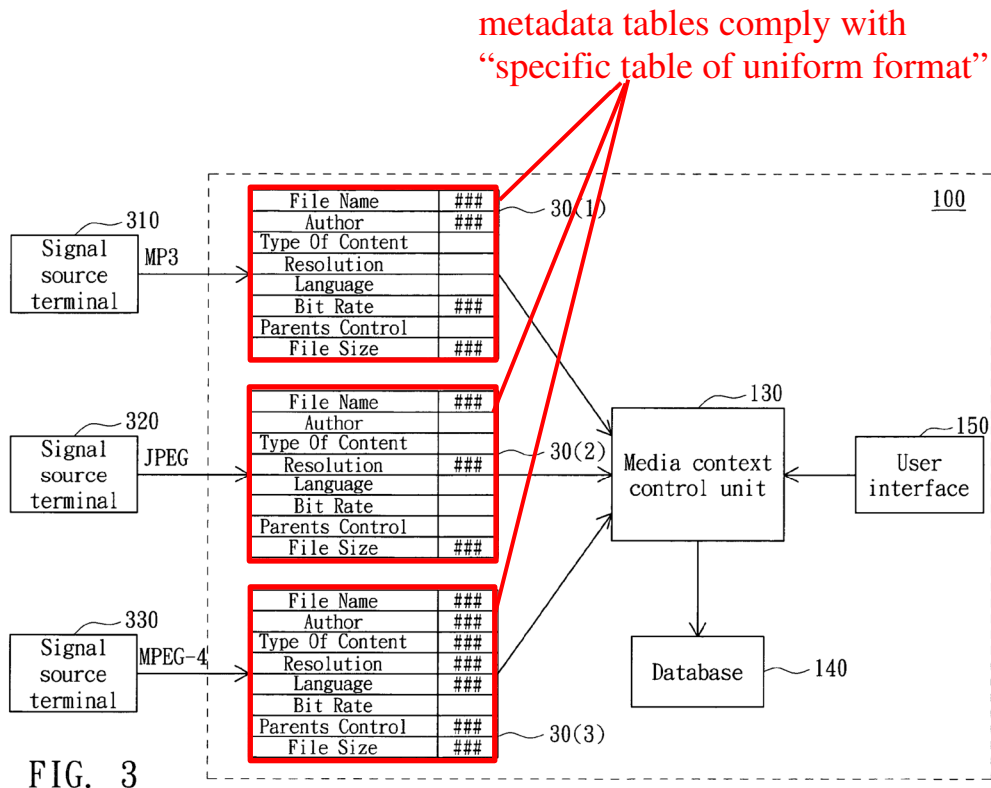
[1.2.2] *wherein the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model;*

As an initial matter, the '805 patent states that “data models define what and how information is to be stored.” Ex.1001, 28:35-45, 21:6-13, Fig. 6. Ex.1003, ¶159. As discussed for element [1.2.1], the Melnychenko-Chen combination renders obvious “*the pre-defined format.*” Ex.1003, ¶160.

In one embodiment, Chen’s 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). Ex.1007, [0019]. 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. Ex.1003, ¶¶161-162.

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.1003, ¶163.



Ex.1007, Fig. 3 (annotated).

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]; Ex.1003, ¶164.

A POSITA would have understood that Chen's teachings represent a general technological principle and are "**not limited**" to the specific media examples. Ex.1007, [0009], [0019]; Ex.1003, ¶165.

Also, 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., VOD media guidance data source, TV/EPG media guidance data source, and 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. Ex.1003, ¶166.

The combination of Melnychenko and Chen is merely combining prior art elements (XML file, per Chen, with Melnychenko's system) according to known

methods (organizing metadata in metadata tables that comply with a specific table of uniform format of an XML file, as taught by Chen) to yield predictable results (organizing metadata in a uniform format). *See also* Reasons to Combine Chen and Melnychenko, above. Ex.1003, ¶167.

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*.” Ex.1003, ¶168.

To the extent argued that the claim requires that each “*data model*” 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. Ex.1003, ¶169; *see In re Larson*, 340 F.2d 965, 968 (CCPA 1965) (merely

combining components into an integral component is *prima facie* obvious); *In re Dulberg*, 289 F.2d 522, 523 (CCPA 1961) (merely separating components from a previously integral component is *prima facie* obvious).

Therefore, the Melnychenko-Chen combination renders obvious element [1.2.2]. Ex.1003, ¶170.

[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*

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 media guidance data source (which may be initially received in a format as shown at Figure 5) to be in a "**uniform format**." Ex.1007, [0017], Ex.1003, ¶¶171-173. For example, it would have been obvious for Melnychenko's 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. Ex.1003, ¶173.

This is consistent with Chen's disclosure of receiving different types of metadata from different sources (sources 310, 320, 330) and then converting each type of metadata into a uniform format that complies with the same table format

for each type of metadata, as shown by metadata tables 30(1) to 30(3) in Figure 3.

Ex.1007, [0019]-[0020], [0019]; Ex.1003, ¶174.

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. Ex.1003, ¶175; *see also* Reasons to Combine Chen and Melnychenko.

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 this element. Ex.1003, ¶176.

[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

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.” Ex.1003, ¶¶177-179.

This principle is illustrated at Chen’s Figure 3, where the metadata tables 30(1)-30(3) (which were generated to conform 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]; Ex.1003, ¶180.

The tables have the same fields

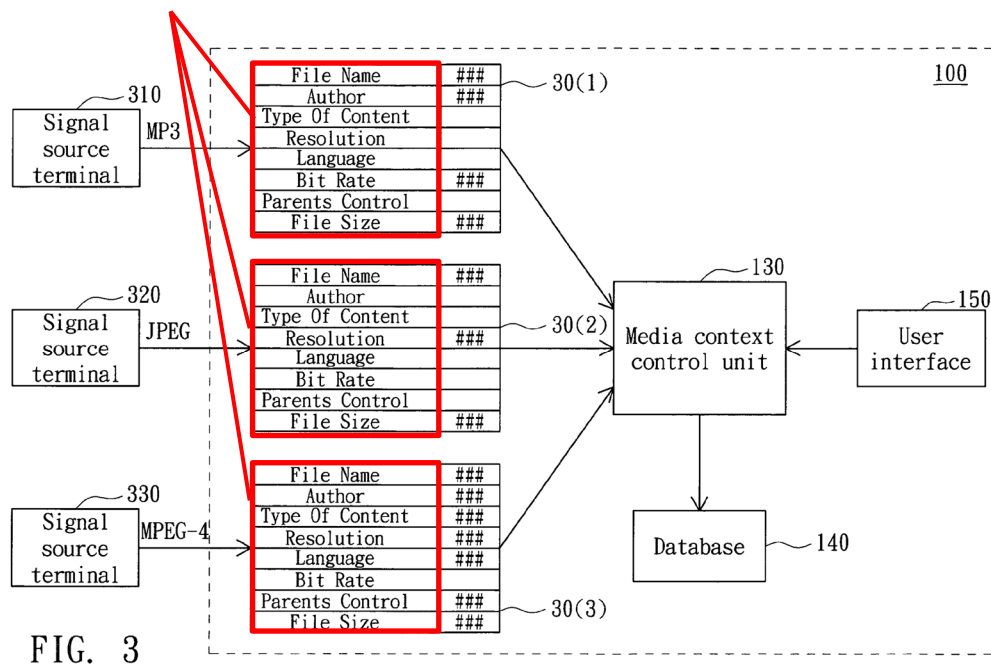


FIG. 3

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

Ex.1007, Fig. 3 (annotated).

