

Declaration of Andrew Wolfe, Ph.D.
U.S. Patent No. 10,375,341

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCL Electronics Holdings Ltd.
(f/k/a TCL Multimedia Technology Holdings, Ltd.)

Petitioner,

v.

Maxell, Ltd.

Patent Owner.

Case IPR2025-00120
U.S. Patent No. 10,375,341

**DECLARATION OF ANDREW WOLFE, PH.D.
ON BEHALF OF PETITIONER**

CLAIMS 1-4

Declaration of Andrew Wolfe, Ph.D.
U.S. Patent No. 10,375,341

I, Andrew Wolfe, Ph.D., declare as follows:

1. I have been retained on behalf of TCL Electronic Holdings Ltd. (f/k/a TCL Multimedia Technology Holdings, Ltd.), (collectively, “TCL” or “Petitioner”) to render my opinion on the patentability of claims 1-4 of U.S. Patent 10,375,341 (the “’341 patent”). I have been asked to consider the state of the art and the prior art available before the time of the ’341 patent. My opinions are provided in this declaration.

2. To the best of my knowledge, I have no financial interest in Petitioner. Petitioner’s counsel has also informed me that a company known as Maxell, Inc. (“Maxell” or “Patent Owner”) is named as the current assignee of the ’341 patent and presumably is the Patent Owner. To the best of my knowledge, I have no financial interest in Maxell and, to the best of my recollection, I have had no contact with Maxell outside of their actions as opposing parties in similar litigation matters. To the best of my knowledge, I similarly have no financial interest in the ’341 patent. To the extent any mutual funds or other investments that I own have a financial interest in the Petitioner, the Patent Owner, or the ’341 patent, I am not aware of, nor do I have control over, any financial interest that would affect or bias my judgment.

3. I am being compensated at my standard consulting rate of \$750 for my time. My compensation is in no way contingent on the results of this or any other proceedings relating to the '341 patent.

4. For ease of understanding, I have annotated figures and added emphasis in my discussions unless otherwise noted.

1. Background and Qualifications

5. My qualifications and professional experience are described in my curriculum vitae, a copy of which is provided as Exhibit 1006. The following briefly summarizes my relevant qualifications and professional experience.

6. I have more than 40 years of experience in consumer electronics and interactive graphics and interactive video computer systems, including as a computer architect, computer system designer, PC graphics designer, educator, and as an executive in the consumer electronics business.

7. In 1985, I earned the B.S.E.E. degree in Electrical Engineering and Computer Science from the Johns Hopkins University. In 1987, I received the M.S. degree in Electrical and Computer Engineering from Carnegie Mellon University and then in 1992, I received a Ph.D. in Computer Engineering from Carnegie

Mellon University. My doctoral dissertation proposed a new approach for the architecture of a computer processor.

8. In 1983, I began designing microprocessor-based computer systems and I/O cards for personal computers as a senior design engineer for Touch Technology, Inc. In some of these design projects, I designed interrupt-based I/O cards for PC-compatible computer systems including the IBM PC-AT to interface interactive touch-based computer terminals that I designed for use in public information systems. I later worked for the Carroll Touch division of AMP where I designed additional touchscreen technologies, developed system firmware, and designed the company's first custom integrated circuit. I designed the touch/pen input system for the Linus WriteTop, which many believe to be the first commercial tablet computer.

9. From 1986 through 1987, I designed and built a high-performance computer system at Carnegie Mellon University. From 1986 through 1988, I also developed the curriculum and supervised the teaching lab for the processor design courses.

10. In 1987-88, I worked as a senior design engineer for ESL-TRW Advanced Technology Division. I designed and built a bus interface and memory

controller for a workstation-based computer system and worked on the design of a multiprocessor system.

11. At the end of 1989, along with some partners, I reacquired the technology I had developed at Touch Technology and at AMP and founded The Graphics Technology Company. As an officer and a consultant, I managed engineering development activities at that company and personally developed dozens of interactive graphics and interactive video computer systems over the next seven years. Each of these included image rendering hardware and software and image-based user interfaces.

12. I have consulted, formally and informally, for a number of consumer electronics design companies. In particular, I have served on the technical advisory boards for two media processor design companies, BOPS, Inc., where I chaired the board, and Siroyan Ltd. I served in a similar role for three networking chip companies, Intellon, Inc., Comsilica, Inc., and Entridia, Inc. and one 3D game accelerator company, Ageia, Inc. I have also served as a technology advisor to Motorola and to several venture capital funds in the U.S. and Europe. Currently, I am a director of Turtle Beach Corporation, providing guidance in its development of premium audio peripheral devices for a variety of commercial electronic products.

13. From 1991 through 1997, I served on the Faculty of Princeton University as an Assistant Professor of Electrical Engineering. At Princeton, I taught undergraduate and graduate-level courses in Computer Architecture, Advanced Computer Architecture, Display Technology, and Microprocessor Systems courses as well as conducting sponsored research in the area of computer systems and related topics. I conducted DOD-sponsored research into client-server video streaming and supervised Ph.D. students working in this area. From 1999 through 2002, I also taught the Computer Architecture course to both undergraduates and graduate students at Stanford University several times as a Consulting Professor. At Princeton, I received several teaching awards, both from students and from the School of Engineering. I have also taught advanced microprocessor architecture to industry professionals in IEEE and ACM sponsored seminars. I am currently a lecturer at Santa Clara University teaching courses on Embedded Systems, Real-Time Computing, Mechatronics, and Engineering Practice.

14. From 1997 through 2002, I held a variety of executive positions at a publicly-held PC graphics company originally called S3, Inc. and later called Sonicblue Inc. These included Chief Technology Officer, Vice President of Systems Integration Products, Senior Vice President of Business Development, and

Director of Technology. At the time I joined S3, it supplied graphics accelerators for more than 50% of the PCs sold in the United States.

15. In these roles, I managed teams of engineers developing complex graphics chips for use in personal computers. I also managed the video research lab. I supervised several engineering design teams that developed 2D/3D graphics chips for notebook PCs including digital video playback hardware. I was involved in every aspect of the relationship with PC manufacturers ranging from discussions of product requirements, testing and qualification procedures, and competitive analysis, to market segmentation and pricing discussions. I met with senior executives in major PC manufacturers on numerous occasions to discuss business opportunities and general market trends. I also developed numerous consumer audio and video products including the Rio MP3 players, the ReplayTV digital video recorders, certain Löewe televisions, and the GoVideo DVD and VCR products. I also developed user interfaces and remote control protocols. I further assisted in the launch of streaming services. During my time at SonicBlue we launched more than 30 new consumer electronics products.

16. I have published more than 50 peer-reviewed papers in computer architecture and computer systems design including papers related to video streaming. I have also chaired IEEE and ACM conferences in microarchitecture

and integrated circuit design. I am a named inventor on at least fifty-seven U.S. patents and thirty-seven foreign patents, including on video recording and playback technology. I am an IEEE Fellow and an IEEE Computer Society Distinguished Contributor.

17. I have been the invited keynote speaker at the ACM/IEEE International Symposium on Microarchitecture and at the International Conference on Multimedia. I have also been an invited speaker on various aspects of technology or the PC industry at numerous industry events including the Intel Developer's Forum, Microsoft Windows Hardware Engineering Conference, Microprocessor Forum, Embedded Systems Conference, Comdex, and Consumer Electronics Show as well as at Harvard Business School and the University of Illinois Law School. I have been interviewed on subjects related to computer graphics and video technology and the electronics industry by publications such as the Wall Street Journal, New York Times, LA Times, Time, Newsweek, Forbes, and Fortune as well as CNN, NPR, and the BBC. I have also spoken at dozens of universities including MIT, Stanford, University of Texas, Carnegie Mellon, UCLA, University of Michigan, Rice, and Duke.

18. In summary, I have extensive familiarity with fields involving electronic device user interfaces, communication protocols, and displays. I am

familiar with the state of this field at the time of the '341 patent, which I have been informed by Petitioner's counsel to assume as being December 7, 2012, for the purposes of this proceeding.

2. Materials Reviewed

19. In preparing this declaration, I have reviewed and considered the references listed below and all other documents referenced in this declaration. I have provided my opinions based on my personal knowledge of these documents as viewed from the view of a person of ordinary skill in the art (a "POSITA"), which I am familiar with based on my education, training, and experience in the field.

Exhibit No.	Document Description
EX1001	United States Patent No. 10,375,341
EX1002	Prosecution History of United States Patent No. 10,375,341
EX1004	U.S. Patent Publication No. 20050036509 ("Acharya")
EX1005	Eli Saber Deposition Transcript (Maxell's expert deposition)
EX1006	Andrew Wolfe, Ph.D. Curriculum Vitae
EX1007	SAMSUNG UN55B8500 Manual
EX1008	New Service Will Stream Local TV Stations in New York

3. Relevant Legal Standards

20. In preparing this declaration, counsel for Petitioner has informed me of the following aspects of the law, which I have applied in providing my opinions.

3.1. Burden of Proof

21. I have been informed and understand that the Petitioner must demonstrate unpatentability of a claim by a preponderance of the evidence. I understand that preponderance of the evidence means more likely than not in this context.

3.2. Person of Ordinary Skill in the Art

22. I have been informed and understand that a patent should be analyzed from the perspective of a POSITA. I have also been informed that factors considered in determining a level of POSITA include: (1) the type of problems encountered in the art or field; (2) prior art solutions to these problems; (3) sophistication of the technology; (4) the rapidity with which innovations are made; (5) education level of workers active working in the field; (6) the named inventor's educational level and training; (7) the general state of the technology; and (8) types of testing and skills required to carry out such tests that are described in the patent.

23. I have been informed and understand that a POSITA is a hypothetical person of ordinary creativity. This person has knowledge of all prior art in the relevant field and takes from each reference what it would teach to a person having the skills of a POSITA. A POSITA is not an automaton and would be able to consider teachings from multiple references.

3.3. Claim Construction

24. I have been informed that to determine the meaning of the terms in the claims of the '341 patent for purposes of this declaration, one should generally use the ordinary and customary meaning as understood by a POSITA at the time of the '341 patent, taking into consideration the claim language and specification of the '341 patent.

25. I have been informed and understand that an application of the patent can explicitly define a specific claim term in the specification. I have been informed and understand that in cases where a special definition is provided in the specification that is different from the normal plain and ordinary meaning of that term, the applicant has acted as his own lexicographer and that definition governs.

26. I have been informed and I understand that the specification of the patent and documents included in the file history of the '341 patent (EX1002) should be considered in evaluating the proper construction of a claim term.

3.4. Obviousness

27. I have been informed that if one or more prior art references teach the claimed limitations, the claim can be found unpatentable based on obviousness.

28. I have been informed and understand that a patent claim would have been obvious to a POSITA over single or multiple references if the differences between the subject matter in the prior art and the subject matter in the claim would have been obvious to a POSITA before the priority date of the patent. I understand that a claim would have been obvious if a POSITA would have been motivated to combine the teachings of two or more prior art references to achieve the claimed subject matter and the POSITA would have had a reasonable expectation of success of doing so.

29. I have been informed and understand that obviousness may be found based on the following exemplary rationales:

- combining prior art elements according to known methods to yield predictable results;

- simple substitution of one known element for another to obtain predictable results;
- use of known technique to improve similar devices (methods, or products) in the same way;
- applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- “obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- known work in one field of endeavor that prompts variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art reference or to combine prior art reference teachings to arrive at the claims.

30. I have been informed and understand that an obviousness analysis cannot be based on the benefit of hindsight obtained from the patent under consideration. In other words, the patent’s specification or claim cannot be used as a map in the consideration of combining prior art references.

4. Summary of Opinions

31. In my opinion, claims 1-4 (the “Challenged Claims”) of the ’341 patent would have been obvious to a POSITA as more fully explained below in my declaration based on the following prior art and grounds.

Prior Art References	
Ref. 1:	U.S. Patent Publication No. 20050036509 A1 to Acharya, et al. (“Acharya”) (EX1004).

GROUNDS			
Ground	Challenged Claims	Asserted Prior Art	Statutory Grounds
1	Claims 1-4	Acharya	AIA 35 U.S.C. §103

5. Technology Background

32. Each of the Challenged Claims is directed to an apparatus or method of controlling a video display apparatus having two types of bi-directional wireless communication. A first bi-directional wireless communication goes through a router. A second bi-directional wireless communication does not go through a router.

33. The assumed priority date of the ’341 patent is December 7, 2012. As of that date, wireless communications to a video display were well established in

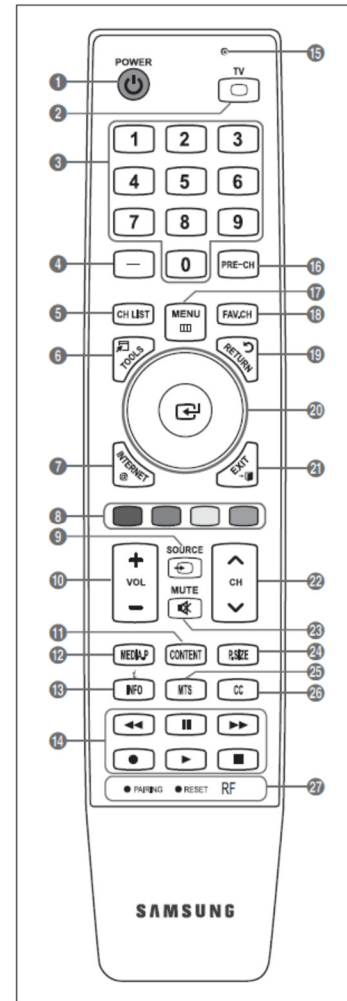
the art. Video displays were available in the form of smart television, tablet computers (such as the iPad), and computer monitors. All were capable of supporting wireless communications at the time.

34. Solely for the purpose of illustrating the state of the art prior to the '341 patent, I have included some excerpts from the manual (attached as Exhibit 1007) for the Samsung UN55B8500 television, which I have had since 2010 and use in my home. This manual indicates that this television supported infrared wireless communications from a remote control and bidirectional RF communications with the remote control, as well as bidirectional Wi-Fi communications with or without an access point.

Viewing the Remote Control

☑ The product color and shape may vary depending on the model.

- ❶ **POWER** : Turns the TV on and off.
- ❷ **TV** : Selects the TV mode directly.
- ❸ **NUMERIC BUTTONS** : Press to change the channel.
- ❹ **[]** : Press to select additional channels (digital) being broadcast by the same station. For example, to select channel '54-3', press '54', then press '[]' and '3'.
- ❺ **CH LIST** : Used to display Channel Lists on the screen.
- ❻ **TOOLS** : Use to quickly select frequently used functions.
- ❼ **INTERNET@** : Press to use various internet services to view useful information and entertaining content.
- ❽ **COLOR BUTTONS** : Use these buttons in the **Channel list**, **Internet@TV**, **Media Play** menu, etc.
- ❾ **SOURCE**: Press to display and select the available video sources.
- ❿ **- VOL +** : Press to increase or decrease the volume.
- ⓫ **CONTENT**: This function enables you to view the **Content Library**.
- ⓬ **MEDIA.P**: Allows you to play music files, pictures, and movies.
- ⓭ **INFO**: Press to display information on the TV screen.
- ⓮ Use these buttons in the **Media Play** and **Anynet+** modes. ([]) : This remote can be used to control recording on Samsung recorders with the **Anynet+** feature)
- ⓯ **SENSING WINDOW**: Senses the brightness of the room and determines whether to turn on the backlight of the remote control button or not. The Backlight enables you to find the remote buttons more easily in a dark room.
- ⓰ **PRE-CH** : Enables you to return to the previous channel you were watching.
- ⓱ **MENU** : Displays the main on-screen menu.
- ⓲ **FAV.CH** : Used to display Favorites Channel Lists on the screen.
- ⓳ **RETURN** : Returns to the previous menu
- ⓴ **WHEEL (UP ▲ / DOWN ▼ / LEFT ◀ / RIGHT ▶) / ENTER []** : Press the Up/Down/Left/Right sections of the wheel button and Enter to select on-screen menu items and change menu values. You can navigate up and down the menu, switch channels and adjust the volume by turning the wheel button.
- ⓵ **EXIT** : Press to exit the menu.
- ⓶ **▼ CH ▲** : Press to change channels.
- ⓷ **MUTE** : Press to temporarily cut off the sound.
- ⓸ **P.SIZE**: Picture size selection.
- ⓹ **MTS**: Press to choose stereo, mono or Separate Audio Program (SAP broadcast).
- ⓺ **CC**: Controls the caption decoder.
- ⓻ **PAIRING / RESET**: Used for pairing the TV and the Remote Control. (see page 5)



☑ This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received including interference that may cause undesired operation.
- Applicant's name : SAMSUNG ELECTRONICS CO.,LTD.
Model name : Remote Controller
IC : 649E-SWPZ01TX
 - Applicant's name : SAMSUNG ELECTRONICS CO.,LTD.
Model name : Rf Transceiver
IC : 649E-SWPZ01RX

Description of the combined IR/RF remote control.

