

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

YEALINK (USA) NETWORK TECHNOLOGY CO., LTD., and
YEALINK NETWORK TECHNOLOGY CO., LTD.
Petitioners,

v.

BARCO N.V.
Patent Owner

U.S. Patent No. 10,762,002
IPR2024-1436

**DECLARATION OF KEVIN C. ALMEROOTH, PH.D.,
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,762,002**

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I, Kevin C. Almeroth Ph.D., declare as follows:

I. INTRODUCTION

1. I have been retained by Yealink (USA) Network Technology Co., Ltd. and Yealink Network Technology Co., Ltd. (collectively, “Petitioners”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 10,762,002 (“the ’002 patent”) (Ex-1001).

2. My name is Kevin C. Almeroth and I am a Professor Emeritus of Computer Science at the University of California, Santa Barbara. I have prepared this declaration as an expert witness on behalf of Petitioners. In this declaration, I will give my opinion as to whether claims 1-3, 9-11, 19, and 21-22 of the ’002 patent are unpatentable. I also provide herein the technical bases for these opinions, as appropriate.

3. For my efforts in connection with the preparation of this declaration, I have been compensated at my usual and customary rate for this type of consulting activity. My compensation is in no way contingent on the outcome of these or any other proceedings.

4. I have been asked to consider whether certain references disclose or suggest the features recited in claims 1-3, 9-11, 19, and 21-22 of the '002 patent. My opinions are set forth below.

II. QUALIFICATIONS / PROFESSIONAL BACKGROUND

5. I am currently a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). All of my opinions stated in this declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in designing, developing, researching, and teaching regarding computer networks and protocols, wireless networking, multicast communication, large-scale multimedia systems, and mobile applications.

6. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I understand that a copy of my current curriculum vitae, which details my education and professional and academic experience, is being submitted by Petitioner as Exhibit 1003. The following provides an overview of some of my experience that is relevant to the matters set forth in this declaration.

7. While at UCSB, I have held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology

(MAT) Program, and the Technology Management Program (TMP). I have also served as the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

8. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia System, minor in Telecommunications Public Policy) earned in June 1997. During my education, I took a wide variety of courses as demonstrated by my minors. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

9. One of the major concentrations of my research over the past 30+ years has been the delivery of multimedia content and data between computing devices, including through various network architectures. In my research, I have studied

large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

10. In 1992, the initial focus of my research was on the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the development of techniques to scale the delivery of on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

11. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicasting is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicasting often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

12. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

13. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the existing channels and watch the content at the point it was currently being transmitted.

14. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users

based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also connected the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

15. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (*i.e.*, when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

16. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in showing how to provide greater communication capability to "lightweight devices," *i.e.*, small form-factor, resource-constrained (*e.g.*, CPU, memory, networking, and power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight

protocols we envisioned were similar in nature to protocols like Bluetooth, Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA).

17. From this initial work, I have made wireless networking—including ad hoc, mesh networks and wireless devices—one of the major themes of my research. My work in wireless networks spans the protocol stack from applications through to the encoding and exchange of data at the data link and physical layers.

18. At the application layer, even before the large-scale “app stores” were available, my research looked at building, installing, and using apps for a variety of purposes, from network monitoring to support for traditional computer-based applications (*e.g.*, content retrieval) to new applications enabled by ubiquitous, mobile devices. For example, my research has looked at developing applications for virtually exchanging and tracking “coupons” through “opportunistic contact” among mobile wireless devices (*i.e.*, communication among devices moving into communication range with each other). In many of the courses I have taught there is a project component. Through these projects I have supervised numerous efforts to develop new “apps” for download and use across a variety of mobile platforms.

19. Toward the middle of the protocol stack, my research has also looked to build wireless infrastructure support to enable communication among a set of mobile devices unaided by any other kind of network infrastructure. These kinds of

networks are useful either in challenged network environments (e.g., when a natural disaster has destroyed existing infrastructure) or when suitable support for network communication never existed. The deployment of such networks (or even the use of traditional network support) are critical to support services like disaster relief, catastrophic event coordination, and emergency services deployment.

20. Yet another theme of my research has been monitoring wireless networks, in particular different variants of IEEE 802.11 compliant networks, to (1) understand the operation of the various protocols used in real-world deployments, (2) use these measurements to characterize use of the networks and identify protocol limitations and weaknesses, and (3) propose and evaluate solutions to these problems. I have successfully used monitoring techniques to study wireless data link layer protocol operation and to improve performance by enhancing the operation of such protocols. For wireless protocols, this research includes functions like network acquisition and channel bonding.

21. One theme in my wireless network research has been cross-layer solutions and innovations. As mentioned above, with greater wireless device use and network support, we envisioned new application paradigms and services, for example, when mobile devices come into contact with each other. Instead of relying on existing infrastructure to relay communication, mobile devices are able to

discover each other and communicate directly. Other examples include discovering and using location information to enhance users' experiences. Network support and novel applications span the use of a variety of network architectures supporting users on foot, in vehicles, and across varying terrains and environments. Finally, we studied how communication efficiency can be supported through intelligent handoffs as well as location and movement prediction.

22. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Since 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. Several of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including

their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

23. My recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content is shared and the cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs.

24. As an important component of my research program, I have been involved in the development of academic research into available technology in the marketplace. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol

Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

25. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the

International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

26. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (CV) (Ex-1003).

27. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa

Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and, in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

28. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

29. Through my graduate education, leadership with CITS, involvement in TMP, role in the development of the Internet2 infrastructure, and consulting with ISPs, I have gained a strong understanding in the role of the Internet in our society and the challenges of deploying large-scale production networking infrastructure. CITS, since its inception, has looked at the role of the Internet in society, including how the evolution of technology have created communication opportunities and challenges, including, for example through disruptive technologies like P2P. TMP

looks to focus on non-purely technical issues, including, for example, state-of-the-art business methods, strategies for successful technology commercialization, new venture creation, and best practices for fostering innovation. Through my industry collaborations and Internet2 work, I have developed significant experience in the challenges of deploying, monitoring, managing, and scaling communication infrastructure to support evolving Internet services like streaming media, conferencing, content exchange, social networking, and e-commerce.

30. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

III. MATERIALS REVIEWED

31. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding, for example, electronic meeting tools, methods of displaying media content, audiovisual display systems, wireless network communication, user interfaces, plug-and-play architectures, and video conferencing applications.

32. In forming my opinions expressed in this Declaration, I reviewed the following materials and information:

EXHIBIT	DESCRIPTION
Ex-1001	U.S. Patent No. 10,762,002

Ex-1003	Curriculum Vitae of Kevin C. Almeroth, Ph.D.
Ex-1004	File History of U.S. Patent No. 10,762,002
Ex-1005	U.S. Patent Application Publication No. 2005/0210390 (“Ono”)
Ex-1006	U.S. Patent Application Publication No. 2008/0074560 (“Ichieda”)
Ex-1007	U.S. Patent Application Publication No. 2006/0069840 (“Corbett”)
Ex-1008	RESERVED
Ex-1009	English Translation of Japanese Patent Application Publication No. 2008-165007 (“Uchida”)
Ex-1010	Japanese Patent Application Publication No. 2008-165007
Ex-1011	Certification for English Translation of Japanese Patent Application Publication No. 2008-165007
Ex-1012	RESERVED
Ex-1013	RESERVED
Ex-1014	International Patent Application Publication No. 2006/113711 (“Ahmed”)
Ex-1015- Ex-1019	RESERVED
Ex-1020	U.S. Patent Application Publication No. 2010/0087139 (“Glass”)
Ex-1021	U.S. Patent Application Publication No. 2009/0198839 (“Banerjee”)
Ex-1022	U.S. Patent Application Publication No. 2011/0115689 (“Sugiyama”)
Ex-1023	U.S. Patent Application Publication No. 2009/0187687 (Hulbert”)
Ex-1024	U.S. Patent Application Publication No. 2003/0112975 (“Taiwanese”)
Ex-1025	RESERVED

Ex-1026	U.S. Patent Application Publication No. 2009/0172219 (“Mardiks”)
Ex-1027	U.S. Patent Application Publication No. 2010/0295994 (“Kaplan”)
Ex-1028	RESERVED
Ex-1029	RESERVED
Ex-1030	EP Patent Application Publication No. 2107463 (“Deforche”)
Ex-1031	JP Patent Application Publication No. 2007-208606 (“Maeda”)
Ex-1033	U.S. Patent Application Publication No. 2002/0196378 (“Slobodin”)
Ex-1034	U.S. Patent Application Publication No. 2002/0174254 (“Kita”)
Ex-1035- Ex-1039	RESERVED
Ex-1050	Imation Wireless Projection Link User Guide
Ex-1051	EZAir Press Release, “EZAir Wireless PC to TV Solutions Now Available Across Europe,” March 16, 2011
Ex-1052	Warpia Product Brief, “Wireless USB PC to TV Audio/Video Display Adapter,” 2009
Ex-1053	Q-Waves Product Overview, “Quicklink TV,” November 2010
Ex-1054	IOGear Installation Guide, “Wireless USB to VGA Kit,” 2008
Ex-1055	JP Patent Application Publication No. 2007-208606
Ex-1056	Certification for English Translation of JP Patent Application Publication No. 2007-208606
Ex-1057	RESERVED
Ex-1058	U.S. Patent Application Publication No. 2011/0038005 (“Ochai”)
Ex-1059	U.S. Patent Application Publication No. 2006/0229100 (“Born”)
Ex-1060	U.S. Patent No. 7,207,059 (“Kurian”)

Ex-1061	U.S. Patent Application Publication No. 2007/0123251 (“McElvaney”)
Ex-1062	U.S. Patent Application Publication No. 2003/0036406 (“Huang”)
Ex-1063	U.S. Patent No. 5,913,174 (“Casarez”)
Ex-1064	U.S. Patent No. 6,717,801 (“Castell”)
Ex-1065	U.S. Patent No. 6,804,541 (“Muramatsu”)

33. I also reviewed any other materials I refer to in this Declaration in support of my opinions.

34. My opinions contained in this declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art (“POSITA”) would have understood the state of the art, the teachings of the prior art, and the claim terms and the specification of the ’002 patent at the time of the alleged invention. My opinions reflect how a person having ordinary skill in the art (which I have described below) would have understood the ’002 patent, the prior art, the knowledge of a POSITA and the state of the art at the time of the alleged invention. I have been asked to initially consider that the time of the alleged invention of the ’002 patent is around September 14, 2011 (the earliest date to which the ’002 patent claims the benefit of priority). However, even if a modestly earlier or later date were selected it would not alter my opinions.

35. Based on my experience and expertise, it is my opinion that the prior art discloses and/or suggests all the features recited in challenged claims 1-3, 9-11, 19, and 21-22 of the '002 patent, as I discuss in detail below.

IV. LEVEL OF ORDINARY SKILL IN THE ART

36. In determining the skills of a hypothetical POSITA of the '002 patent at the time of the claimed invention, I considered several things, including various prior art techniques for audio and screen scraping, wireless transmission of audiovisual media content, wireless networking, user input/control, peripheral device interfaces, and device drivers. I also considered the type of problems that such techniques gave rise to and the rapidity with which innovations were made. I also considered the sophistication of the technologies involved and the educational background and experience of those actively working in the field.