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; Ex.1003, ¶181.

Thus, the Melnychenko-Chen combination renders obvious that “*each of the VOD data model, EPG data model, and media data model provide a uniform format for the plurality of subservices.*” Ex.1003, ¶182.

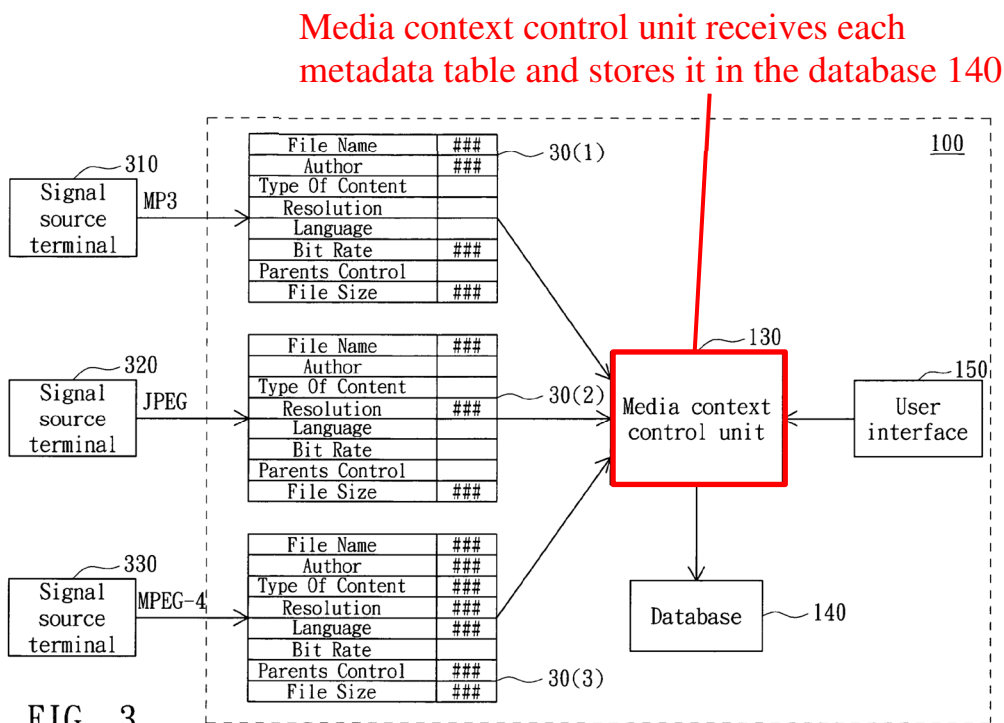
[1.3] providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.

The ’805 patent’s phrase “*one or more,*” includes “at least one of A, B, or C.” Ex.1001, 3:21-28. Also, the ’805 patent defines “*module*” as “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; Ex.1003, ¶¶183-185.

First, as discussed at [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*”). Ex.1003, ¶186.

Second, Chen discloses that the organized metadata tables are provided to a media context control unit 130 which facilitates storage in a database 140, as shown below at Figure 3. Ex.1007, [0016]-[0017]. Ex.1003, ¶187



Ex.1007, Fig. 3 (annotated).

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

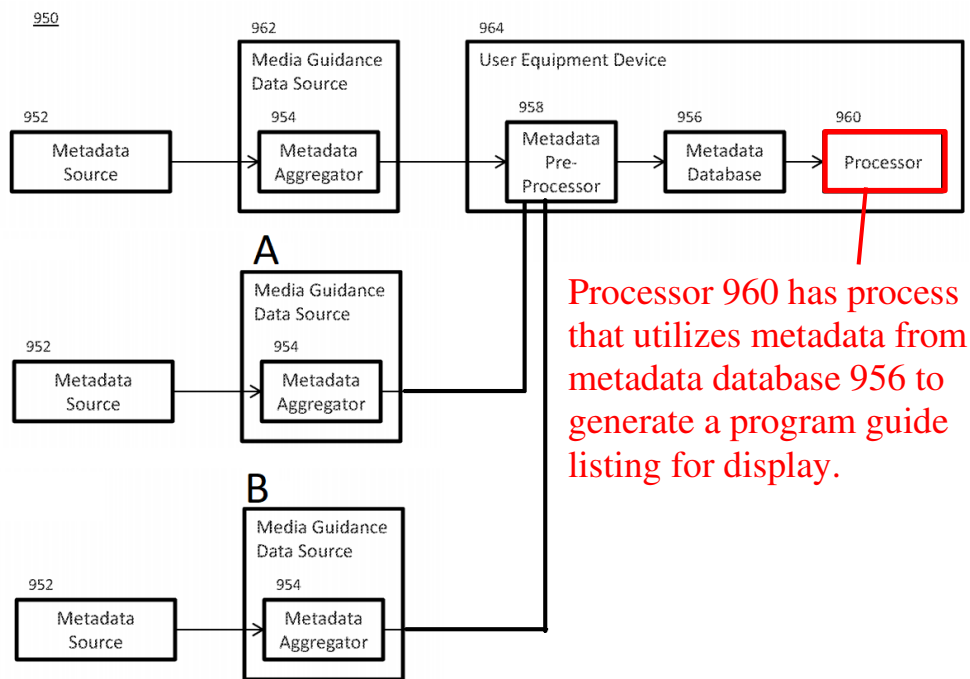
properly stored in Melnychenko's database. Because the metadata is organized and properly stored, it "can promptly and correctly [be] retrieve[d] [from] the database." Ex.1007, [0020]; *see also* Reasons to Combine Chen and Melnychenko; Ex.1003, ¶188.

In the proposed combination, Melnychenko's system would be implemented with a media context control unit (per Chen) positioned between one or more pre-processor 958 and the database 956. The media context control unit corresponds to "*one...content provider modules of the TV.*" During operation, pre-processor 958 would provide the organized metadata tables to a media context control unit so that it can be stored in database 956, which renders obvious "*providing, by the processor, the organized data to one...content provider modules of the TV.*" Ex.1003, ¶¶189-190.

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, [0071],

[0182]; Ex.1003, ¶191.

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.1003, ¶192.



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

Accordingly, 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 [] Intelligent TV.” Ex.1001, 2:47-51; *see also infra*, Claim 2 (“*wherein the plurality of content provider modules comprises an EPG data provider.*”); Ex.1003, ¶193.

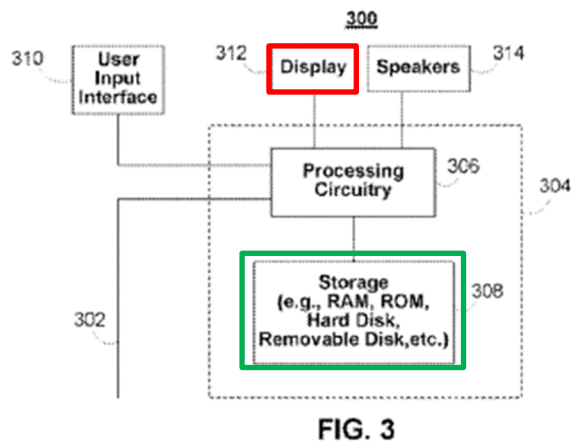
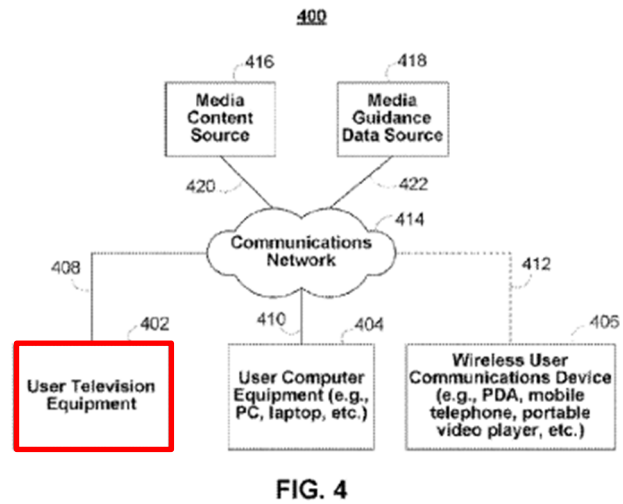
Thus, because in the proposed combination of Melnychenko and Chen there are two different content providers, the prior art combination renders obvious “*a plurality of content provider modules of the TV.*” Ex.1003, ¶194.