Mini Remote Control

The Mini Remote Control is a simplified remote control that consists of the power, channel and volume buttons only.

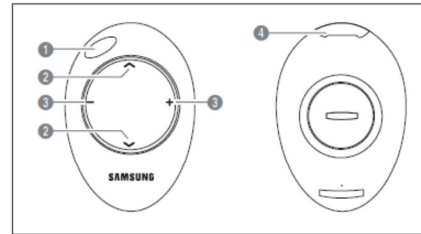
- ❶ Power On/Off button
- ❷ ^ : Next channel / v : Previous channel
- ❸ + : Volume increase / - : Volume decrease
- ❹ IrDA transmitter

☑ Use the Mini Remote Control so that this part faces the TV.

☑ The items color and shape may vary depending on the model.

☑ CALIFORNIA USA ONLY

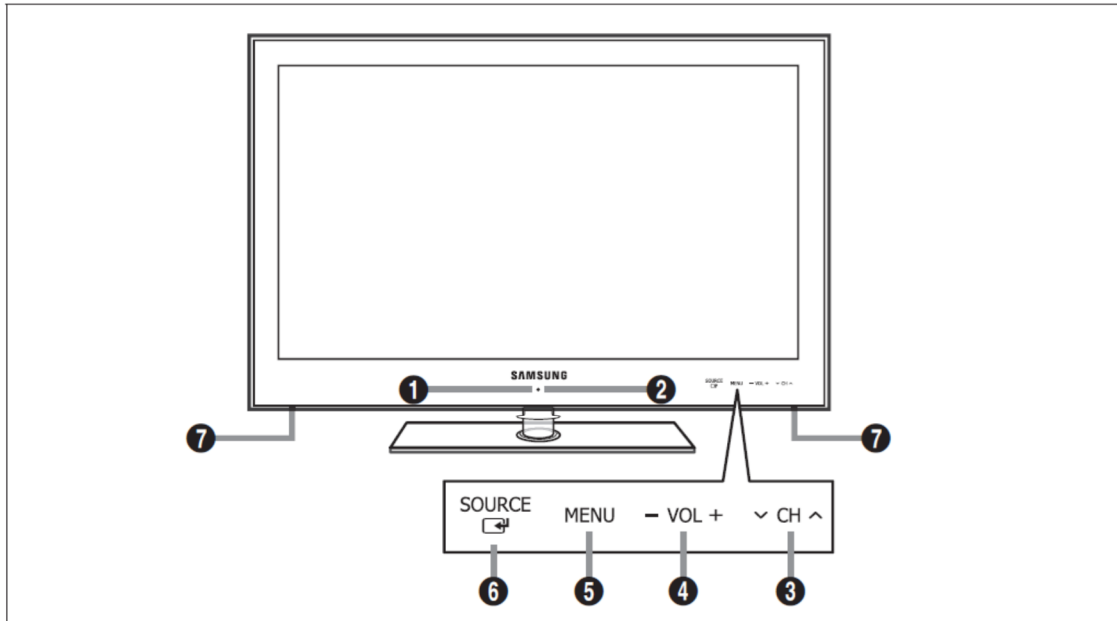
This Perchlorate warning applies only to primary CR (Manganese Dioxide) Lithium coin cells in the product sold or distributed ONLY in California USA 'Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate.'



Alternate IR remote control

Viewing the Control Panel

- ⑦ The product color and shape may vary depending on the model.
- ⑦ The front panel buttons can be activated by touching them with your finger.



- ① **REMOTE CONTROL SENSOR:** Aim the remote control towards this spot on the TV.
- ② **⏻ (POWER):** Press to turn the TV on and off.
- ③ **▽ CH ▲:** Press to change channels. In the on-screen menu, use the ▽ CH ▲ buttons as you would use the ▼ and ▲ buttons on the remote control.
- ④ **- VOL +:** Press to increase or decrease the volume. In the on-screen menu, use the - VOL + buttons as you would use the ◀ and ▶ buttons on the remote control.
- ⑤ **MENU:** Press to see an on-screen menu of your TV's features.
- ⑥ **SOURCE** : Toggles between all the available input sources. In the on-screen menu, use this button as you use the ENTER  button on the remote control.
- ⑦ **SPEAKERS**

Disclosure of the IR remote sensor

Pairing the Remote Control

A process that enables two-way communication between the TV and the remote control. This enables the remote to control this TV only.

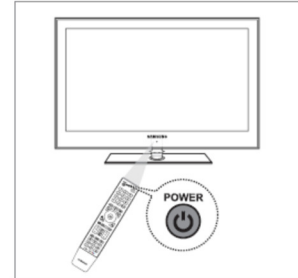
❑ Auto Pairing

A method that completes the automatic pairing of the TV and the remote control.

☑ If Auto Pairing does not work, refer to the 'Manual Pairing'.

■ When the TV is turned off (Standby mode)

1. Press the **POWER** (⏻) button on the remote control.
☑ The remote control enters pairing mode.
2. The TV that receives the Power command is turned on.
☑ The TV enters pairing mode. Pairing mode is maintained until pairing is complete.
3. Pairing mode is completed.
☑ The remote control beeps.



■ When the TV is turned on

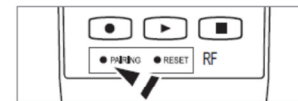
1. Press any button on the remote control.
☑ The remote control enters pairing mode.
☑ After pairing is complete, the button pressed by the user transmits the corresponding command to the TV.
☑ The time taken to complete the pairing and to send the command is less than 1 second.
2. Pairing mode is completed.
☑ The remote control beeps.



❑ Manual Pairing

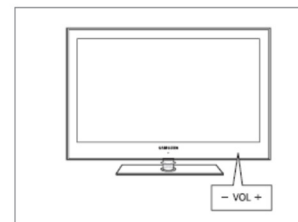
You can pair the TV and the remote control so that the remote control only controls the TV.

1. Plug the TV power plug into the power outlet.
☑ Turn the TV power switch off.
2. Press the **PAIRING** button on the remote control.
☑ Use a sharp object to press the button.
☑ Keep a distance of less than 3 feet (1 m) between the TV and the remote control.
3. Press the **POWER** (⏻) button on the front panel of the TV. The TV is turned on and Pairing with the remote control is completed.
4. Press the remote control buttons to check if the remote control is properly paired.
☑ If the remote control does not work, attempt the pairing process again.
☑ If the remote control does not work even after the above measures have been taken, press the **RESET** button, and replace the batteries.



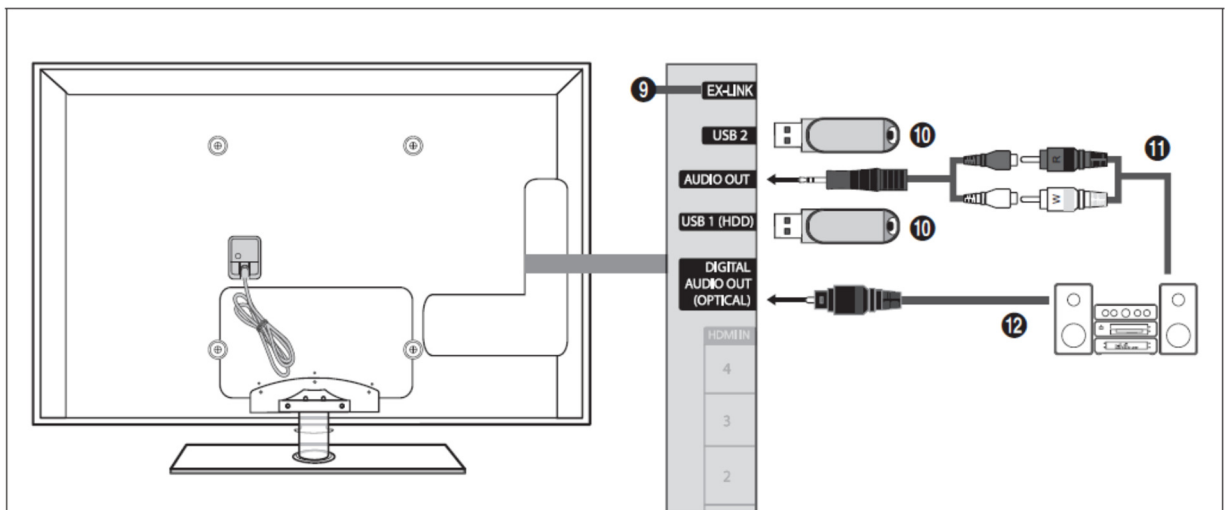
Finding the Remote Control

1. Press the Volume (-) button on the front panel of the TV and hold it down for 10 seconds. The TV will transmit a signal to find the remote control.
2. The remote control will generate an alarm sound for 30 seconds. Search for the remote control from the location where the sound is heard the loudest.
☑ If no sound is heard, please try again.
3. If the remote control has been found, press any remote control button to stop the sound.



Disclosure of RF remote pairing and bidirectional communications

35. Note that the television supports two remote control options, both wireless. One is based on IR while another is based on RF and is bidirectional. The pairing buttons on the remote further indicate that pairing is for RF communications. No router is used. This manual also clearly explains that Wi-Fi is supported through a companion USB adapter and that it can operate through a router or in ad-hoc mode without a router.



9 EX-LINK

Connector for service only.

10 USB 1 (HDD) / USB 2

Connector for software upgrades and Media Play, etc. You can connect to Samsung's network wirelessly using the 'Samsung Wireless LAN Adapter' (Sold separately).

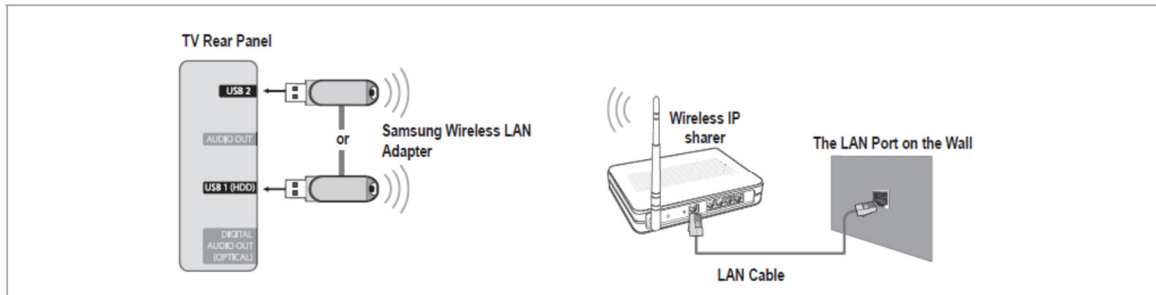
☑ For USB HDD, use the **USB 1 (HDD)** port.

☑ Turning on or off the TV while a USB device is connected may damage the files on the USB device.

Illustration of the Wireless LAN adapter

☐ **Network Connection - Wireless**

You can connect to the network wirelessly through a wireless IP sharer.



1. Connect the 'Samsung Wireless LAN Adapter' into the **USB 1 (HDD)** or **USB 2** terminal of the TV.
 - ☑ You must use the 'Samsung Wireless LAN Adapter'(WIS09ABGN) to use a wireless network.
 - ☑ Samsung's Wireless LAN adapter is sold separately. The WIS09ABGN Wireless LAN adapter is offered by select retailers, Ecommerce sites and Samsungparts.com.
 - ☑ To use a wireless network, your TV must be connected to a wireless IP sharer. If the wireless IP sharer supports DHCP, your TV can use a DHCP or static IP address to connect to the wireless network.
 - ☑ Samsung's Wireless LAN adapter supports IEEE 802.11A, IEEE 802.11B, IEEE 802.11G, IEEE 802.11N. When you play DLNA video over IEEE 802.11B/G connection, the video may not be played smoothly.
 - ☑ If the wireless IP sharer allows you to turn the Ping connection function on/off, turn it on.
 - ☑ Select a channel for the wireless IP sharer that is not currently being used. If the channel set for the wireless IP sharer is currently being used by another device nearby, this will result in interference and communications may fail.
 - ☑ If you apply a security system other than the systems listed below, it will not work with the TV.
 - When applying the security key for the AP (wireless IP sharer), only the following is supported.
 - 1) Authentication Mode : OPEN, SHARED, WPAPSK, WPA2PSK
 - 2) Encryption Type : WEP, TKIP, AES
 - When applying the security key for the Ad-hoc mode, only the following is supported.
 - 1) Authentication Mode : SHARED, WPANONE
 - 2) Encryption Type : WEP, TKIP, AES
 - ☑ If your AP supports WPS(Wi-Fi Protected Setup), you can connect to the network via PBC (Push Button Configuration) or PIN (Personal Identification Number). WPS will automatically configure the SSID and WPA key in either mode.
 - ☑ If the device isn't certified, it may not connect to the TV via the 'Samsung Wireless LAN Adapter'.

Setting the Network

☐ Network Type

Select Cable or Wireless as the method to connect to the network.

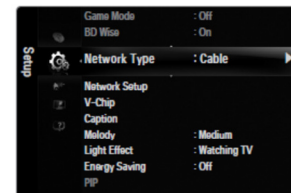
- ☒ The menu is activated only if the 'Samsung Wireless LAN Adapter' is connected.

☒ Cable

Connect to the network using a cable.

☒ Wireless

Connect to the network wirelessly.



☐ Network Setup

☒ Cable Network Setup (when Network Type is set to Cable)

- ☒ Please check if the LAN cable is connected.

- ☒ Internet Protocol Setup → Auto Setup / Manual Setup

- ☒ Network Test: You can test or confirm the network connection status after setting up the network.

- ☒ When unable to connect to a wired network

If your Internet service provider has registered the MAC address of the device used to connect to the Internet for the first time and authenticates the MAC address each time you connect to the Internet, your TV may not be able to connect to the Internet as the MAC address differs from that of the device (PC).

In this case, ask your Internet service provider about the procedures to connect devices other than your PC (such as your TV) to the Internet. If your Internet service provider requires an ID or password to connect to the Internet (network), your TV may not be able to connect to the Internet. In this case, you have to enter your ID or password when connecting to the Internet using an Internet Sharer (Router).

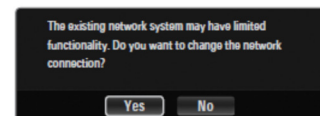
The internet connection may fail due to a firewall problem. In this case, contact your Internet service provider. If you cannot connect to the Internet even if you have followed the procedures of your Internet service provider, please contact Samsung Electronics at 1-800-SAMSUNG.

Disclosure of Wi-Fi standards and the use of an access point or router

- **Ad-hoc:** You can connect to a mobile device without an access point through the 'Samsung Wireless LAN Adapter' by using a peer to peer network.

How to connect to new Ad-hoc

1. Choose **Select a network**, then a device list is displayed.
2. While in the device list, press the Blue button on the remote or select **Ad-hoc**.
 - ☒ The message **The existing network system may have limited functionality. Do you want to change the network connection?** is displayed.
3. Input the generated **Network Name(SSID)** and **Security Key** into the device you want to connect.



How to connect an existing Ad-hoc device

1. Choose **Select a network**, the device list is displayed.
2. Select the device you want in the Device list.
3. If security key was applied, input the security key again.
 - ☒ If network doesn't operate normally, please check the **Network Name(SSID)** and **Security Key** again. If the **Security Key** is incorrect, it may be the reason for the malfunction.