37. For the purposes of my analysis, I have been asked to assume that a POSITA in the field of art of the '002 patent would have had at least a Master's Degree in Electrical Engineering with at least five years of work experience in computer science and embedded systems, or a Master's Degree in Computer Science with at least five years of work experience in electrical and computer engineering and embedded systems. Additional educational experience could substitute for some of the work experience. My opinions below have taken that into account and reflect

that level of skill in determining the content of the prior art and what it would have suggested to a POSITA.

V. BACKGROUND OF THE TECHNOLOGY

38. At the time of the alleged invention, media sharing between electronic devices was well established and used in an increasing variety of applications to share media data between devices. In the decades before the alleged invention, a wide array of electronic tools were developed to facilitate meetings and share content among individuals, particularly in business and educational settings. As acknowledged by the '002 patent, there has been “an explosion” of such tools by the time of the alleged invention. (Ex-1001, 1:19-27.) By the 2000s, there was already “widespread acceptance of using computers to facilitate group communications.” (Ex-1033, ¶4.)

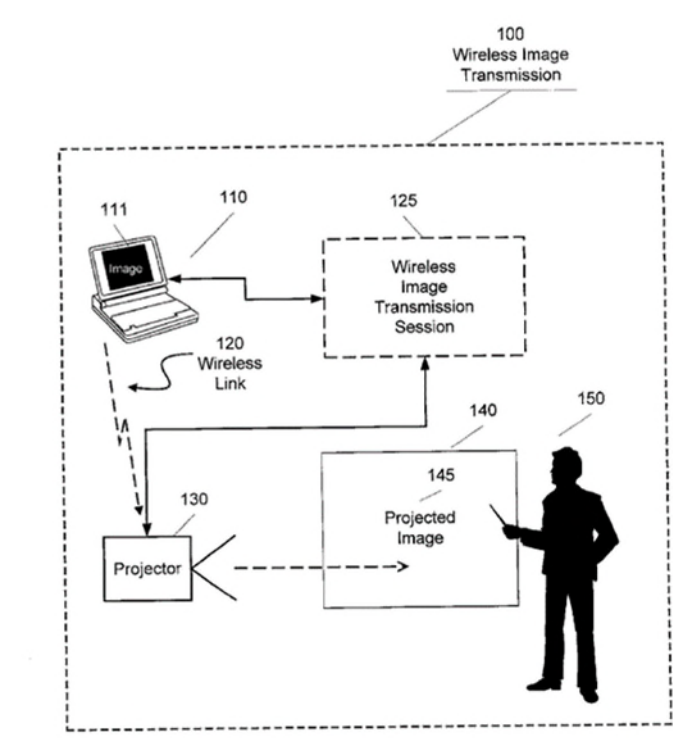
39. The oldest solutions involved wired connections between electronic devices. As wireless networking techniques became more common, wireless applications to electronic tools became prevalent. Indeed, by the time of the alleged invention in 2011, and acknowledge by the '002 patent, wireless networks were commonplace and widespread from classrooms to boardrooms.

40. Wireless media sharing arose, in part, from the recognition that sharing media content from one device to one or more separate devices (in settings such as

a meeting, presentation, *etc.*) using physical cable connections presented certain physical limitations. For example, one limitation with physical cable connections was the case in which multiple presenters wish to perform presentations while taking turns using respective personal computers (PCs). (Ex-1006, ¶4; *see also* Ex-1031, ¶3 (recognizing the limitation of physical cable connections in meetings requires physically reconnecting each electronic device to share media on separate electronic devices)). By designing systems utilizing wireless communication, between a media device (*i.e.*, computer) and a display device (*i.e.*, a second computer, projector, or similar device), “the cable can be prevented from becoming an obstacle.” (*Id.*)

41. Techniques developed for wirelessly sharing media content included, particularly to share the content displayed on a laptop computer or other portable electronic device with another display, for example, in a conference room. Although early on bandwidth of the wireless systems was a potential issue, to address this problem, US Patent Application Publication No. 2002/0196378 (“Slobodin”) proposed a method and apparatus for wireless transmission of “screen scraped” images to a projector to reduced amount of transmission bandwidth. (Ex-1033, Title, Abstract, ¶¶12-14.) As shown in FIG. 1 of Slobodin (reproduced below), an image-generating device 110 (*e.g.*, a laptop computer) generates a digital image on a display device 111 that is transmitted over a wireless link 120 to a remote presentation