5. Claim 10

Claim 10 is substantially similar to claim 1 except for elements [10.0] and [10.2], which are addressed below. *See* Ex.1017. For elements [10.1], [10.3.1]-[10.5], *see* analysis at [1.1.1]-[1.3]; Ex.1003, ¶¶195, 200, 204-210.

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

Melnychenko discloses “systems and methods” for a TV. Ex.1005, Abstract, Fig. 1; *see also* Ex.1005, [0030]. Melnychenko’s system is “*a data service in a Television (TV),*” because as described for claim 1 above, Melnychenko’s system provides content and related metadata in a user equipment device 300 (e.g., TV) display 312 annotated in red in Figure 3 below, and/or user television equipment 402 annotated in red in Figure 4. *See, e.g.*, [1.0] and [1.1.1] above, *see also*, Ex.1005, [0047], [0055]; Ex.1003, ¶¶196-199.



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

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

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 Melnychenko's “media guidance applications.” See Fig. 3 above, with memory 308 annotated in green; *see also*, Ex.1005, [0048]-[0051], [0071]; Ex.1003, ¶201.

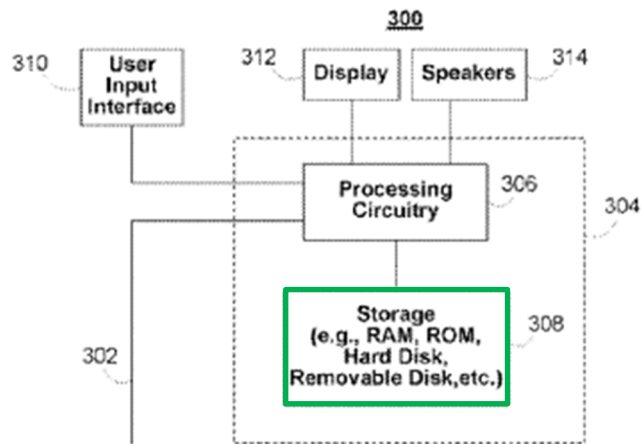


FIG. 3

Ex.1005, Fig. 3 (annotated).

Melnychenko discloses that functions of the control circuitry 304 (embodied by metadata pre-processor 958 in Figure 9B) are performed by executing software. Ex.1005, [0051], [0071], [0182]; Ex.1003, ¶202.

6. Claim 17

Claim 17 is substantially similar to claims 1 and 10 except for element [17.0], which is addressed below. *See* Ex.1017. For elements [17.1.1]-[17.4], *see* analysis at [10.2] and [1.1.1]-[1.3]; Ex.1003, ¶¶201-203, 214-222.

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

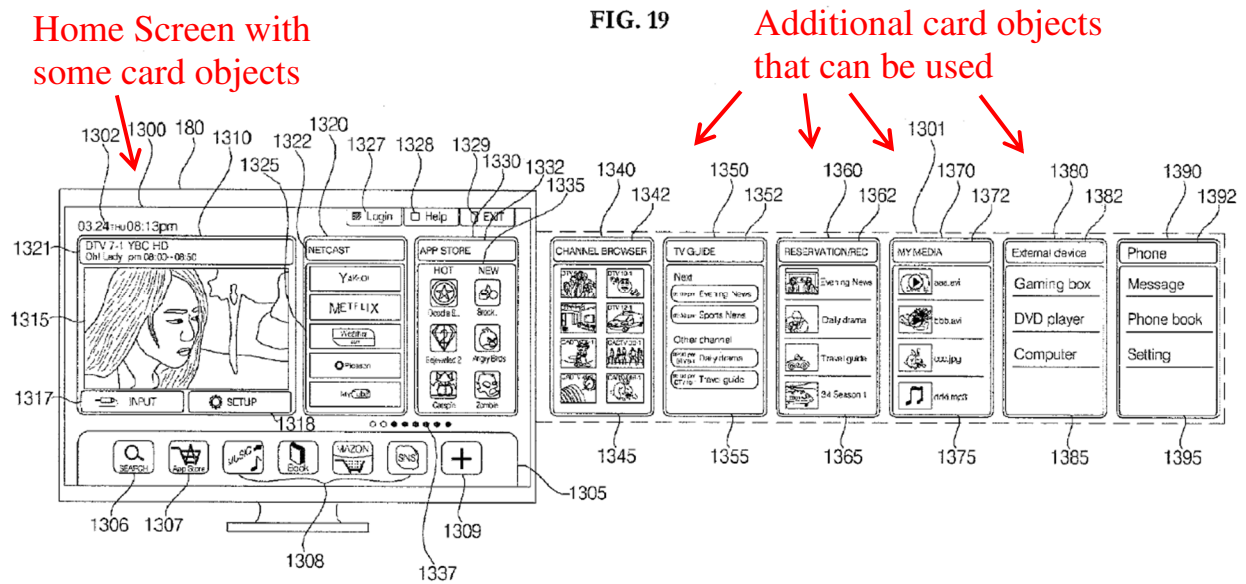
As discussed at [1.0], Melnychenko renders obvious a method “*for providing content for a television (TV).*” Melnychenko discloses a “*computer program product,*” because it “*methods...may be embodied in a computer program product*” Ex.1005, [0182]; Ex.1003, ¶211.

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

A summary of Melnychenko and Chen are provided in the previous Ground 1, with reasons to combine. The present ground additionally utilizes Kim and Lee-1, and provides additional analysis to Ground 1 independent claims 1, 10, and 17, as well as new analysis for dependent claims 2-4, 6, 11-13, 16, and 18.

1. Summary of Kim

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, Ex.1006, [0038]. Kim is adapted to display various “card objects” that are generated by an OSD generator 340 with associated memory to provide access to different types of content in a “home screen” of the smart TV. Ex.1006, [0094] 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. Ex.1003, ¶¶224-228.



Ex.1006, Fig. 19 (annotated).

2. Summary of Lee-1

Lee-1 provides additional details regarding the thumbnails described by Kim. 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]. Regarding methods of using thumbnails, Lee-1 teaches that a “[t]humbnail 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; Ex.1003, ¶230.

3. Reasons to Combine Melnychenko and Kim

A POSITA would have been motivated to combine Kim with Melnychenko

(as modified per Chen) for numerous reasons as discussed below. Ex.1003, ¶231.

a) Analogous Art

Kim, like Melnychenko and Chen, is analogous art because it is in the same field of endeavor as the '805 patent. Ex.1001, 2:16-32; Ex.1005, [0005], [0030]-[0032]; Ex.1006, [0086], Abstract; 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; Ex.1003, ¶232.

b) Motivation to Combine Kim with Melnychenko

A POSITA would have been motivated to modify apply Kim's teachings to Melnychenko (as modified per Chen) to obtain predictable and beneficial results. Ex.1003, ¶233.