Disclosure of Wi-Fi ad-hoc mode support (no router)

Home Network Center

About the Home Network Center

The **Home Network Center** connects the TV and mobile phones through a network. You can view call arrivals, text message contents, and schedules set on the mobile phone on the TV using the **Home Network Center**. In addition, you can play the media contents saved on the mobile phones such as videos, photos and music by controlling them onto the TV via the network.

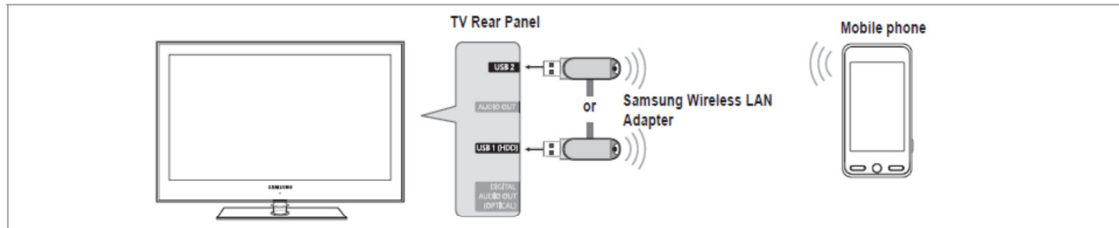
- ☑ If the device supports DLNA DMC (Digital Media Controller) function, Home Network Center function is available.
- ☑ For more information, visit www.samsung.com or contact the Samsung call center. The mobile device may need additional software installation. For details, refer to the phone's user's guide.

Connecting to the Home Network Center

For more information about the network settings, refer to 'Setting the Network'. (see pages 34~36)

- **Connecting through a Wi-Fi Ad-hoc Network**

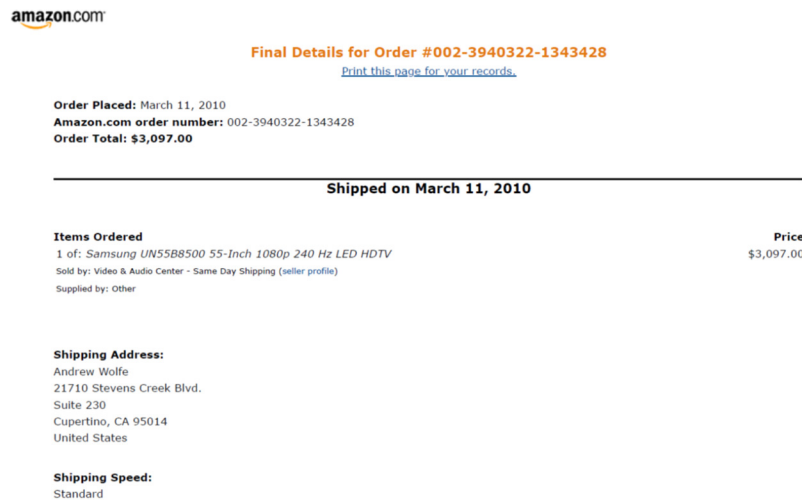
1. Connect the 'Samsung Wireless LAN Adapter' to the **USB 1 (HDD)** or **USB 2** port of the TV.



2. For more information on how to configure Ad-hoc network, refer to 'Setting the Network'. (see page 36)
 - ☑ For information on configuring the mobile phone's network settings, refer to the mobile phone manual.
 3. Set up the IP address, SSID and password for the mobile phone in the Ad-hoc Settings of the mobile phone using the **Network Name (SSID)** and **Security Key** (password) displayed on the TV.
- **Connecting through a wired/wireless IP sharer**
1. Connect the LAN port of the TV and the Wired/Wireless IP sharer using the LAN cable or connect the **USB 1 (HDD)** or **USB 2** port of the TV and the 'Samsung Wireless LAN Adapter'.
 - ☑ For the procedures to set up the wired/wireless sharer and the mobile phone, refer to the manual of the corresponding device.

Disclosure of Wi-Fi router-based and ad-hoc mode support with a mobile phone

Declaration of Andrew Wolfe, Ph.D.
U.S. Patent No. 10,375,341



36. As such, it is clear that the display units and multiple bidirectional wireless communication protocols and devices, as well as the general functions and interoperability of these components, were well established in the industry at the time of the '341 priority date.

37. Furthermore, systems with similar structure and capabilities were known in the patent art. U.S. Patent Publication No. 20050036509 A1 to Acharya, et al. ("Acharya") discloses essentially the same system and methods as claimed in claims 1–4 of the '341 patent.

6. THE '341 PATENT

38. The '341 Patent is a continuation of a national phase application claiming priority back to Japanese Patent Application No. 2012-267765, filed

December 7, 2012. For the purposes of this declaration, I have been asked to assume that the priority date of the '341 Patent is December 7, 2012.

39. The '341 Patent purports to provide a “user-friendly video display apparatus and terminal apparatus.” Col. 2, ll. 32-33, EX1001. More specifically, the '341 Patent purports to provide a better viewing experience when multiple users are sharing a display apparatus for different content. Col. 2, ll. 19-23, EX1001.

40. The '341 Patent has four claims, each of which is an independent claim. Claims 1 and 3 are apparatus claims and Claims 2 and 4 are method claims. All four claims have essentially the same limitations.

41. Each claim includes two pairs of wireless control device and bi-directional wireless communication capabilities: a first wireless control device is paired with a first bi-directional wireless communication system *without a router* and a second wireless control device is paired with a second bi-directional wireless communication system *via a router*. Claims 1-4, EX1001. For example, see elements [1B] of claim 1 and [3B] of claim 3.

42. The claims also include the feature that, if a command for changing a video content is received, the display apparatus will terminate the previous content

that was playing and start playing a newly requested content. The display apparatus will then send a signal informing the wireless control device that originally requested the previous content about the termination through the specifically paired bi-directional wireless communication route. Claims 1-4, EX1001.

43. For example, if the terminated content was originally requested by the first wireless control device (paired with the first bi-directional wireless communication without communicating through a router), then the termination signal is sent back to the first wireless control device without communicating through a router. Similarly, if the terminated content was originally requested by the second wireless control device (paired with the second bi-directional wireless communication through a router), then the termination signal is sent back to the second wireless control device through a router. Claims 1-4, EX1001. Specifically, see elements [E] and [F] of claims 1-4. The differences of elements [E] and [F] among the claims are shown in the table below in bold text for clarity.¹

¹ The labelling of claim elements was suggested by the Petitioner and is sufficient for illustrating my opinions.

	Claim 1	Claim 2	Claim 3	Claim 4
Pre	A video display apparatus comprising:	A method for changing a content on a video display apparatus comprising	A video display apparatus comprising:	A method for changing a content on a video display apparatus comprising:
A	a display unit that displays a video content from a broadcast station or from a video content delivery source;	displaying step to display a video content from a broadcast station or from a video content delivery source, on a display unit of the video display apparatus;	a display unit that displays a video content from a broadcast station or from a video content delivery source;	displaying step to display a video content from a broadcast station or from a video content delivery source, on a display unit of the video display apparatus;
B	a communication unit that executes two types of bi-directional wireless communication including first bi-directional wireless communication with a first wireless control device without going via a router and second bi-directional wireless communication via a router with a second wireless	first communication step to execute bi-directional wireless communication with a first wireless control device without going via a router; second communication step to execute bi-directional wireless communication via a router with a second wireless control device that is	a communication unit that executes two types of bi-directional wireless communication including first bi-directional wireless communication with a first wireless control device without going via a router and second bi-directional wireless communication via a router with a second wireless	first communication step to execute bi-directional wireless communication with a first wireless control device without going via a router; second communication step to execute bi-directional wireless communication via a router with a second wireless control device that is

	control device that is different from the first wireless control device;	different from the first wireless control device; and	control device that is different from the first wireless control device;	different from the first wireless control device; and
C	an infrared receiver unit that receives infrared rays from a third wireless control device; and	infrared ray receiving step to receive infrared rays from a third wireless control device;	an infrared receiver unit that receives infrared rays from a third wireless control device; and	infrared ray receiving step to receive infrared rays from a third wireless control device;
D	a controller that controls the display unit, the communication unit and the infrared receiver unit,		a controller that controls the display unit, the communication unit and the infrared receiver unit,	
E	wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to a second video content is transmitted from the second wireless control device to the communication unit via the router during the	wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to a second video content is transmitted from the second wireless control device to the video display apparatus via the router during	wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to another video content is transmitted from the second wireless control device to the communication unit via the router during the first video	wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to another video content is transmitted from the second wireless control device to the video display apparatus via the router during the first video

	first video content is displayed on the display unit, the display unit terminates displaying the first video content and starts to display the second video content and the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and	the first video content is displayed on the display unit, the video display apparatus terminates displaying the first video content and starts to display the second video content and the video display apparatus sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and	content is displayed on the display unit, the display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another video content and the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and	content is displayed on the display unit, the video display apparatus terminates displaying the first video content for changing a content to be displayed from the first video content to another video content and the video display apparatus sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and
F	wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to	wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control	wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to	wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control

	another video content is transmitted from the third wireless control device to the infrared receiver unit by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content and the communication unit sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.	device to another video content is transmitted from the third wireless control device to the video display apparatus by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content and the video display apparatus sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.	another video content is transmitted from the third wireless control device to the infrared receiver unit by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to another video content and the communication unit sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.	device to another video content is transmitted from the third wireless control device to the video display apparatus by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to another video content and the video display apparatus sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.
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44. Claims 1 and 3 are apparatus claims directed to a “video display apparatus.” Claims 2 and 4 track claims 1 and 3 as methods for “changing a content on a video display apparatus.”

45. The preamble and limitations [A], [B], [C], and [D] of claims 1 and 3 are essentially the same, as shown in the table above. The difference between [3E] and [1E] is that [3E] recites “...the display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another ~~and starts to display the second video content~~ and...,”. Further, the difference between [3F] and [1F] is that element [3F] recites “...the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to ~~and starts to display~~ another video content and...,” See Table 1 above. The differences between claims 1 and 3 are not meaningful in terms of claim scope.

46. The preamble and limitations [A], [B], and [C] of claims 2 and 4 are also essentially the same. The difference between [2E] and [4E] is that [4E] recites “...the video display apparatus terminates displaying the first video content for changing a content to be displayed from the first video content to another ~~and starts to display the second video content~~ and ...,”. Further, the difference between [4F] and [2F] is that element [4F] recites “...the display unit terminates displaying

the second video content for changing a content to be displayed from the second video content to and starts to display another video content and ...,”. See Table 1 above. The differences between claims 2 and 4 are not meaningful in terms of claim scope.

6.1. Prosecution History of the '341 Patent

47. I have reviewed the prosecution history of the '341 patent, which I summarize below:

48. U.S. Patent No. 10,375,341 issued from U.S. Patent Application No. 15/889,735. Applicant filed U.S. application 15/889,735 on February 6, 2018, from which the '341 Patent issued on August 6, 2019. EX1002. The US application 15/889,735 is a continuation of U.S. patent application 14/649,895, filed June 4, 2015, which is a National Phase of PCT/JP2013/079953, filed November 6, 2013, which claims priority to Japanese Patent Application No. 2012-267765, filed December 7, 2012. I have been asked to assume that the priority date of the '341 patent is December 7, 2012.

49. In the only substantive Office Action, dated January 25, 2019, the Examiner issued a non-statutory double patenting rejection based on U.S. Patent No. 9,924,124 (granted from U.S. Patent Application No. 14/649,895, the parent

application of the '341 Patent). EX1002. In response, Applicant filed a terminal disclaimer to overcome the rejection. EX1002. The '341 patent then issued on August 6, 2019. EX1001

7. Level of Ordinary Skill in the Art

50. As I noted above, I have been informed that a patent and the prior art should be analyzed from the perspective of a POSITA. In my opinion, a POSITA as of the priority date of the '341 patent claims priority to (i.e., December 7, 2012) would have had a Electrical Engineering or Computer Engineering or a similar field as well as some understanding of wireless communications, together with two years of practical experience in the research, design, or development of television or video display systems or the equivalent, with additional education possibly substituting for practical experience and vice versa.

51. As of December 7, 2012, I met and/or exceeded these requirements for a POSITA for at least the reasons described in the qualifications section above. Additionally, I worked with and managed many POSITAs and can evaluate documents from their perspective.

8. Claim Construction

52. I have reviewed the claims, specification, and file history of the '341 patent.

53. I have been asked to opine if any claim terms must be construed for the Board to understand how the challenged claims read on the prior art. I do not believe the Board needs to necessarily construe any particular claim terms for the purposes of this proceeding.

54. As explained in this declaration, the challenged claims would have been obvious under their ordinary and customary meanings as understood by a POSITA.

55. It is my understanding that in the parallel district court proceeding, *Maxell v. TCL et al.*, Case No. 5:23-CV-00108-RWS-JBB, Patent Owner has asserted that Communication Unit is a nonce term requiring construction under 112(f). It is also my understanding that Patent Owner has further asserted that the disclosure at column 6, lines 40-51 of the '341 patent provides the requisite structure. In particular, patent owner has asserted that the “communication unit” must be construed to include the structure of a “LAN Communication Unit” that is “connected to the wireless router 6 by wire or by wireless, and can receive a video

content or the like from the Internet network or the like” and “receive[s] various types of commands from the terminal apparatus 1 via the wireless router 6 or the like by using, for example, Wi-Fi” and “may directly transit and receive the command and the status information to and from the terminal apparatus 1 without the wireless router 6 or the like by using, for example, infrared rays, Wi-Fi Direct, or Bluetooth.” EX1001, 6:40-51. It is also my understanding that Petitioner TCL disagrees that communication unit requires means-plus-function construction. Out of an abundance of caution, I have also evaluated and opined on the prior art under this construction.

9. Description of the Asserted Prior Art

A. Acharya (EX1004)

56. Acharya was filed on June 2, 2004, and published on February 17, 2005. It is my understanding that Acharya qualifies as a prior art over '341 Patent under Pre-AIA 35 U.S.C. § 102(a), (b), and (e). It is also my understanding that Acharya was not considered by the Examiner during prosecution of the '341 Patent. EX1002.

57. Acharya is directed to a video display apparatus that can be shared by multiple users. EX1004, ¶¶3, 7-9, 13, 16, Figs 1-2. Each user may control the

video display apparatus through different wireless controllers, e.g., laptop computers, handheld computing devices, personal digital assistants, and cellular telephones. EX1004, ¶¶ 3, 7-9, 13, 16, Figs 1-2, Claim 1. The wireless communication protocols between the display apparatus and wireless controllers can be, e.g., WiFi (IEEE 802.11a, 802.11b, 802.11g, 802.11n), Bluetooth (802.15), infra-red, and others. EX1004, ¶51. Note that at least the recited wireless communication protocols IEEE 802.11a, 802.11b, 802.11g, and 802.11n can go through a router (an access point). EX1004, ¶¶51, 71. Moreover, before December 7, 2012, a POSITA would have been aware that the aforementioned communication protocols could be used for ad-hoc, peer-to-peer, Wi-Fi Direct protocols, without going through a router. *See also* Ex1004 ¶¶ 71-72, 74, Figures 7-8, and Claim 48. The disclosed Bluetooth® and infra-red are additional examples of ad-hoc, peer-to-peer communications that do not go through a router. EX1004, ¶¶51, 71.²

² The '341 patent explicitly discloses that Bluetooth®, infrared, and Wi-Fi Direct are examples of communication protocols that do not require communicating through a router. The '341 patent discloses in col. 5, ll. 57-62: “[a]lternatively, the LAN communication unit 26 may directly transmit and receive the command and

58. FIG. 1 of Acharya discloses an exemplary environment 100 in which a display system is shared by several users, which is reproduced below. ¶ 36, EX1004.

