

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

SAMSUNG ELECTRONICS CO., LTD. AND
SAMSUNG ELECTRONICS AMERICA, INC.

Petitioners,

v.

MAXELL LTD.,
Patent Owner

Case: IPR2025-01311

U.S. Patent No. 11,812,091

**DECLARATION OF KARANSHER SINGH IN SUPPORT OF
PATENT OWNER'S RESPONSE**

Mail Stop **Patent Board**
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF KARAN SHER SINGH

I. INTRODUCTION

1. My name is Karansher Singh. I have been retained by counsel for Maxell, Ltd. (“Patent Owner”) to provide expert testimony in connection with Inter Partes Review No. IPR2025-01311 (“IPR”), which involves U.S. Patent No. 11,812,091 (the “’091 Patent”), titled “Multimedia Player Displaying Operation Panel Depending on Contents.” I understand that Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (“Samsung” or “Petitioner”), have challenged Claims 1–20 of the ’091 Patent as allegedly obvious under 35 U.S.C. § 103. I have reviewed the Declaration of Dr. Benjamin B. Bederson (EX1003), which Samsung submitted in support of its Petition. In my opinion, Dr. Bederson’s technical analysis is flawed for the reasons set forth below.

2. I am being compensated for my time in this matter at the rate of \$750 per hour. My compensation is not contingent upon the outcome of this proceeding or the substance of my opinions.

3. In forming the opinions set forth below, I have reviewed the ’091 Patent (EX1001), its prosecution history (EX1002), the Petition filed by Samsung, Dr. Bederson’s Declaration (EX1003), the Patent Owner’s Preliminary Response, and each of the prior art references cited in the Petition, including Phillips (EX1010), Wallis (EX1011), Logan (EX1013), Ellis (EX1014), Uchida (EX1015), and Ellis

'091 (EX1021). I have also reviewed the Decision Granting Institution and all other materials referenced in this Declaration. My opinions are based on these materials and my professional knowledge, education, training, and experience in the relevant field.

II. BACKGROUND AND QUALIFICATIONS

4. My qualifications to testify about the '091 Patent and the relevant technology are set forth in my curriculum vitae ("CV"), which I have attached here as EX2020. My CV includes a list of my relevant work experience, publications, patents, and prior expert witness experience in cases involving human computer interaction and graphics technologies.

5. A brief summary of my qualifications to render opinions regarding the technology of the '091 Patent is provided in the following paragraphs but I reserve rights to testify about any additional qualifications at trial that are identified in my CV.

6. I am a Professor of Computer Science at the University of Toronto, where I co-direct a graphics and human computer interaction laboratory dgp (dynamic graphics project).

7. I hold several Computer Science and Engineering degrees. In 1991, I received my Bachelor of Technology degree in Computer Science from the Indian

Institute of Technology. I was awarded a Master of Science degree in 1992, and a Ph.D. in 1995, in Computer and Information Science, from Ohio State University.

8. My Ph.D. dissertation pertained to the creation of models and representations of digital humans that could interact in graphical environments. I can fluently read and write software programs in various computer programming languages. In 1994, I also worked as an invited researcher at the Advanced Telecommunications Research laboratory in Kyoto, Japan, on topics related to telecommunication and virtual environments.

9. Between 1995 and 1999, I worked at Alias Wavefront in Toronto, Canada. My responsibilities included designing character animation and facial modeling tools for the first release of Maya, a software system for computer graphical modeling, animation, and rendering. The software won a technical Oscar in 2003, and is still the premiere software package used for modeling and animation.

10. I have worked with Chris Landreth, a director of animated films, since I started with Alias Wavefront in 1995. Chris and I worked together on the design of Maya, and have subsequently worked on a number of film projects. Notable among these projects is the short film “Ryan,” which won an Oscar for Best Animated Short in 2005.

11. Later in 1999, I joined a start-up company in California called Paraform Inc., where I designed and developed software tools for digital scanning, design, and fabrication.

12. Since 2002, I have been a Professor of Computer Science at the University of Toronto, where I have and continue to conduct research and teach classes in graphics and in human computer interaction. During this period, I have also undertaken consulting projects with various companies on topics related to computer graphics and human computer interaction, including most recently Weta Digital, where I worked on the creation of a facial animation system for the film “Avatar: the way of water,” which won an Oscar for Best Visual Effects in 2022.

13. I have co-founded multiple companies including most recently JALI Research, in the area of digital characters.

14. My research interests lie in interactive graphics, spanning geometric and anatomic modeling, visual perception, character and facial animation, sketch and touch based user interfaces, and interaction and collaboration techniques using a variety of computing platforms and devices including mobile, volumetric, and Augmented Reality and Virtual Reality (AR/VR).

15. As shown in my CV, I have authored or co-authored over 150 peer-reviewed publications on a variety of topics in computer science. I am an inventor

on several U.S. patents related to topics in human computer interaction and computer graphics.

III. PERSON OF ORDINARY SKILL IN THE ART

16. I understand that Samsung has proposed that a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention would have had a bachelor’s degree in computer science, electrical or computer engineering, or a comparable field of study, plus approximately one or two years of professional experience with user interface design for mobile devices or other relevant industry experience. I do not dispute this general characterization, though I note that additional specialized knowledge of server-client architectures in digital broadcast and video-on-demand systems would be expected of a POSITA working in this specific technological area.

17. In particular, by 2005, client-server software architectures had evolved through several generations—from mainframe architectures, to two-tier client-server models, to three-tier and distributed object architectures—each introducing more sophisticated divisions of processing responsibility between client and server. *See* EX2021, Client/Server Software Architectures—An Overview, Software Engineering Institute, Carnegie Mellon University, https://web.archive.org/web/20050228093112/http://www.sei.cmu.edu:80/str/descriptions/clientserver_body.html. A POSITA in this field would have understood the

fundamental architectural distinction between logic and data that reside on a server versus logic and data that execute locally on user equipment—a distinction that is central to the claims of the '091 Patent. This distinction is not merely theoretical; it has practical consequences for system design. In a server-driven architecture, the server maintains authoritative control over application behavior, including user interface presentation logic, and communicates instructions or metadata to the client device that determine what the user sees and how the interface responds. By contrast, in a client-driven architecture, the local device independently determines its own user interface (“UI”) behavior based on locally stored logic, responding only to local user inputs without consulting the server for presentation-layer decisions. The '091 Patent’s architecture falls squarely into the server-driven category: the outside server delivers information—specifically, “related information” including “time related information” and “panel related information”—that governs the client device’s UI presentation decisions. This is a fundamentally different design philosophy from systems in which the client device autonomously decides what to display based on hardcoded local logic or user inputs alone.

18. I am and was at all relevant times at least a person of ordinary skill in the relevant art, and I am able to provide insight and opinions into the understandings of such persons of ordinary skill in the art.

IV. OVERVIEW OF THE '091 PATENT

19. The '091 Patent is directed to a digital content reproducing apparatus that intelligently manages the display of user operation panels based on metadata received from an outside server. The patent addresses a longstanding problem in digital content reproduction. As the specification explains, “[a] conventional digital broadcasting compatible HDD/DVD decoder which is a digital content reproduction apparatus requires, in addition to channel tuning, reproduction control keys for linear contents such as video and audio, the keys including ‘reproduce’, ‘stop’, ‘fast forward’, ‘fast backward’, ‘temporary stop’ and other operation keys. The apparatus further requires ‘up’, ‘down’, ‘right’, ‘left’, ‘decide’ and four-color keys for operation control of data broadcasting. In order to deal with all functions, a number of remote keys are required.” EX1001 at 1:29-38. An “apparatus using GUI is also required to display all keys so that a wide operation panel rendering area is used.” EX1001 at 1:61-63. This made the user interface cumbersome and difficult to learn. This problem was well-recognized in the human-computer interaction literature by the early 2000s. The phenomenon of “feature creep”—in which successive versions of software or hardware accumulate ever more functions, overwhelming users with choices they rarely need—was a central concern of interface designers in this era. EX2022 (<https://www.cbsnews.com/news/feature-fatigue-hits-gadget-users/>). A remote control or on-screen panel presenting dozens of buttons—many irrelevant to

the user's current task—thus imposes unnecessary cognitive burden. The '091 Patent directly addresses this problem by presenting only the buttons relevant to the user's current context, as determined by server-supplied metadata.

20. The '091 Patent solves this problem through an elegant architectural insight: rather than displaying all keys at once, the apparatus provides two (or more) distinct types of operation panels—a “linear content operation panel” (A4) and an “interactive content operation panel” (A5)—that are “displayed exclusively and are not displayed at the same time” in the same operation panel display area (A3). EX1001 at 3:66–4:1; Figs. 2–4. The linear content operation panel A4 provides conventional playback functions such as reproduce, stop, temporary stop, fast forward, fast backward, previous skip, and next skip. EX1001 at 3:53–59. The interactive content operation panel A5 provides functions for interacting with data broadcast services such as numerical keys 0–9, up/down/right/left keys, a decide key, and blue/red/green/yellow keys. EX1001 at 3:60–65.

FIG. 2

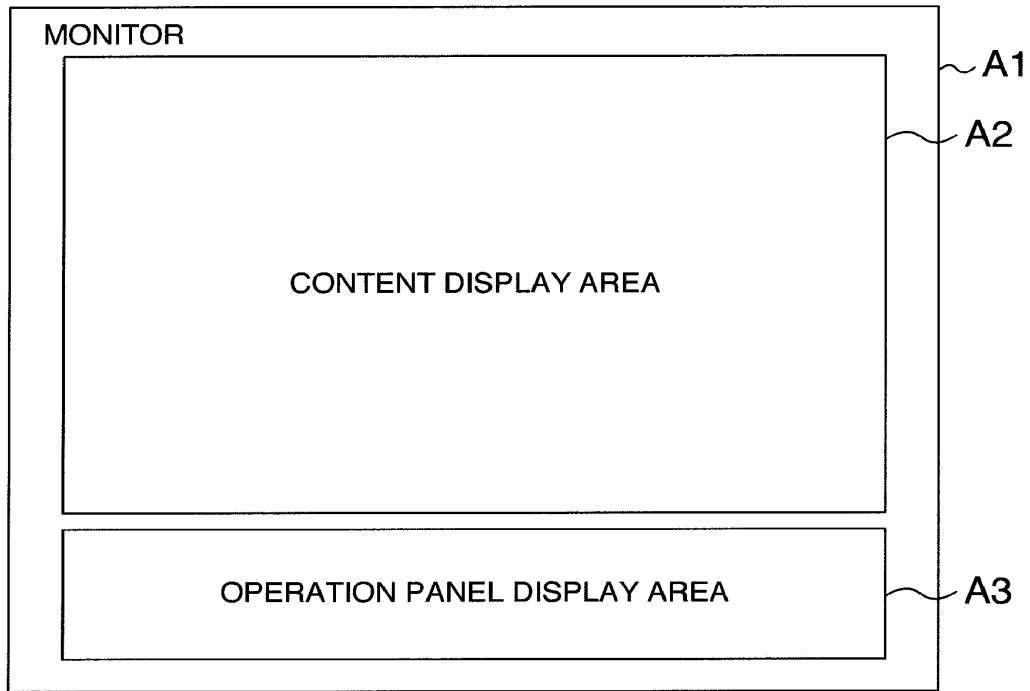
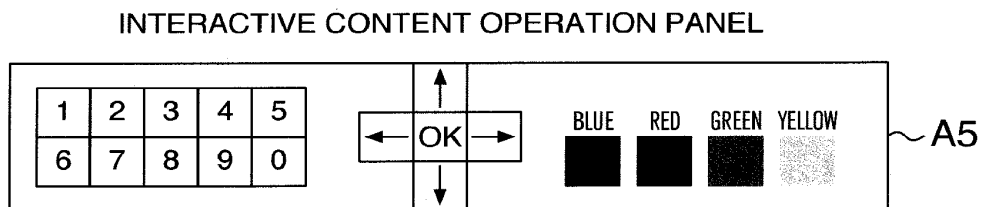


FIG. 3



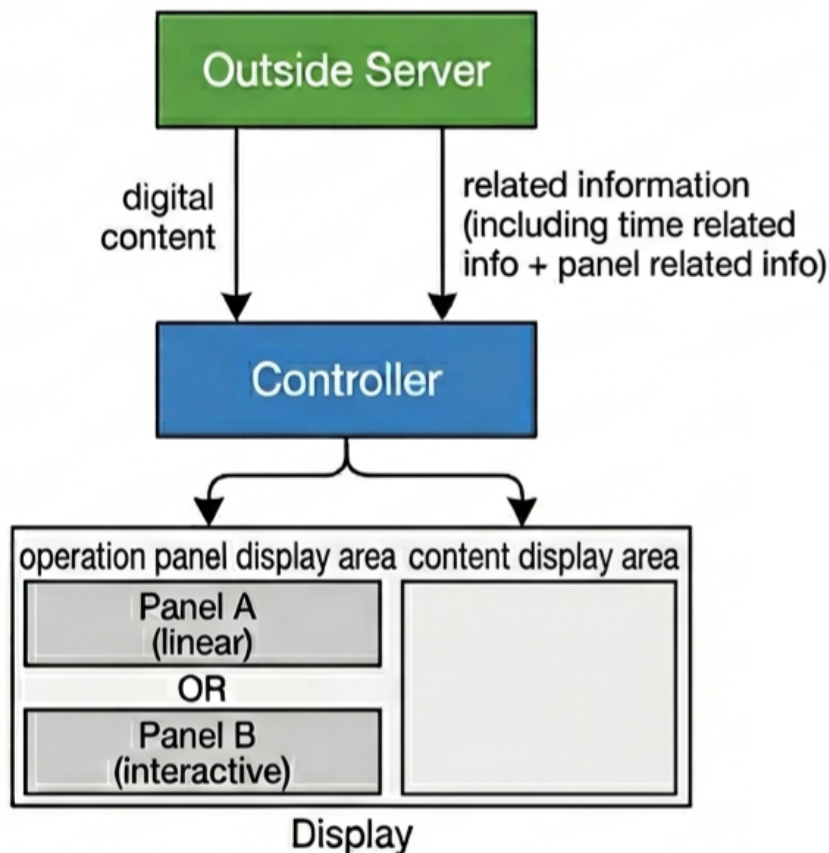
FIG. 4



EX1001 at Figs. 2-4 (showing the digital content reproduction apparatus with the linear content operation panel A4 and interactive content operation panel A5, which are displayed exclusively in the operation panel display area A3).

21. To put this in everyday terms, consider a television system that can play a large variety of content including locally recorded movies, streamed movies, live broadcast, television series, lifestyle content, and interactive content such as game shows. Given the diversity in the types of content that can be presented and how a user might want to interact with it, a plurality of ways of interacting with the content can be useful. For example, when the user plays a recorded movie, they need playback buttons: play, pause, fast-forward, rewind. As another example, when the user plays an interactive game show, they need navigation buttons: up, down, left, right, select. As another example, consider a television show with multiple episodes. In this example, the user may need interactive buttons that enable easy or sequential viewing of subsequent episodes. Before the '091 Patent, systems either displayed all of these buttons at once (cluttering the screen and confusing the user) or required the user to manually switch between control modes. The '091 Patent's innovation is that the server sending the content also sends metadata—information about the content—that tells the player which set of buttons to display. The player does not need to figure out what kind of content it is receiving; the server tells it, and the player adapts its controls accordingly. This is the fundamental architectural distinction at issue in

this case: who decides which controls to show—the server (through metadata), or the local device (through its own hardcoded logic)?



Above is an exemplary System Architecture Diagram, in which the '091 Patent's server-to-controller-to-display architecture is visually presented. In this example, an outside server transmits digital content together with related information—including time related information and panel related information—to a controller, which processes the related information and selects between a linear operation panel and an interactive operation panel for display alongside the reproduced digital content.

22. Critically, the switching between these two panels is not merely a local, user-driven mode change. Rather, the '091 Patent teaches that the apparatus receives “related information” from an outside server, and that this related information includes both “time related information” and “panel related information.” EX1001 at Claim 1. In one embodiment, the controller uses the time related information to determine a period during which at least one of the interactive operation panels is displayed, and outside that time period, the controller displays one or more linear or interactive operation panels based on the panel related information. EX1001 at Claim 1.

23. The specification illustrates the practical importance of this architecture using the concept of an “appreciation term”: “includes up-to-date news, weather forecast and the like ... have a nature of an appreciation term and it is difficult to consider that these contents are referred to after, e.g., one month.” EX1001 at 5:42–46. Accordingly, “[i]f contents are outside the appreciation term, data broadcasting is not displayed even if the auto_start_flag is ‘1’, but the linear content operation panel is displayed. If the contents are within the appreciation term and a user does not still view the contents, the data broadcasting is automatically displayed even if the auto_start_flag is ‘0’ and the interactive content operation panel is displayed.” EX1001 at 5:49–55. In other words “appreciation term” suggests a time period during which the content is designed to be “appreciated” or interacted with, in a

manner other than simple linear operation (for example, a time period during which users may interactively choose to vote for a piece content; after the time period these votes get tallied and users can continue to view the content using the linear panel, but no longer vote using the interactive panel). For example, in a live television competition, it might make sense to present voting buttons for the participants while the competition is still going on. Once the program is over, it would not make sense to allow voting, since the winner has already been selected. Outside of this appreciation term, it would make sense to present other panels, such as those including rewind and forward buttons, so the user can control playback. This passage illustrates the metadata-driven, server-informed character of the panel-switching architecture: the system consults content attributes, including time-based attributes, to decide which operation panel to present, rather than relying solely on the user's manual selection. In general, the '091 Patent enables a person of ordinary skill in the art to use a customized panel display based on time-related information of the content provided by the server. That time-related information can be absolute based on things like date and time, or relative based on what is being viewed at a particular time relative to, for example, the duration of the reproduced content.

24. The core innovation of the '091 Patent is therefore a metadata-driven, server-informed UI switching architecture: the outside server delivers content together with information that governs which type of operation panel is displayed,

and time information that further informs the type of operation panel to be displayed, depending on when the content is viewed. This is fundamentally different from systems in which the user interface responds only to local user actions or locally-determined UI logic. A POSITA would have recognized that the '091 Patent's approach offloads the intelligence about which UI mode is appropriate from the user (or from hardcoded local logic) to the content provider, who can embed the relevant information in the metadata that accompanies each piece of digital content.

25. The distinction between server-driven and client-driven UI adaptation is architecturally significant: in a client-driven system, the local device must contain all the logic needed to determine the appropriate interface for every possible content type, which requires firmware or software updates whenever new content categories are introduced. In the server-driven system described in the '091 Patent, the content provider can introduce new content types and associated UI behaviors without modifying the client device—the metadata that accompanies the content carries the instructions for appropriate UI presentation. This is a practical advantage that a POSITA would have appreciated, as it allows for greater presentation flexibility depending on the content and the time at which it is being viewed, and reduces the UI logic maintenance burden on deployed devices and enables content providers to innovate in UI presentation without requiring coordinated client software updates.

V. THE PROSECUTION HISTORY CONFIRMS THE NOVELTY OF THE CLAIMED ARCHITECTURE

26. In the Notice of Allowance dated July 3, 2023, the Examiner provided specific reasons for allowance, identifying as uniquely distinct the features reciting “wherein the related information includes: time related information which represents a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed, and panel related information for deciding whether displaying the first operation panel including at least one of the linear operation buttons or the second operation panel including at least one of the interactive operation buttons, wherein the controller, when controlling reproduction of the digital contents, is further configured to: display at least one of the interactive operation buttons during the time represented by the time related information, and other than the time represented by the time related information, display at least one of the linear operation buttons or at least one of the interactive operation buttons based on the panel related information.” EX1002 at 23.