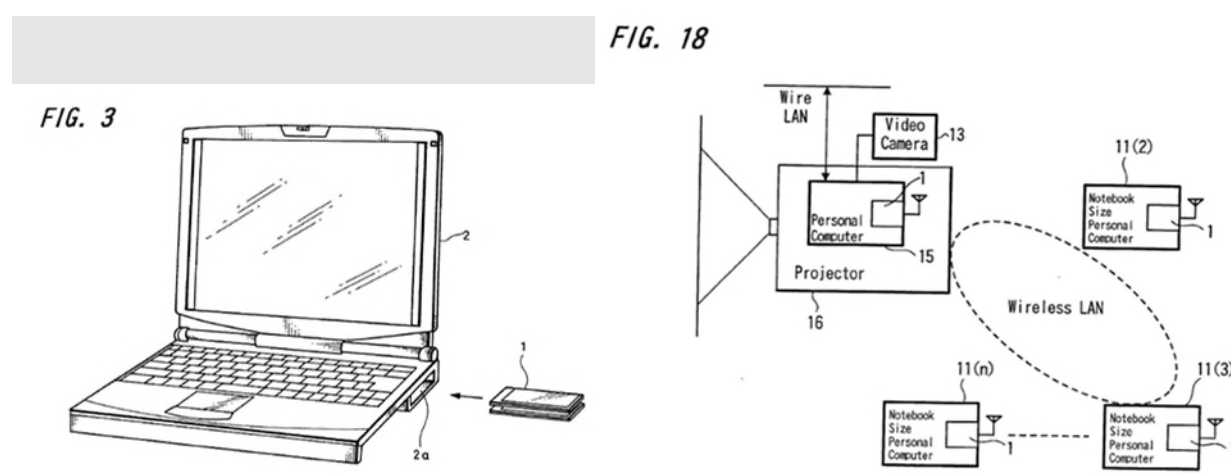
projector 130 for projection 145 by a presenter 150. (Ex-1033, ¶133.) Screen scraping was used to capture display data that was transmitted to the projector. (Ex-1033, ¶¶12-14.) The '002 patent borrows this same screen scraping technique from Slobodin. (See Ex-1001, 14:4-8.)



(Ex-1033, FIG. 1.)

42. As wireless networking technology progressed, focus shifted to making the tools more user-friendly and pluralistic. For example, efforts focused on making it easier for multiple users to establish network connections to implement wireless communication for image sharing. (See, e.g., Ex-1034, ¶¶1-8.) For example, U.S. Patent Application Publication No. 2002/0174254 (“Kita”) (Ex-1034) describes a

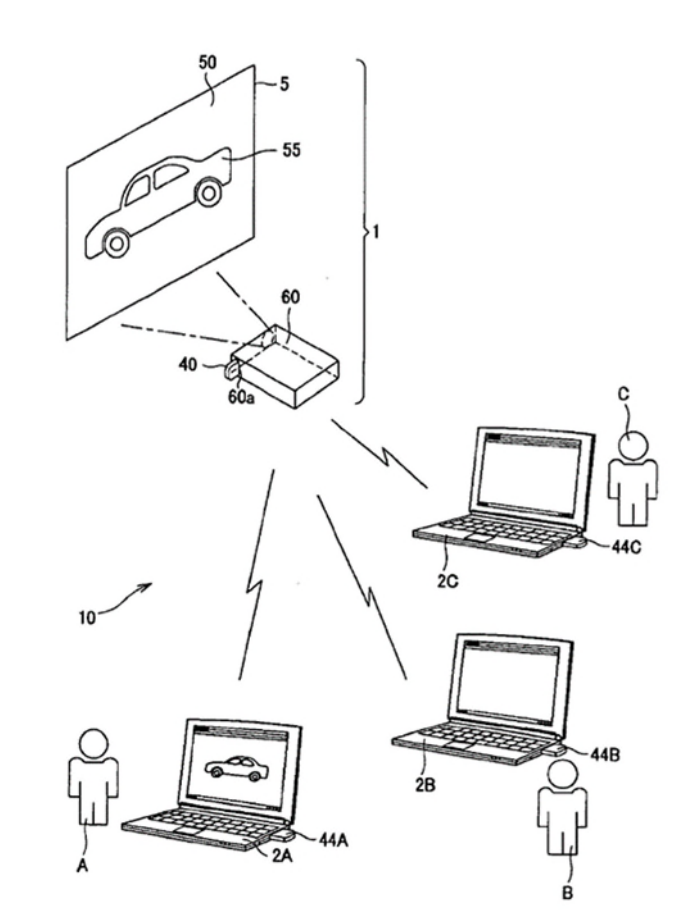
system in which network interface cards were preconfigured to connect to a wireless LAN, such that multiple computers 11 could be wirelessly connected to a projector 16 by merely inserting one of these interface cards 11 without participants needing to configure a network connection. (See, e.g., Ex-1034, ¶¶14-17 and FIGS. 3 and 18, reproduced below.)



(Ex-1034, FIGs. 3 and 18.)

43. During the 2000s, wireless technology shifted from wireless LAN cards, as described by Kita, to the increasingly more ubiquitous Universal Bus Standard (USB) standard. A range of plug-and-play USB-type devices emerged for sharing both image and audio. For example, U.S. Patent Application Publication No. 2005/0210390 (“Ono”) proposed the use of USB-type “communication modules” to wirelessly connected an image projector with multiple “information terminal apparatuses,” depicted below as laptop personal computers. (Ex-1005, ¶¶36-39.) The communications modules plug into a USB port of the information

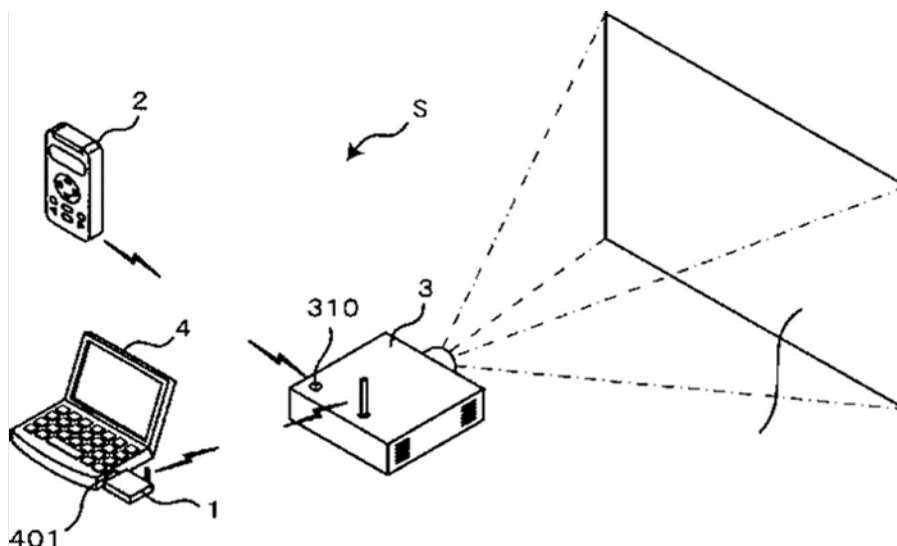
terminal apparatuses and wirelessly transmit images via a wireless network from the laptop display to a corresponding wireless connection module coupled to the image projector. (Ex-1005, ¶¶36-39, 54.)