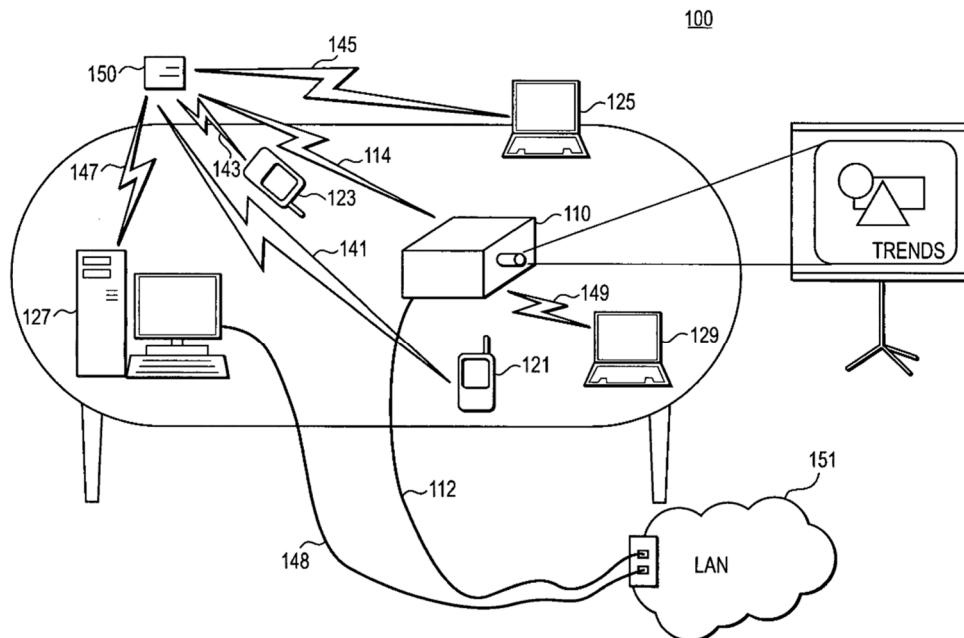


FIG. 1

59. Acharya discloses the following: “[a] projector 110 may be shared by several users for projecting video onto a projection screen. The various users may

the status information to and from the video display apparatus 3 without the wireless router 6 and the like by using, for example, infrared rays, Wi-Fi Direct, or Bluetooth (registered trademark).” A POSITA would have also been aware of these protocols and the ability for direct communications.

control the projector 110 through a variety of computing devices, such as laptop computers 125 and 129, a desktop computer 127, or PDAs 121 and 123. Other computing devices may also be used, including portable and non-portable computing devices. Portable devices include devices such as PDA's, cellular telephones and other mobile telephones, and integrated devices such as palm-held computing devices with or without wireless telephone or network connectivity. The computing devices may connect to the projector 110 through a variety of links. In this illustration, the projector 110 is connected into a computer network through a wireless access point 150 through a wireless link 114.” EX1004 ¶36. A POSITA would understand that access point 150 can be a wireless router as many Wi-Fi access points at the time were built into a router including almost all for home and/or small office use. The computing devices 121, 123, 125, and 127 connect to projector 110 through the wireless access point 150, e.g., a router. EX1004, ¶36. Hence, the computing device 129 connects to the projector 110 through an ad-hoc, peer-to-peer network link 149 without going through the access point 150, e.g., a router. EX1004, ¶¶36, 71.

60. FIG. 13, reproduced below, shows an example of a display-sharing interface 1300 that may be displayed on a user's computing device once the user

establishes communication with a shared display device, such as the projector 110 in FIG. 1, and gains control over that display device. EX1004, ¶84.

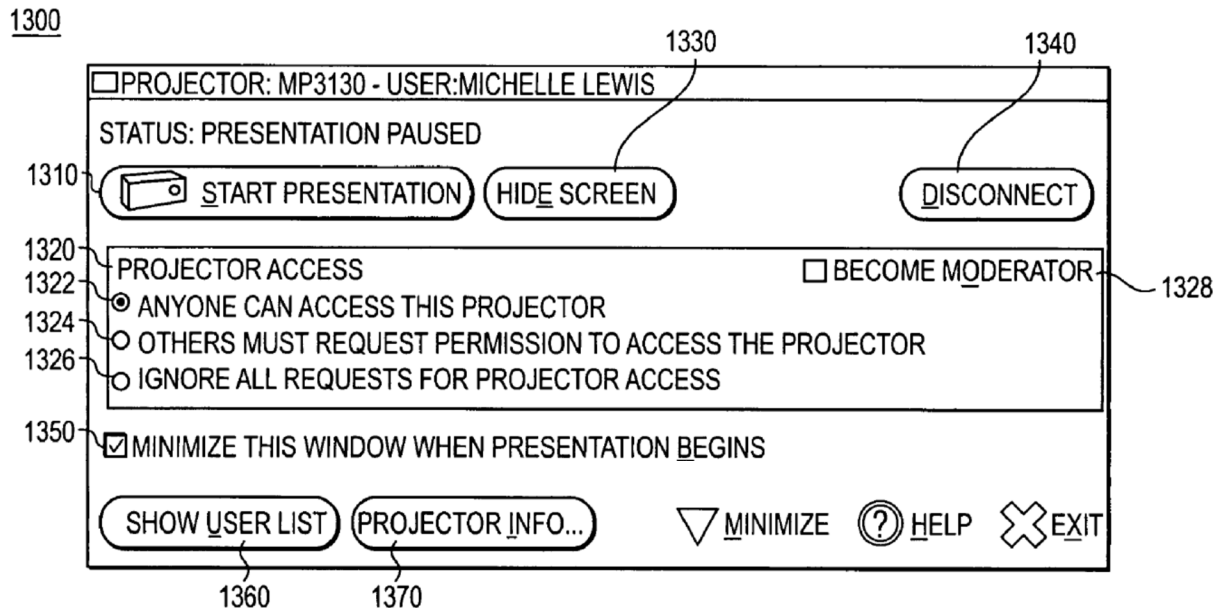


FIG. 13

61. Acharya discloses: “[t]he Sharing Mode section 1320 depicted in FIG. 13 includes options for selecting a mode for sharing access to the display device. As depicted in this example, this section includes radio buttons to select one of three access modes 1322, 1324, 1326. A first access mode 1322 is designated to allow any user to gain control of the projector. This first access mode 1322 may implement the access-sharing protocol described above for the self-service multiple-user access mode.” EX1004 ¶86.

62. Acharya discloses that under self-service multiple-user access mode 1322, a series of dialog windows that shows up on the wireless control devices when one user (e.g., Bob) takes control of the projector 110 from another user (e.g., Jane). EX1004, ¶¶90. FIG. 15 shows the sharing mode section 1320 in FIG. 13. “Anyone can access this projector” 1322 setting is selected. This means any user connected to projector 110 can take control over another user who is already in use. EX1004, ¶¶90. *See also* Figures 16-18.

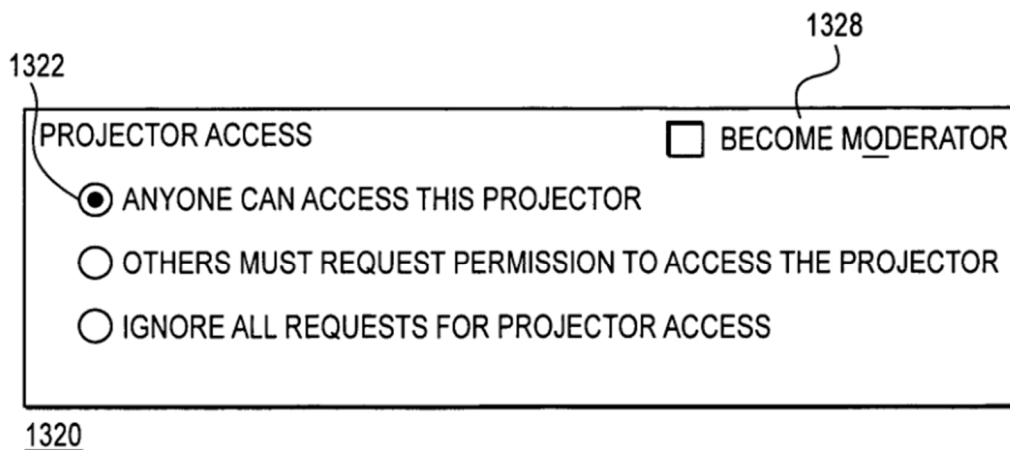


FIG. 15

63. When Bob requests control of the projector, Bob's computing device displays a dialog box 1600 from FIG. 16, informing Bob that “projector ABC is in use by Jane,” and that Jane will be disconnected if Bob elects to connect nonetheless. EX1004, ¶¶90. FIG. 16 is reproduced below.

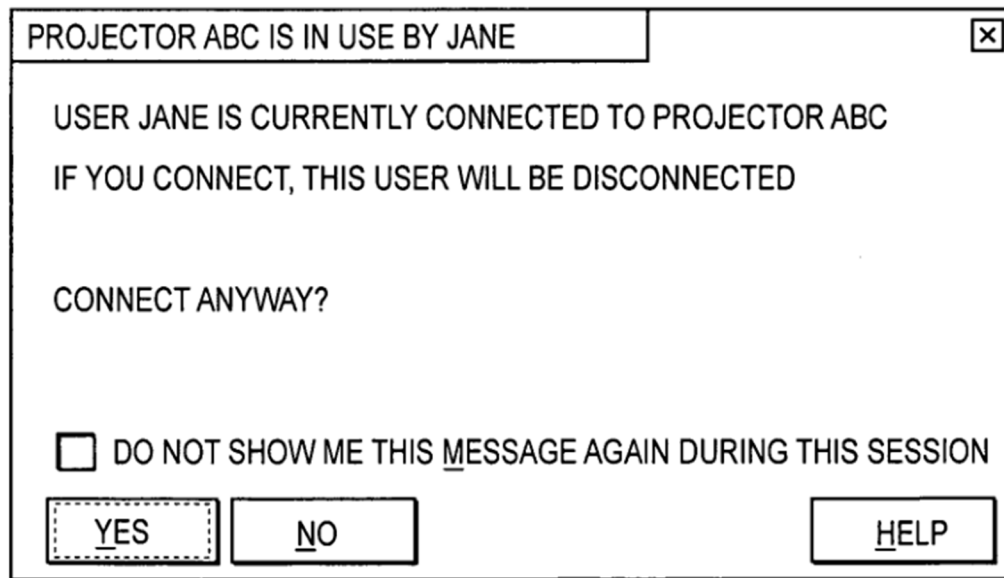
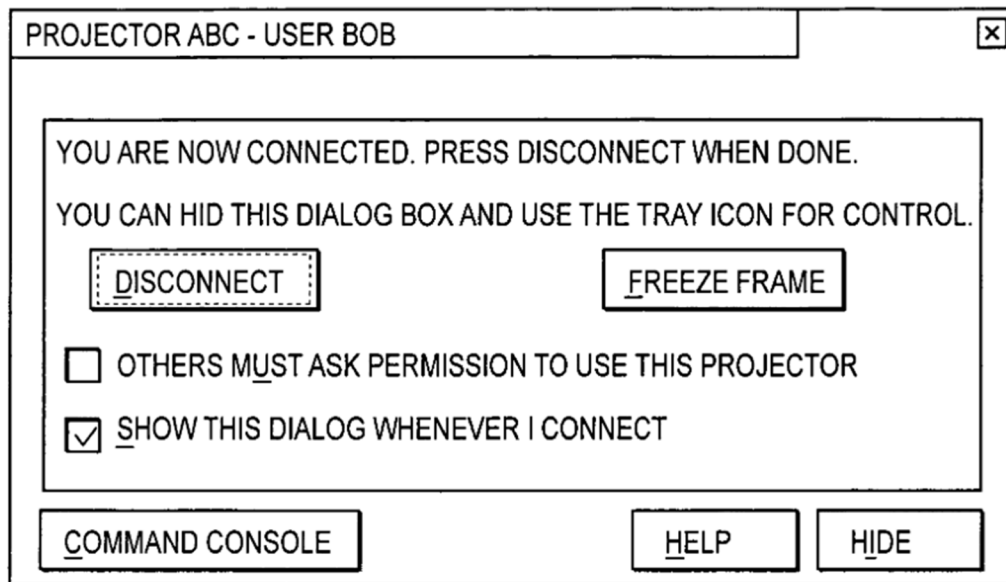


FIG. 16

1600

64. If Bob indicates that he wishes to connect nonetheless, his computing device then displays a message such as a dialog box 1700 in FIG. 17, informing him that he now has control over Projector ABC. EX1004, ¶90. FIG. 17 is reproduced below.



1700

FIG. 17

65. At the same time, Jane's computing device displays a message such as a dialog box 1800 in FIG. 18, informing her that she has lost control over Projector ABC to Bob. EX1004, ¶90. A corrected FIG. 18 is reproduced below.³

³ The original FIG. 18 of Acharya includes a typo (underlined): “CONTROL HAS BEEN TRANSFERRED TO JIM.” In view of the disclosure of Acharya ¶90, the name “JIM” is clearly a typo and should be “BOB.”

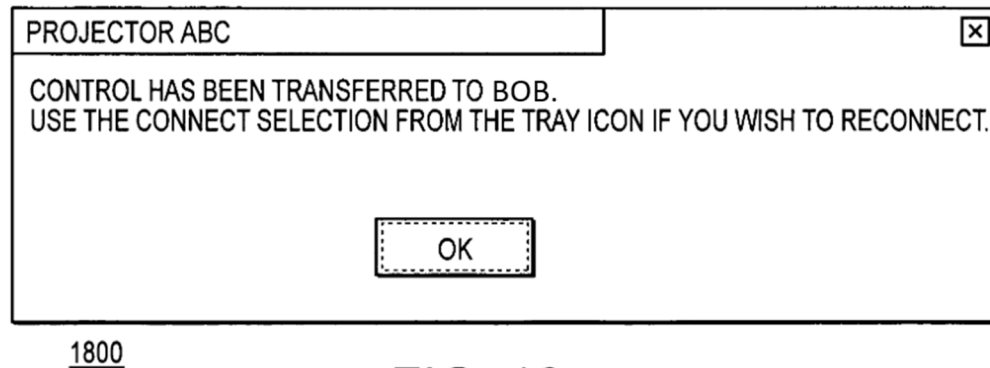


FIG. 18

66. FIG. 18 shows that the video display apparatus of Acharya returns a message informing the wireless device (Jane's device) that the display the content it requested is terminated.

67. Acharya discloses: "in a self-serve mode, users send video data to the shareable display system, and the shareable display system updates the display with the most recently received video data received." A POSITA would understand this to mean the display apparatus will terminate the previous video content (e.g., Jane's video content) and play the newly received video content (e.g., Bob's video content). EX 1004 ¶13.

10. Obviousness Analysis

68. Claims 1-4 of the '341 patent would have been obvious to a POSITA in view of Acharya. Acharya discloses and/or renders obvious each and every

element of the Challenged Claims under Pre-AIA 35 U.S.C. § 103. All of the cited disclosures herein apply to Acharya's "self-serve mode," which is one of various sharing modes of the shareable display system disclosed by Acharya. In "self-serve mode," user #2 can take control of the shareable display system from user #1 and send video data to the shareable display system. EX1004, ¶¶13, 56, 90, FIGs. 4, 15-18. The shareable display system updates the display with the most recently received video data received from user #2, e.g., by terminating the video previously requested by user #1 and starting to play the new video requested by user #2. *Id.*

10.1. Claim 1

10.1.1. Preamble: "A video display apparatus comprising:"

69. I do not see any reason why the preamble in this claim would be a limitation, however to the extent that it is, Acharya discloses a video display apparatus. Acharya discloses a "multiple-user display system," that can be shared and controlled by multiple users. EX1004, ¶¶5, 7-9. In particular, Acharya teaches a "multi-user display system," that can be e.g., a liquid crystal display (LCD) projector, computer monitor, or other video display that may be shared by a group of users. EX1004, ¶¶5, 7 (stating in ¶7 "[t]hese techniques and systems may be used in a display system that may be shared by a group of users, each of whom

wishes to present video data on a shared digital projector, computer monitor, or other video display”). Acharya further discloses in ¶7 that “video data” may include still images, text, graphics, moving pictures, and presentations. Acharya also teaches that each user may control the video display apparatus through different wireless controllers, e.g., laptop computers, handheld computing devices, personal digital assistants, and cellular telephones. EX1004, ¶¶7-9. Acharya further discloses in ¶40 that “The display system may include a network interface that enables the display system to read video data from an archive, or a server, or an internet address, or a data file accessible through the network connection.” The POSITA would have understood that each of these various devices disclosed in Acharya ¶ 7 would be a multi-user video display apparatus as claimed. Where Acharya references a projector in his embodiments, a POSITA would understand the teaching to apply to each of these disclosed video display devices, e.g., a computer monitor, laptop computers, etc. Accordingly, in the below discussion, references to a “multi-user display system,” “display system,” a “shared display system,” or a “projector,” all relate to Acharya’s multi-user display system.