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]; Ex.1003, ¶234.

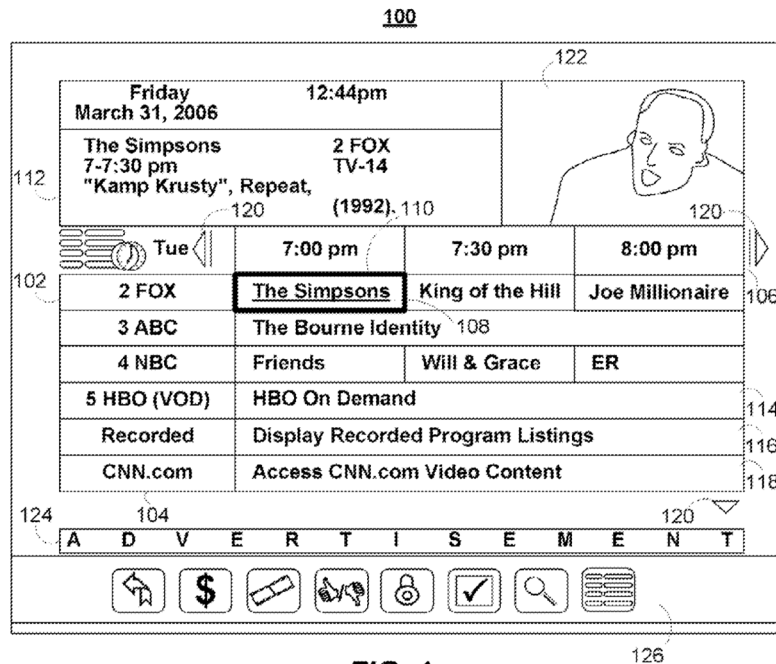


FIG. 1

Ex.1005, Fig. 1.

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]; Ex.1003, ¶235.

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]; Ex.1003, ¶236.

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, (collectively referred to hereinafter as “functional programs”) where one functional program generates one card object (see Fig. 19). Ex.1006, [0299]; Ex.1003, ¶237.

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 that generates and provides signals to display card objects on a home screen, per Kim, to thereby “**provid[e] a more intuitive graphical interface.**” Ex.1006, [0282]; Ex.1003, ¶238.

The combination is nothing more than applying a known technique (e.g., using an OSD generator 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]; Ex.1003, ¶239.

Additionally, the combination of Kim with Melnychenko (as modified per Chen) is merely combining prior art elements (e.g., an OSD generator, per Kim, with Melnychenko's processor 960) according to known methods (e.g., a processor utilizing an OSD generator, for example in software, 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]; Ex.1003, ¶240.

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 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]; Ex.1003, ¶***.

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]; Ex.1003, ¶¶***.

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 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]; Ex.1003, ¶¶***.

c) Reasonable Expectation of Success

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]; Ex.1003, ¶241.

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**.”); Ex.1003, ¶¶242-243.

4. Reasons to Combine Melnychenko and Lee-1

A POSITA when considering the combination of Melnychenko, Chen, and Kim would have also considered the incorporated teachings of Lee-1. Ex.1006, [0106]. In so doing, a POSITA would have applied Lee-1's thumbnail generator teachings to successfully implement the combination of Melnychenko and Kim, which uses thumbnails. It would have been obvious to a POSITA, to apply Lee-1's

thumbnail generator teachings because they provide implementation details directly applicable to 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 teachings. Nevertheless, additional reasons are provided in the claim analysis below. Ex.1003, ¶¶244-245.

5. Claim 1

Elements [1.0]-[1.2.4]

For elements [1.0]-[1.2.4], see [1.0]-[1.2.4] Ground 1. To remove any doubt that element [1.3] is rendered obvious, Melnychenko and Chen in further combination with Kim and Lee-1 renders it obvious. Ex.1003, ¶246.

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

The '805 patent's phrase "*one or more*," includes "at least one of A, B, or C." Ex.1001, 3:21-28. Also, a "*module*" is "any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software." Ex.1001, 30:65-31:3; Ex.1003, ¶247.

First, as discussed at [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; Ex.1003, ¶248.

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.*" Ex.1003, ¶249.

As discussed at [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]; Ex.1003, ¶250.

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]; [0193], [0133], [0137]. Kim's "controller 170 may provide overall control," including controlling the display of content stored in memory 140. Ex.1006, [0081], [0089], [0092]-[0093]; *see also* Ex.1006, [0133], Fig. 10; Ex.1003, ¶251.

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). Ex.1003, ¶252. 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.*” Ex.1003, ¶252.

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; Ex.1003, ¶253.

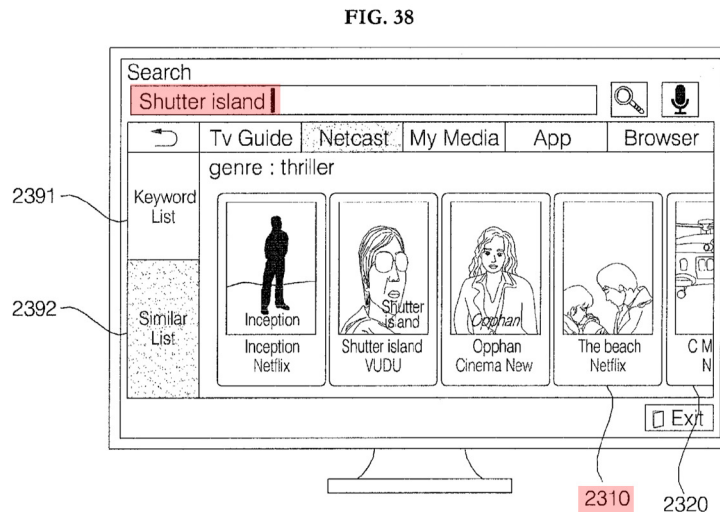
In the proposed combination, Melnychenko’s processor 960 would access the organized metadata in metadata database 956 (Ex.1005, [0067], [0126]), and provide the metadata to an OSD generator (realized with “[f]unctional programs, code, and code segments”, Ex.1006, [0299]) to generate card objects. This

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]; Ex.1003, ¶254.

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]; *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.*”); Ex.1003, ¶255.

In addition, Kim discloses a “search application menu item 1306” displayed on the home screen that allows a user to search for (scan) media and other content. Ex.1006, [0216]. Kim’s Figure 38 below illustrates that the controller 170 outputs a “search results object 2310” identifying results that match a keyword search

(“Shutter island”). Ex.1006, [0269]-[0271]; Ex.1003, ¶256.



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 the functional program provides search results 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*”); Ex.1003, ¶257.

It would have been obvious to a POSITA to implement a search functional program in Melnychenko, 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; Ex.1003, ¶258.

Third, and additionally, the further combination with Lee-1 discloses a “*content provider module[]*” as a “thumbnail generator.” Ex.1008, Abstract; Ex.1003, ¶260.

Kim discloses “**generat[ing] thumbnail images**.” Ex.1006, [0104], [0186], [0205]-[0206]. 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]; Ex.1003, ¶261. 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” so that it has an “appropriate size when it is displayed.” 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; Ex.1003, ¶262.

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; Ex.1003, ¶263.

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. See Ex.1005, [0041]. 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" (Ex.1008, 8:38-40); Ex.1003, ¶264.

Thus, the combination of Melnychenko, Chen, Kim, and Lee-1 also renders obvious "*a plurality of content provider modules of the TV.*" Ex.1003, ¶265.