(Ex-1005, FIG. 1.)

44. Around the same timeframe, Japanese Patent Application Publication No. 2008-165007 (“Uchida”) (Ex-1009) described a similar image projection system. Uchida describes a personal computer device 4 wirelessly connected to an image projection device 3 (*e.g.*, a projector) via a wireless device 1. (*See, e.g.*, Ex-1009, ¶39 and FIG. 1, reproduced below.) The wireless device 1 is described as a

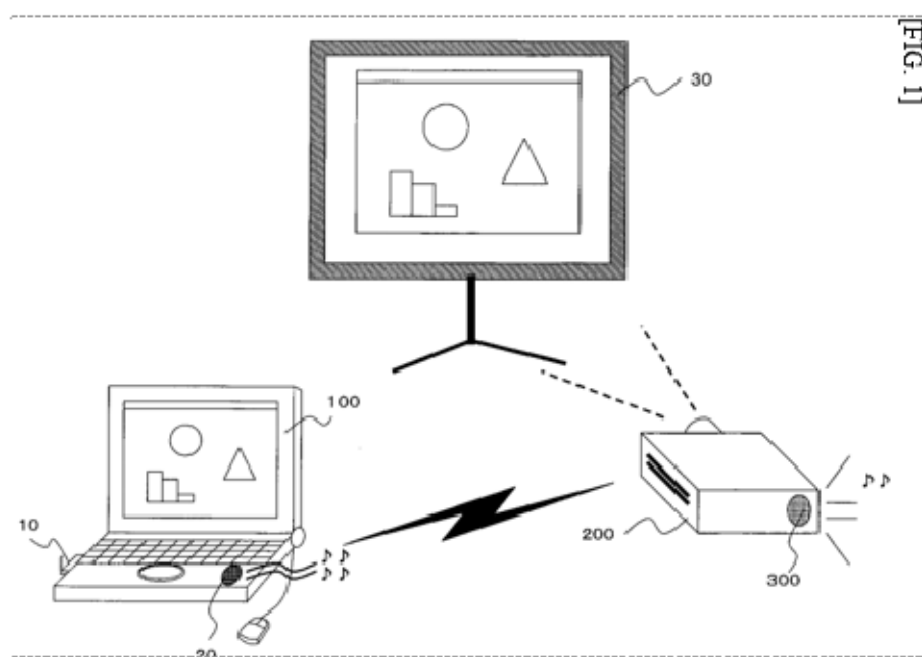
USB dongle. (Ex-1009, ¶39.) The wireless device 1 is connected to the computer 4 and transmitted image data from the computer 4 to the image projection device 3 for display. Wireless setting information is automatically provided without requiring a user to enter this information—thereby making it more convenient for the user to make use of the tool. (Ex-1009, ¶¶41-44.)



(Ex-1009, FIG. 1.)

45. Likewise, Japanese Patent Application Publication No. 2007-208606 (“Maeda”) disclosed using a PC as an image generation device to generate images and audio, to be transmitted to a projector using a wireless local area network (LAN). (Ex-1031, ¶15.) In operation, the “screen displayed on the display of PC 100 is transmitted from PC 100 to projector 200 and the screen received by projector 200 is projected onto a screen 30. A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio

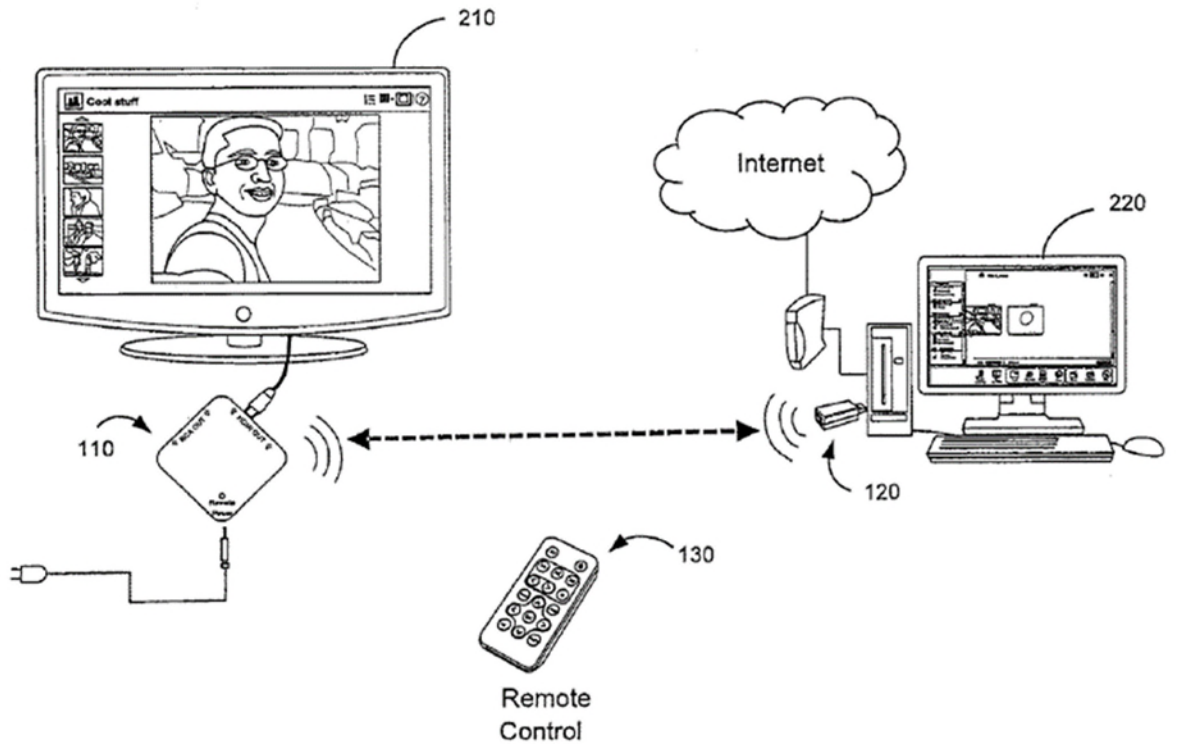
signals to projector 200 via the wireless LAN.” (Ex-1031, ¶17.) I discuss Maeda in greater detail below.