70. As shown in FIG. 1, reproduced below, ¶36 discloses “[a] projector 110 may be shared by several users for projecting video onto a projection screen.” A POSITA would have realized Acharya’s refers interchangeably to a “multi-user

display system,” “video display system,” “shared display system,” or the like. A “projector” such as shown in FIG. 1 is simply an embodiment thereof, by no means to be limiting. A POSITA would understand the “multi-user display system,” “video display system,” “shared display system,” or the like of Acharya include any device mentioned in ¶¶5, 7 such as computer monitor, laptop computer, or any device proper for displaying the video.

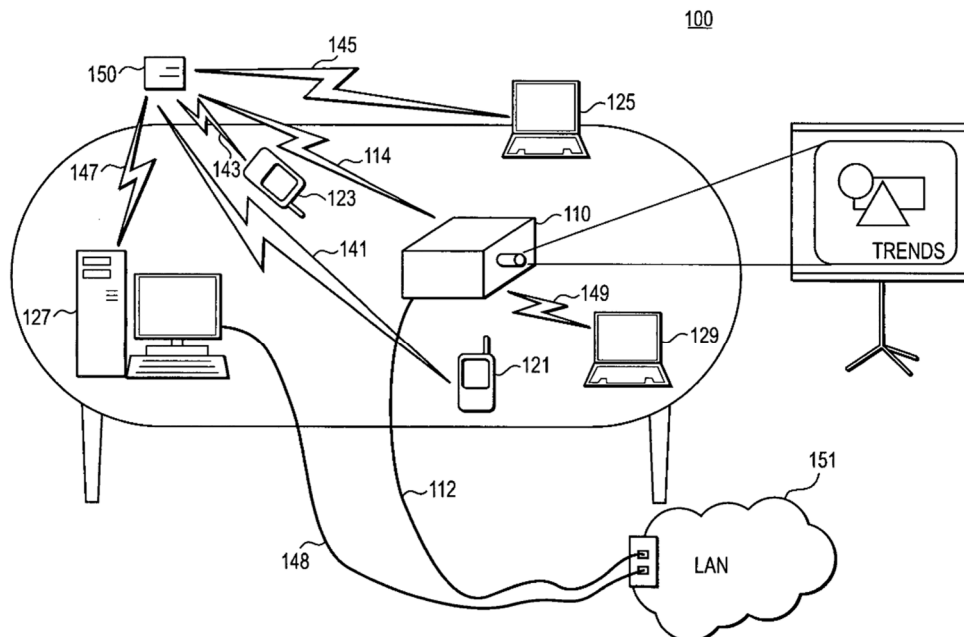


FIG. 1

71. Acharya thus disclosed or rendered obvious the preamble of claim 1.

10.1.2. Element [1A]: “a display unit that displays a video content from a broadcast station or from a video content delivery source;”

72. Acharya teaches “a display unit” as required by limitation 1[A].

73. Acharya discloses a liquid crystal display (LCD) projector, computer monitor, or other video display as the video display apparatus. Ex 1004, ¶¶5,7 Acharya also discloses that a shareable display system can be an LCD monitor or a CRT monitor that may use wired or wireless data connections. Ex 1004, ¶10 This discloses “a display unit” of [1A].

74. Acharya discloses in FIG. 2 a block diagram illustrating an example of a shareable video display apparatus, e.g., the LCD monitor or projector. FIG. 2 is reproduced below. EX1004, ¶16.

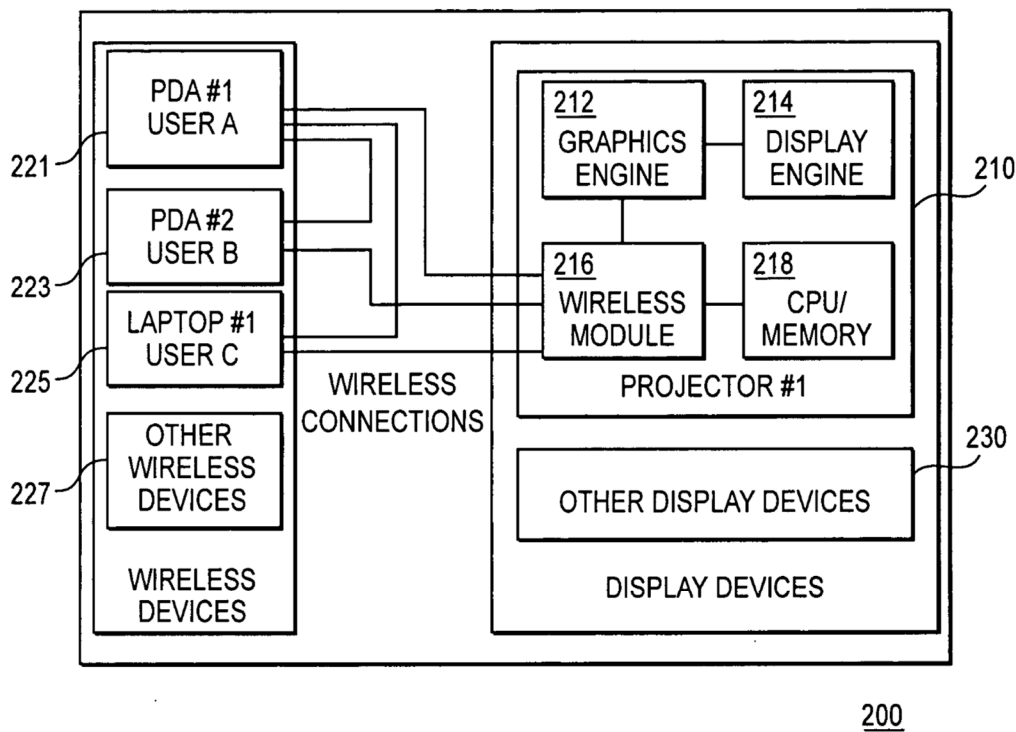


FIG. 2

75. Acharya in ¶51 discloses “[t]he projector 210 as shown here has a wireless module 216 to send and receive data or command signals by a wireless protocol, a CPU and memory 218 having a processor and associated memory for processing commands and reformatting data, a graphics engine 212 for setup timing, color information, image and scaling as required by the associated display, and a display engine 214 that provides interface circuitry to a display projector.”

76. The LCD monitor/LCD projector individually or, in alternative, in combination with the display engine 214 disclosed by Acharya discloses “a display unit” of limitation [1A].

77. With respect to the limitation “displays a video content from a broadcast station *or* [emphasis added] from a video content delivery source” of [1A], the ‘341 patent disclosed in col. 4, ll.60-67 that a “broadcast station” is an example of “video content delivery source” and that Internet video content accessed via a URL is another example of “video content delivery source.” EX1001, col. 4, ll.60-67.

78. Acharya discloses in ¶40 that the display system, e.g., LCD projector/LCD monitor, may include a network interface that enables the display system to read video data from an archive, or a server, or an internet address, or a data file accessible through the network connection. Further, referring to circuit 3000 in FIG. 30, an embodiment of wireless module 216, Acharya disclosed in ¶125 that “a user may be able to issue a command to the display system to display an audiovisual presentation stored in a file or on a server or at a URL accessible through an internet connection or other network connection.” EX1004, ¶¶122, 125. Acharya’s disclosure of video content accessible through internet at a URL discloses the claimed “video content delivery source” of [1A]. Furthermore, a

POSITA would understand at the time that it would be obvious for a video display, like a TV, monitor, or a projector, to be able to display broadcast TV content as well, either over the air or via cable or satellite transmission, or via a streaming service.⁴ To the extent Acharya does not implicitly disclose or render obvious the “broadcast station,” Acharya at least disclosed the “video content delivery source” (e.g., internet accessible video content at a URL). Since “broadcast station” and “video content delivery source” are connected in alternative by “or” in [1A], Acharya sufficiently discloses and/or renders obvious element [1A].

10.1.3. Element [1B]: “a communication unit that executes two types of bi-directional wireless communication including first bi-directional wireless communication with a first wireless control device without going via a router and second bi-directional wireless communication via a router with a second wireless control device that is different from the first wireless control device;”

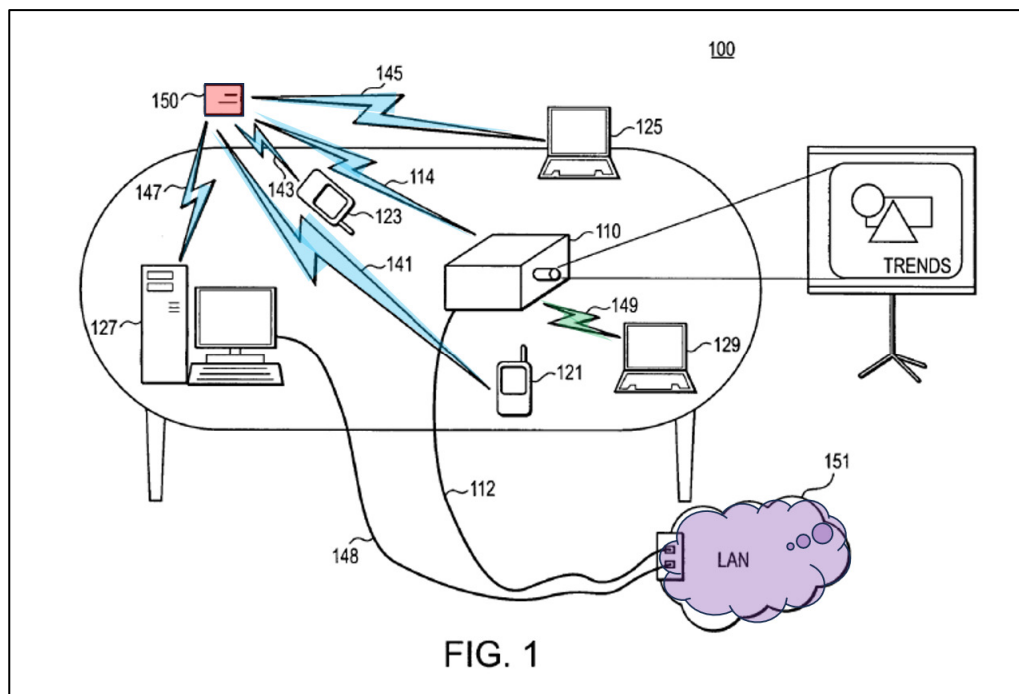
79. Acharya’s projector 110 includes a wireless module (e.g., communication unit) that executes two types of bi-directional wireless

⁴ The commercial broadcast TV streaming service AEREO was launched in New York City in March 2012 (EX1008).

<https://archive.nytimes.com/mediadecoder.blogs.nytimes.com/2012/02/14/new-service-will-stream-local-tv-stations-in-new-york/?smid=tw-nytimetv&seid=auto>

communications with different devices, where one communication goes via a router and the other does not go via a router. EX1004, ¶¶36, 51. Acharya teaches that the “projector 110 may be shared by several users for projecting video onto a projection screen,” where “[t]he various users may control the projector 110 through a variety of computing devices, such as laptop computers 125 and 129, a desktop computer 127, or PDAs 121 and 123.

80. As shown in FIG. 1, reproduced and annotated below, Acharya’s projector includes a communication unit that communicates bidirectionally with different devices via different wireless links.



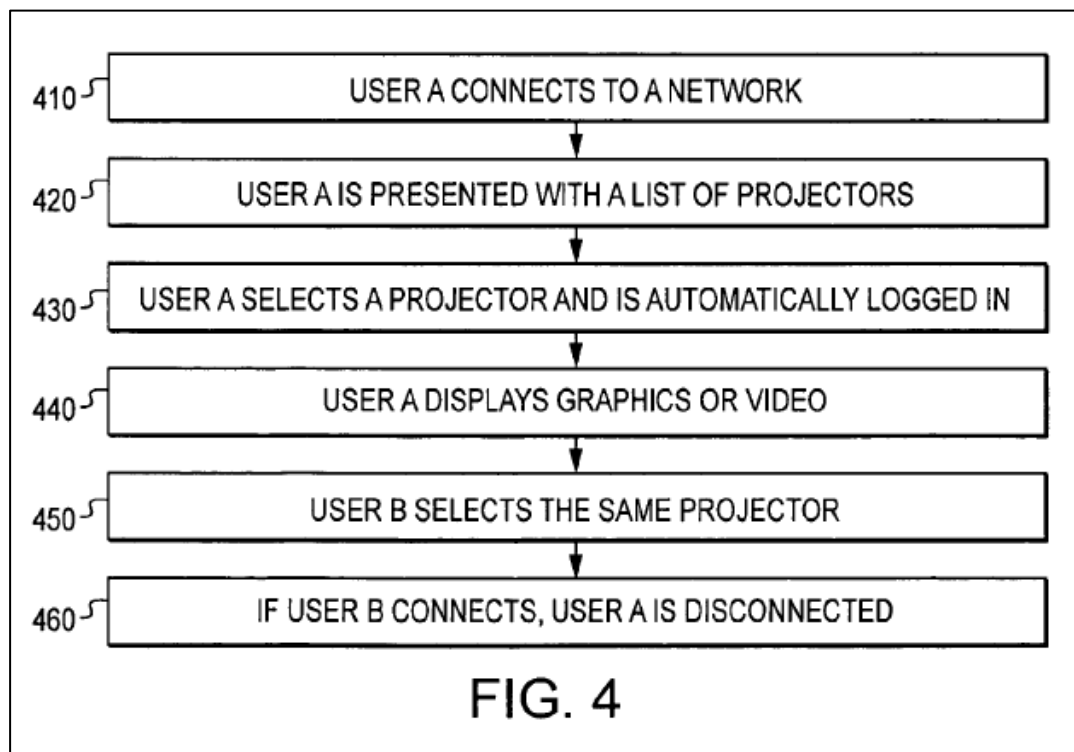
81. As shown in FIG. 1, Acharya's projector 110 communicates with different computing devices 121, 123, 125, and 127 through **wireless access point 150** (in red) (e.g., a router) via **wireless links 141, 143, 145, and 147** (in blue) . EX1004, ¶36. The computing devices 121, 123, 125, 127 of Acharya disclose "a second wireless control device that is different from the first wireless control device" of [1B].

82. Further, as shown in FIG. 1, Acharya communicates with computing device 129 "through an **ad-hoc network link 149** (in green)," which a POSITA would understand, as illustrated in FIG. 1, to be a direct link that does not go through a router. EX1004, ¶36. The computing device 129 discloses "a first wireless control device without going via a router" of [1B].

83. Acharya teaches that different users may connect to the display device through different communication links, for example where one link is through a router (e.g., through an infrastructure network) and where the other is not through a router (e.g., a direct or ad-hoc link). EX1004, ¶¶56-57; see also Fig. 8.

84. With respect to the limitation "second bi-directional wireless communication via a router" of [1B], Acharya teaches in ¶56 and FIG. 4, reproduced below, that User A connects to a projector through a network, e.g., via

a router. EX1004, ¶56, FIG. 4 (stating “User A, *connects with a network* [emphasis added] in act 410 through a computing device such as a laptop computer.” Next, at act 420, Acharya teaches that “User A’s computing device presents User A with a list of projectors available on the network” and that “User A then selects a projector, contemplates any sign-in or authentication procedures required by the projector in act 430, and is automatically granted control as the initial user.”).