27. The Examiner further noted that the closest prior art, Holloway et al. (US 2006/0041655), failed to anticipate or render obvious these limitations. EX1002 at 23. The Examiner also considered several of the references that Samsung now relies upon. Phillips (EX1010) and Uchida (EX1015) are listed on the face of the '091 Patent on Page 2. EX1001 at Page 2. Wallis (EX1011) and Ellis (EX1014) are

listed on the face of the '091 Patent on Page 3. EX1001 at Page 3. And although Ellis '430 (EX1021) was not itself cited on the face of the patent, a later application publication in the same patent family—US 2008/0184297 A1 to Ellis et al.—was cited and considered. EX1001 at 3; EX2016 at Page 1 (confirming that U.S. Patent Application No. 10/105,128, which is the application number of Ellis '430, is listed on the face of that publication and that it shares the same 126 Figures and corresponding description as EX1021). Thus, the substance of Ellis '430's disclosure was before the Examiner.

28. Moreover, the Examiner did not merely have these individual references before him in isolation. The file history of the '091 Patent shows that the Examiner also considered prior IPR Petitions that applied combinations of these same references to the '091 Patent's great-grandparent patent (U.S. Patent No. 8,170,394, "the '394 Patent"). EX1001 at Pages 1, 3. Specifically, the Examiner considered the Petition for IPR2019-00089 (*Blackberry Corp. v. Maxell, Ltd.*), which challenged claims 2–9 of the '394 Patent on six grounds of unpatentability, including: (1) claims 2, 4, 5, 7, and 8 as anticipated by Phillips; (2) claims 2, 4, 5, 7, and 8 as obvious over Phillips and Wallis; (3) claims 2, 3, 4, 6, 7, and 9 as obvious over "Phillips-based grounds" and Uchida; and (4) claims 2, 4, 5, 7, and 8 as obvious over Phillips and Ackley. EX1001 at Page 3; EX1005 at 1–6. That proceeding was instituted, and the Board's March 29, 2019 Institution Decision analyzed these

references at length. EX1005. The Examiner also considered the Petition for IPR2022-01348 and the Petition for IPR2023-00316. EX1001 at Pages 1, 3. In addition, the Examiner had before him the Expert Report of Benjamin B. Bederson, Ph.D., Regarding Invalidity of U.S. Pat. No. 8,170,394—the same expert Samsung now relies upon in this proceeding—which applied these same prior art references against the claims of the '394 Patent. EX1001 at 36. In short, the Examiner was fully aware of the prior art theories that Samsung advances here, had before him detailed expert analysis applying these references to the patent family, and nevertheless found claims 1–20 of the '091 Patent patentable because of limitations not present in the '394 Patent claims—specifically, the time related information and panel related information limitations identified in the Reasons for Allowance.

29. The PTAB's March 29, 2019 Institution Decision in IPR2019-00089 reveals the specific manner in which Phillips and Wallis were previously combined. EX1005. In that earlier proceeding, Petitioner Blackberry relied on Phillips as disclosing all limitations of claims 2, 4, 5, 7, and 8, and added Wallis only "[t]o the extent there is a more narrow interpretation of the claim language 'a controller which controls the alternative display of either of the linear content operation panel or the interactive content operation panel . . . ,' such that this limitation requires an assessment of the content's metadata to determine if it is linear or interactive content and then, based on that determination, display an appropriate operation panel."

EX1005 at 41-42. The Board instituted review on all grounds. EX1005 at 2. The Examiner of the '091 Patent was therefore aware of the specific Phillips–Wallis combination theory—metadata-driven panel switching—and nonetheless found the '091 Patent's claims patentable because the '091 Patent adds the time related information and panel related information architecture that neither Phillips nor Wallis, alone or in combination, discloses.

VI. UNDERSTANDING OF LEGAL STANDARDS

30. I have been informed by counsel of the following legal standards, which I have applied in forming the opinions set forth in this Declaration.

31. I understand that under 35 U.S.C. § 103, a patent claim is unpatentable if the differences between the claim and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person of ordinary skill in the art. I further understand that obviousness is a question of law based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) any objective indicia of non-obviousness (so-called “secondary considerations”). These factors provide the analytical framework that I have applied in evaluating each of Samsung's six grounds of unpatentability. I also understand that an obviousness analysis must not use hindsight.

32. I understand that claim terms are generally given their plain and ordinary meaning as understood by a person of ordinary skill in the art at the time of the invention, in light of the specification and the prosecution history.

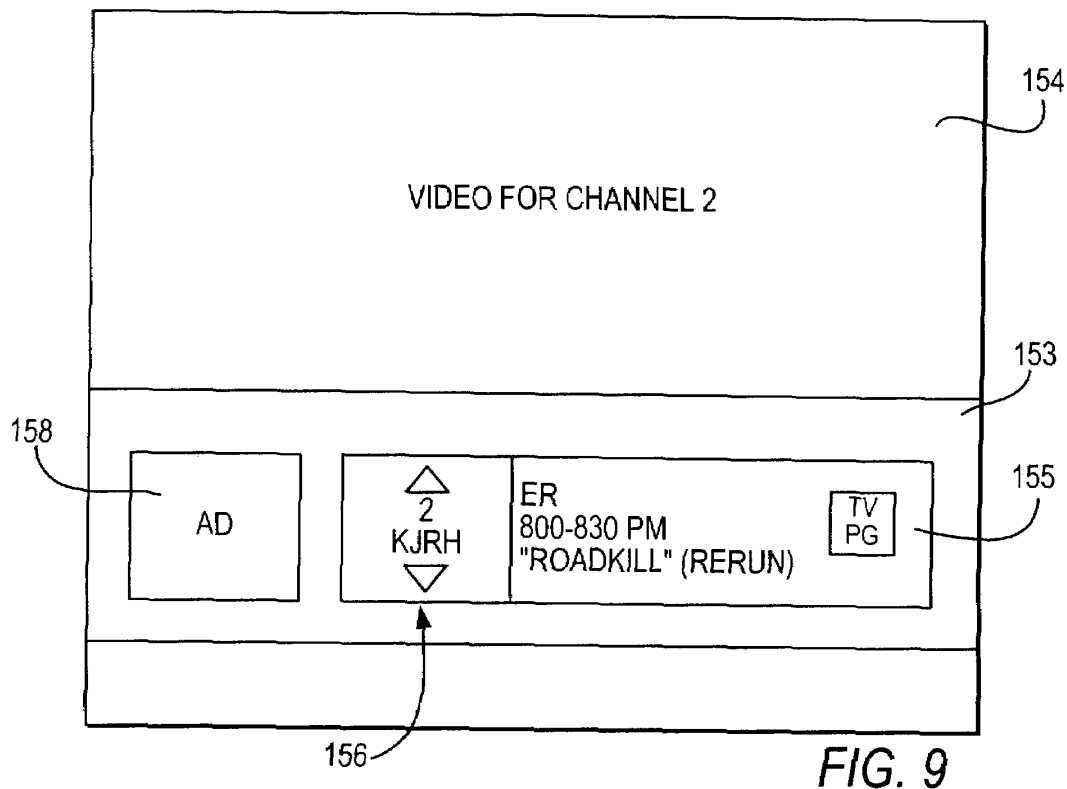
VII. DR. BEDERSON’S OPINIONS ON GROUND 1 ARE TECHNICALLY FLAWED

A. Overview of Phillips and Wallis

33. Phillips (EX1010) describes an “Interactive Television Program Guide for Recording Enhanced Video Content.” EX1010 at Page 1. Phillips provides an interactive television system in which users can access program guides, browse channels, access video-on-demand content, and record programs. The system is described as supporting multiple user equipment configurations, including a set-top box arrangement (EX1010, Fig. 2), a digital video recorder set-top box (Fig. 3), and a personal computer (Fig. 5), each of which communicates with a television distribution facility and data sources over a communications network. EX1010 at 9:23-24, 11:33-35, 12:41-42.

34. Phillips discloses several distinct user interface modes, each tied to a particular use case. I will describe the most relevant ones. First, Phillips provides a “flip” tuning feature. As shown in Figure 9, reproduced below, “when the user invokes the flip mode, flip display 153 may be provided over a portion of a channel (i.e., channel 2) that the user is currently tuned to and is watching on display screen

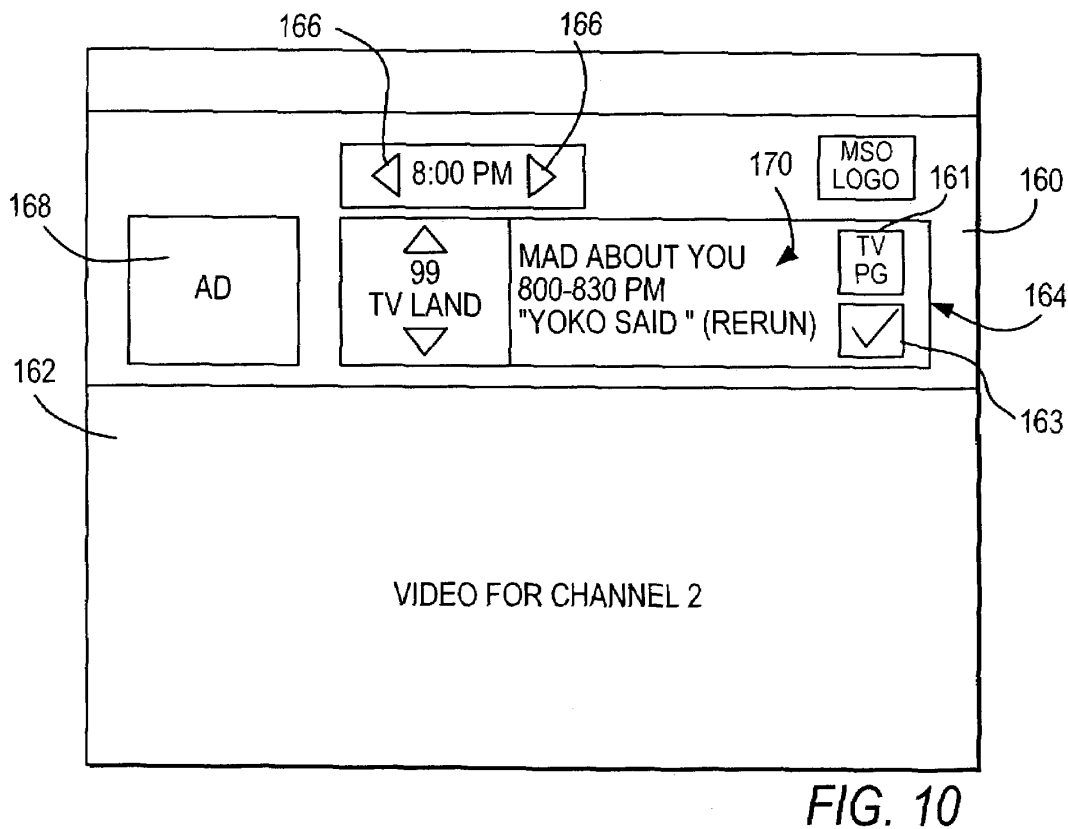
154.” EX1010 at 16:23-26. Flip display 153 contains information on the current program. EX1010 at 16:26-29. “The flip display 153 may be removed manually or automatically (e.g., after a few seconds or other suitable time period of user inactivity).” EX1010 at 16:36-38.



EX1010 at Fig. 9.

35. Second, Phillips provides a browse feature. As shown in Figure 10, reproduced below, browse display 160 is “displayed as an overlay over a portion of the channel (i.e., channel 2) that is being displayed on the user’s display screen 162 and to which the user is currently tuned.” EX1010 at 16:59-64. The browse display allows the user to view information about programming on other channels while

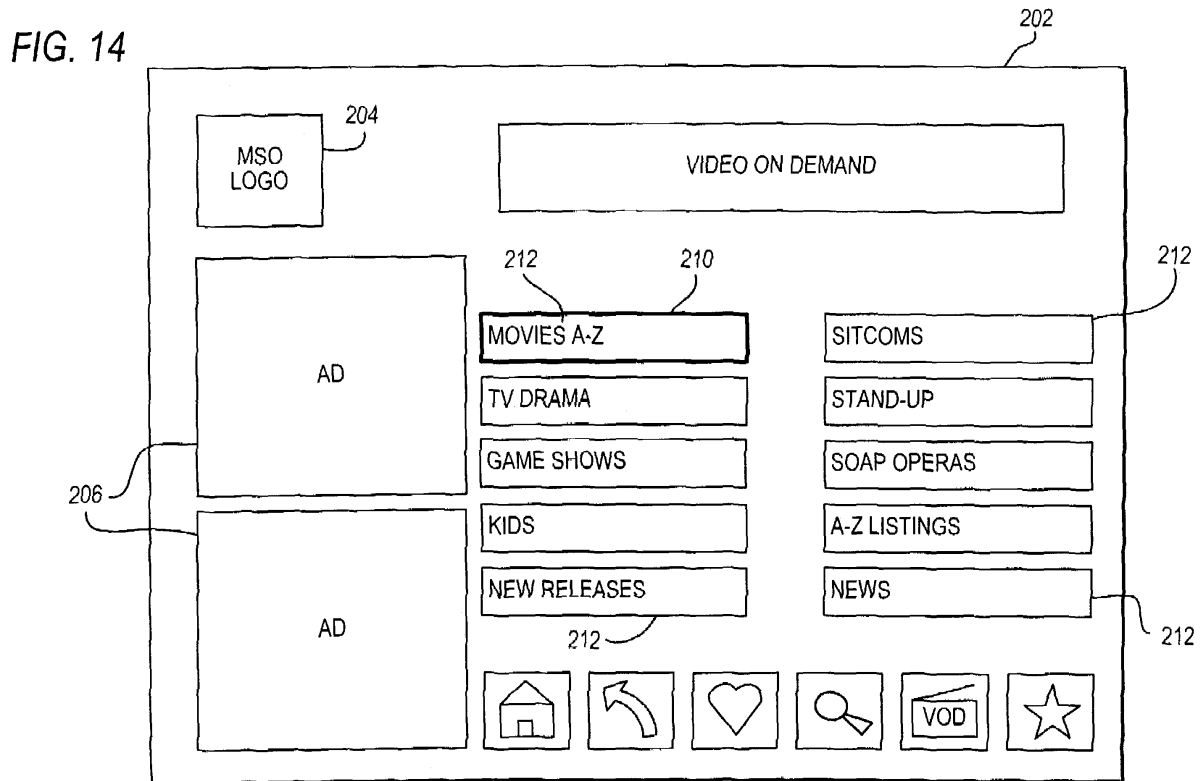
continuing to watch the current channel. EX1010 at 17:3-10. “The browse display 160 may-be removed manually or may be removed automatically from display screen 162 after a suitable period of user inactivity (e.g., after a few seconds or a minute or two).” EX1010 at 17:25-28.



EX1010 at Fig. 10.

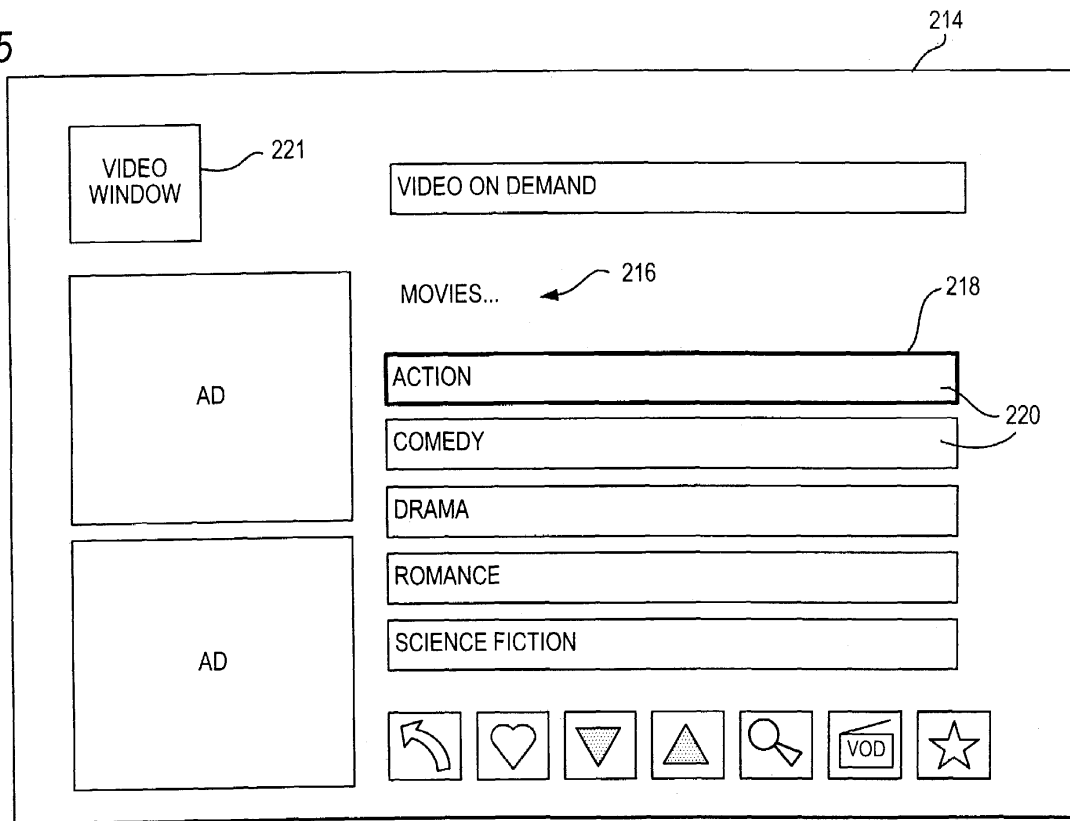
36. Third, Phillips discloses video-on-demand screens (Figures 14–17a, reproduced below) through which users can navigate categories, subcategories, and individual titles, and ultimately purchase VoD content. EX1010 at 19:61-20:17. Notably, Figure 17a shows a VoD information screen 232 with options to go back,

buy the content, and record it—but no digital content is being reproduced on this screen. EX1010 at 19:30-36..