(Ex-1031, FIG. 1)

46. Near the end of the 2000s, the availability of greater wireless bandwidth led to greater amounts of media content being streamed wirelessly to different devices. For example, U.S. Patent Application Publication No. 2010/0295994 (“Kaplan”) (Ex-1027) describes a communications system in which a computer 220 is wirelessly connected to a display device 210 via a USB transmitter 120. (See, e.g., Ex-1027, ¶¶16-18 and FIG. 2, reproduced below.) The transmitter is pre-paired with a receiver 110 connected to the display device 210, such that a user does not need to

configure the wireless connection. I discuss Kaplan in greater detail below in Ground 1.



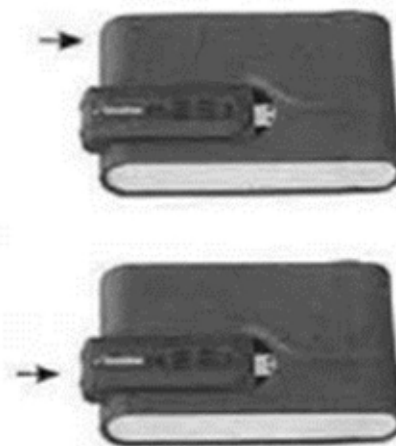
(Ex-1027, FIG. 1.)

47. Around the same time, several commercial products were available that employed similar USB dongles for wireless communication between a personal computer and a projector or other display. One example was sold by Imation from at least during 2008 (Ex-1050 (Imation), p. 8.) The Imation system included a USB transmitter dongle that plugged into a personal computer and allowed communication with a base unit that was connected to a projector or monitor. (See image below reproduced from Ex-1050 (Imation), p. 2.) Imation's system adaptable

for use at a conference or meeting with multiple wireless adapters able to communicate with the same projector/monitor (Ex-1050(Imation), p. 6 “Associate a New Dongle to the WPL Base Unit”).)

1. Projector Receiver
(base unit)

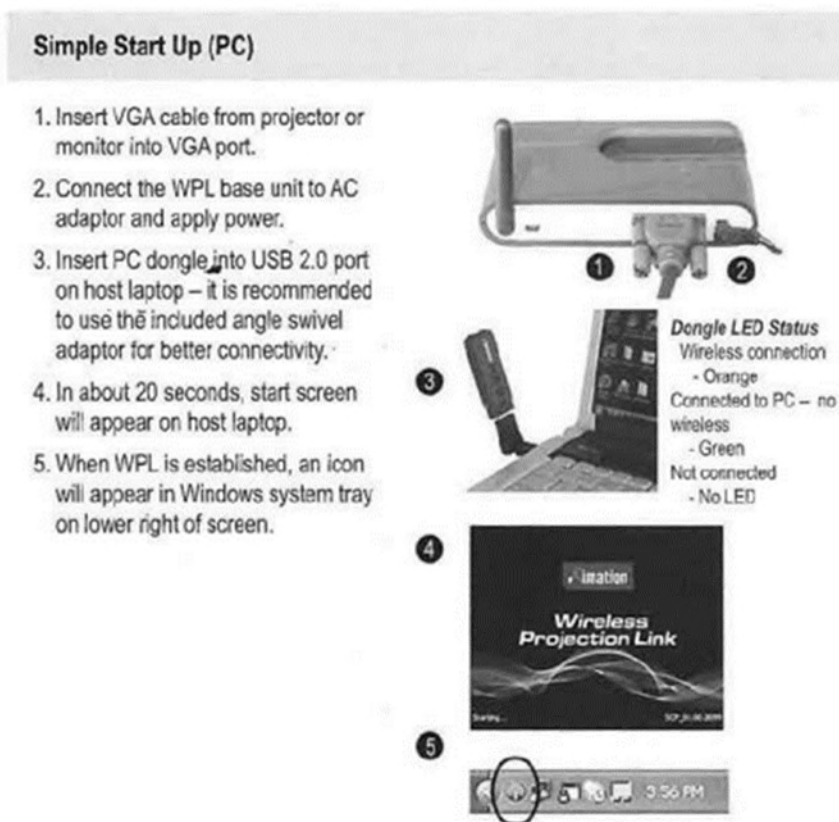
2. USB Transmitter Dongle
(nested on top of base unit)



(Ex-1050, p. 6.)