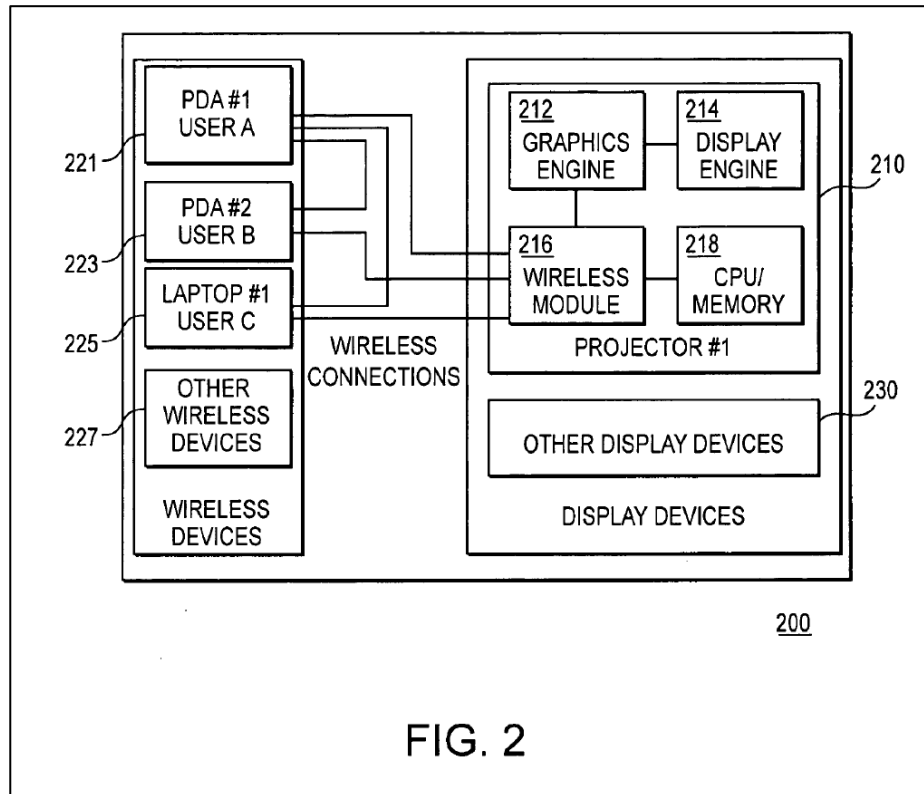


85. With respect to the “first bi-directional wireless communication with a first wireless control device without going via a router” of [1B], in the continuing example in ¶57 and FIG. 4, Acharya teaches that User B may take control of the

projector from User A, through **a direct or ad-hoc link** [emphasis added].

EX1004, ¶57. A POSITA would understand the direct or ad-hoc link of Acharya is a communication without going via a router. See paragraph 57 above. These are well-known terms in Wi-Fi and/or other radio protocols. In addition, Acharya specifically discloses that an exemplary network would be named for the projector and created through the projector UI and not have a general network name. *See e.g.* Ex1004 ¶72, ¶74, Figure 8.

86. Further with respect to wireless communications of [1B] “via a router” or “without going via a router”, Acharya provides WiFi, Bluetooth, and infra-red as examples, but contemplates “others” as well. EX1004, ¶51. As shown in FIG. 2 and ¶51, Acharya specifically teaches that the wireless links can be through various protocols such as “IEEE 802.11b, ... 802.11a, 802.11g, 802.11n, 802.15.3a, Bluetooth, and infra-red, among others.” EX1004 ¶51.



87. A POSITA would recognize that Bluetooth® and infra-red are two specific examples of ad-hoc, peer-to-peer direct communication between wireless devices and display apparatus, correlating to “first bi-directional wireless communication...without going via a router” of [1B]. Bluetooth, part of the IEEE 802.15 standard, is well known to support peer-peer communications such as a wireless remote control or the connection between a headset and a mobile phone. Wi-Fi also has an ad-hoc mode (often called Wi-Fi Direct) which would be known by a POSITA and is indicated in Ex1004 Figure 8 (see “AD-HOC” radio button.

PROJECTOR SELECTOR

ENTER THE INFORMATION FROM THE QUICK CHOICE>WIRELESS PRESENTER MENU ON THE PROJECTOR

☒ WIRELESS NETWORK ☐ WIRED NETWORK [LAN]

PROJECTOR NAME: MP3130

PROJECTOR PASSWORD: fremont

NETWORK ID [SSID]: HPPROJECTOR

WIRELESS NETWORK TYPE: ☐ INFRASTRUCTURE ☒ AD-HOC

IP ADDRESS: 172.16.0.1

CONNECT HELP CANCEL

800

FIG. 8

A POSITA would also understand that the Wi-Fi standards e.g., IEEE 802.11b, ... 802.11a, 802.11g, 802.11n, disclosed by Acharya disclose the “second bi-directional wireless communication via a router” of [1B]. See also paragraph 57 above.

88. Further, A POSITA reading Acharya would understand that Acharya’s wireless access point 150 suggests a router as I noted above. For example, a POSITA would understand that a router is a typical example implementation of the wireless access point 150 disclosed in ¶36, including as illustrated in FIG. 1, especially as Acharya’s projector connects to “a computer network” (e.g., internet) through the wireless access point 150. EX1004, ¶¶36, 41,

FIG. 1 (illustrating the projector 110 being connected into a computer network through a wireless access point 150 and connecting to computing devices 121, 123, 125, and 127). A wireless router can assign and/or connect to local internet addresses in addition to providing wireless connections. They were among the most common types of access point at the time. Furthermore, there were only a finite number (i.e. 2) practical choices for a wireless access point at the time using the disclosed protocols, one of which was a wireless router, rendering that choice obvious to try. A POSITA would have determined that the use of a router as the disclosed access point would have been routing according to known methods to yield predictable results with a reasonable expectation of success. Furthermore, because Acharya teaches that devices like PDAs can communicate with the projector via IEEE 802.11 and Acharya illustrates PDAs 121 and 123 to communicate via access point 150, a POSITA would understand Acharya's access point 150 to suggest the "router" of [1B].

89. Thus, Acharya discloses limitation [1B], or, at least renders it obvious.

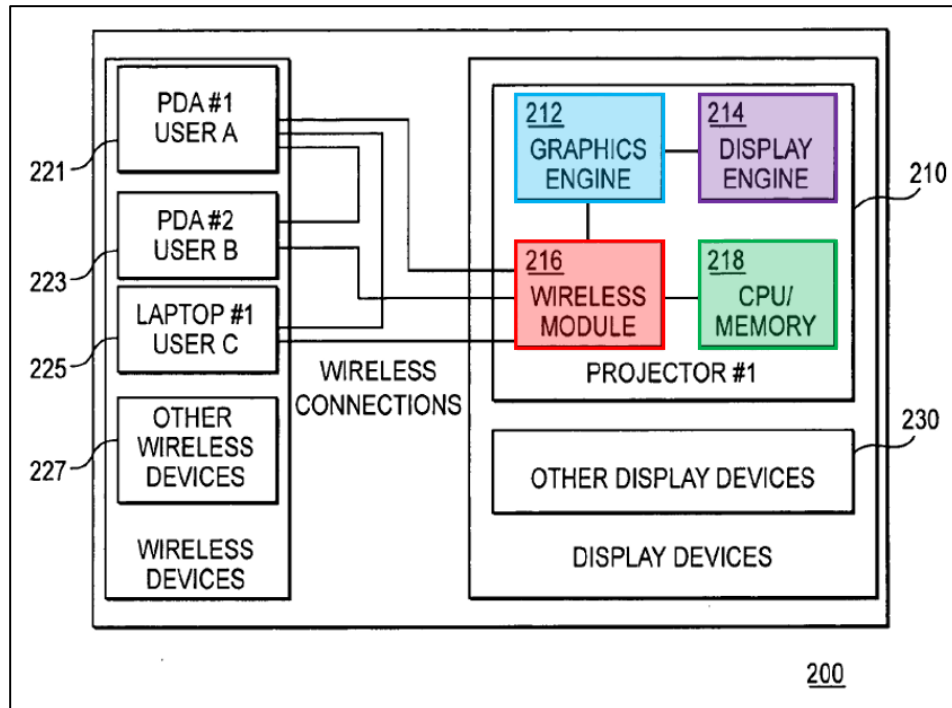
10.1.4. Element [1C]: "an infrared receiver unit that receives infrared rays from a third wireless control device; and"

90. Acharya in ¶51 teaches that the wireless communication protocols executed by wireless module 216 of the projector 110, 210 can be "... infra-red

...,”. This correlates to “an infrared receiver unit that receives infrared rays” of [1C]. See also ¶¶12, 16, 36, FIGs. 1 and 2, EX1004. Acharya in ¶51 and FIG. 2 further discloses wireless module 216 (which, as noted above, may include infrared capability) wirelessly connects to laptop device 225 by user C (in addition to PDA#1 by user A 221 and PDA#2 by user B 223). U.S. Patent 7,123,212, which is incorporated by reference into Acharya as U.S. patent application 09/746,841 also discloses bidirectional infrared communications with a handheld device. U.S. Patent 7,123,212 17:2-36 and Figure 6. This discloses “a third wireless control device” of [1C]. Thus, Acharya discloses “an infrared receiver unit that receives infrared rays from a third wireless control device” as required by limitation [1C]. Acharya discloses [1C], or, at least renders it obvious.

10.1.5. Element [1D]: “a controller that controls the display unit, the communication unit and the infrared receiver unit,”

91. Acharya’s ¶51 and FIG. 2 disclosure of the CPU and memory 218 (in green) or, in the alternative, in combination with graphics engine 212 (in blue) correlates to “a controller” of [1D]. Annotated FIG. 2 is reproduced below.



92. Acharya discloses in ¶51 that “[t]he projector 210 may be, for example, a digital projection display device with 802.11b wireless communication protocol and a suitable firmware program loaded in its program memory. As noted above, A POSITA would apply these teachings to the other display devices discussed in Acharya as well. The projector 210 as shown here has a **wireless module 216** (in red) to send and receive data or command signals by a wireless protocol, a **CPU and memory 218** (in green) having a processor and associated memory for processing commands and reformatting data, a **graphics engine 212** (in blue) for setup timing, color information, image and scaling as required by the associated display, and a **display engine 214** (in purple) that provides interface circuitry to a display projector.

93. The CPU and memory 218 control the display engine 214 (which correlates to the claimed display unit, see [1A]) through the graphics engine 212. The CPU and memory 218, or in the alternative, in combination with graphics engine 212 correlate to “a controller” that “controls the display unit” of [1D]. The CPU and memory 218 further control the wireless module 216 (which correlates to the claimed communication unit and infrared receiver unit, see [1B] and [1C]), thus disclosing “a controller controls...the communication unit and the infrared receiver unit” of [1D].

94. Acharya further discloses in ¶101 an exemplary software architecture 2600 of the CPU and memory block 218, stating “FIG. 26 is a block diagram of one implementation of an architecture 2600 for embedded software for a shared display system (such as the projector 110). Various portions of the software may be stored in a memory of the shared display system, such as memory in the CPU and memory block 218 shown in FIG. 2.” FIG 26 is reproduced below.

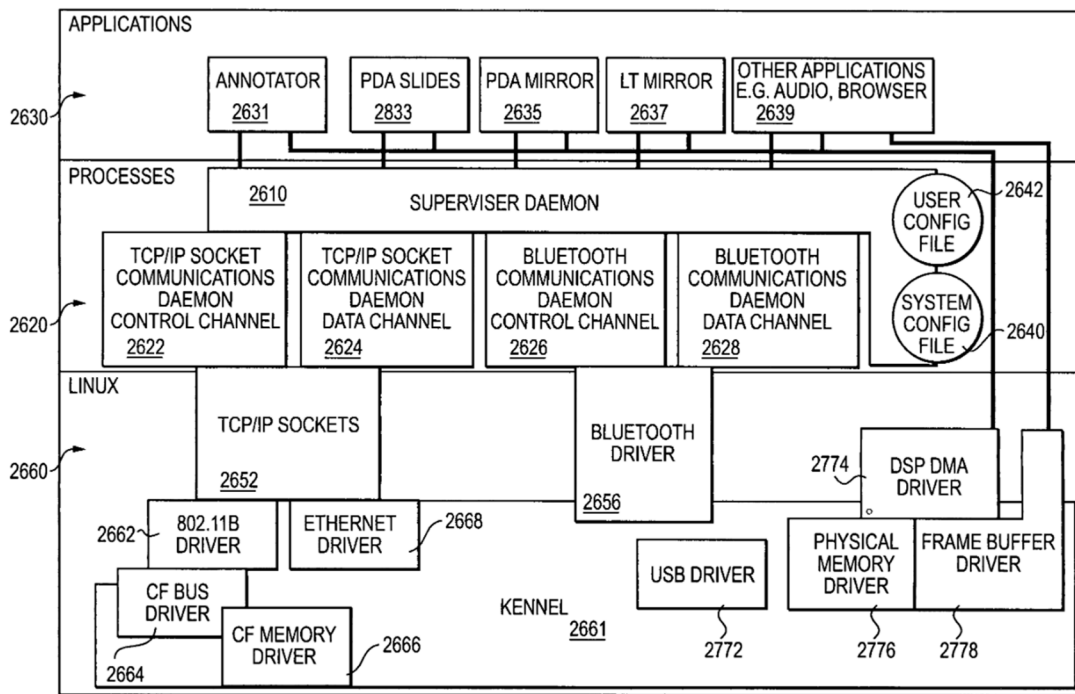


FIG. 26

95. The CPU and memory block 218 includes a supervisory daemon 2610, which controls the communication daemon 2620 and various applications 2630 for display. EX1004, ¶¶102, 105-107. The communication daemon 2620 controls the TCP/IP daemon 2622, 2624 and Bluetooth daemon 2626, 2628. The TCP/IP daemon 2622, 2624 utilizes 802.11B [i.e. Wi-Fi] driver 2662 to establish W-iFi communication. EX1004, ¶105. The Bluetooth daemon 2626, 2628 utilizes Bluetooth driver 2656 to establish Bluetooth communication. EX1004, ¶105. A POSITA reading ¶105 and ¶51 (stating infrared is a disclosed communication protocol) would understand the communication daemon 2620 to also include an infrared communication daemon component in at least some embodiments for

establishing infrared communication. The above shows that the CPU and memory block 218, which includes the supervisory daemon 2610, discloses “a controller controls...the communication unit and the infrared receiver unit” of [1D].

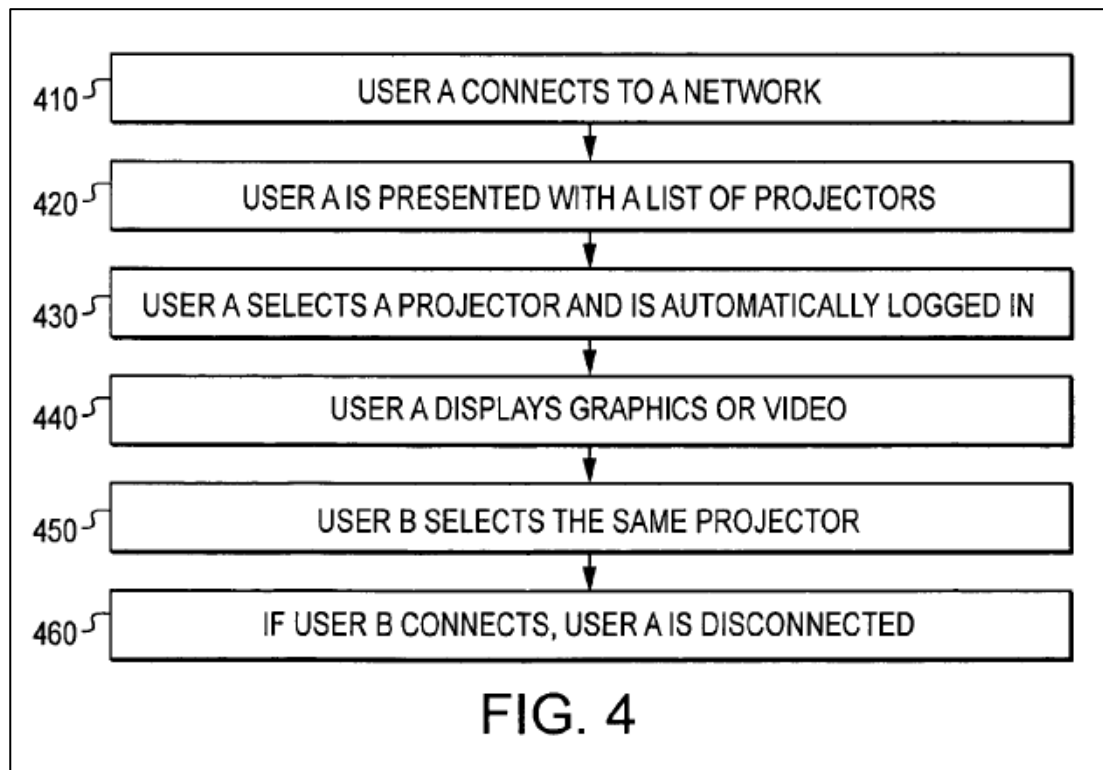
96. The supervisory daemon 2610 further controls various applications 2630 to control the display. EX1004, ¶107. The supervisory daemon 2610 may “arbitrate access to a graphics engine [212] or a display engine [214] or other components that process images for display on a shared display device.” EX1004, ¶107. For example, the annotator application 2631 may be configured to display a mouse cursor or other annotation overlaid on a display of the shared display device. EX1004, ¶108. The annotator application 2631 may share the display with one of the other applications. EX1004, ¶108. In another example, the PDA mirror software 2635 may be configured to receive PDA mirror data and transfer the mirror data to DSP display processing portions of the wireless module for decoding and display. EX1004, ¶110. Thus, the CPU and memory block 218, which includes the supervisory daemon 2610, discloses “a controller that controls the display unit.”