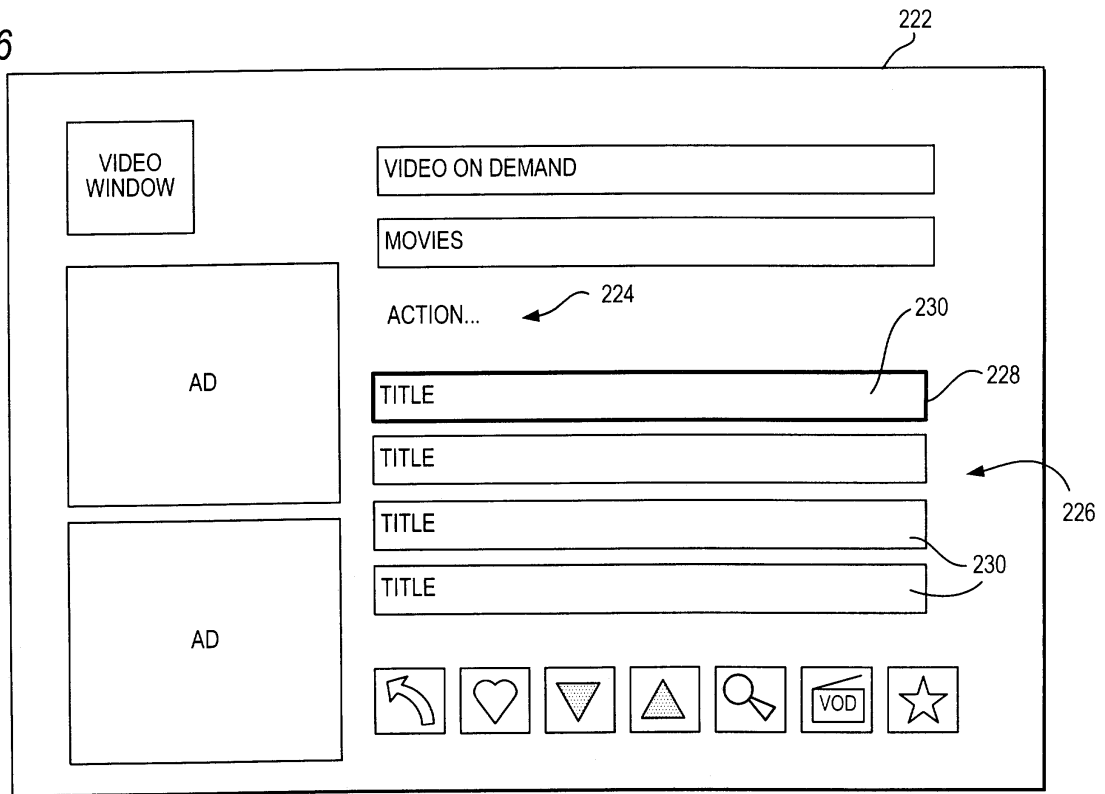
EX1010 at Fig. 14.

FIG. 15



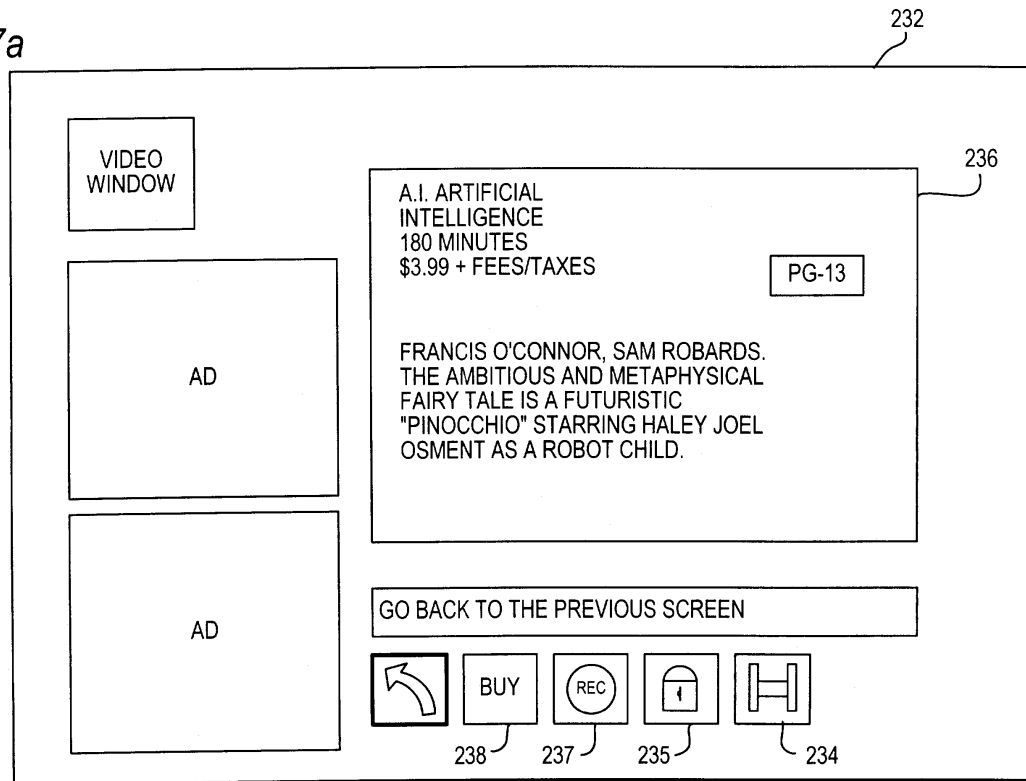
EX1010 at Fig. 15.

FIG. 16



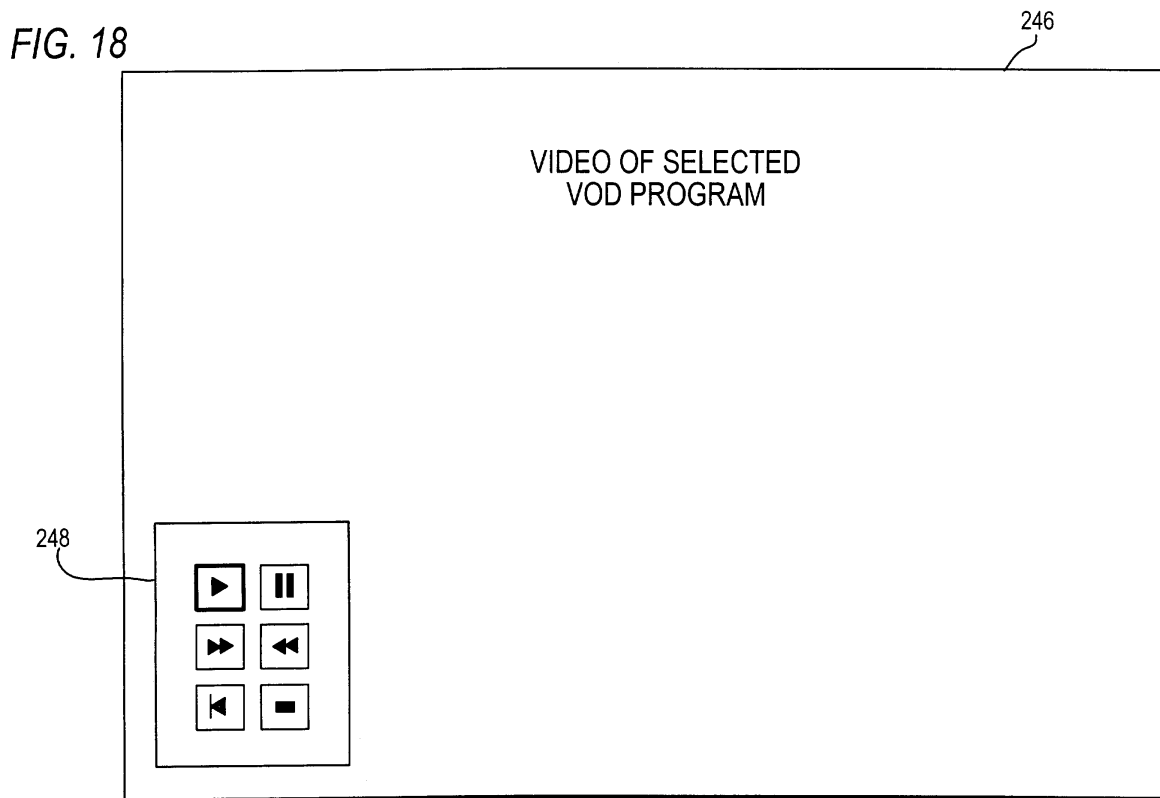
EX1010 at Fig. 16.

FIG. 17a



EX1010 at Fig. 17a.

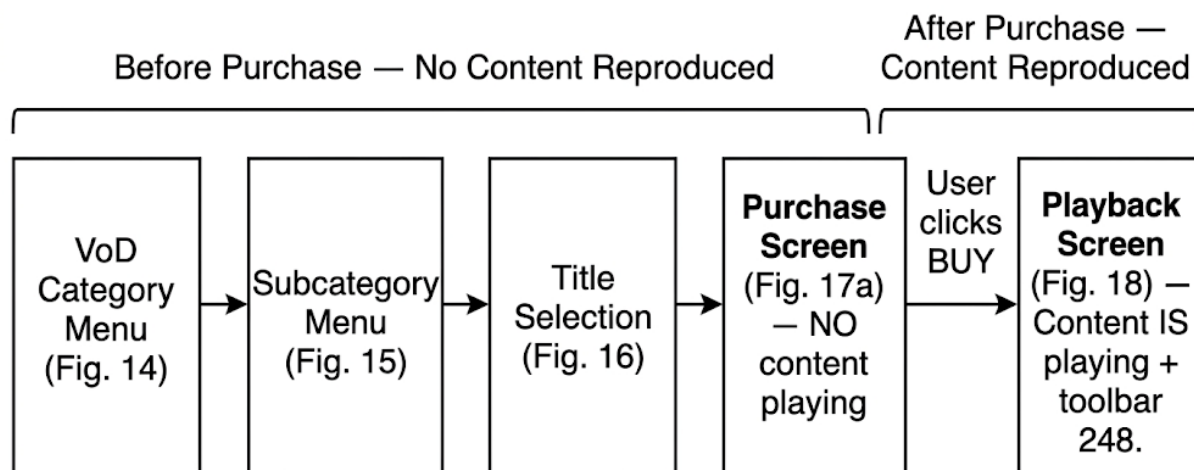
37. Fourth, Phillips shows a playback display in Figure 18, reproduced below. When the user purchases VoD content, a display screen 246 shows “video of selected VOD program” with a toolbar 248 that includes options to “rewind the video-on-demand content to the beginning, rewind, play, fast-forward, pause, stop delivery of the video-on-demand content, or perform other video playback options.” EX1010 at 20:18-27.



EX1010 at Fig. 18.

38. What is critical to understand about Phillips is that each of these interface modes is self-contained and context-specific. The flip and browse overlays appear during live television viewing and provide program listing information; they are not operation panels for controlling the playback of reproduced digital contents. The VoD purchase screens (Figures 14–17a) appear before content has been purchased and are transactional in nature; no content is being reproduced. The playback toolbar 248 (Figure 18) appears only during VoD playback. There is no disclosure in Phillips of a mechanism by which a controller alternatively selects

between two types of operation panels—one linear and one interactive—to display with the same reproduced digital content based on metadata received from a server.



Phillips does NOT alternatively display two panels with the same content.

Phillips Sequential Workflow Diagram (illustrating that Phillips’s Figures 14–17a depict a sequential purchase workflow occurring before any content is reproduced, while Figure 18 depicts a separate playback screen displayed only after the user completes a purchase—demonstrating that these are not two operation panels “alternatively displayed together with the reproduced digital contents” but rather sequential steps in a buy-then-watch process).

39. Wallis (EX1011) describes a “Non-Linear Interactive Video Navigation” system for delivering interactive video and audio content items within a video-on-demand environment. Wallis addresses the problem that conventional VoD interaction was “linear in the sense that the viewing of the content items on any given broadcast or VoD channel consists of selecting a content item then letting the content item stream onto the user display with no further input from the user.”

EX1011 ¶8. Wallis sought to make VoD content sequences more interactive by associating each content item with attributes that enable non-linear navigation.

40. Wallis's system architecture, illustrated in Figure 2, reproduced below, includes a video server 200 with a content server 202, a service database 204, a content store 206, a video server manager 208, and a set-top box session manager 210. EX1011 ¶¶35–40. The service database 204 stores “service data, which define the services offered to users” and “also stores attributes associated with respective content items stored in the content store 206.” EX1011 ¶¶39, 41.

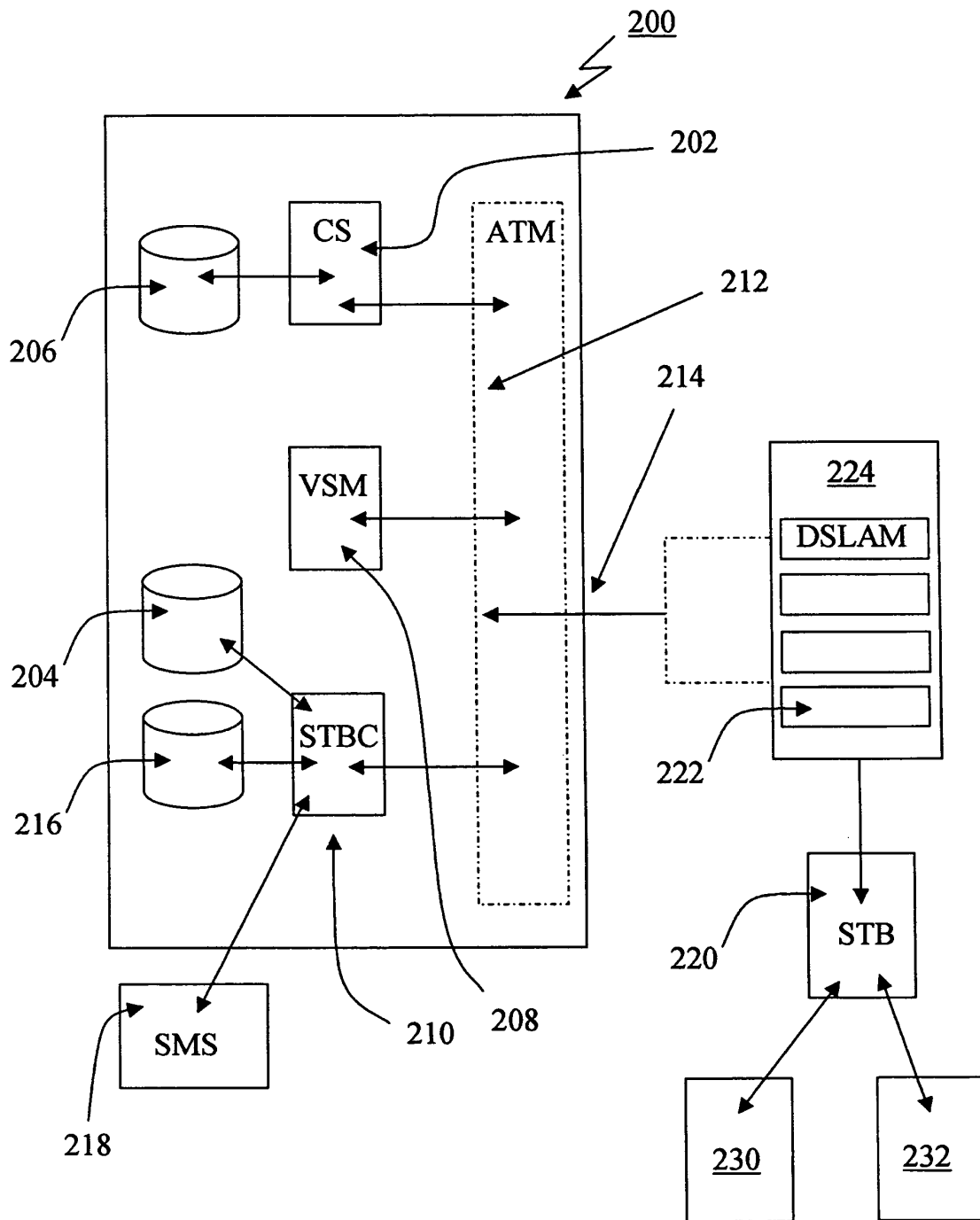


Fig 2

EX1011 at Fig. 2.

41. Each content item has associated attributes that detail its navigational properties, including flags such as “can skip,” “video controllable” (“whether the ff/rew/pause keys active”), “can save to favourites” (“whether a button press can cause an item to be added to the user’s favourites list”), “target” (“the specified destination of the link”), “can jump” (“whether the customer is allowed to action the link to Target”), and “returnable” (whether the content item reappears when skipping backwards). EX1011 ¶¶57–65.

42. It is important to understand what Wallis’s attributes actually do. As illustrated in Figure 1, reproduced below, the content sequence 100 comprises a series of content items—stings (interstitials), video content items, and promos—each with different attribute settings. EX1011 ¶¶29–34. A “Sting” (like Sting A 102) might be non-skippable and have no target. EX1011 ¶30. A video content item (like Content B 104) might be skippable, VCR-controllable, savable to favorites, and linked to a target content item. EX1011 ¶31. A promo (like Promo C 106) might prohibit skipping and VCR control, since “[a]s might be expected, the attributes for this advertisement prohibit skipping of the content item.” EX1011 ¶32.

ATTRIBUTES

SKIPPABLE	N	Y	N	Y	Y
VCR-LIKE	N	Y	N	Y	N
TARGET	N	CONTENT F	N	CONTENT G	CONT. SEQ. 2
SAVE TO FAVOURITES	N	Y	N	Y	N

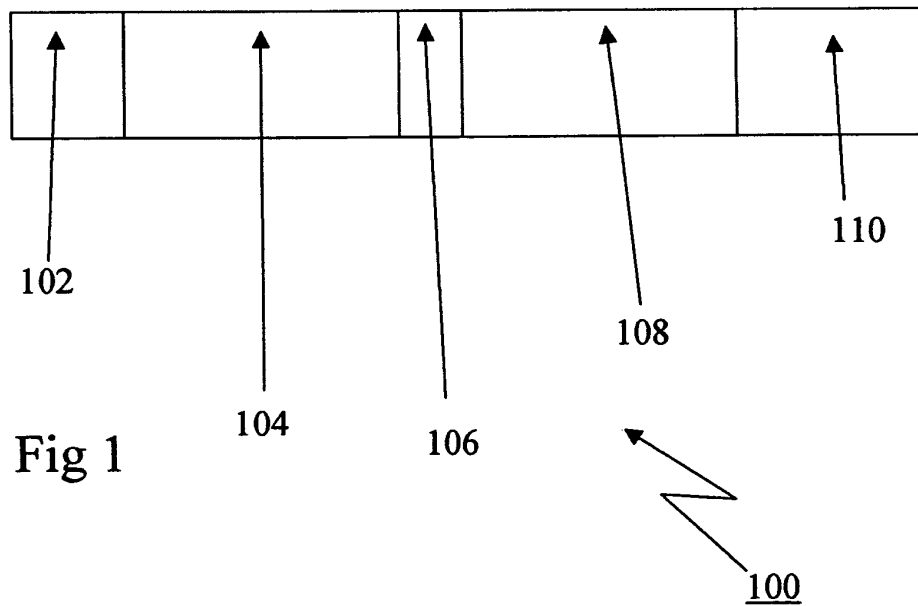


Fig 1

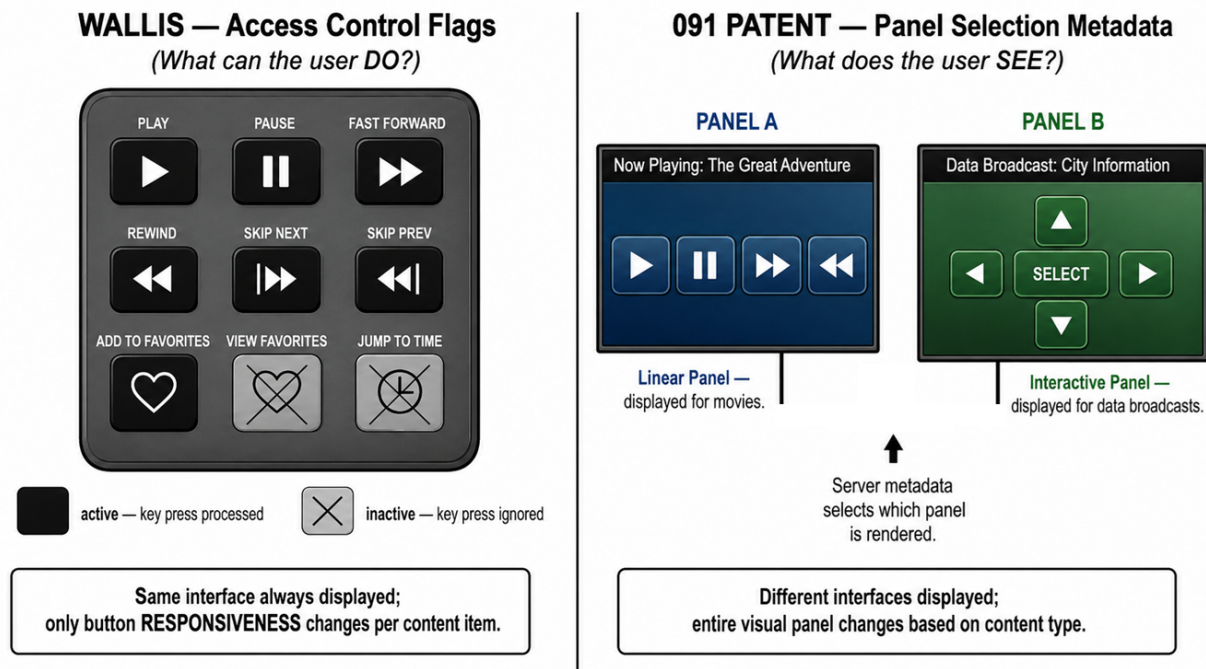
EX1011 at Fig. 1.