48. The Imation system had a simple startup that only required attaching the base unit to the projector/display and to power and inserting the USB transmitter dongle into the personal computer. After only about 20 seconds, a start screen appeared that allowed transferring an image from the computer to be displayed on the projector/monitor. (See image reproduced below from Ex-1050 (Imation), p. 2 “Simple Start UP (PC)”.) Since no other installation steps were indicated, pre-installed generic drivers and generic communication protocols of the computer’s operating system most likely allowed setup of the USB transmitter dongle and communication between the PC and dongle. Although an optional special driver

was available, this driver was not necessary for operation (Ex-1050(Imation),
“Installing DisplayLink™ Driver (PC)”.)



(Ex-1050, p. 2.)

49. Another wireless adapter system was sold under the EZAir brand from around 2010 (Ex-1051 (EZAir), p. 1.) According to promotional materials for the EZAir, “[t]he products operate via a Plug&Play USB dongle that plugs into a USB port available in any PC/Laptop and an adapter that connects to the target device (such as flat TV, speaker system or PC peripherals).” (Ex-1051 (EZAir), p. 2.) The adapter was also marketed for use in small business and education where multiple

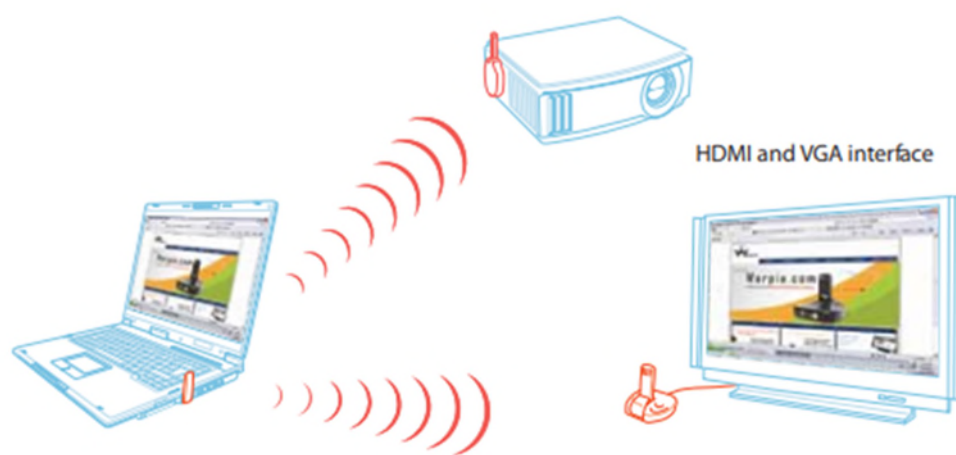
participants commonly need to interact with the same projector/display (Ex-1051 (EZAir), p 2.) An image from the EZAir marketing material (Ex-1051 (EZAir)) illustrates the Plug&Play USB dongle transmitting image and audio data wirelessly to the adapter connected to a television. The image of an undersea scene from the laptop connected to the dongle is reproduced on the television.



(Ex-1051, p. 1.)

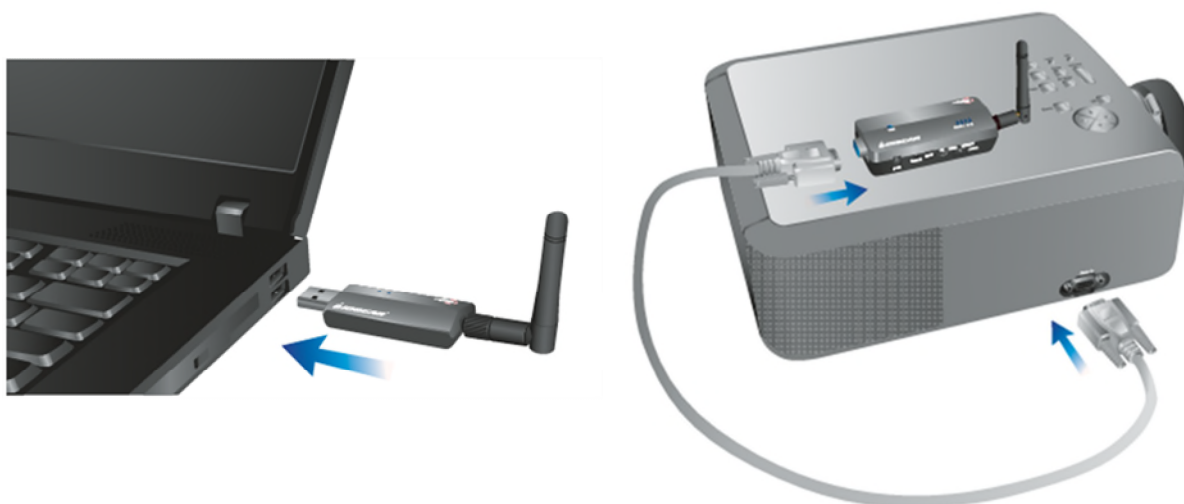
50. Wireless adapters with a similar form factor were also sold under the Warpia (Ex-1052 (Warpia) and Q-Waves (Ex-1053 (Q-Waves)) brands. According to marketing materials from 2009, the Warpia system allowed wireless connectivity from a notebook or PC to displays, such as projectors, TVs, and monitors (Ex-1052 (Warpia), p. 1, “Key Features,” “Overview”.) The Warpia system included pre-associated (*i.e.*, pre-paired) adapters that provided audio and video communication to the display (Ex-1052 (Warpia), p. 1, “Key Features”.) The system was easy and

quick to set up. (Ex-1052 (Warpia), p. 1, “Key Features”.) An image from the Warpia marketing material (Ex-1052 (Warpia)) is shown below, illustrating image transfer from a PC Adapter connected to a laptop computer to A/V Adapters connected to a projector and a television. The PC Adapter was able to connect to a USB port, which was common to all notebooks & PCs at the time, and the A/V Adapter connected to an HDMI port or VGA port of a display device. (Ex-1052 (Warpia), p.1 “Overview”.)