97. Thus, the CPU and memory block 218 alone or in combination with graphics engine 212 teaches “a controller that controls the display unit, the

communication unit and the infrared receiver unit” of [1D]. Acharya discloses [1D] or at least renders it obvious.

10.1.6. Element [1E]: “wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to a second video content is transmitted from the second wireless control device to the communication unit via the router during the first video content is displayed on the display unit, the display unit terminates displaying the first video content and starts to display the second video content and the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and”

98. Acharya teaches in ¶¶56-57 and FIG. 4, reproduced below, that in self-serve mode, User B can take over control of the projector from User A. Acharya specifically teaches in ¶57 that among multiple users, e.g., Users A and B, “one of the users may communicate with the projector through a **networked link** [e.g., WiFi, via a router,] while the other user communicates with the projector through a **direct or ad-hoc link** [e.g., Bluetooth, infra-red].”



99. Also, with respect to the disclosed self-serve mode, Acharya teaches in ¶90 that a second user, Bob, takes over control of the projector 110 from a first user, Jane. Figures 16 and 17 of Acharya show two dialog windows that are displayed on Bob's second wireless control device. FIG. 18 of Acharya illustrates information sent to Jane's first wireless control device for informing Jane that her display session with the projector 110 has been terminated. As explained below, this disclosure teaches the limitation [1E] of the '341 patent's claim 1.

100. A POSITA reading Acharya's disclosure in ¶¶36, 51, 71, and FIGs. 1-2 regarding the shareable display system, in view of ¶¶56-57 and FIG. 4 regarding User B taking over control of the shareable display system from User A through

different communication protocols, and further in view of the embodiment in ¶¶90 and FIGs. 16-18 of Bob taking control of the projector from Jane, would teach a usage scenario in which Jane's first wireless control device can directly connect to projector 110 through Bluetooth, without a router (e.g., ad-hoc, peer-to-peer, link 149 in FIG. 1). Concurrently, Bob's second wireless control device can connect to projector 110 through Wi-Fi, e.g. IEEE 802.11b, via a router (e.g., access point 150 in FIG. 1).

101. When Bob's second wireless control device requests control of the projector, Bob's computing device displays a dialog box 1600 from FIG. 16, informing Bob that "Projector ABC is in Use by Jane," and that Jane will be disconnected if Bob elects to connect nonetheless. EX1004, ¶¶90. FIG. 16 is reproduced below.

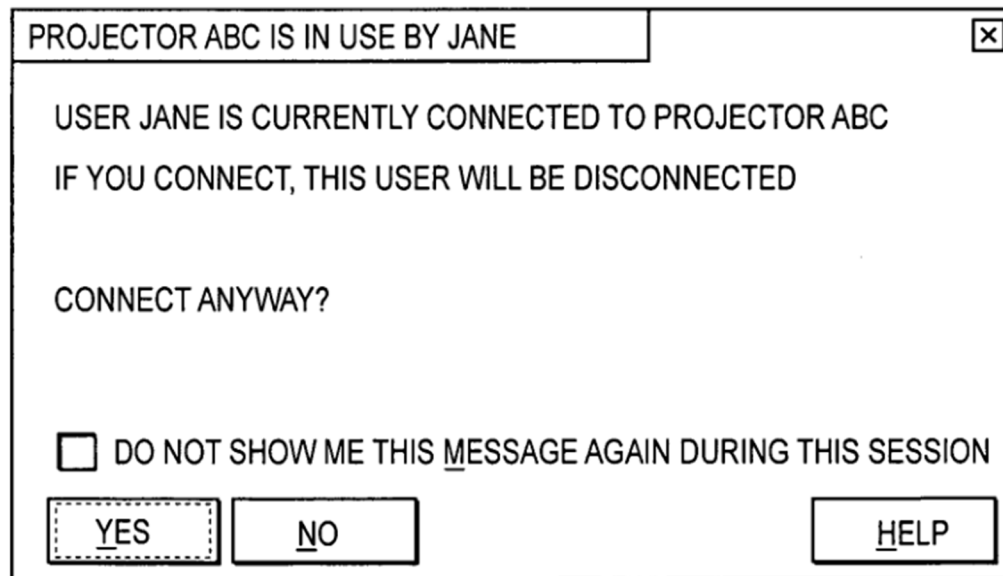


FIG. 16

1600

102. If Bob indicates that he wishes to connect despite this warning, his computing device then displays a message such as a dialog box 1700 in FIG. 17, informing him that he now has control over Projector ABC. EX1004, ¶90. FIG. 17 is reproduced below.

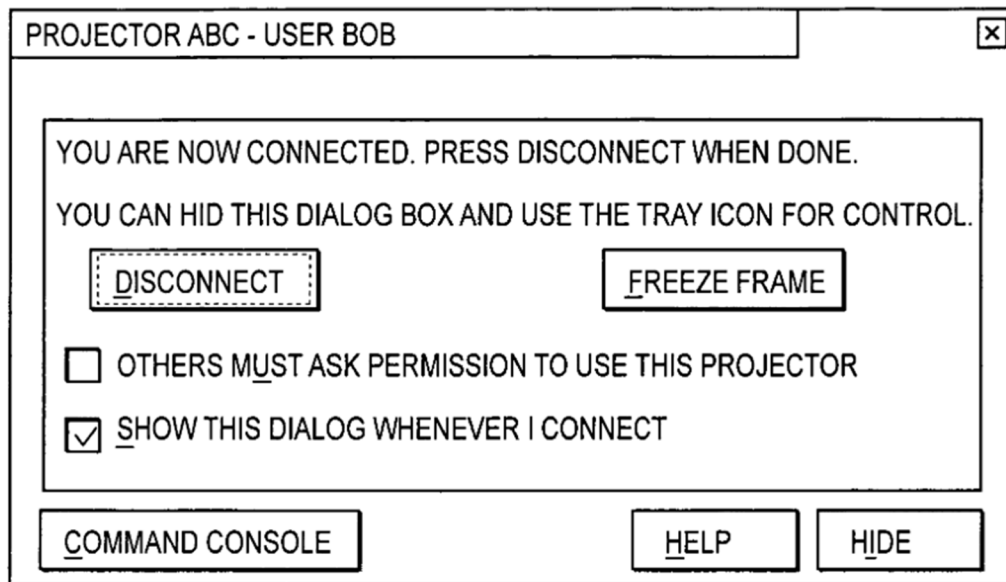


FIG. 17

103. At this point, Bob's second wireless control device (communicating via a router) has sent a first command for changing the display from a first content (Jane's content) to a second content (Bob's content), while Jane's first wireless control device is directly connected to the projector without going via a router (e.g. via Bluetooth) and Bob's second wireless control device is connected to the projector going via a router (e.g. via IEEE 802.11b Wi-Fi). This teaches the requirement of limitation [1E] "wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to a second video content is transmitted from the second wireless control device to the communication unit via the router during the first video

content is displayed on the display unit, the display unit terminates displaying the first video content and starts to display the second video content.”

104. In addition, and specific to the requirement of “starts to display the second video content” of limitation [1E], Acharya discloses in ¶13 that in a self-serve mode, users send video data to the shareable display system, and the shareable display system **updates** [emphasis added] the display with the most recently received video data received. A POSITA reading ¶13 in view of ¶90 of Acharya would understand that, when Bob takes over control of the projector from Jane, Jane’s video content display is terminated and Bob’s video content will be displayed.

105. When Bob takes over the control, Jane’s second wireless control device receives a message sent by projector 110 such as a dialog box 1800 in FIG. 18, informing her that she has transferred control of Projector ABC to Bob. EX1004, ¶90. Modified FIG. 18 is reproduced below.⁵

⁵ See prior footnote regarding the typographical error “JIM” in place of “BOB.”

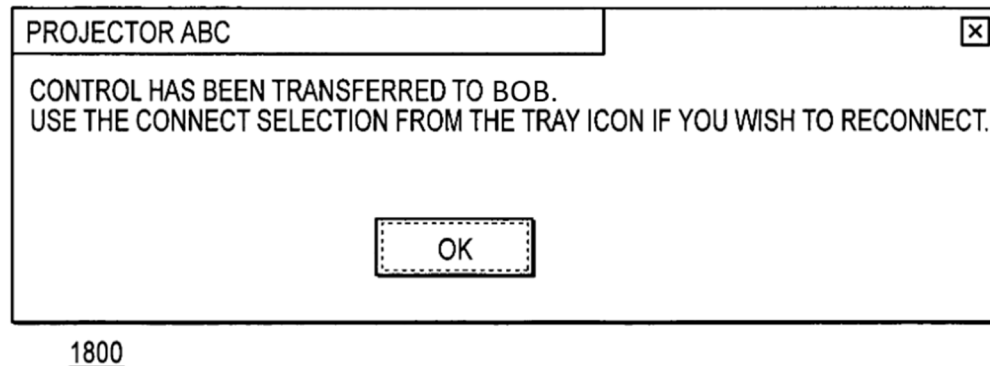


FIG. 18

106. The termination message shown in Acharya's FIG. 18 along with the other evidence mentioned above discloses the feature "the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device" limitation of [1E].

107. Since, Jane's first wireless control device can be connected to the projector 110 through Bluetooth without a router, a POSITA would have understood the termination information in FIG. 18 to be sent back to Jane through the original Bluetooth connection without a router. Acharya teaches that this is a bidirectional connection and does not specify any alternate mechanism for this communication. This correlates to the limitation [1E] "the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device *without going via a router.*"

108. I also note that a POSITA would reasonably understand that the termination information is sent back through the communication channel already established between the shareable display device and the wireless control device. For example, Patent Owner's expert Eli Saber (in the parallel district court case *Maxell v. TCL Electronics Holdings, et al*, E.D.Tex. 5:23-cv-00108) stated in his deposition that the '341 termination signal is sent back to the wireless control device through the communication channel originally setup for that particular wireless control device. Page 71, line 25 to page 72, line 17, EX1005.⁶ Vis-à-vis

⁶ When questioned about what mechanism on the display apparatus is determining whether the termination message goes with or without via a router, Maxell's expert Eli Saber answered: "[w]ell, first of all, you obviously have -- you have multiple devices that communication unit can communicate with. You have device one that can communicate with via say a router. A device [two], it can communicate without a router or vice versa. So, the communication unit and the device have -- you know, when you install the device and you basically -- there is essentially a pivotal understanding that -- how this communication is gonna take place. So, the communication unit knows that this device is a direct communication versus this

the '341 patent's lack of disclosure for any methods and/or mechanisms of sending back termination information, Mr. Saber further states in his deposition that it would be readily understood by a POSITA that the termination information is sent back through the original communication channel. Page 74, lines 11-17, EX1005.⁷ There is no reason that a POSITA would not apply the same understanding to Acharya. In my opinion, the feature "without going via a router" of [1E] is disclosed or, in alternative, obvious to a POSITA reading the disclosure of Acharya. Thus, Acharya discloses limitation [1E], or, at least renders it obvious.

other one I go through the router. So, that's understood at the installation time and setup time and et cetera."

⁷ When questioned about the '341 Patent's lack of support regarding the feature of sending a termination signal back to the wireless control device through its original communication channel with or without a router, Mr. Saber responded: "it would be understood by a POSITA that a communication unit has to be able to communicate with a wireless device. So, depending on the capabilities of the wireless device, the communication unit has the capability of doing this communication with or without a wireless router."

10.1.7. Element [1F]: *“wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to another video content is transmitted from the third wireless control device to the infrared receiver unit by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content and the communication unit sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.”*

109. Limitation [1F] is similar to limitation [1E], but recites a command transmitted to the infrared receiver unit. It is disclosed for the same reasons as limitation [1E].

110. As with limitation [1E], Figures 16-18 explain how Acharya’s disclosure teaches limitation [1F] or, in alternative, renders it obvious.

111. A POSITA reading Acharya’s disclosure in ¶¶36, 51, 71, and FIGs. 1-2 regarding the shareable display system, in view of ¶¶56-57 and FIG. 4 regarding User B taking over control of the shareable display system from User A, and further in view of the embodiment in ¶90 and FIGs. 16-18 of Bob taking control of the projector from Jane, would understand that a usage scenario is taught in which Jane is using the “second wireless control device,” while Bob is using the “third wireless control device” of [1F], and wherein Jane’s second wireless control device can connect to projector 110 through Wi-Fi, e.g. IEEE 802.11b, via a router, e.g.,

access point 150 in FIG. 1. Concurrently, Bob's third wireless control device can directly connect to projector 110 through infra-red connection without a router, e.g., ad-hoc, peer-to-peer, link 149 in FIG. 1.

112. The above teachings along with ¶90 and FIGs. 16-17 of Acharya, show that Bob, using the third wireless device connected through infra-red connection without a router, sends a message (i.e. a "second command" of limitation [1F]) to take control of projector 110 from Jane. Prior to this message, Jane was displaying her content (i.e. "second video content" of limitation [1F]) on projector 110. The content requested by Bob correlates to "another video content" of limitation [1F]. Jane's second wireless device was disclosed as connected to projector 110 through IEEE 802.11b (Wi-Fi) via a router. This usage scenario teaches "wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to another video content is transmitted from the third wireless control device to the infrared receiver unit by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content" of limitation [1F].

113. Specifically with respect to the "starts to display another video content" limitation of [1F], Acharya discloses in ¶13 that in a self-serve mode,

users send video data to the shareable display system, and the shareable display system **updates** the display with the most recently received video data received. Paragraph 90 of EX1004 explains that the dialogs in FIGs. 15-18 are under the self-serve mode.

114. When Bob takes control, Jane's second wireless control device receives a message sent by projector 110 such as a dialog box 1800 in FIG. 18, informing her that she has lost control of Projector ABC due to Bob. The termination message of FIG. 18 illustrates “the communication unit sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device” limitation of [1F].

115. Specifically referring to the “via the router” limitation of [1F], Jane’s second wireless control device can be connected to the projector 110 through IEEE 802.11b (Wi-Fi) via a router. A POSITA would have understood the termination message of FIG. 18 to be sent by projector 110 to Jane’s second wireless control device through the originally-established IEEE 802.11b communication via a router. See also Dr. Saber’s testimony referenced above.

116. For these reasons, Acharya discloses limitation [1F], or at least renders it obvious.

117. Acharya discloses or renders obvious each and every limitation of the '341 patent's claim 1. Further, based on the disclosure of Acharya, a POSITA would have been motivated to arrive at the invention claimed in the '341 patent's claim 1 because Acharya teaches or suggests the same arrangement of elements as the '341 patent's claim 1. Further, based on Acharya, the POSITA would have had a reasonable expectation that he or she would successfully create the system of the '341 patent's claim 1. Thus, in my opinion claim 1 is obvious under 35 U.S.C. § 103.

10.2. Independent Claim 2

118. Independent claim 2 is a restatement of claim 1 as a method claim. The substantive limitations of claims 1 and 2 are essentially the same. As explained below, Acharya discloses or at least renders obvious the '341 patent's claim 2.

10.2.1. Preamble: "A method for changing a content on a video display apparatus comprising:"

119. Whether or not the preamble is limiting, this method is disclosed for the same reasons I explained with respect to claim 1.