43. These attributes control how the user navigates through a sequence of promotional content—they do not select between two different types of operation

panels displayed on screen with reproduced content. To be precise about the technical distinction: Wallis's attributes function as access-control flags on navigation actions—they define the permissible operations a user may perform on a given content item within a sequential playlist, enabling or disabling specific remote-control key responses on a per-item basis. This is a well-understood design pattern in digital media systems, often called "Digital Rights Management" or "usage rules" enforcement at the content-item level, in which metadata associated with each piece of content specifies what actions the playback system should permit or deny. Such access-control flags operate at a fundamentally different architectural layer than UI presentation logic.

44. Access-control flags answer the question "what can the user do?"—they enable or disable functionality. Panel-selection metadata, by contrast, answers the question "what does the user see?"—it determines which visual interface elements are rendered on screen. These are distinct concerns in software architecture, typically handled by different subsystems: the former by a permissions or policy engine, the latter by a UI rendering or presentation layer. A POSITA would have recognized that Wallis's attributes belong to the former category and would not have understood them as performing the latter function. Wallis never describes two or more distinct operation panels based on enabled/disabled attributes, and never describes using its attributes to choose which of these panels to display.

45. To illustrate this distinction with a concrete analogy: consider a movie theater that shows both standard films and interactive “choose-your-own-adventure” films. An access-control system determines whether the audience is allowed to pause the movie (e.g., during a live broadcast film, a pause button may be disabled; during a rental or streamed screening of that film, a pause button may be enabled; during a “choose-your-own-adventure” film, a choice button may be enabled). This is what Wallis’s attributes do—they control what attribute button inputs are enabled or disabled and implement them within the existing user interface, as illustrated in the example diagram below. In the example of Wallis’ control flags below, certain content may cause the system to enable attributes such as play (shown in black) and certain content may cause the system to disable attributes such as view favorites and jump to time (shown in gray). A panel-selection system, by contrast, determines which set of controls is displayed on the armrest console—a simple play/stop interface for standard films, or a full navigation interface with directional buttons for interactive films. This is what the ’091 Patent does—it determines what the user sees on screen. Wallis’s system answers the question “may the user press fast-forward?”; the ’091 Patent answers the question “should the fast-forward button be visible on screen at all, and if not, what buttons should appear instead?” These are fundamentally different engineering tasks, handled by different parts of a software system.



As shown above in the Technical Distinction Diagram, Wallis’s “video controllable” attribute determines whether remote-control keys are responsive (non-responsive keys shown in gray), which is an input-filtering function. In contrast, the ’091 Patent’s panel related information determines which visual operation panel is rendered on screen, which is a view-selection function.

B. Dr. Bederson’s Motivation to Combine Is Hindsight-Driven

46. Dr. Bederson opines that a “POSITA would have been motivated to combine Phillips and Wallis at least because they are analogous art to the ’091 patent as they are directed to the same field of endeavor, i.e., interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls.” EX1003 ¶149. From this high-level observation,

Dr. Bederson concludes that a “POSITA would have been specifically motivated to incorporate Wallis’s metadata attribute table ... into Phillips’s systems to control whether an interactive operation panel or a linear operation panel is displayed to the user.” EX1003 ¶150.

47. In my opinion, this rationale is insufficient for two reasons. First, Philips never selects between a linear and interactive display panel for any piece of content: at most Philips allows user controlled (not server information determined) selection between two interactive panels (flip and browse) for live streaming content; and upon purchase of a video on demand only linear panel is ever displayed for the purchased video content, once the purchase has been made. No aspect of Wallis when combined with Philips would suggest the ability to contextually exclusively show a linear or interactive panel for any given content. At most the metadata attributes as disclosed in Wallis could be used to disable some aspects of the UI in a linear or interactive panel, but not choose between a linear and interactive panel. Second, even if such an argument could be made, it represents impermissible hindsight reasoning. The field of interactive television in 2005 encompassed a vast range of systems addressing many different problems—electronic program guides, video-on-demand content management, personal video recording, interactive advertising, home shopping, home banking, and more. *See, e.g.*, EX1010 at 1:15-26. The mere fact that two references both operate within this broad field does not

provide a specific, articulable reason to combine them in the particular manner proposed. In the interactive television field circa 2005, the set of possible combinations was enormous: the ATSC standard alone defined dozens of distinct functional layers—transport, session management, application signaling, content referencing, user interaction, and more—each with its own set of design problems and solutions. A POSITA faced with Phillips’s program guide and Wallis’s promotional sequence navigation system would have recognized that these references address different layers of the interactive television stack and solve different problems, and would have had no specific reason to extract Wallis’s per-item navigation flags and repurpose them as UI panel-selection metadata within Phillips’s playback system. The proposed combination is not a natural evolution of either system’s architecture; it is a retrofit driven by knowledge of the ’091 Patent’s claims.

48. Phillips and Wallis address fundamentally different problems in different contexts. Phillips focuses on program guides and VoD playback using mode-specific screens and a standard playback toolbar. Its user interface is organized around discrete modes of operation: a main menu (Figure 7), program guide screens (Figure 8), flip and browse overlays (Figures 9–10), VoD navigation and purchase screens (Figures 14–17a), and a VoD playback screen (Figure 18). EX1010 at 14:29–20:27. The transitions between these modes are user-driven—the user presses

buttons on the remote control to navigate between menus, invoke the flip or browse feature, purchase VoD content, and control playback.

49. Wallis, by contrast, focuses on non-linear navigation through sequences of VoD promotional clips, using attributes to control skipping, favorites, and link targets within a promotional content sequence. Wallis's attributes are metadata associated with individual content items within a sequence—they govern what navigation actions are available for each item in that sequence (e.g., can the user skip this promo? can the user fast-forward? can the user jump to the target content?). EX1011 ¶¶29–34, 56–65. They are not attributes associated with reproduced digital content that control which of two operation panels should be displayed.

50. Neither reference discusses varying the type of playback operation panel—linear versus interactive—on a per-content basis using metadata. That concept originates from the '091 Patent, not from the prior art. A POSITA reading Phillips and Wallis together, without the benefit of the '091 Patent's disclosure, would have had no reason to take Wallis's navigation attributes (which control skipping and linking within promo sequences) and repurpose them as panel-selection attributes (which choose between two distinct operation panels displayed with reproduced content). These are fundamentally different functions serving fundamentally different purposes.

51. Dr. Bederson further opines that “[d]eciding which operation panel (or buttons within an operation panel) to display would be a simple and predictable outcome of a condition in an ‘if’ programming statement.” EX1003 ¶152. This argument conflates the mechanical act of writing a conditional statement in code with the inventive insight of recognizing that server-delivered metadata should control which type of operation panel is displayed with reproduced content. The fact that a programmer could write an “if” statement does not explain why a POSITA would write it or why they would have a reasonable expectation of success in refactoring Phillips in the manner proposed. From a software engineering perspective, the difficulty in system design is identifying what condition to test, what data to use as input, and how to architect the flow of that data through the system. The essential complexity lies in the architectural decision to route server-delivered metadata to a client-side controller and use it as the branching condition for UI panel selection. Dr. Bederson identifies no teaching in Phillips or Wallis that would have led a POSITA to write an “if” statement that checks server-delivered metadata to select between two playback operation panels. The proposed combination does not arise naturally from the teachings of Phillips and Wallis, but only by using the ’091 Patent itself as a roadmap—the inventor’s solution is used as a template, and the prior art is then selectively mined for components that can be rearranged to match.

C. Dr. Bederson Mischaracterizes Phillips’s User Interface as “Alternatively Displayed” Operation Panels (Limitation [1e])

52. Claim 1 of the ’091 Patent requires, at limitation [1e], “wherein the controller is configured to alternatively display either of a first operation panel including at least one of linear operation buttons, receiving user-instructions regarding linear reproduction functions of the reproduced digital contents, or a second operation panel including at least one of interactive operation buttons, receiving user-instructions of interactive functions to the outside server, together with the reproduced digital contents.” EX1001 at Claim 1.

53. Dr. Bederson opines that “Phillips displays either interactive content, as shown in the VoD screens of Figures 14-17, or linear content, as shown in the video display of Figure 18. And depending on the digital content displayed, Phillips shows a linear content operation panel allowing user-instruction regarding the linear reproduction functions, or an interactive content operation panel allowing user-instruction of interactive functions to an outside server of the digital content reproducing apparatus.” EX1003 ¶98. He further asserts that “the outputted digital content—e.g., video-on-demand menus or the selected video—is displayed concurrently in the same screens as the displayed operation panels, which are themselves unique depending on displayed content.” EX1003 ¶60.

54. In my opinion, Dr. Bederson’s analysis fundamentally mischaracterizes Phillips’s user interface by conflating screens that are displayed in different contexts with different content—not together with the same reproduced digital content. To understand why Dr. Bederson’s mapping is incorrect, it is helpful to walk through what actually happens in Phillips’s system from a user’s perspective.

55. When a user navigates to VoD content, Phillips presents a series of menu screens (Figures 14–16) that allow the user to select categories, subcategories, and individual titles. EX1010 at 18:65-19:29. At Figure 17a, the user sees information screen 232 with the title, runtime, price, rating, and a description of the VoD content, along with options to “BUY” or “REC” (record). EX1010 at 19:30-44. At this point, no digital content is being reproduced—the user is still browsing and has not yet purchased or accessed the content. Only after the user completes the purchase does Figure 18 show a display screen 246 with “video of selected VOD program” and a playback toolbar 248. EX1010 at Fig. 18, 20:18-22.

56. These are sequential steps in a purchase-and-play workflow, not two operation panels that are alternatively displayed “together with the reproduced digital contents.” The VoD information screen (Figure 17a) exists to help the user decide whether to buy; the playback screen (Figure 18) exists to control playback after purchase. A POSITA would not have understood these as “alternatively displayed” operation panels presented “together with the reproduced digital

contents” because they serve entirely different purposes at different stages of the user’s interaction with the system. Dr. Bederson’s characterization of VoD menus (displayed before content is purchased) as “operation panels” displayed “concurrently” with reproduced content (EX1003 ¶60) ignores this fundamental sequential relationship.

57. Dr. Bederson also identifies Phillips’s flip and browse overlays as “interactive operation panels.” EX1003 ¶¶101–102. He asserts that “[w]hen the flip tuning (or flip mode) feature is invoked, interactive operation buttons are displayed on flip display 153 ... allowing the viewer to ‘change the channel using channel up and down keys....’” EX1003 ¶102. Similarly, Dr. Bederson claims the browse display allows “the viewer to browse advertisements, program and program-related information, or the like.” EX1003 ¶102. Dr. Bederson then concludes that “[b]ased on these disclosed features, it would have been obvious to a POSITA that the flip display and the browse display receive inputs from the user and then interact with an outside server.” EX1003 ¶102.

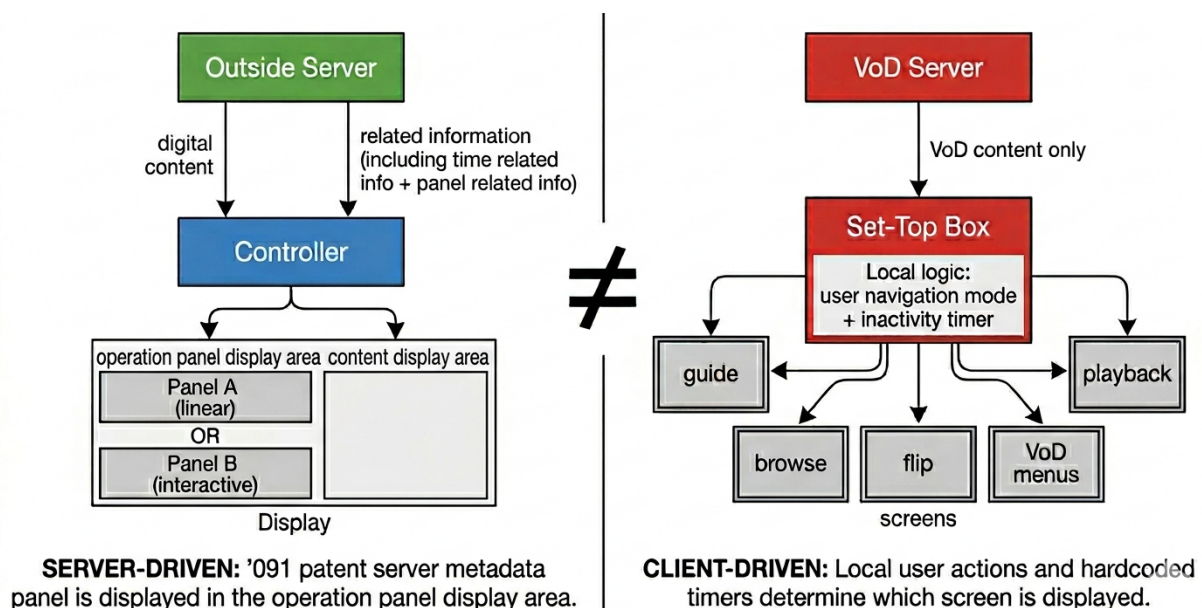
58. In my opinion, this characterization is technically incorrect. Figures 9 and 10 of Phillips show the flip and browse overlays, which display “program listings information for the current channel” or “a channel that may differ from the current channel.” EX1010 at 5:9-18. These overlays are displayed over live broadcast television. They contain program schedule information—titles, times,

channels, ratings—not operation buttons for controlling the reproduction of the currently viewed digital content. The flip display 153 (Figure 9) shows information related to the available channels and allows flipping between these channels untethered to panel-related or time-related information. EX1010 at 16:26-29. The browse display 160 (Figure 10) shows information about programming on channels other than the one the user is currently watching. EX1010 at 17:3-10. These program listings overlays have nothing to do with the VoD playback controls of Figure 18. They appear in an entirely different context (live TV browsing versus VoD playback) and display entirely different types of information (program schedule data versus playback transport controls). At no point does Dr. Bederson explain how such overlays can be considered to be displayed “together with the reproduced digital contents” as required by claim 1.

59. Dr. Bederson relies on a prior PTAB decision in the Blackberry IPR to support his mapping, quoting the Board’s statement that “Figures 17a and 18 are examples of the alternative display of either the linear content operation panel or the interactive content operation panel..., together with outputted digital content.” EX1003 ¶105 (quoting EX1004 at 29). But this citation does not cure the technical deficiency I have identified: Figure 17a does not display any reproduced digital content. The Board’s prior statement does not alter the fact that Phillips’s system

presents these screens sequentially, in different use contexts, not as alternative panels displayed “together with the reproduced digital contents.”

60. In summary, Dr. Bederson’s mapping of Phillips’s interface to limitation [1e] fails because Phillips does not disclose a controller that is configured to alternatively display between two operation panels—one linear and one interactive—together with the same reproduced digital content based on received related information. At most, Phillips discloses one linear playback toolbar (Figure 18) and a variety of non-playback overlays and menus (Figures 7–10, 14–17a), each appearing in different contexts with different content, at different stages of the user’s interaction with the system.



As illustrated in the Comparison Diagram above, the '091 Patent describes a server-driven panel selection, while Phillips describes client-driven local UI behavior.

D. Dr. Bederson Mischaracterizes a Local UI Timeout as “Time Related Information” (Limitation [1f])

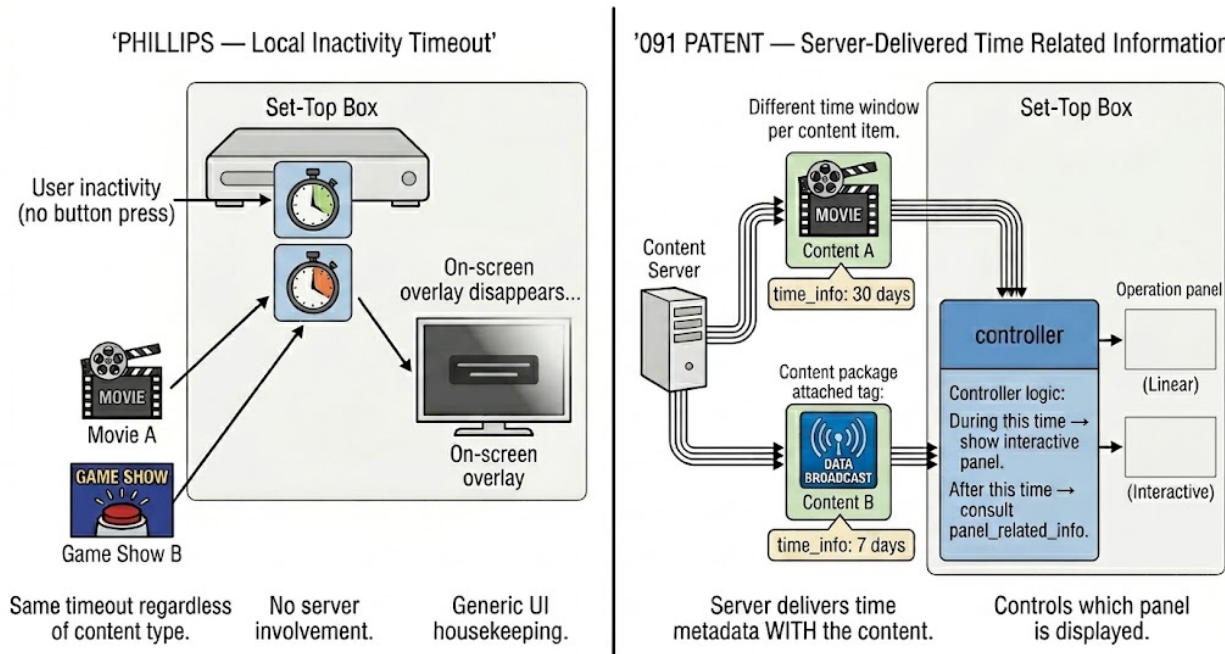
61. Claim 1 requires, at limitation [1f], that the “related information” received from an outside server includes “time related information which represents a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed.” EX1001 at Claim 1.