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.*

Claim 2 depends on claim 1, which as discussed above is obvious over Melnychenko in view of Chen (Ground 1) and additionally, over Melnychenko in view of Chen, Kim, and Lee-1 (Ground 2). The claim 2 analysis below further builds on both of these grounds.

As discussed at [1.3], Ground 2 above, Kim's OSD generator ("realize[d]" with "[f]unctional programs" – citing Ex.1006, [0299]) provide multiple different "*content provider modules*". Ex.1003, ¶¶266-267. Kim and Lee-1, which is incorporated by reference in Kim, describe and show that all of the listed *content provider modules* in claim 2 were known and obvious.

i. "an EPG data provider"

Consistent with the discussion at [1.3], Ground 2, 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. Ex.1003, ¶268.

ii. "a media data provider"

Consistent with the discussion at [1.3], Ground 2, 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. Ex.1003, ¶269.

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. Ex.1003, ¶270.

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. Ex.1003, ¶¶271-272.

iii. “a media browser”

Consistent with the discussion at [1.3], Ground 2, 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]; Ex.1003, ¶273.

OSD generator (realized with a functional program) generates an External Device card object 1380 that 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; Ex.1003, ¶¶274, 276.

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. Ex.1003, ¶¶275-276.

iv. “*a media scanner*”

Consistent with the discussion at [1.3], Ground 2, it would have been obvious for Melnychenko’s processor 960 to implement a search functional program, which renders obvious “*a media scanner*,” as claimed. Ex.1003, ¶277.

v. “*a thumbnail engine*”

Consistent with the discussion at [1.3], Ground 2, 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. Ex.1003, ¶278.

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.*

Consistent with the discussion at [1.3], Ground 2, 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.”); Ex.1003, ¶¶279-280.

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.”); Ex.1003, ¶¶281-282.

8. Claim 9

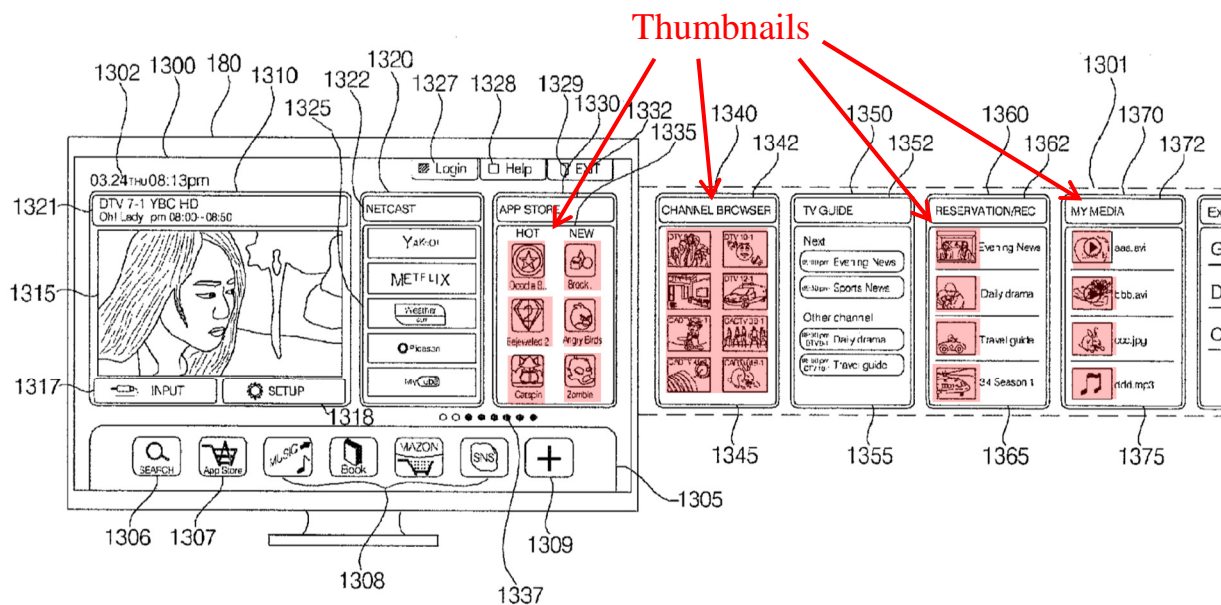
[9.0] *The method of claim 2, wherein the thumbnail engine is configured to provide thumbnails for media, applications, or other contents.*

Consistent with the discussion at [1.3], Ground 2, 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; Ex.1003, ¶¶283-285.

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]; Ex.1003, ¶286.

FIG. 19



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

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);

Ex.1003, ¶¶287-288.

9. Claim 10

For elements [10.0]-[10.4.4] see [10.0]-[10.4.4], Ground 1. Ex.1003, ¶¶289-299. For element [10.5], see [1.3], Ground 2; Ex.1003, ¶300.

10. Claim 11

See [2.0]. Ex.1003, ¶301.

11. Claim 12

See [11.0] and [3.0]. Ex.1003, ¶302.

12. Claim 16

See [11.0] and [9.0]. Ex.1003, ¶303.

13. Claim 17

For elements [17.0]-[17.3.4] see [17.0]-[17.3.4], Ground 1. Ex.1003, ¶¶304-312. For element [17.4], see [1.3], Ground 2; Ex.1003, ¶313.

14. Claim 18

See [17.0] and [2.0]. Ex.1003, ¶314.

D. Ground 3: Claims 4 and 13 are obvious over Melnychenko in view of Chen, Kim, Lee-1, and Lee-2.

1. Summary of Lee-2

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.

Ex.1003, ¶316.

FIG. 39B



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

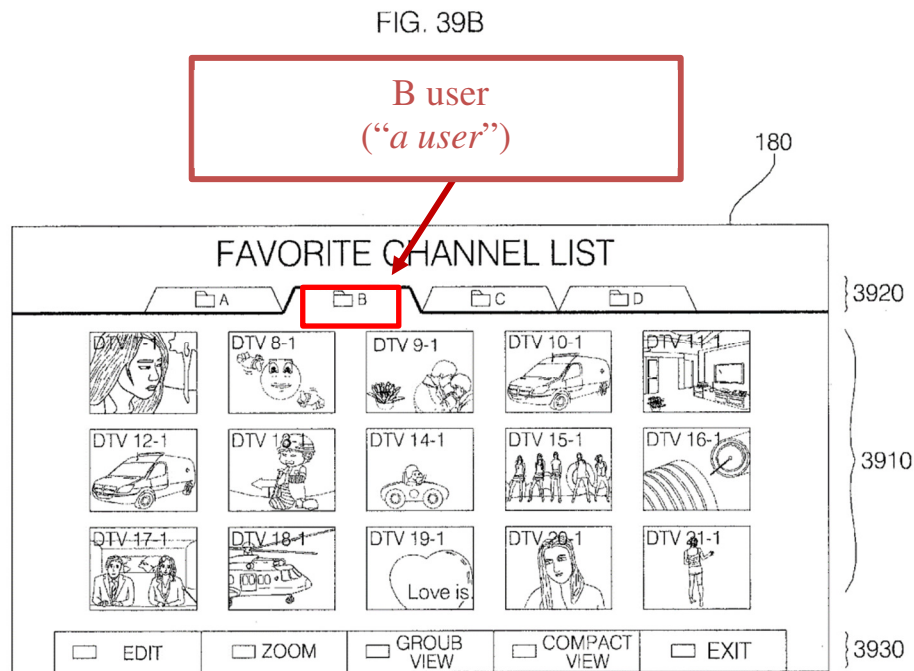
Lee-2 also discloses that the favorite channel list settings are configured by the user using a setup menu 3930, shown above at Figure 39B. Ex.1009, 41:61-67. Additionally, Lee-2 discloses that upon a user input of a local key or favorite channel key on the remote controller a FAVORITE CH card object 2060 is displayed to the user to be instantly aware of favorite channels. Ex.1009, 33:63-67; 37:61-38:2, Figs. 32A, 32B; Ex.1003, ¶¶318-322.