10.2.2. Element [2A]: “displaying step to display a video content from a broadcast station or from a video content delivery source, on a display unit of the video display apparatus;”

120. Element [2A] is a restatement of limitation [1A] as a method step with no meaningful difference in substance. My opinions and analyses regarding limitation [1A] above show that Acharya discloses limitation [2A] or at least renders it obvious for the same reasons.

121. Acharya Figure 4 illustrates that the previously discussed limitations are part of a method comprised of steps. The POSITA would have understood that step 440 in this figure correlates to the “displaying step” of limitation [2A].

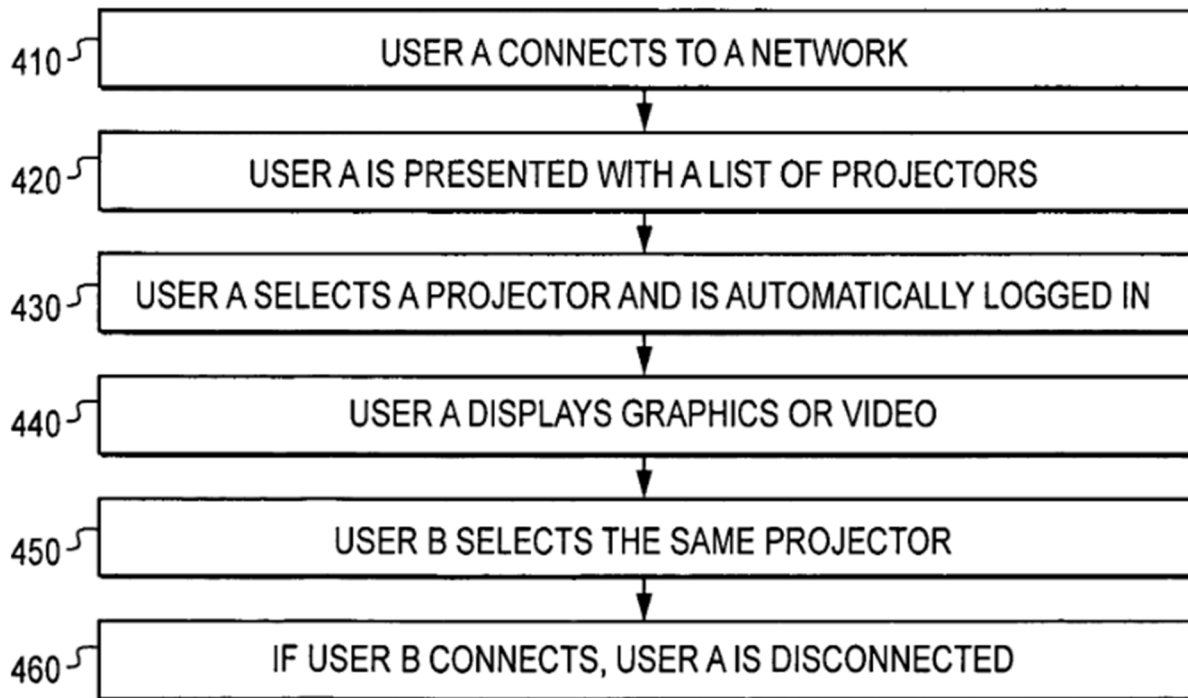


FIG. 4

10.2.3. Element [2B]: “first communication step to execute bi-directional wireless communication with a first wireless control device without going via a router; second communication step to execute bi-directional wireless communication via a router with a second wireless control device that is different from the first wireless control device; and”

122. Element [2B] is a restatement of limitation [1B] as a method step with no meaningful difference in substance. My opinions and analyses regarding limitation [1B] above show that Acharya discloses limitation [2B] or at least renders it obvious for the same reasons. In addition, the POSITA would have understood that Acharya’s step 430 in which user A selects a projector and is

automatically logged in is the same as the “first communication” step of limitation [2B].

123. Acharya Figure 4 illustrates that the previously discussed limitations are part of a method comprised of steps. See also ¶¶ 56-57 in EX1004.

10.2.4. Element [2C]: “infrared ray receiving step to receive infrared rays from a third wireless control device;”

124. Element [2C] is a restatement of limitation [1C] as a method step with no meaningful difference in substance. My opinions and analyses regarding limitation [1C] above show that Acharya discloses limitation [2C] or at least renders it obvious for the same reasons.

125. Acharya Figure 4 illustrates that the previously discussed limitations are part of a method comprised of steps. See also ¶¶ 56-57 in EX1004. More specifically, Acharya teaches in ¶¶56–57 and Figure 4 how multiple users can connect to a display apparatus. Acharya’s ¶57 teaches “...one of the users may communicate with the projector through a networked link [for example, user A in step 410] which the other user communicates with the projector through a direct or ad-hoc link [for example, user B at step 450].” Acharya’s 36, 51, and 71 teach that the ad-hoc link can be infrared.

10.2.5. Element [2D]: “wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to a second video content is transmitted from the second wireless control device to the video display apparatus via the router during the first video content is displayed on the display unit, the video display apparatus terminates displaying the first video content and starts to display the second video content and the video display apparatus sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and”

126. Element [2D] is a restatement of limitation [1E] as a method step with no meaningful difference in substance. My opinions and analyses regarding limitation [1E] above show that Acharya discloses limitation [2D] or at least renders it obvious for the same reasons. The difference is that [2D] recites “...is transmitted from the second wireless control device to the video display apparatus ~~communication unit~~ via the router during the first video content is displayed on the display unit...” and “...the video display apparatus ~~communication unit~~ sends first information for informing termination...,” (wherein the struck-out language applies to [1E]).

127. Acharya discloses projector 210 in ¶51 and FIG. 2, which includes a wireless module 216 (correlating to the “communication unit” of limitations [1B] and [1E]. See my opinions related to limitation [1B]). The projector 210 is capable of communicating with wireless control devices bi-directionally via e.g., IEEE 802.11b, Bluetooth, and infra-red communication protocols. EX1004, ¶¶36,

51, and FIGs. 1-2. The projector 210 of Acharya correlates to the “video display apparatus” of limitation [2D].

128. Acharya Figure 4 illustrates that the previously discussed limitations are part of a method comprised of steps. See also ¶¶ 56-57 in EX1004.

10.2.6. Element [2E]: “wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to another video content is transmitted from the third wireless control device to the video display apparatus by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content and the video display apparatus sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device”

129. Element [2E] is a restatement of limitation [1F] as a method step with no meaningful difference in substance. My opinions and analyses regarding limitation [1F] above show that Acharya discloses limitation [2E] or at least renders it obvious for the same reasons. The difference between [2E] and [1F] is that [2E] recites “...transmitted from the third wireless control device to the video display apparatus ~~infrared receiver unit~~ by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content and starts to display another video content and the video

display apparatus ~~communication unit...~~,” (wherein the struck-out language belongs to limitation 1[F]).

130. Acharya discloses projector 210 in ¶51 and FIG. 2, which includes a wireless module 216 (correlating to the “infrared receiver unit” of [1C] and [1F]). Projector 210 is capable of communicating with wireless control devices bi-directionally via e.g., IEEE 802.11b, Bluetooth, and infra-red communication protocols. EX1004, ¶¶36, 51, and FIGs. 1-2. The projector 210 of Acharya correlates to the “video display apparatus” of limitation [2E].

131. Acharya Figure 4 illustrates that the previously discussed limitations are part of a method comprised of steps. See also ¶¶ 56-57 in EX1004.

132. Acharya discloses or renders obvious each and every limitation of the ’341 patent’s claim 2. Further, based on the disclosure of Acharya, a POSITA would have been motivated to arrive at the invention claimed in the ’341 patent’s claim 2 because Acharya teaches or suggests the same arrangement of elements as the ’341 patent’s claim 2. Further, based on Acharya, the POSITA would have had a reasonable expectation that he or she would successfully create the system of the ’341 patent’s claim 2. Thus, in my opinion claim 2 is obvious under 35 U.S.C. § 103.

10.3. Independent Claim 3

133. Independent claim 3 is substantially the same as independent claim 1 and both are apparatus claims. The difference between the claims is that claim 3 recites changing the video being played and claim 1 recites starting videos. For the same reasons as explained above with respect to claim 1, Acharya teaches, or at least renders obvious, the '341 patent's claim 3.

10.3.1. Preamble: "A video display apparatus comprising:"

134. See Claim 1 preamble.

10.3.2. Element [3A]: "a display unit that displays a video content from a broadcast station or from a video content delivery source;"

135. See Claim 1 limitation [1A].

10.3.3. Element [3B]: "a communication unit that executes two types of bi-directional wireless communication including first bi-directional wireless communication with a first wireless control device without going via a router and second bi-directional wireless communication via a router with a second wireless control device that is different from the first wireless control device;"

136. See Claim 1 limitation [1B].

10.3.4. Element [3C]: "an infrared receiver unit that receives infrared rays from a third wireless control device; and"

137. See Claim 1 limitation [1C].

10.3.5. Element [3D]: “a controller that controls the display unit, the communication unit and the infrared receiver unit,”

138. See Claim 1 limitation [1D].

10.3.6. Element [3E]: “wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to another video content is transmitted from the second wireless control device to the communication unit via the router during the first video content is displayed on the display unit, the display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another video content and the communication unit sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and”

139. Element [3E] is substantially the same as [1E]. The difference between [3E] and [1E] is that [3E] recites “...the display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another ~~and starts to display the second~~ video content and...,” (wherein the strike-out language belongs to [1E]). The claim language difference is not meaningfully different, nor does the specification of the ‘341 patent provide any support for the idea that there is any substantial difference between the scope of element [3E] and element [1E]. Thus, my opinions and analyses regarding [1E] show Acharya discloses limitation [3E], or at least renders it obvious.

140. To the extent the claim language difference is substantively distinguishable, Acharya discloses in ¶13 that in a self-serve mode, users send video data to the shareable display system, and the shareable display system **updates** the display with the most recently received video data received. This teaches “the display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another”. This is also shown in ¶90 of Acharya, which shows a self-serve mode. Thus, Acharya teaches, or at least renders obvious, limitation [3E].

10.3.7. Element [3F]: “wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to another video content is transmitted from the third wireless control device to the infrared receiver unit by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to another video content and the communication unit sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.”

141. Element [3F] is substantially the same as [1F]. The difference between [3F] and [1F] is that element [3F] recites “...the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to ~~and starts to display~~ another video content and...,” wherein the strike-out language belongs to [1F]. The difference is not

meaningfully discernible, nor does the specification of the '341 patent provide any support for the idea that there is any substantial difference between the scope of element [3E] and element [1E]. Thus, my opinions and analyses regarding limitation [1F] show Acharya discloses limitation [3F], or at least renders it obvious.

142. To the extent the claim language difference is substantively distinguishable, Acharya discloses in ¶13 that in a self-serve mode, users send video data to the shareable display system, and the shareable display system **updates** the display with the most recently received video data received. This discloses the “display unit terminates displaying the first video content for changing a content to be displayed from the first video content to another” of limitation [3F].

143. Acharya discloses or renders obvious each and every limitation of the '341 patent's claim 3. Further, based on the disclosure of Acharya, a POSITA would have been motivated to arrive at the invention claimed in the '341 patent's claim 3 because Acharya teaches or suggests the same arrangement of elements as the '341 patent's claim 3. Further, based on Acharya, the POSITA would have had a reasonable expectation that he or she would successfully create the system of the

'341 patent's claim 3. Thus, in my opinion claim 3 is obvious under 35 U.S.C. § 103.

10.4. Independent Claim 4

144. Independent claim 4 is substantially the same as independent claim 2 and both are method claims. For the same reasons as explained above with respect to claims 1, 2 and 3, Acharya teaches, or at least renders obvious, the '341 patent's claim 4.

10.4.1. Preamble: "A method for changing a content on a video display apparatus comprising:"

145. See Claim 2 preamble.

10.4.2. Element [4A]: "displaying step to display a video content from a broadcast station or from a video content delivery source, on a display unit of the video display apparatus;"

146. See Claim 2 limitation [2A].

10.4.3. Element [4B]: "first communication step to execute bi-directional wireless communication with a first wireless control device without going via a router; second communication step to execute bi-directional wireless communication via a router with a second wireless control device that is different from the first wireless control device; and"

147. See Claim 2 limitation [2B].

10.4.4. Element [4C]: “infrared ray receiving step to receive infrared rays from a third wireless control device;”

148. See Claim 2 limitation [2C].

10.4.5. Element [4D]: “wherein, if a first command for changing a video content on the display unit from a first video content selected by the first wireless control device to another video content is transmitted from the second wireless control device to the video display apparatus via the router during the first video content is displayed on the display unit, the video display apparatus terminates displaying the first video content for changing a content to be displayed from the first video content to another video content and the video display apparatus sends first information for informing termination of the displaying of the first video content to the first wireless control device without going via a router, and”

149. Element [4D] is substantially the same as [2D]. The difference is that [4D] recites “...the video display apparatus terminates displaying the first video content for changing a content to be displayed from the first video content to another ~~and starts to display the second~~ video content and ...,” wherein the strike-out language belongs to [2D]. The claim language difference is not meaningfully distinguishable, nor does the specification of the ’341 patent provide support for the idea that there is any substantial difference between the scope of element [4D] and element [2D]. Thus, my opinions and analyses regarding limitation [2D] show Acharya discloses limitation [4D], or at least renders it obvious.

150. To the extent the claim language difference is substantively distinguishable, Acharya discloses in ¶13 that in a self-serve mode, users send video data to the shareable display system, and the shareable display system **updates** the display with the most recently received video data received. This discloses the “video display apparatus terminates displaying the first video content for changing a content to be displayed from the first video content to another video content,” and thus discloses or at least renders obvious limitation [4D].

10.4.6. Element [4E]: “wherein, if a second command for changing a video content on the display unit from a second video content selected by the second wireless control device to another video content is transmitted from the third wireless control device to the video display apparatus by infrared rays during the second video content is displayed on the display unit, the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to another video content and the video display apparatus sends second information for informing termination of the displaying of the second video content via the router to the second wireless control device.”

151. Element [4E] is substantially the same as [2E]. The difference is that [4E] recites “...the display unit terminates displaying the second video content for changing a content to be displayed from the second video content to ~~and starts to display~~ another video content and ...,” wherein the strike-out language belongs to [2E]. The claim language difference is not meaningfully distinguishable, nor does the specification of the ’341 patent provide any support for the idea that there is any

substantial difference between the scope of element [4E] and element [2E]. Thus, my opinions and analyses regarding [2E] show Acharya discloses [4E], or at least renders it obvious.

152. To the extent the claim language difference is substantively distinguishable, Acharya discloses in ¶13 that in a self-serve mode, users send video data to the shareable display system, and the shareable display system **updates** the display with the most recently received video data received. This teaches the “display unit terminates displaying the second video content for chaining a content to be displayed from the second video content to another video content” and this this disclosure teaches or at least renders obvious limitation [4E].

153. Acharya discloses or renders obvious each and every limitation of the '341 patent's claim 4. Further, based on the disclosure of Acharya, a POSITA would have been motivated to arrive at the invention claimed in the '341 patent's claim 4 because Acharya teaches or suggests the same arrangement of elements as the '341 patent's claim 4. Further, based on Acharya, the POSITA would have had a reasonable expectation that he or she would successfully create the system of the '341 patent's claim 4. Thus, in my opinion claim 4 is obvious under 35 U.S.C. § 103.

11. Secondary Considerations

154. At this stage of these proceedings, it is my understanding that Petitioner has no burden to identify and rebut secondary considerations. Rather, it is my understanding that Patent Owner must first present a prima facie case for such consideration, which Petitioners should then have the chance to rebut. That said, I have considered evidence of secondary considerations that I am aware of at this time, and I am currently unaware of any evidence of secondary considerations that would support a finding of non-obviousness. If additional evidence of secondary considerations becomes available, I would ask to be able to opine on it at that time.

12. Availability for Cross-Examination

155. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time as mutually agreed between the parties.

13. Right to Supplement

156. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner may raise. This declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information that becomes available to me and on my continuing analysis of the materials already provided.

14. Jurat

157. Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

November 3, 2024

Date

A handwritten signature in dark ink, appearing to read 'A. Wolfe', is written over a light gray rectangular background.

Andrew Wolfe, Ph.D.