62. Dr. Bederson opines that Phillips’s “flip display 153 and browse display 160 ‘may be removed automatically from [the] display screen’ e.g., ‘after a few seconds or a minute or two,’” and asserts that this disclosure constitutes “time related information.” EX1003 ¶109 (quoting EX1010, 16:36-38, 17:25-28). He then claims the timeout is received from an outside server because “[p]rogram guide application functions and the functions of other interactive television applications may be supported using server 36 and other servers connected to communications network 34 such as server 56.” EX1003 ¶110 (quoting EX1010, 8:1-7).

63. In my opinion, Dr. Bederson’s analysis conflates two fundamentally different technical concepts. The cited passages in Phillips merely describe a local user-interface behavior: if the user does nothing for “a few seconds or a minute or two,” the overlay disappears. EX1010 at 16:36–38, 17:25–28. This is a generic, user-inactivity-driven timeout—a ubiquitous feature in graphical user interfaces that simply prevents stale overlays from cluttering the screen. A POSITA would have

recognized this as a standard implementation of an “idle timer” or “inactivity timeout”—a well-known UI pattern in which an interface element is dismissed after a period of no user interaction, regardless of what content is being displayed.

64. Such timeouts are implemented locally on the client device, typically as a countdown timer that resets with each user input event and triggers a UI state change (hiding the overlay) upon expiration. They are device-level settings, not content-level metadata. Phillips never labels this timeout as “time information,” never associates it with any particular content, and never indicates that the timeout values are delivered from an outside server along with the content. The underlying television program continues normally; only the overlay is removed. The timeout is not content-specific: it applies identically regardless of what program is airing, what data broadcast information is available, or what type of content is being displayed. Phillips describes no mechanism by which time metadata received from a server defines a period during which a particular operation panel is displayed together with the reproduced content, as claim 1 requires.



As shown in the illustration above, Phillips’s content-independent local inactivity timer removes any overlay after the same fixed period of user inactivity regardless of what content is playing. This demonstrates a generic UI housekeeping function. In contrast, the ’091 Patent’s time related information is content-specific metadata delivered by the server with each content item specifying time-related information, for example, time windows during which the interactive operation panel is displayed.

65. To put this in context, a POSITA would have readily understood the difference between a local UI inactivity timeout and the “time related information” of the ’091 Patent. The ’091 Patent’s time related information is content-specific metadata that travels with the digital content from the outside server. It “represents

a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed.” EX1001 at Claim 1. This information is intrinsically tied to the nature and characteristics of the specific content being reproduced—for example, the appreciation term described in the specification is set “in accordance with record days and times and information on the contents.” EX1001 at 5:46–48. Accordingly, “[i]f contents are outside the appreciation term, data broadcasting is not displayed even if the auto_start_flag is '1', but the linear content operation panel is displayed. If the contents are within the appreciation term and a user does not still view the contents, the data broadcasting is automatically displayed even if the auto_start_flag is '0' and the interactive content operation panel is displayed.” EX1001 at 5:49–55. This passage is significant because it illustrates the metadata-driven, server-informed character of the panel-switching architecture: the system consults content attributes, including time-based attributes, to decide which operation panel to present, rather than relying solely on the user’s manual selection. In computer science terms, Phillips captures a locally pre-defined “imperative” UI structure and workflow, whereas the '091 Patent UI design has content and time specific elements of “declarative” or “policy-based” UI: the server declares, via metadata, time-related information such as temporal windows during which certain UI elements should be active, and rendered by the client.

66. The ‘091 patent requires information to flow from server to client; Philips is designed to operate entirely within the client’s local state machine. Phillips’s overlay timeout, for example, is a generic local setting that is the same regardless of the content. Philips and the ‘091 patent describe architecturally distinct concepts that a POSITA working in digital broadcast systems circa 2005 would not have confused.

67. Dr. Bederson attempts to bridge this gap by speculating that “[i]t was well known to a POSITA that graphical user interfaces (GUIs) often have numerous settings that control details of the display (often including fonts, colors, timing, and more),” and that “one of the simplest ways to ensure consistency of such settings is to have them configured centrally, for example, through a content or service provider,” invoking Shneiderman’s “Eight Golden Rules of Interface Design” and the first rule of “consistency.” EX1003 ¶¶112–113; *see also* EX1016 at 92. In my opinion, this reasoning does not withstand technical scrutiny. Shneiderman’s “consistency” rule is a general UI design heuristic advising designers to maintain “consistent color, layout, capitalization, fonts, and so on ... throughout.” EX1016 at 92. This principle is directed at visual and behavioral uniformity across an application’s interface: it advises that similar operations should be performed in similar ways, that terminology should be consistent, and that visual styling should be uniform. It does not prescribe, or even suggest, any particular system architecture

for achieving that consistency, much less an architecture in which a server delivers content-specific time values as metadata to control UI panel display periods. A design heuristic that says “be consistent” does not teach the specific technical mechanism of server-delivered, content-specific metadata governing which operation panel is displayed during which time period. To reason from “consistency is desirable” to “therefore a server should send time metadata that controls panel display” requires multiple non-obvious inferential leaps that Dr. Bederson does not identify or justify. The general principle of consistency can be satisfied by many different implementations, including purely local implementations in which a consistent timeout is hardcoded into the device firmware, and nothing about the consistency principle specifically motivates the server-delivered, content-specific time related information architecture of the '091 Patent. A POSITA would have understood these as fundamentally different concepts operating at different architectural layers.

E. Dr. Bederson Mischaracterizes Wallis’s Navigation Attributes as “Panel Related Information” (Limitation [1g])

68. Claim 1 requires, at limitation [1g], “panel related information for deciding whether displaying the first operation panel including at least one of the linear operation buttons or the second operation panel including at least one of the interactive operation buttons.” EX1001 at Claim 1.

69. Dr. Bederson opines that Wallis’s attributes constitute “panel related information” because they “govern the presentation of selectable portions of the screen.” EX1003 ¶114. Specifically, Dr. Bederson asserts that “Wallis discloses attributes that determine whether interactive operation buttons are displayed, such as the ‘can save to favourites’ attribute which determines ‘whether a button press can cause an item to be added to the user’s favourites list,’ and the ‘target’ attribute which determines whether the content links to other content.” EX1003 ¶115.

70. Dr. Bederson opines that “Wallis also discloses attributes that determine whether linear operation buttons are displayed, such as the ‘video controllable’ attribute, which determines ‘whether the ff/rew/pause keys [are] active’ (i.e., whether fast forward, rewind, and pause keys are active). ... That is, when the ‘video controllable’ attribute is present, a linear operation panel enabling control of a video is displayed.” EX1003 ¶116.

71. In my opinion, Dr. Bederson’s characterization is not rooted in Wallis’s actual disclosure and reflects a fundamental misreading of the reference. Wallis describes a system in which VoD promotional content items are associated with attributes that govern their navigational properties—whether a promo can be skipped, whether the viewer can save the item to a favorites list, whether fast-forward/rewind is enabled, and to what “target” a content item links. EX1011 ¶¶57–65.

72. Dr. Bederson’s assertion that “when the ‘video controllable’ attribute is present, a linear operation panel enabling control of a video is displayed” (EX1003 ¶116) is simply not what Wallis says. The “video controllable” attribute does not mean “display a linear operation panel with ff/rew/pause buttons.” Wallis states that the “video controllable” attribute indicates “whether the ff/rew/pause keys [are] active.” EX1011 ¶61. These are very different concepts. One describes which buttons to render on screen in an operation panel; the other describes which physical remote control keys are responsive to user input during playback of a particular content item in a promotional sequence. To appreciate this distinction, a POSITA would have understood that “active” in the context of remote control keys refers to whether a key press will be recognized and processed by the system—not whether a corresponding visual button is displayed on screen. This is a standard distinction in embedded systems and set-top box design: input handling (which keys the system responds to) is architecturally separate from display rendering (what visual elements appear on screen).

73. A key that is “inactive” simply means the system ignores button presses on that key during playback of a particular content item—it does not mean a visual panel is removed from the screen, nor does it mean a different visual panel is substituted. Conversely, a key that is “active” means the system will process presses of that key—it does not mean a visual panel containing that key’s function is drawn

on screen. The mapping between key activity and on-screen panel display is precisely the inventive contribution of the '091 Patent—using metadata to determine which visual operation panel to render—and it is absent from Wallis. Nothing in Wallis states that the “video controllable” attribute causes an operation panel to be rendered on screen, let alone that it selects between two different operation panels. Dr. Bederson has re-labeled Wallis’s navigation-attribute functionality as “panel related information” by adding a technical interpretation that Wallis itself does not support.

74. Wallis itself confirms that the “video controllable” attribute controls remote control key responsiveness, not on-screen panel selection. Wallis states: “The user has varying degrees of control over the interactive navigation video content item. By setting the video controllable metadata flag in the associated attributes for a given content item, it is possible to indicate that VCR style controls are allowed, permitting the user to pause, fast forward or rewind the interactive navigation video at the touch of the appropriate remote control buttons.” EX1011 ¶0079. This passage makes clear that “video controllable” governs whether the physical remote control buttons for VCR-style functions are responsive—it does not govern which visual operation panel is rendered on screen. The attribute controls input handling at the remote-control layer, not display rendering at the presentation layer. A POSITA

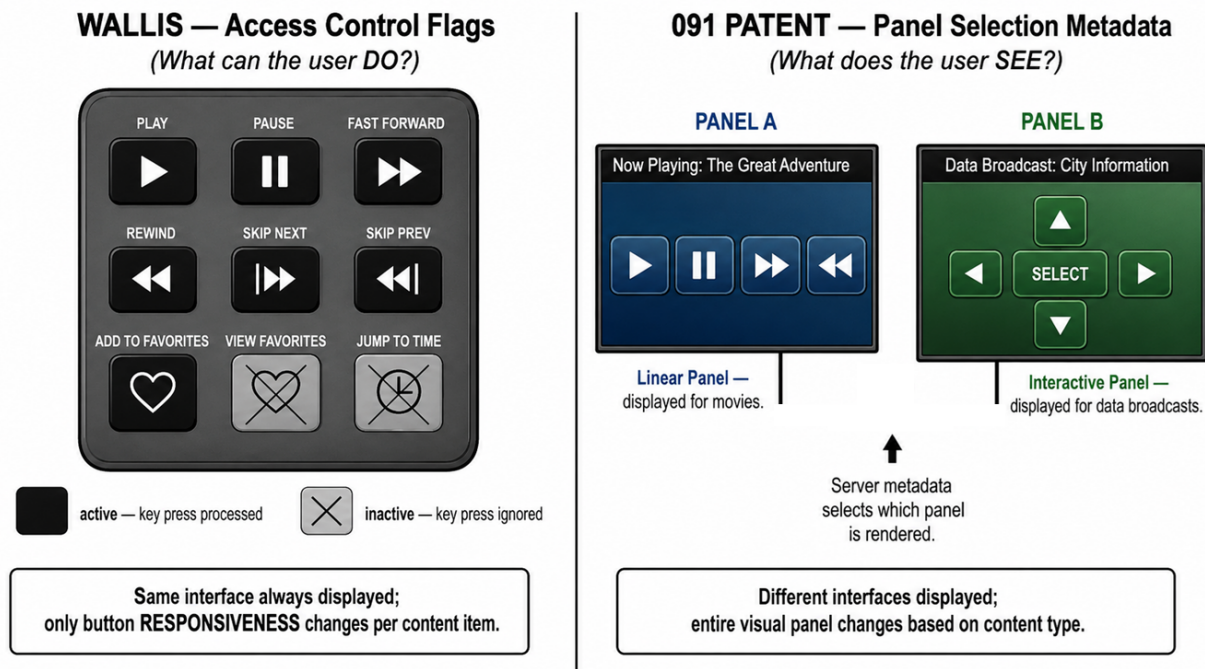
would have understood this distinction and would not have read Wallis's "video controllable" flag as panel-selection metadata.

75. A concrete example is helpful. Consider the content sequence in Wallis's Figure 1. Sting A (an interstitial branding clip) is not skippable and has no target; the user must watch it. Content B (a music video) is skippable, VCR-controllable, savable to favorites, and linked to Content F as a target; the user can skip it, fast-forward through it, save it, or jump to a related full-length video. Promo C (an advertisement) is not skippable and not VCR-controllable; the user must watch the ad. EX1011 ¶¶30–32. The attributes thus control the user's navigational freedom within the sequence on a per-item basis. They do not control which of two operation panels is displayed on screen. Nowhere does Wallis state that when the "video controllable" attribute is set to true for Content B, a linear operation panel with ff/rew/pause buttons is drawn on screen; it merely states that the physical ff/rew/pause keys on the remote are "active," i.e., responsive to presses, during playback of that item. *See, e.g.*, EX1011 ¶30 ("Sting A's attributes indicate that it is not skippable (pressing the 'Skip' button on the remote is not enabled while this content item is streamed onto the user display)."). This is a critical functional difference that Dr. Bederson ignores.

76. None of Wallis's attributes is described as a selector between two different playback operation panels. Wallis nowhere teaches two distinct on-screen

operation panels or any mechanism in which the value of an attribute causes one panel or the other to be drawn. Rather, the attributes control the semantics of navigation within promotional sequences; they determine what the user can do with a given promotional content item, not which type of operation panel is displayed on screen.

77. Moreover, Wallis primarily describes its attributes as stored and used in a service database 204 on the server side. The attributes are used to govern the behavior of the content server 202 and the video server manager 208 in delivering content. EX1011 ¶¶35–42. Dr. Bederson identifies no passage in Wallis where those attributes are described as being provided to the playback device and then used by the device to choose between two different operation panels displayed with reproduced contents.



Technical Distinction Diagram of Wallis “Video Controllable” Attribute vs. ’091 Patent Panel Selection (illustrating that Wallis’s “video controllable” attribute determines whether remote-control keys are responsive, an input-filtering function, while the ’091 Patent’s panel related information determines which visual operation panel is rendered on screen, a view-selection function).

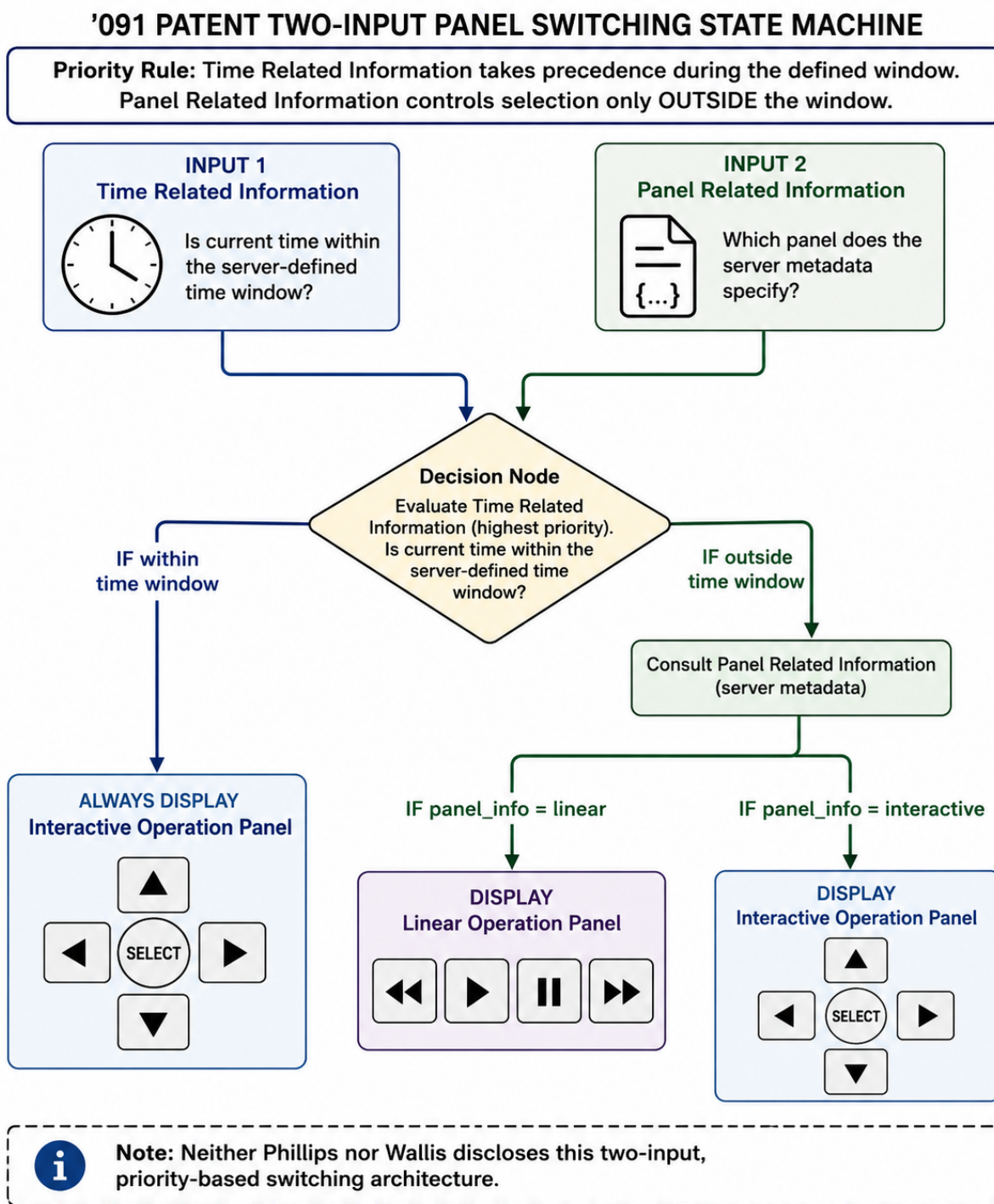
F. Dr. Bederson Constructs an Unsupported Scenario for Time-Governed Display Switching (Limitations [1i] and [1j])

78. Claim 1 requires, at limitation [1i], that the controller “display at least one of the interactive operation buttons during the time represented by the time related information.” At limitation [1j], claim 1 further requires that “other than the time represented by the time related information,” the controller “display at least one of the linear operation buttons or at least one of the interactive operation buttons based on the panel related information.” EX1001 at Claim 1.

79. These limitations, taken together, define a time-governed switching architecture: during a server-defined time period, interactive buttons are displayed; outside that period, the display is controlled by panel related information. This is at the core of the '091 Patent's innovation, and it is the very feature the Examiner identified as the basis for allowance. EX1002 at 23. From a systems-engineering perspective, this architecture implements a state machine in which the current state (which panel is displayed) is determined by two distinct inputs: (1) a temporal condition (whether the current time falls within the server-defined period), and (2) a metadata condition (the panel related information). The temporal condition takes priority: during the defined time window, interactive buttons are displayed regardless of other factors. Only outside that window does the panel related information become the controlling input. This priority-based, multi-factor state machine is not found in any of the cited prior art, either individually or in combination.

80. To explain this in plain language: in the above embodiment of use of time information, the '091 Patent's controller operates like a traffic light with two modes and two sets of instructions. During certain hours specified by the server with the content (the "time related information" window), the traffic light is always green for the interactive panel; no matter what else is happening, the interactive operation buttons are displayed. Outside those hours, the traffic light switches based on a

separate set of instructions (the “panel related information”); these instructions, delivered from the server with the content, tell the controller whether to show the linear panel or the interactive panel. The critical point is that neither Phillips nor Wallis describes the role of content specific time periods in determining the presentation of UI panels. Phillips has overlays that appear and disappear based on what the user does locally (pressing remote buttons, or simply waiting). Wallis has flags that enable or disable remote-control key responses on a per-item basis. Neither reference has a system where two different types of server-delivered metadata work together (one controlling a time window, and the other controlling panel selection outside that window) to determine which operation panel is displayed with the reproduced digital content. Dr. Bederson’s attempt to construct such a system by combining elements of Phillips and Wallis is not grounded in anything either reference actually teaches; it is a reconstruction that only makes sense if one starts from the ’091 Patent’s claims and works backward.