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.

First, as discussed at [1.3], Ground 2, the prior art discloses OSD generator functional programs that generate different card objects (“*content provider modules*”). Ex.1003, ¶¶323-324.

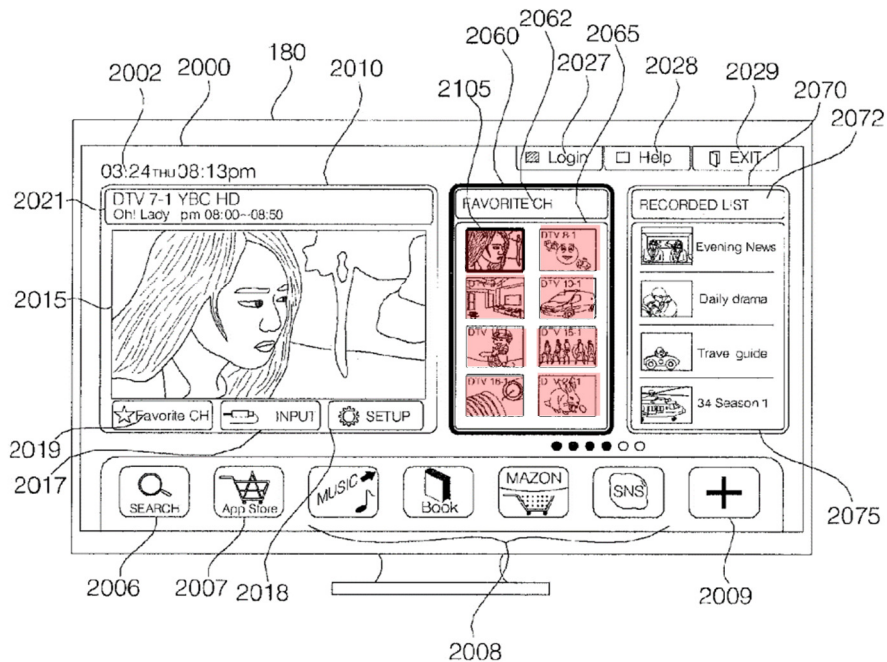
Second, Kim discloses “**pre-stored user channels (e.g., favorite list)**,” but provides limited implementation details on this feature. Ex.1006, [0206]. Lee-2 supplements by teaching a favorite channel list that is personalized for a user (e.g., B user). Ex.1010, 41:47-55; *See also* Ex.1010, 39:57-63 (“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.”); Ex.1003, ¶325.



Ex.1010, Fig. 39B (annotated).

Lee-2's favorite channel list settings are configured by the user. Ex.1010, 41:61-67. As shown below at Figure 33B, Lee-2's OSD generator functional program (Ex.1010, 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. Ex.1003, ¶¶326-327.

FIG. 33B



Ex.1010, Fig. 33B (annotated).

Consistent with the discussion at [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. Ex.1003, ¶¶328-329. 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.1010, 37:67-38:2; *see also* Reasons to Combine Lee-2 and Melnychenko; Ex.1003, ¶329.

3. Claim 13

See [11.0], Ground 2 and [4.0], Ground 2. Ex.1003, ¶330.

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

1. Summary of Ferren

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.1010, 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; Ex.1003, ¶332.

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.*

First, as discussed at [4.0], the prior art discloses an OSD generator functional program that generates a Favorite Channel card object (“*media data provider*”). Ex.1003, ¶¶333-334.

Second, as explained above at [4.0], the favorite channel list is set by the user via a setup menu. Ex.1010, 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.1010, 41:47-55; Ex.1003, ¶335.

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. Ex.1003, ¶336.

Further, as discussed at [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; Ex.1003, ¶337.

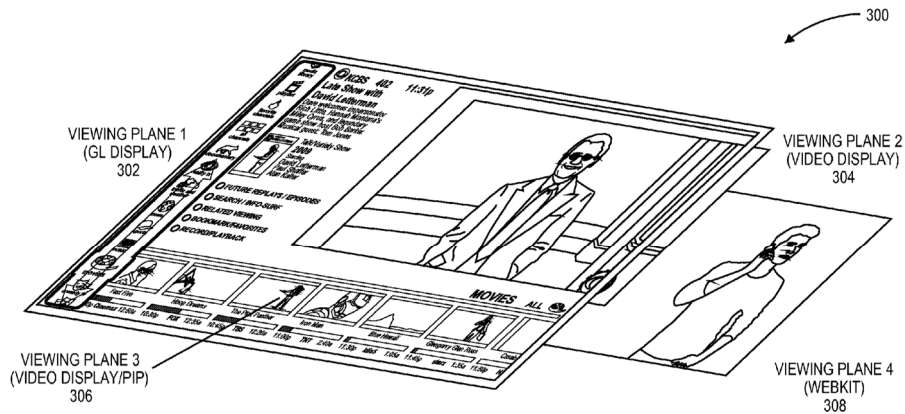


FIG. 3A
Ex.1010, Fig. 3A.

Like Melnychenko, Ferren discloses that metadata related to multimedia data is stored in an SQLite database. Ex.1010, 10:4-36; Ex.1003, ¶338.

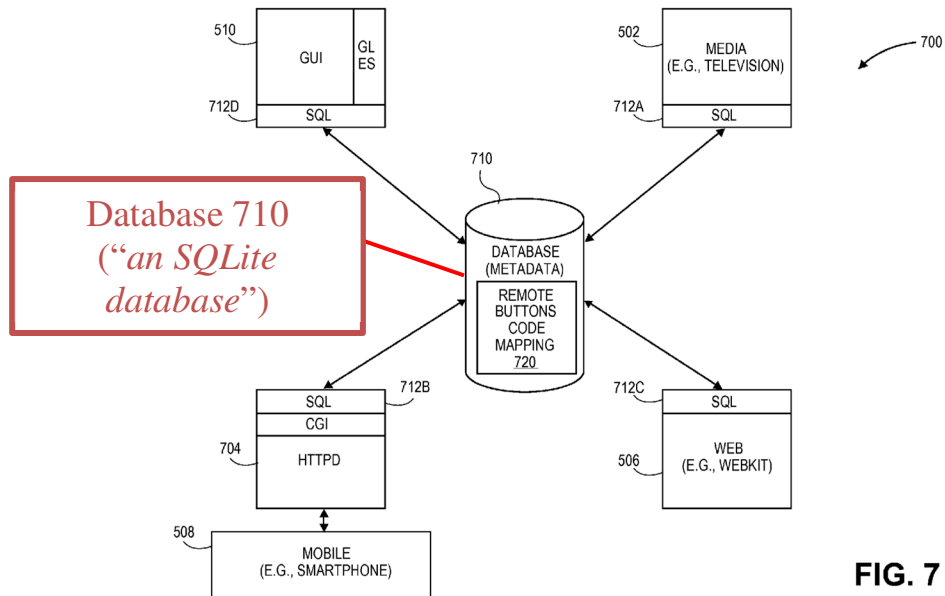


FIG. 7
Ex.1010, Fig. 7 (annotated)

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; Ex.1003, ¶339.

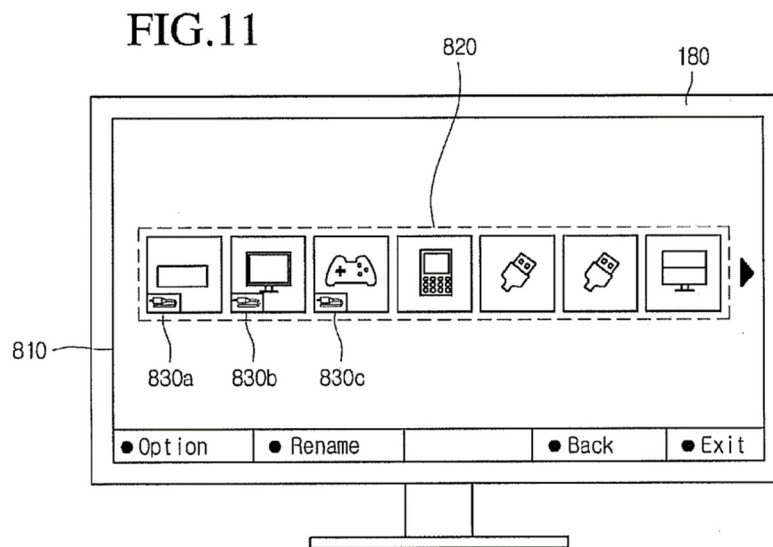
This would have been the combination of prior art elements (metadata database 956 in Melnychenko's Figure 9B configured as an SQLite database, as taught by Ferren) according to known methods (using an SQLite database to store metadata, as taught by Ferren) to yield the predictable result of operating 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; Ex.1003, ¶¶340-341.

A. 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

Choi generally discloses methods and systems of displaying content on a television. Ex.1011, [0002]-[0004]. Choi discloses that devices determined to be externally connected to an input port of the television may be represented by icons with specific symbols to distinguish connected devices. Ex.1011, [0250]; Ex.1003, ¶¶343-344.



Ex.1011, Fig. 11.

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.

First, as discussed at [2.0], the prior art discloses an OSD generator functional program that generates External Device card object 1380 (“*media browser*”). Ex.1003, ¶345.

Second, Kim discloses that the External Device card object 1380 includes “a list of external devices which may be connected” via an input port, e.g., “HDMI,” etc. Ex.1006, [0077], [0196], [0205]-[0210], Fig. 19. The list of external devices may include “Gaming box,” “DVD player,” etc. Ex.1006, [0210], Fig. 19; Ex.1003, ¶346.

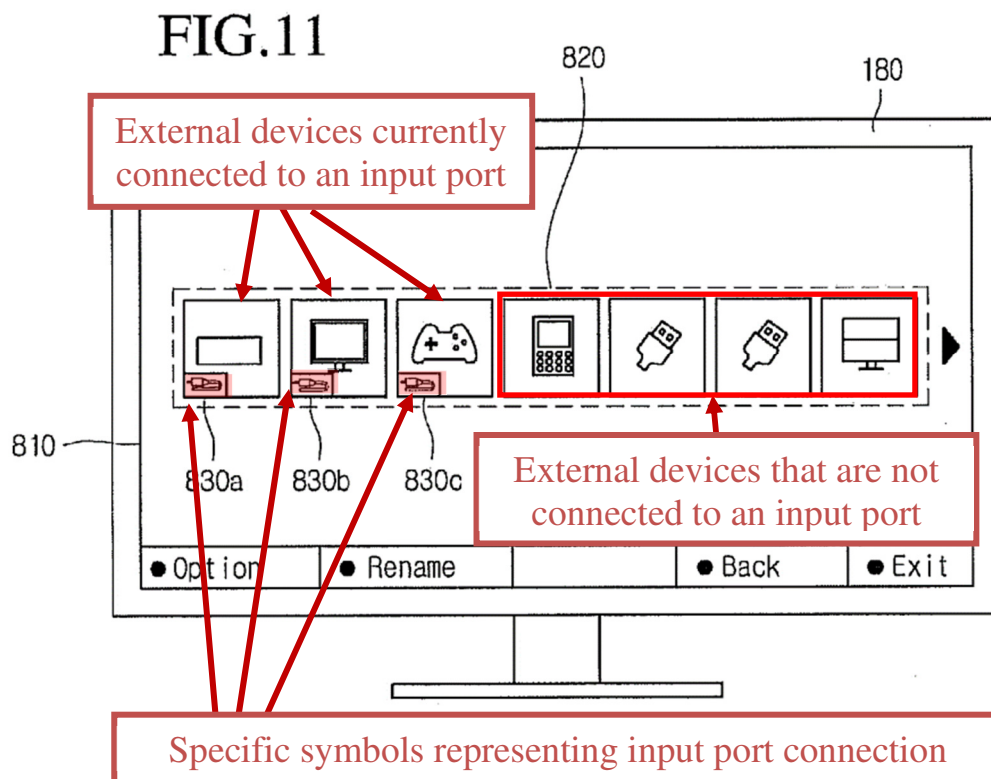
Choi discloses that external devices determined to be connected may be represented by icons with specific symbols. Ex.1011, [0250] (“As shown in FIG. 11, a plurality of **external device icons 820 representing a plurality of external devices are displayed... the control unit 170 determines which external device icons 820 are connected to the image display device 100 in order to display specific symbols 830a, 830b and 830c.**”). 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. Ex.1003, ¶347.

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...[such as] 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...using NonVolatile RAM (NVRAM) or flash memory.”); Ex.1003, ¶348.

Choi’s Figure 11 provides a real-time view of external devices that are determined to be currently connected to an input port, represented in list of icons with specific symbols indicating input port connections. Ex.1003, ¶349.