As shown in the illustration above, in the '091 Patent's two inputs (time-related information and panel-related information) can be used in an embodiment to define

a priority-based (whether within time window) panel selection embodiment. The controller first evaluates whether the current time falls within the server-defined time window. If the time falls within that time window, the interactive operation panel is always displayed regardless of other metadata. If the time falls outside that time window, it uses the panel related information to determine which operation panel (linear or interactive) to display.

81. For limitation [1i], Dr. Bederson opines that “when Phillips’s flip or browse mode is invoked, interactive operation buttons are displayed for a short period of time (time represented by the time related information).” EX1003 ¶119. He asserts that “[t]he interactive operation buttons are displayed only during the time represented by the time related information, i.e., when flip display 153 and browse display 160 are displayed.” EX1003 ¶119. But Phillips merely states that these overlays “may be removed” after “a few seconds or other suitable time period of user inactivity.” EX1010 at 16:36-38. As I explained above regarding limitation [1f], there is no indication that these timeouts are part of any “information” received from an outside server, nor that they are associated with particular digital contents as opposed to being generic local UI settings.

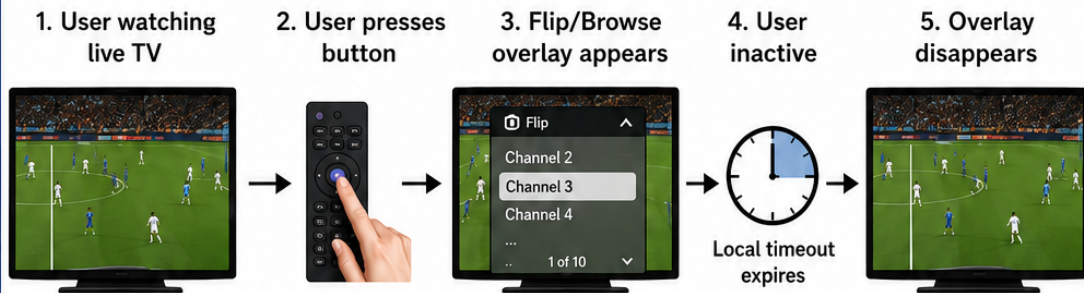
82. For limitation [1j], Dr. Bederson constructs a scenario not found in either reference. He opines: “when either the flip tuning or browse features disclosed by Phillips are not being invoked by the user, the flip or browse interactive buttons

will not be displayed temporarily In this case, the panel related information disclosed in Wallis controls whether the linear operation buttons or the interactive operation buttons are displayed.” EX1003 ¶121. Dr. Bederson then elaborates: “when the interactive operation buttons associated with the flip tuning feature disappear from the display (after a short period of time), the linear operation panel ... would then be displayed on the channel being viewed, for example, based on Wallis’s panel related information associated with the content.” EX1003 ¶122.

83. In my opinion, Dr. Bederson has fabricated a sequence of events that is never described in either Phillips or Wallis. Phillips does not state that removal of the flip or browse overlays causes any playback toolbar to appear, let alone the VoD toolbar 248 over live television. The cited passages simply say that the overlays “may be removed” after a period of inactivity. EX1010 at 16:36–38, 17:25–28. There is no disclosure in Phillips that any information, panel-related or otherwise, controls whether a linear playback panel versus an interactive panel is displayed after the flip or browse overlay disappears. Dr. Bederson stitches together the flip overlay timeout from Phillips and the navigation attributes from Wallis to construct a scenario that neither reference describes, and that only makes sense if one has already read the ’091 Patent. Wallis does not teach using its navigation attributes as selectors between two types of playback operation panels. Re-purposing those attributes to decide which panel to show “other than during the time represented by

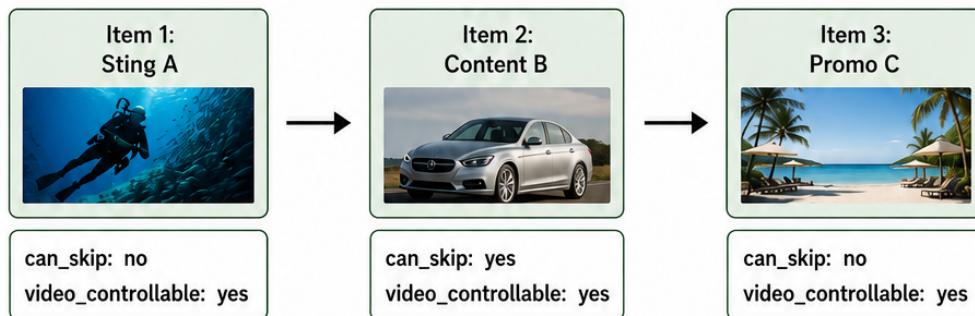
the time related information” is not a teaching of Wallis; it is the invention of the '091 Patent projected back onto the prior art. Moreover, Wallis's attributes, when applied, do not remove or redesign a different panel—they merely disable specific controls within the existing interface.

What Phillips Actually Discloses



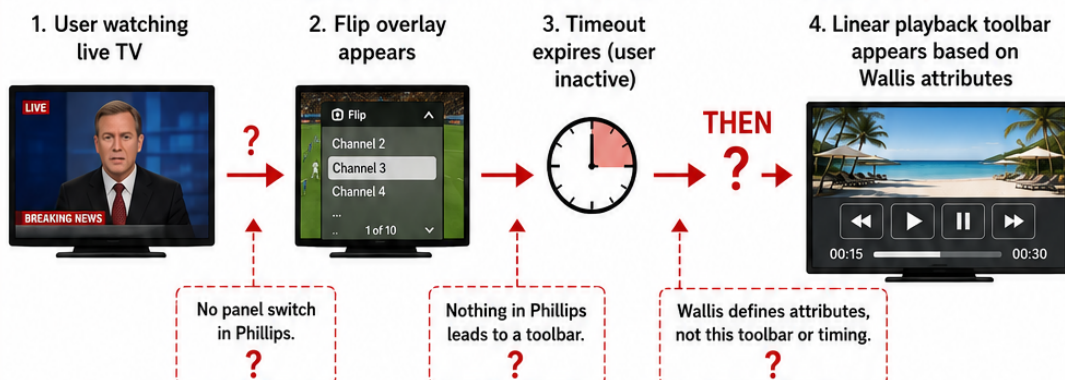
What Wallis Actually Discloses

Promotional Content Sequence (delivered to the user)



Attributes control navigation permissions within a promo sequence.
No operation panels shown.

What Dr. Bederson CONSTRUCTS (not found in either reference)



This sequence is NEVER described in Phillips or Wallis.
It only makes sense if you already know the 091 Patent claims.

As shown in the illustration above, Dr. Bederson's fabricated scenario is unrelated to Phillips' and Wallis' actual disclosures: (1) what Phillips actually discloses: flip/browse overlays that appear during live TV and disappear upon user inactivity, with no panel switching and no playback toolbar triggered; (2) what Wallis actually discloses: per-item attribute flags that control navigation permissions within a promotional content sequence, with no operation panels shown on screen; and (3) the scenario Dr. Bederson constructs from neither reference: in which the disappearance of Phillips's overlay somehow triggers the appearance of a linear playback toolbar whose button responsiveness is controlled by Wallis's attributes, a sequence never described in either reference and only intelligible to someone who already knows the '091 Patent claims.

G. Dr. Bederson's Analysis of Independent Claim 14 Is Deficient

84. Claim 14 recites the same core controller architecture as claim 1, but further specifies that both the digital contents and the related information are received "from a video on demand server." EX1001 at Claim 14. Dr. Bederson does not meaningfully address these additional requirements. Instead, the Petition and Dr. Bederson's Declaration simply cross-reference the analysis of claim 1 ("See claim [1pre]," "See claims [1a] and 13," etc.) for every limitation. EX1003 ¶¶132–142.

85. Phillips' VoD server supplies VoD content, but all UI behavior (toolbar appearance, flip/browse overlays, menu transitions) is driven locally at the set-top

box, not by related information received from the VoD server. Wallis' navigation attributes, which relate to skip behavior, favorites, and link targets in promo sequences, are not the claimed panel related information and are not tied to VoD playback or time-windowed UI behavior. Dr. Bederson nowhere identifies where Phillips or Wallis discloses a VoD server delivering the claimed time related information or panel related information.

86. Additionally, a POSITA would not have been motivated to combine Phillips and Wallis to achieve the claimed invention. Phillips's UI is organized around discrete mode-specific screens for different tasks (program guide, VoD purchase, playback). Wallis's system manages navigation attributes for promotional content sequences. A POSITA would not have modified Phillips's mode-specific screen architecture to incorporate Wallis's promotional navigation attributes as panel-selection metadata because: (i) Phillips's screens serve different functions at different stages of user interaction and are not interchangeable panels; (ii) Wallis's attributes control promotional sequences, not which type of operation panel to render; and (iii) combining them would require fundamentally rearchitecting Phillips's locally-controlled UI to accept server-delivered metadata for panel selection—a design concept neither reference contemplates.

VIII. DR. BEDERSON’S OPINIONS ON GROUND 2 ARE TECHNICALLY FLAWED

87. Ground 2 adds Logan (EX1013) to the Phillips–Wallis combination of Ground 1. Dr. Bederson opines that Logan’s Mini-Nav Bar provides additional evidence of “time related information” because “the ‘manner in which the Mini-Nav bar is presented may be configured by ... the provider’ to control ... ‘the time duration after which the Mini-Nav Bar disappears.’” EX1003 ¶¶155–161. Dr. Bederson further asserts that a “POSITA therefore would have been motivated to add the Mini-Nav Bar feature of Logan with the flip tuning and browse features of Phillips because doing so would add another like feature very similar to those already disclosed by Phillips.” EX1003 ¶162. He concludes that “[d]oing so would have been a simple software modification and well within the capabilities of a POSITA.” EX1003 ¶162.

88. To understand why Logan does not cure the deficiencies of the Phillips–Wallis combination, it is necessary to examine what Logan actually discloses. Logan (EX1013) is entitled “Methods and Apparatus for Recording and Replaying Video Broadcasts” and describes a system for replaying broadcast sports events using video-on-demand or personal video recording systems. The system records an entire sports broadcast and uses metadata, created by human editors or automated techniques, to subdivide the broadcast into segments, each with associated

descriptive information (“slugs” or “labels”). EX1013 ¶¶0049–0062. Playlists specify ordered subsequences of segments for selective playback. The system presents a segment selection guide, either as a transparent overlay on full-screen video or as a separate panel alongside a reduced video window, that allows the viewer to navigate between segments. EX1013 ¶¶0072–0083.

89. The Mini-Nav Bar is one of several navigation interfaces Logan describes. It is “a small graphic bar displayed near or at the bottom of the screen” that shows segment titles. EX1013 ¶0087. The Mini-Nav Bar “appears only when the user presses a remote control button” or “automatically makes the Mini-Nav Bar appear to display the segment title being selected/browsed to.” EX1013 ¶0087. Critically, “[a]fter a timeout (e.g., several seconds) the Mini-Nav Bar disappears, leaving only fullscreen video.” EX1013 ¶0087. Logan further states that the “manner in which the Mini-Nav bar is presented may be configured by the viewer or the provider, either dynamically or statically, to control” certain display parameters including when it appears and disappears. EX1013 ¶¶0093-0100.

90. It is important to understand the context and purpose of Logan’s Mini-Nav Bar. The Mini-Nav Bar is a navigation aid for sports-segment browsing; it shows the titles of segments in a football game (e.g., “1st Quarter - Touchdown Pass,” “2nd Quarter - Field Goal”) and allows the user to jump between segments in a playlist. EX1013 ¶¶0087–0089. As a threshold matter, the Mini-Nav Bar does not

constitute a first AND second operation panel that are “alternatively displayed” because there is no alternative display—the same Mini-Nav Bar is displayed each time it appears. There is no second, different panel that is shown in lieu of the Mini-Nav Bar; the user sees the identical interface element on each invocation. This is fundamentally incompatible with claim 1’s requirement of a controller configured to “alternatively display either of a first operation panel ... or a second operation panel.” Logan further states: “The manner in which the Mini-Nav bar is presented may be configured by the viewer or the provider, either dynamically or statically, to control: a) where on the screen the Mini-Nav Bar is displayed. b) the time duration after which the Mini-Nav Bar disappears may be varied.” EX1013 ¶¶0093–0095. These configuration options relate to how a single navigation overlay is presented—not to selecting between two different operation panels. These options are also not content-specific like the ’091 Patent.

91. Moreover, neither the Petition nor Dr. Bederson’s declaration has explained how the segment titles shown in the Mini-Nav Bar constitute both “linear operation buttons receiving user-instructions regarding linear reproduction functions of the reproduced digital content” AND “interactive operation buttons receiving user-instructions of interactive functions to the outside server.” Claim 1 requires two distinct types of buttons serving two distinct functions—one set for linear reproduction control and another for interactive server-directed functions. I

understand from counsel that Samsung bears the burden of demonstrating that each element of the claim is met, and neither the Petition nor Dr. Bederson has identified which segment titles in the Mini-Nav Bar are “linear operation buttons” and which are “interactive operation buttons,” or explained how any segment title could serve both functions simultaneously. The segment titles in Logan’s Mini-Nav Bar serve a single, uniform function: allowing the user to jump between pre-defined segments in a sports replay playlist. This is not the dual-function operation panel architecture required by the claims.

92. In my opinion, Dr. Bederson’s analysis does not cure the deficiencies of his Phillips–Wallis opinions. Even if Logan teaches that a provider can configure the timeout duration for the Mini-Nav Bar, that is still merely a timeout for a specific navigation overlay, not the “time related information which represents a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed” as required by claim 1. The provider-configurable display parameters in Logan are system-wide presentation preferences for a single overlay element, not content-specific metadata that governs panel selection on a per-content basis.

93. Even if Logan’s Mini-Nav Bar were incorporated into Phillips, the resulting system would still not perform the controller-based switching required by claims 1 and 14, namely, a controller that (1) displays interactive operation buttons

during a server-defined time related interval, and (2) outside that interval, displays linear or interactive operation buttons based on panel-related information. Logan neither teaches nor suggests this controller logic. Dr. Bederson's approach merely stacks unrelated overlay features together and declares the result "obvious" as a "simple software modification," without identifying any coherent modification pathway that would yield the claimed time-governed panel-switching architecture.

94. Moreover, Dr. Bederson's motivation-to-combine rationale for adding Logan to the Phillips–Wallis combination is insufficient. Dr. Bederson asserts that Logan is "analogous art" because it relates to interactive television systems, and that a POSITA would have been motivated to add the Mini-Nav Bar "because doing so would add another like feature very similar to those already disclosed by Phillips." EX1003 ¶¶ 159, 162. But this rationale would justify combining any two references in the interactive television field merely because they both display something on a screen. I understand from counsel that the question for analyzing obviousness is not whether a combination is possible, but whether there is a specific, articulable reason to make the specific combination in the specific manner proposed. Dr. Bederson identifies no teaching in Logan that would make it useful or desirable to inject sports-highlight navigation into Phillips's VoD interface or Wallis's metadata-driven attribute system. Logan's Mini-Nav Bar serves a fundamentally different purpose (segment selection within a sports replay playlist) from Phillips's flip/browse

overlays (program information display during live TV) or Wallis’s attribute-governed promo navigation (controlling skip/save/link behavior in promotional sequences).

95. Dr. Bederson’s characterization of the Mini-Nav Bar’s provider-configurable timeout as “time related information” also fails on its own terms. Logan states that the provider may configure parameters such as when the Mini-Nav Bar appears and disappears. EX1013 ¶¶0093-0100. But this is a configuration preference for a navigation overlay, analogous to a system administrator setting the screen-saver timeout on a computer, not content-specific metadata that travels with each piece of digital content and determines which operation panel to display at a given time. The ’091 Patent’s “time related information” is intrinsically tied to the nature of the specific content being reproduced: for example, the appreciation term is set “in accordance with record days and times and information on the contents.” EX1001 at 5:46–48. Logan’s provider-configured timeout, by contrast, applies uniformly to the Mini-Nav Bar regardless of which sports segment is playing; it is a system-wide display preference, not per-content metadata. This distinction between a global UI configuration parameter and content-specific server-delivered metadata is the same distinction I identified in Phillips’s overlay timeout (Section VII.D), and Logan does nothing to bridge that gap.

96. Furthermore, a POSITA would not have been motivated to combine Phillips, Wallis, and Logan to achieve the claimed invention. Logan's Mini-Nav Bar is a sports-segment navigation overlay for jumping between segments in a playlist. It serves a completely different purpose than Phillips's playback controls or Wallis's promotional navigation attributes. A POSITA would not have combined these three references because they each address unrelated problems in different content domains (program guides, promotional navigation, sports replay navigation) and combining them does not yield the claimed architecture of a controller that uses server-delivered time related information and panel related information to alternatively display linear and interactive operation panels with reproduced digital contents.

IX. DR. BEDERSON's OPINIONS ON GROUND 3 ARE TECHNICALLY FLAWED

97. Ground 3 adds Uchida (EX1015) to the Phillips–Wallis combinations of Grounds 1 and 2 for dependent claims 2, 6, 10, and 16. Claims 2 and 10 require displaying “either the first operation panel or the second operation panel in a substantially same panel rendering area as alternative operation panels.” EX1001 at claims 2 and 10. Claims 6 and 16 require maintaining “a rendering area size of the reproduced digital contents” even when either operation panel is displayed. EX1001 at claims 6 and 16.

98. To understand why Uchida does not supply the missing elements, it is helpful to examine what Uchida actually discloses. Uchida (EX1015) is entitled “Display Device, Two-Way Communication System and Display Information Using Method.” Uchida describes a display device that “receives an information signal from a base device, and displays main display information” (video content) on an LCD, with a separate control panel area adjacent to the content area. EX1015, Abstract. As shown in Figures 10A–10C, the display is divided into a content region (left side) and a control panel (right side). Figure 10A shows a control panel CP with various operation keys. Figure 10B shows a control panel CP1 with a pause key, a fast-forward key, a rewind key, a reproduction, key, a stop key, and a record key. Figure 10C shows a control panel CP2 with an on/off key of a power Supply and numerical keys for channel selection. EX1015 at 21:54-67.

99. Critically, Uchida’s system operates entirely locally. The “base device” from which the display device receives signals is not an “outside server” or a video-on-demand server; it is a local hardware relay station connected to the display device via IEEE 802.11 short-range radio and physically wired to external input devices such as DVD players, VTRs, and BS digital tuners. EX1015 at 4:51–65. The base device “compresses an information signal such as a video signal or an audio signal” and transmits it to the display device; it does not transmit any metadata about which control panel to display. EX1015 at 4:55–61. The control panel itself is generated

entirely by the display device's own local software: the patent explicitly describes it as "a so-called software key which is displayed by software to be executed by a control section of the display device." EX1015 at 5:11–13. The display device's controller "reads necessary information from the ROM 132, forms information for displaying the control panel CP, and supplies the information to the OSD processor 106." EX1015 at 9:65–10:3. In other words, the control panel layout data is stored locally in the display device's own read-only memory, as shown in Fig. 2, not received from a server. The panels change based on which local external input device is currently connected: "in the case where a plurality of external input devices are connected to the base device 200, the control panel corresponding to the external input device that is connected to the base device 200 is displayed on the display screen of the display device 100." EX1015 at 21:49–53. The switching mechanism is triggered by the user physically touching the screen: "When the user's finger repeatedly touches the touch panel other than the display area of the control panel, the control panels corresponding to the base device 200 and the respective external input devices which are connected to the base device 200 can be displayed in a rotation fashion." EX1015 at 22:3-7. There is no metadata delivered from a server that instructs the display device which control panel to show, no time-based window during which interactive buttons must be displayed, and no "panel related information" determining which of two panels to present. This is a fundamentally

different architecture from the '091 Patent, which requires the controller to receive “related information” from an outside server and use that information (including both time related and panel related components) to determine which panel to display.