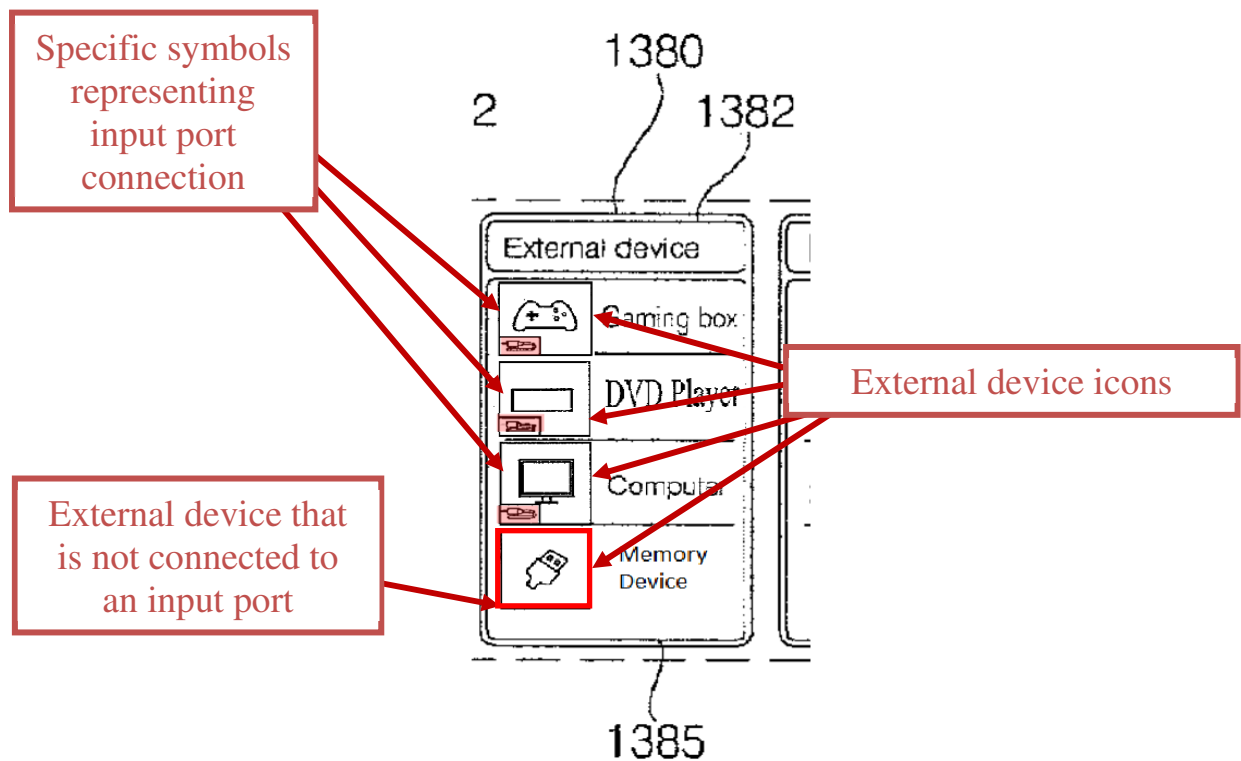


Ex.1011, Fig. 11 (annotated).

Like Kim, Choi's external devices may correspond to a DVD player, a Blue Ray player, a game console, etc. 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 HDMI port, etc. Ex.1006, [0077], Ex.1011, [0099]; Ex.1003, ¶350.

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**”, Ex.1006, [0196]), to include icons representing external devices with specific symbols for devices determined to be connected and to store this list in memory (e.g., RAM). 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. Ex.1003, ¶351.

In the proposed combination 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 shown below in Kim's modified Figure 19. Ex.1003, ¶352.



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

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]. 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. Ex.1003, ¶¶353.

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. Ex.1003, ¶¶354-355.

3. Claim 7

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

As discussed at [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. Ex.1003, ¶356.

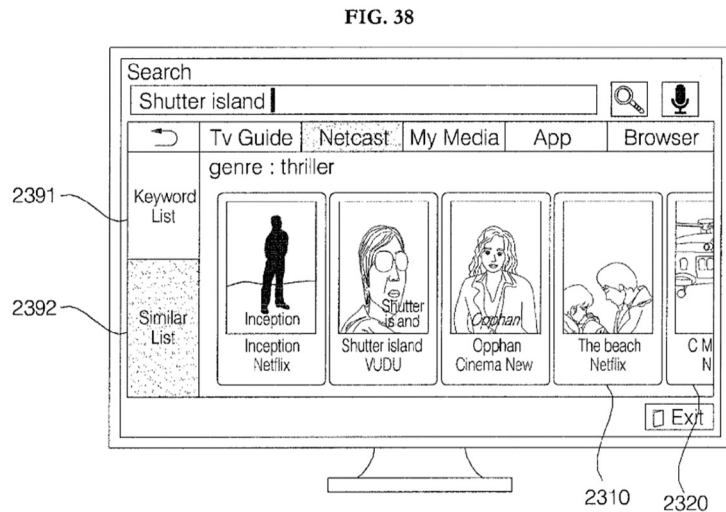
4. Claim 8

[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.*

First, as discussed at [2.0], the prior art discloses a search function program (“*media scanner*”) and card object 1380 (External Device) (“*media browser*”). Ex.1003, ¶357.

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. Ex.1003, ¶358.

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]; Ex.1003, ¶359.



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. Ex.1003, ¶360.

5. Claim 14

See [11.0] and [6.0]. Ex.1003, ¶361.

6. Claim 15

See [11.0] and [8.0]. Ex.1003, ¶362.

VIII. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE

A. Discretionary denial under the *Fintiv* factors is not appropriate

The *Fintiv* factors favor institution. (1) No motion to stay has been filed. (2) The trial date is irrelevant in light of Petitioner’s stipulation below. (3) The co-pending litigations are in relatively early stages. (4) **Petitioner hereby stipulates**

that if instituted, Petitioner will not pursue in District Court the specific grounds asserted here, or on any other ground that was raised or could have been reasonably raised in this IPR. For this reason alone, the Board should not discretionarily deny institution in view of the parallel proceedings. *See* June 21, 2022 Director Memo, p. 3. (5) Petitioner’s involvement in the parallel proceeding should not be a basis for denying institution. (6) The merits of this case are compelling for the reasons described above. Accordingly, discretionary denial is inappropriate here.

B. Discretionary denial under 35 U.S.C. § 325(d) is not appropriate

Denial under § 325(d) is not warranted because the challenges presented in this petition are neither cumulative nor redundant to the prosecution of the ’805 Patent.

IX. CONCLUSION

Accordingly, Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: December 22, 2023
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Registration No. 32,271

X. MANDATORY NOTICES

A. Real Party-in-Interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner certifies that the real party-in-interest is LG Electronics, Inc. and LG Electronics, U.S.A., Inc.

B. Related Matters

Pursuant to 37 C.F.R. § 42.8(b)(2), to the best knowledge of the Petitioner, the '805 patent is involved in the following cases:

Case Heading	Number	Court	Date
<i>Multimedia Technologies Pte. Ltd. v. LG Electronics Inc. et al.</i>	2:22-cv-00494	EDTX	December 23, 2022
<i>Multimedia Technologies Pte. Ltd. v. Vizio, Inc.</i>	2-23-cv-00124	EDTX	March 24, 2023

C. Lead and Back-up Counsel and Service Information

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XI. CLAIM APPENDIX

- [1.0] 1. A method of providing content for a television (TV), the method comprising:
- [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,
- [1.1.2] wherein the plurality of subservices comprises a video-on-demand (VOD) subservice, electronic programming guide (EPG) subservice, and a media subservice
- [1.2.1] organizing, by the processor, the data according to a pre-defined format corresponding to each of the plurality of subservices,
- [1.2.2] wherein the pre-defined format comprises one of a VOD data model, an EPG data model and a media data model,
- [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
- [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
- [1.3] providing, by the processor, the organized data to one or more of a plurality of content provider modules of the TV.
- [2.0] 2. 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.

[3.0] 3. 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.

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

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

[6.0] 6. 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.

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

[8.0] 8. 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.

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

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

[10.1] a processor; and

[10.2] a computer-readable storage medium storing computer-readable

instructions, which when executed by the processor, cause the processor to perform:

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

[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;

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

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

[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

[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

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

- [11.0] 11. 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.
- [12.0] 12. 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.
- [13.0] 13. The data service system of claim 11, wherein the media data provider is configured to provide media metadata personalized for a user.
- [14.0] 14. 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.
- [15.0] 15. 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.
- [16.0] 16. The data service system of claim 11, wherein the thumbnail engine is configured to provide thumbnails for media, applications, or other contents.
- [17.0] 17. 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,

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

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

[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;

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

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

[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

[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

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

[18.0] 18. 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.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and in reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,945.

Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: December 22, 2023

/David L. McCombs/
David L. McCombs
Lead Counsel for Petitioner
Registration No. 32,271

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

Date of service December 22, 2023

Manner of service *FEDERAL EXPRESS*

Documents served Petition for *Inter Partes* Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 9,247,805; Petitioner's Exhibit List; Exhibits Ex. 1001 through Ex. 1018; Petitioner's Power of Attorney.

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