100. Ground 3 depends on the same Phillips–Wallis combinations addressed in Grounds 1 and 2. Because those underlying combinations fail to disclose the required two-panel architecture governed by time related and panel related information, as I have explained above, Ground 3 necessarily fails as well, regardless of what Uchida adds.

101. In addition, Dr. Bederson’s reliance on Uchida does not independently cure these deficiencies. Dr. Bederson opines that “Uchida’s display 108 is divided into a dedicated content display area ... and a dedicated control panel display area ... within which Fig. 10A and 10C show interactive control panels (CP, CP2) and Fig. 10B shows a linear control panel (CP1).” EX1003 ¶168. He further asserts that “Uchida further discloses that the control panel display area may alternate between different control panels depending upon what is output to the display.” EX1003 ¶84.

102. In my opinion, Uchida merely shows that a static control region exists at the right side of a content display region. EX1015, Figs. 10A-10C. The type of buttons appearing in that control region does not depend on server-supplied information, nor does the appearance of the region alternate based on “related information” as claimed. In other words, Uchida provides evidence that a display

can be divided into a content area and a control area, a screen layout principle, but it says nothing about how or why the buttons in the control area should change based on metadata received from a server. The question of layout geometry is entirely separate from the question of metadata-driven panel selection. A POSITA would have understood this distinction. Uchida's static layout does not respond to metadata, does not alternate operation panels based on time related and panel related information received from a server, and therefore does not satisfy the requirements of claims 2, 6, 10, or 16.

103. Dr. Bederson's motivation-to-combine argument for Ground 3 rests on high-level generalities about "interactive television systems" and abstract design guidelines. He asserts that "a POSITA would have been motivated to combine Uchida with the Phillips-Wallis combinations and modify the displays such that the operation panels are always located in the same panel rendering area of the display." EX1003 ¶177. He then invokes Shneiderman's "Eight Golden Rules" to support the proposition that "[d]oing so would enhance the user experience by providing consistency in the graphic interface." EX1003 ¶¶178–181. In my opinion, such abstract design principles do not provide the kind of specific, articulated rationale required to establish that a POSITA would combine Phillips's locally controlled playback toolbar, Wallis's metadata governing promotional clip navigation, and Uchida's static panel layout to yield the claimed invention.

104. To put this in concrete terms: Uchida teaches that a screen can be divided into a video area and a button area, and that different buttons can appear in the button area. That is a layout principle; it answers the question “where on the screen should buttons be placed?” But claims 2, 6, 10, and 16 presuppose the entire panel-switching architecture of claim 1: a system in which the server delivers metadata that tells the controller which panel to display and for how long. Uchida’s layout geometry cannot satisfy a claim requirement that depends on an architectural feature (server-driven panel selection) that neither Phillips nor Wallis discloses. It is like arguing that because a building has rooms, it therefore has a security system; the existence of physical space does not imply the existence of the control system that governs access to that space. Similarly, the existence of a panel-rendering area does not imply the existence of the metadata-driven controller logic that selects which panel appears in that area.

105. Moreover, Petitioner’s reliance on Shneiderman’s “Eight Golden Rules” as motivation to combine is misplaced for an additional reason specific to Ground 3. The “consistency” rule advises designers to present similar operations in similar ways, for example, always placing a “save” button in the same location. But consistency is a principle about visual uniformity, not about system architecture. A POSITA could achieve consistency in panel placement (putting buttons in the same screen area) using purely local logic without any need for server-delivered metadata.

Nothing about the desire for visual consistency motivates the specific, non-obvious architectural decision to have a server deliver “related information” that governs which panel to display and when. Dr. Bederson’s invocation of Shneiderman conflates a cosmetic design preference (button location) with a fundamental architectural innovation (server-driven panel selection governed by time and panel metadata). These are entirely different engineering concerns.

106. A POSITA also would not have been motivated to combine Uchida with the Phillips–Wallis combination to achieve the claimed invention. Uchida’s contribution is purely layout geometry—dividing a screen into a content area and a control area. This addresses a different engineering question (where to place panels) than the claimed invention (which panel to display based on server metadata). A POSITA would not have been motivated to combine Uchida’s static layout with the Phillips–Wallis combination because layout geometry does not solve the problem of metadata-driven panel selection. The claimed invention requires an architectural mechanism for determining which panel to show based on server-delivered information; Uchida’s teaching about screen division does not supply, suggest, or render obvious that mechanism.

X. DR. BEDERSON’S OPINIONS ON GROUND 4 ARE TECHNICALLY FLAWED

107. Ground 4 adds Ellis (EX1014) to the Phillips–Wallis combination of Ground 1 for claims 8, 9, 18, and 19. Claim 8 requires that “the time related information is an appreciation term corresponding to one digital content of the digital contents.” EX1001 at Claim 8. Claim 9 further requires that “the appreciation term is related to a predetermined date.” EX1001 at Claim 9.

108. To understand these claim limitations, it is helpful to explain the concept of an “appreciation term” as used in the ’091 Patent. The specification explains that certain digital broadcast content, such as up-to-date news and weather forecasts, has a “nature of an appreciation term” because “it is difficult to consider that these contents are referred to after, e.g., one month.” EX1001 at 5:42–46. The appreciation term is a time-based attribute that travels with the content and governs the user interface: “[i]f contents are outside the appreciation term, data broadcasting is not displayed even if the auto_start_flag is ‘1’, but the linear content operation panel is displayed. If the contents are within the appreciation term and a user does not still view the contents, the data broadcasting is automatically displayed even if the auto_start_flag is ‘0’ and the interactive content operation panel is displayed.” EX1001 at 5:49–55. The appreciation term thus operates at the presentation layer: it directly controls what the user sees on screen during playback.

109. Because Ground 4 depends on the Phillips–Wallis combination of Ground 1, it fails for all the reasons Ground 1 fails.

110. Additionally, Dr. Bederson’s reliance on Ellis does not cure the deficiencies of his Phillips–Wallis opinions. Dr. Bederson relies on Ellis’s disclosure of program expiration dates to satisfy the “appreciation term” limitation. See EX1003 ¶¶188–191. But in the ’091 Patent, an “appreciation term” governs the user’s ability to interact with digital content using interactive operation buttons; it defines a time period during which the interactive content operation panel is displayed with the content. As the specification explains, the appreciation term is set “in accordance with record days and times and information on the contents,” and “[i]f contents are outside the appreciation term, data broadcasting is not displayed even if the auto_start_flag is '1', but the linear content operation panel is displayed.” EX1001 at 5:49–51. In other words, the appreciation term directly controls which operation panel is shown to the user during playback; it determines whether the interactive features associated with the content are still available.

111. Ellis (EX1014), by contrast, is entitled “Interactive Television Systems with Digital Video Recording and Adjustable Reminders” and describes a system “in which an interactive television application is used to support network-based or local personal video recorder capabilities.” EX1014, Abstract. Ellis discloses that programs stored on a network-based personal video recorder (“PVR”) have

associated expiration dates that determine when the programs will be automatically deleted from storage. EX1014 ¶¶0012, 0165. The user may be alerted that a program is about to expire and given the option to extend the storage period or copy the program to local storage before it is deleted. EX1014 ¶0166. This is a storage-management function: the expiration date determines how long a recording occupies space on the network PVR's hard drive. It has nothing to do with what buttons appear on screen during playback, what type of operation panel is displayed, or whether interactive features are available to the user.

112. The distinction between these two concepts, the '091 Patent's appreciation term and Ellis's expiration date, is not merely a difference in terminology. They operate at entirely different layers of the system architecture and serve entirely different engineering purposes. The appreciation term is a presentation-layer attribute: it controls what the user sees during playback (which operation panel is displayed). The expiration date is a data-layer attribute: it controls how content is persisted on disk (when a recording is deleted). In the well-established layered architecture model used in software engineering, the presentation layer (responsible for what the user sees and interacts with) is logically separated from the data layer (responsible for data persistence, storage management, and lifecycle).

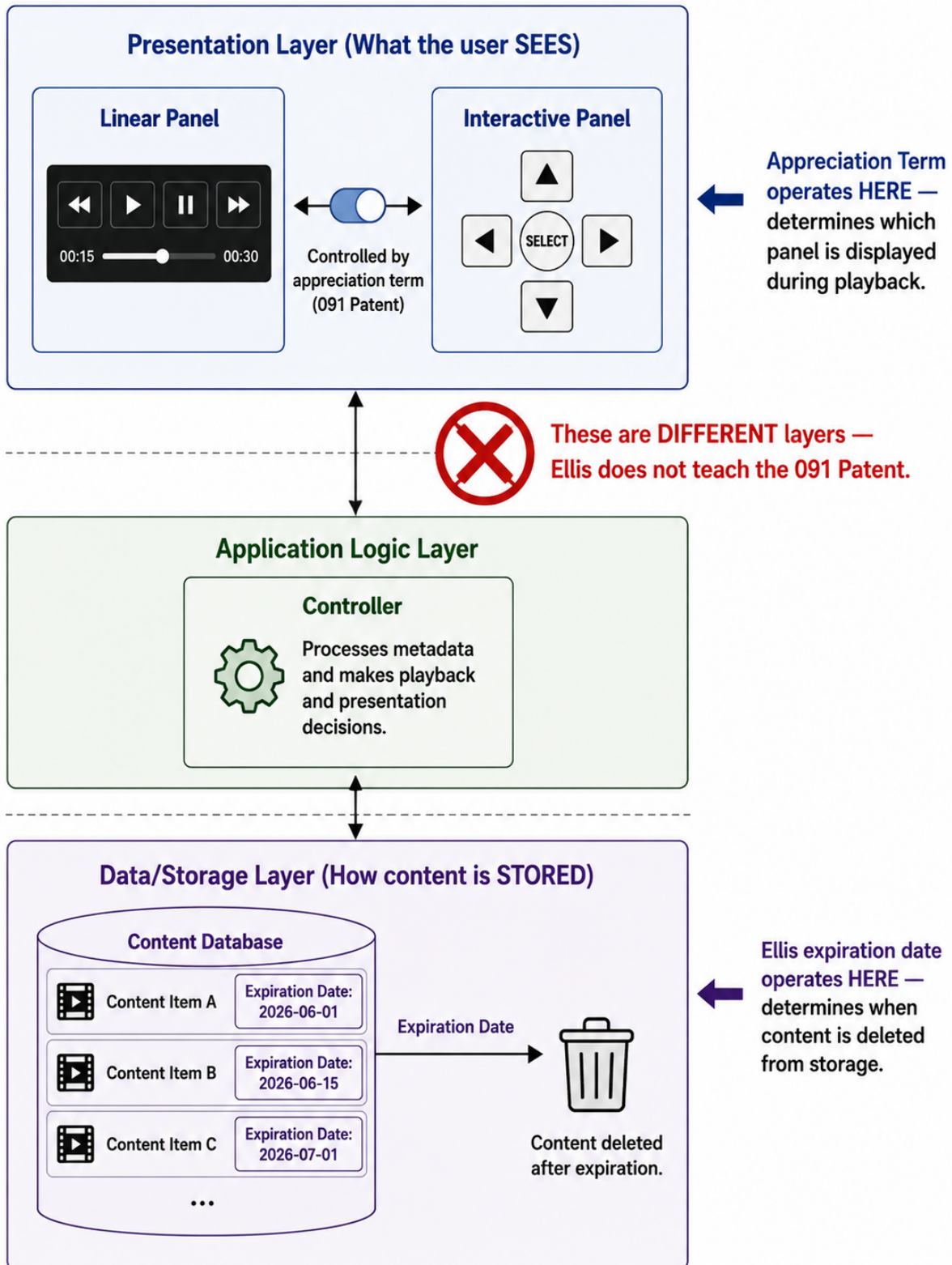
113. Dr. Bederson's attempt to equate Ellis's expiration date with the '091 Patent's appreciation term also fails because the two attributes interact with entirely different system components. The appreciation term interacts with the controller, the specific component in the '091 Patent's architecture that sits between the decoder and the display and performs metadata-driven panel selection. When the controller receives content and its associated related information (including the appreciation term), it evaluates whether the content is within or outside the appreciation term and displays the appropriate operation panel. The expiration date in Ellis, by contrast, interacts with the storage subsystem; it triggers a deletion process when the date passes, purging the recording from disk. Ellis nowhere describes the expiration date being communicated to a controller that uses it to determine which operation panel to display, nor does Ellis describe any mechanism by which the passage of an expiration date causes a change in the user interface during playback. The two attributes thus interact with different components, trigger different actions, and produce different outcomes.

114. In Ellis, by contrast, the expiration date governs only how long a program remains in storage before being deleted from a network-based or local personal video recorder. This is a storage management function, not a user-interface function. The expiration date in Ellis has no connection to the display of operation panels, the availability of interactive operation buttons, or the type of user interface

presented during playback. These are fundamentally different concepts operating at different layers of the system architecture: one at the user-interface/presentation layer, the other at the storage/data-management layer. In the well-established layered architecture model used in software engineering, the presentation layer (responsible for what the user sees and interacts with) is logically separated from the data layer (responsible for data persistence, storage management, and lifecycle). An expiration date that triggers deletion of stored content operates entirely within the data layer; it governs when a recording is purged from disk, not what buttons appear on screen during playback. The '091 Patent's "appreciation term," by contrast, operates at the presentation layer: it determines which operation panel is displayed to the user during content reproduction. A POSITA would have understood that these are not merely different implementations of the same concept, but fundamentally different concepts addressing different engineering concerns at different architectural layers. Equating a storage-lifecycle attribute with a UI-presentation-control attribute requires conflating two distinct architectural concerns that a POSITA would have kept separate. Accordingly, a POSITA, in my opinion, would not have equated them.

115. A concrete analogy may help illustrate why Ellis's expiration date is not the claimed "appreciation term." Consider a library that lends both books and interactive educational kits. The library's retention policy says: "Delete overdue items from the catalog after 90 days." This is a storage-management rule—it governs

when items are removed from the library's inventory, not how patrons interact with the items while they have them. Now consider a separate rule that governs the patron's home screen: "For the first 30 days after checkout, display the interactive kit's full set of educational activities on the patron's screen; after 30 days, switch to a simplified display showing only the reading materials." This second rule governs the user interface—what the patron sees and interacts with during use. Ellis's expiration date is the first rule: it controls when content is deleted from storage. The '091 Patent's appreciation term is the second rule: it controls which operation panel is shown to the user during playback. These rules operate at entirely different layers of the system—one at the data-management layer, the other at the presentation layer—and a POSITA would not have treated one as equivalent to the other.



Architectural Layers Diagram: Storage vs. Presentation (illustrating a three-layer software architecture in which the presentation layer at the top controls what the user sees on screen—where the '091 Patent's appreciation term operates by determining which operation panel is displayed during playback—while the data/storage layer at the bottom controls how content is persisted and lifecycle-managed—where Ellis's expiration date operates by determining when a recording is deleted from storage—demonstrating that these are different architectural concerns addressed by different system components, and that equating a storage-lifecycle attribute with a UI-presentation-control attribute conflates two distinct engineering domains).

116. Dr. Bederson also has not shown a sufficient motivation to combine Ellis with the Phillips–Wallis combination. He asserts that “the addition of Ellis simply expands the functionality of the Phillips-Wallis combinations ... and does not alter the fact that Phillips's control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel.” EX1003 ¶199. But as I have explained, Phillips's control circuitry does not control the alternative display of operation panels based on server-delivered metadata. Dr. Bederson's motivation rationale presupposes the very combination it purports to justify.

117. Furthermore, Dr. Bederson has not demonstrated a reasonable expectation of success in combining Ellis with the Phillips–Wallis combination. Even if a POSITA had some reason to look at Ellis's expiration dates, they would have recognized that converting a storage-lifecycle attribute into a UI-presentation-control attribute requires a fundamental architectural redesign, not merely a “simple software modification.” The programmer would need to: (1) intercept the expiration

date at a point before it reaches the storage subsystem; (2) route it to the controller instead of (or in addition to) the storage subsystem; (3) have the controller interpret it as a time window for displaying interactive operation buttons rather than as a deadline for content deletion; and (4) implement the logic by which the controller alternates between operation panels based on whether the current time is within or outside the expiration date. None of these steps is suggested by Ellis, which treats expiration dates solely as triggers for storage management actions. A POSITA would have had no reason to repurpose a deletion trigger as a UI-switching trigger, and no reasonable expectation that doing so would yield a functional and useful system.

118. A POSITA would also not have been motivated to combine Ellis with the Phillips–Wallis combination to achieve the claimed invention. Ellis’s expiration dates operate at the storage/data-management layer to trigger deletion of recordings. Converting a storage-lifecycle attribute into a UI-presentation-control attribute would require repurposing a component designed for one architectural layer to perform a function at an entirely different layer. A POSITA would not have been motivated to take Ellis’s deletion trigger and reroute it to a UI controller for panel selection because these operate at fundamentally different architectural layers—the data-management layer and the presentation layer, respectively—and nothing in Ellis suggests that its expiration dates should be used for any purpose other than storage management.

XI. DR. BEDERSON’S OPINIONS ON GROUND 5 ARE TECHNICALLY FLAWED

119. Ground 5 adds Ellis to the Phillips–Wallis–Logan combination of Ground 2 for claims 8, 9, 18, and 19. Claims 8 and 18 require that the “time related information” of independent claims 1 and 14 is an “appreciation term corresponding to one digital content of the digital contents.” EX1001 at Claims 8 and 18. Claims 9 and 19 further require that the “appreciation term is related to a predetermined date.” EX1001 at Claims 9 and 19.

120. Ground 5 fails for the combined reasons that Grounds 2 and 4 fail. First, as I explained in Section VIII, Dr. Bederson’s opinions on Logan do not cure any of the deficiencies in the Phillips–Wallis combination. Logan’s Mini-Nav Bar is a sports-segment navigation overlay whose provider-configurable timeout is a system-wide display preference, not the content-specific “time related information” required by the claims. Adding Logan to the Phillips–Wallis combination does not supply the missing time related information, panel related information, or the two-panel architecture governed by those metadata elements.

121. Second, as I explained in Section X, Ellis’s program expiration dates are not the claimed “appreciation term.” An appreciation term in the ’091 Patent operates at the presentation layer to control which operation panel is displayed during content playback. Ellis’s expiration date operates at the storage layer to

determine when a recording is deleted from the PVR. These are fundamentally different architectural functions, and nothing in the Phillips–Wallis–Logan–Ellis combination bridges that gap. Even assuming Logan were properly added to the Phillips–Wallis combination (which it is not), the resulting system would still lack any mechanism for using server-delivered, content-specific time metadata to control the display of operation panels, and Ellis’s storage-deletion dates cannot supply that mechanism.

122. Third, Dr. Bederson provides no independent motivation-to-combine analysis for the four-reference combination of Phillips, Wallis, Logan, and Ellis. The Petition simply incorporates by reference its rationale from Grounds 2 and 4 and asserts that the combination is obvious. Dr. Bederson identifies no coherent modification pathway by which a POSITA would: (1) start with Phillips’s VoD program guide system; (2) import Wallis’s promotional-sequence navigation attributes as panel-selection metadata; (3) add Logan’s sports-segment Mini-Nav Bar timeout as content-specific time metadata; and (4) repurpose Ellis’s storage-deletion expiration date as a presentation-layer appreciation term. Each step in this chain requires inferential leaps that are individually non-obvious to a POSITA, and their combination compounds rather than resolves the deficiency.

XII. DR. BEDERSON’S OPINIONS ON GROUND 6 ARE TECHNICALLY FLAWED

A. No Component in Ellis ’430 Performs the Claimed Controller Function

123. Ground 6 relies on Ellis ’430 (EX1021) and Wallis. Ellis ’430 is entitled “Systems and Methods for Interactive Program Guides with Personal Video Recording Features” and describes a system in which an interactive television application is implemented on user equipment to provide enhanced PVR-related and interactive program guide functionality. EX1021, Abstract. The application supports features including scheduling recordings, managing delete priorities for recordings, displaying a list of PVR recordings, configuring recording settings, and integrating pay-per-view and VoD features. EX1021, ¶¶0010–0012. The system architecture shown in Figure 1, reproduced below, includes a main facility 102 with a server 104 and database 106, a distribution facility 110 with a server 112, and user equipment 122 connected via communications paths 114. EX1021, ¶¶0156–0164. User equipment (Figures 2A–2C) includes a set-top box 202, recording equipment 204 (including PVR 208), a display device 206, and a remote control 212. EX1021, ¶¶0169–0174. The interactive television application provides overlays and display screens for program listings, recordings management, and playback control, but at no point does Ellis ’430 describe a controller that receives metadata from an outside

server and uses that metadata to select between two distinct types of operation panels displayed with reproduced digital contents.

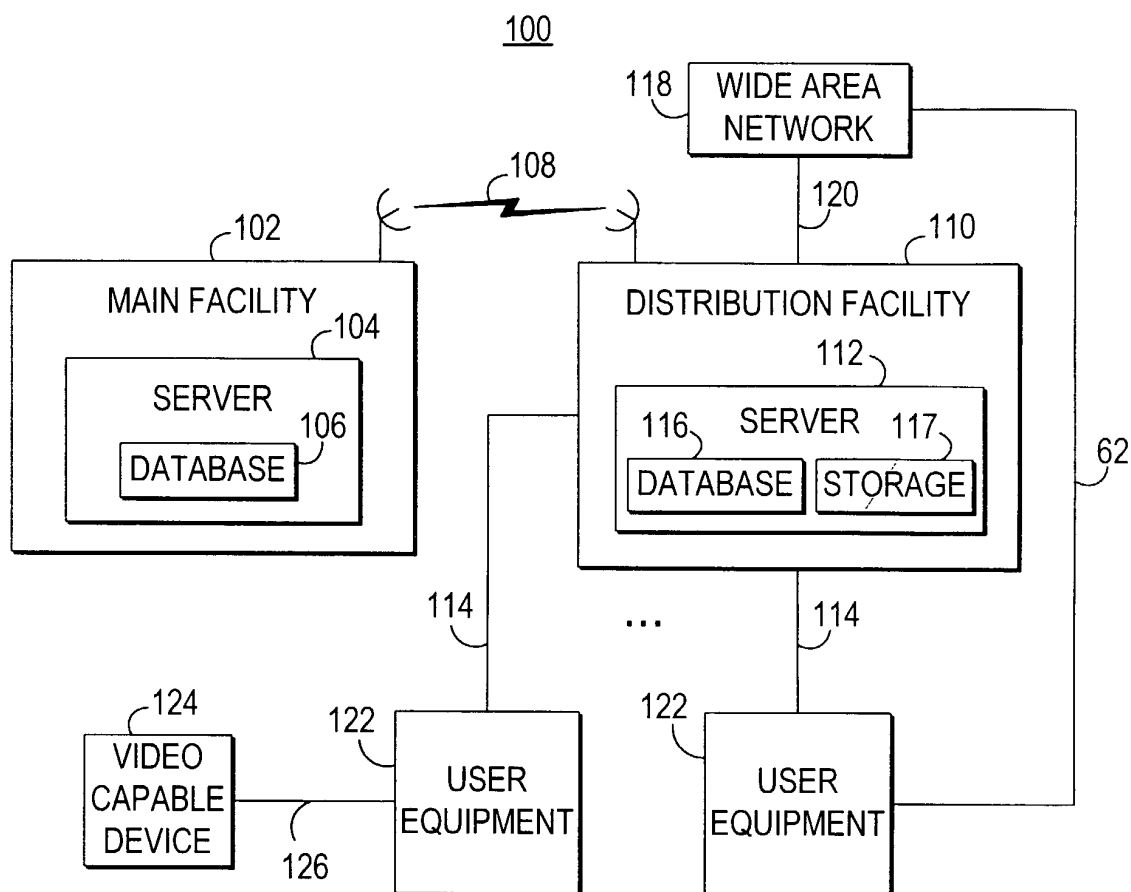


FIG. 1

EX1021 at Fig. 1.

124. Dr. Bederson maps Ellis '430's set-top box 9922 and server 9908 (in the remote-PVR arrangement of Figure 2C) to the claimed "controller." EX1003 ¶¶218–219. But the question is not whether Ellis '430 has a component that can be

labeled a “controller,” the question is whether any component in Ellis ’430 performs the specific function the claims require: receiving metadata from an outside server and using that metadata to select between two distinct types of operation panels displayed with reproduced digital contents. No component in Ellis ’430 performs that function. The set-top box 202 “may send audio/video signals and signals that are representative of graphics to display device 206 for presentation to the user.” EX1021, ¶0173. In a client/server arrangement with PVR 208, the set-top box processes “[a]ll requests for information received from remote control 212 or other input devices” and communicates with the PVR to “obtain the information or recording.” EX1021, ¶0174. These are signal-routing and remote-control-handling functions, i.e., tuning to channels, passing through audio/video, generating program guide graphics, and managing PVR recording requests. None of these functions involves receiving content-associated metadata from an outside server and using that metadata to determine which of two different operation panels to display with the reproduced content.

125. Indeed, the word “controller,” in the sense of a component that processes metadata to determine panel display, does not appear in Ellis ’430’s entire 174-page disclosure encompassing 126 Figures and 149 claims. The word “tuner” appears several times, consistently describing a component that selects among broadcast signals. EX1021, ¶¶0170, 0029. This is not merely a labeling difference;

it reflects a fundamental architectural distinction. In the Model-View-Controller (MVC) pattern, well-established by 2005, a “controller” receives input, processes it according to application logic, and determines which view to present. The ’091 Patent’s controller performs exactly this function with server-delivered metadata as its input and operation panel selection as its output. Ellis ’430’s set-top box receives remote control inputs and routes broadcast signals; it does not receive content-associated metadata from a server and use it to determine which operation panel to display.

126. To be clear: even if one calls the set-top box a “controller,” that label does not supply the missing function. Dr. Bederson’s analysis assumes that if Ellis ’430 has a component that processes inputs and generates displays, then it must be the claimed controller. But the claims do not require just any processor; they require a controller that is “configured to control reproduction of the digital contents decoded by the decoder and display of the reproduced digital contents on the display” (limitation [1d]) and that is further configured to “alternatively display” two distinct operation panels based on “related information” including “time related information” and “panel related information” received from an outside server (limitations [1e]–[1j]). EX1001, Claim 1. Even calling Ellis ’430’s set-top box a controller, it still does not receive “related information” that includes time related and panel related components, it still does not use that information to select between

two operation panels, and it still does not perform the priority-based, time-governed switching logic that the claims require. The functional gap cannot be closed by nomenclature.

B. Ellis '430's Overlays Are Not "Alternatively Displayed" Operation Panels Since They Serve Different Activities With Different Content (Limitation [1e])

127. Dr. Bederson maps Ellis '430's browse/flip overlay 260 (Figure 16) as an "interactive content operation panel" and PVR playback overlay 2404 (Figure 39) as a "linear content operation panel." EX1003 ¶¶221–225. He opines that "Ellis'430 discloses one or the other of the interactive and linear operation panels are displayed (alternatively display)." EX1003 ¶223. In my opinion, this mapping fails for multiple independent reasons, each of which is independently fatal to Dr. Bederson's analysis.

128. First, the two overlays do not satisfy the claim requirement that a controller is configured to "alternatively display" two operation panels "together with the reproduced digital contents." The browse/flip overlay 260 and the PVR overlay 2404 are not alternative panels for the same content; they correspond to fundamentally different user activities involving fundamentally different content. Overlay 260 appears during live television viewing when the user enters browse or flip mode. EX1021, ¶¶0234–0236. It shows program information: "change channel option 262" provides "the user with the ability to scroll through channels" and "title

264” changes to show the current program on each channel. EX1021, ¶0234. Overlay 2404 appears during PVR playback of a previously recorded program from local storage. EX1021, ¶0321 (“PVR playback video overlay 2404 displayed over video 2402 of a program that the interactive television application is playing from a recording on a PVR”). A user browsing live TV channels is engaged in a completely different activity from a user playing back a recorded program. There is no metadata-driven decision point where the system evaluates content attributes and selects one overlay instead of the other for the same reproduced content. The user’s own navigation choices—entering browse mode versus selecting a PVR recording—determine which overlay appears. This is user-triggered, not metadata-triggered.

129. Second, the browse/flip overlay 260 does not send “user-instructions of interactive functions to the outside server” as required by limitation [1e] for the second operation panel. Overlay 260 is a local navigation tool: pressing remote control right or left arrow keys displays titles for later or earlier programs on the selected channel; pressing “OK” tunes to a channel or plays a recorded program. EX1021, ¶0235. In flip mode, “a user may change the channel to change the current channel that is being displayed and to change title 264.” EX1021, ¶0236. These are all local operations—channel tuning, program title browsing, and PVR playback initiation—executed between the set-top box and its locally connected equipment. None involves sending interactive function instructions to an outside server. The

PVR overlay 2404 is likewise strictly local: its buttons—rewind, play, fast-forward, pause, stop—control “the flow of video 2402” from a recording stored on the local PVR. EX1021, ¶0322. Neither overlay satisfies the claim requirement that one panel sends “user-instructions of interactive functions to the outside server.”

130. Third, no component in Ellis ’430 selects between these two overlays based on received “related information.” Ellis ’430’s overlay appears when the user presses navigation buttons to enter browse or flip mode and “[i]n response to no activity by the user, the overlay may be removed after a predetermined amount of time.” EX1021, ¶¶0234, 0289 (describing the same local timeout mechanism as Phillips). The PVR playback overlay 2404 appears when the user selects a recording for playback from a PVR recording list and presses play. EX1021, ¶¶0310, 0321. These overlays are triggered by distinct user actions, such as pressing browse/flip buttons for overlay 260 or selecting a PVR recording for overlay 2404, not by metadata received from a server. At no point does Ellis ’430 describe the system evaluating content-associated metadata and, based on that evaluation, choosing between overlay 260 and overlay 2404 for display with the same reproduced content. The system simply displays whichever overlay corresponds to the user’s current mode of interaction. This is the same local-logic, user-driven design I identified in Phillips, and it is architecturally incompatible with the server-driven, metadata-responsive panel selection required by the claims.

C. Dr. Bederson's Opinions on Limitations [1f], [1g], [1i], and [1j] for Ellis '430 Are Flawed

131. For limitation [1f], Dr. Bederson identifies program guide schedule times in Ellis '430 and the browse/flip overlay's availability during live buffered television. EX1003 ¶¶226–232. He opines that “program guide information or content transmitted by main facility 102 to distribution facility 110 may include television program listings data (such as program times...)” and asserts that “both the time during which the live broadcast airs (program times), and the browse/flip mode displayed as an overlay on the live television display are received from distribution facility 110 (an outside server).” EX1003 ¶¶227, 232. But this reasoning fundamentally mischaracterizes what Ellis '430 actually teaches. Ellis '430's program listings data, “television program listings data (such as program times, channels, titles, descriptions, program type, genre, actors),” is scheduling information that tells users when programs air. EX1021, ¶0159. It is not metadata that governs how long an operation panel is displayed. The browse/flip overlay's appearance and disappearance is based entirely on user navigation and local inactivity timeouts, not on any “time related information” received from a server as part of “related information” that accompanies digital contents. Ellis '430 nowhere states that program schedule times are used to define a period during which an overlay is displayed, nor that the overlay's display duration is governed by metadata

received with the content. The overlay appears when the user invokes browse/flip mode and disappears “[i]n response to no activity by the user.” EX1021, ¶0289. This is the same type of local UI timeout behavior I identified in Phillips (Section VII.D), and it is not the content-specific, server-delivered “time related information” required by the claims.

132. For limitation [1g], Dr. Bederson concedes that “Ellis’430 does not disclose this limitation” and turns to Wallis instead. EX1003 ¶233. But as I have explained in Section VII.E above, Wallis’s navigation attributes are not panel-selection metadata. They govern skip behavior, favorites, and link targets within promotional content sequences (arguably not the desired content but content imposed on the user by the server); they do not decide which of two operation panels to display with reproduced contents.

133. For limitation [1i], Dr. Bederson opines that the “browse or flip” operation panel is invoked “when a live television broadcast airs based on the program time information (during the time represented by the time related information).” EX1003 ¶235. But Ellis ’430 does not derive or receive any time field that represents a specific interval during which the overlay must be displayed, nor is any such field part of “related information” received from a server. Dr. Bederson equates the existence of the browse/flip overlay during a live broadcast with a time-governed display period, but that is not what Ellis ’430 describes.

134. For limitation [1j], Dr. Bederson opines that “at least one time other than the time when the user is viewing a scheduled live broadcast ..., a linear operation panel overlay 2404 is displayed during playback of a program video.” EX1003 ¶236. He then acknowledges that “Ellis’430 does not disclose displaying at least one of the linear operation buttons based on the panel related information, but ... Wallis does.” EX1003 ¶237. In my opinion, Dr. Bederson again constructs a scenario not found in either reference. Ellis ’430 does not say that deactivation of the browse/flip overlay leads to the display of overlay 2404 on the same content. Overlay 2404 appears in the context of PVR playback, not as a default panel whenever “interactive” overlays are absent. Treating Wallis’s attributes as panel-selection flags that decide which type of operation panel appears “other than during the time represented by the time related information” is not based on any disclosure in Wallis; it is an application of the ’091 claim structure to the prior art with hindsight.

D. Dr. Bederson’s Motivation to Combine Ellis ’430 with Wallis Is Insufficient

135. Dr. Bederson opines that a “POSITA would have been motivated to combine Ellis’430 and Wallis at least because they are analogous art to the ’091 patent as they are directed to the same field of endeavor, i.e., interactive televisions systems that provide enhanced user experiences through specially formatted screen

displays and presentation of user controls.” EX1003 ¶263. He further asserts that “Wallis’s attribute table could easily, and with a reasonable expectation of success, be integrated into Ellis ’430. Deciding which operation panel to display is a simple and predictable outcome of a condition in an ‘if’ programming statement.” EX1003 ¶266.

136. In my opinion, this rationale suffers from the same deficiency as Dr. Bederson’s motivation to combine Phillips and Wallis: it is insufficient and hindsight-driven. Ellis ’430 addresses PVR and interactive program-guide functionality: recording scheduling, storage management, delete priorities, buffering live television, multi-user profiles, and dozens of UI overlays and display screens. EX1021, ¶¶0010–0040. Wallis addresses metadata-controlled navigation within sequences of VoD promotional items, controlling whether users can skip, save, or jump between promotional clips. EX1011 ¶¶29–34. Neither reference discusses using server-provided metadata to select between two different types of playback operation panels presented with the same reproduced digital contents and governed by server-defined time windows, as required by the ’091 claims. The fact that both references relate to “interactive television systems” at a high level does not provide any specific rationale to combine the references to a POSITA. Under this logic, any two references in the field of interactive television could be combined, because the field is inherently interconnected.

137. I understand from counsel that the question is not whether a combination is abstractly possible, but whether there is a reason why a POSITA would make this specific combination in this specific way, and Dr. Bederson provides no such reason beyond hindsight. Moreover, Ellis '430's inventors designed dozens of overlays, dozens of display screens, and dozens of user interaction modes, yet never once described using server-delivered metadata to select between two types of operation panels. If a POSITA in this field would "obviously" have implemented the claimed architecture, Ellis '430's exhaustive treatment of every other conceivable PVR and program guide feature makes it inexplicable that this particular architecture, which, according to Dr. Bederson, is merely a "simple and predictable outcome of a condition in an 'if' programming statement," was never conceived. The proposed combination does not arise naturally from the teachings of Ellis '430 and Wallis; it uses the '091 Patent itself as a roadmap.

E. Dr. Bederson's Analysis of Independent Claim 14 for Ground 6 Is Deficient

138. Claim 14 imposes the additional requirement that both the digital contents and the related information be received "from a video on demand server." EX1001 at claim 14. Dr. Bederson nowhere identifies where Ellis '430 or Wallis discloses a VoD server delivering the claimed time related information or panel

related information. His declaration simply cross-references his analysis of claim 1, which was already deficient. For all the reasons explained above regarding claims 1 and 14, Dr. Bederson fails to establish that Ellis '430 in view of Wallis renders obvious claims 14–19.

139. Moreover, a POSITA would not have been motivated to combine Ellis '430 with Wallis to achieve the claimed invention. Ellis '430's exhaustive treatment of PVR and program-guide functionality—dozens of overlays, display screens, and user interaction modes—never once describes using server-delivered metadata to select between two types of operation panels. A POSITA would not have modified Ellis '430's user-driven overlay system to incorporate Wallis's promotional navigation attributes as panel-selection metadata because Ellis '430's overlays are triggered by distinct user actions (pressing browse/flip buttons, selecting recordings), not by metadata evaluation. The absence of any suggestion in Ellis '430's comprehensive disclosure that server-delivered metadata could or should govern panel selection—despite the reference's exhaustive treatment of every other conceivable PVR and program guide feature—affirmatively teaches away from the proposed combination.

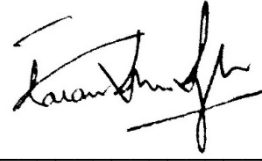
XIII. CONCLUSION

140. For the foregoing reasons, it is my opinion that Dr. Bederson's technical analysis does not support Samsung's assertion that any of the challenged claims of

the '091 Patent would have been obvious over the cited prior art combinations. Across all six grounds, Dr. Bederson's declaration fails to demonstrate that the prior art discloses or renders obvious the claimed architecture in which a controller receives "related information" from an outside server—including both "time related information" and "panel related information"—and uses that information to alternatively display linear and interactive operation panels with the reproduced digital contents. This is a central innovation of the '091 Patent, it was the basis for the Examiner's allowance, and Dr. Bederson's declaration does not identify any prior art disclosure that teaches or renders obvious this architecture.

141. I reserve the right to supplement this Declaration in connection with any sur-reply, deposition, or oral hearing.

142. I hereby declare that all statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true. Further, I am aware that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001, and with the knowledge that such willful false statements may jeopardize the results of these proceedings. I declare under penalty of perjury that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read 'Karansher Singh', is positioned above a horizontal line.

Dated: May 29, 2026

Karansher Singh, Ph.D.