(Ex-1052, p. 1.)

51. IOGEAR sold another wireless media communication kit from at least 2008 (Ex-1054 (IOGEAR), p.44 (copyright date).) The kit included a wireless USB host adapter that plugged into a computer from which media was transmitted wirelessly to a wireless VGA adapter connected to a projector or other display. (See images below reproduced from Ex-1054 (IOGEAR), pp.13,16.)



(Ex-1054, pp.13 (left – wireless host adapter), 16 (right – wireless VGA adapter).)

52. The IOGEAR product anticipated that the host computer operating system would have included pre-installed USB drivers that allowed the USB host adapter to be set up automatically. For instance, IOGEAR indicated that one can “[p]lug the Wireless USB Host Adapter to your computer via option 1 or 2. Windows will detect the device and complete the driver installation process automatically.” (Ex-1054 (IOGEAR), p. 13.) The wireless USB host adapter and wireless VGA adapter were pre-associated (or pre-paired) to improve ease of use, such that no network configuration needs to be entered by a user. (Ex-1054 (IOGEAR), p. 40.) The IOGEAR kit was also adaptable for use by multiple participants in a meeting. For example, additional wireless USB host adapters could be paired with the same wireless VGA adapter (Ex-1054, p. 28.) A “HOST” button on the wireless VGA adapter could then be used to switch between which wireless USB host adapter was

transferring data to the VGA adapter for display. (See Ex-1054 (IOGEAR), p. 28, “Wireless USB Host Adapter Selection” reproduced below.)



(Ex-1054, p. 28.)

53. It is apparent from the example prior art patent and product literature discussed above that content sharing techniques were well-established by the time of the invention. I have discussed several examples of techniques to transfer image data from a computer to a display routed through a wireless USB dongle or similar set of devices, so that data from the computer display can be presented on another display. The USB technology of these various products utilized standardized USB drivers and communication protocols available to allow a plug-and-play experience. (See, e.g., Ex-1050 (Imation), p. 2 “Simple Start Up (PC)”.)

VI. OVERVIEW OF THE '002 PATENT

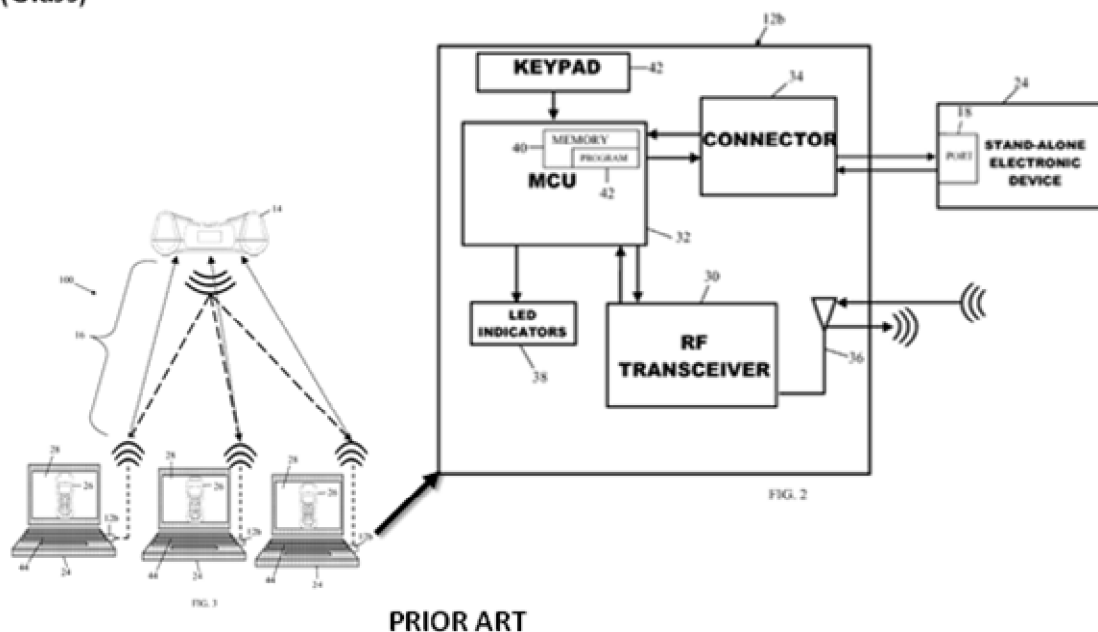
A. Prior Art Techniques Acknowledged by the '002 Patent

54. The '002 patent is directed to electronic tools for meetings, including methods or devices for use in displaying media content. (Ex-1001, 1:4-9; *see also id.*, 5:61-6:17, 17:28-21:23.) In this vein, the '002 patent recognizes a recent “explosion of communication electronic communication tools” allowing ad hoc communication, such as “synchronous and asynchronous conferencing, online chat, Instant Messaging, audio conferencing, videoconferencing, data conferencing, application sharing, remote desktop sharing, electronic meeting systems, collaborative management (coordination) tools, project management systems, knowledge management systems, and social software systems.” (Ex-1001, 1:15-27.) The '002 patent contends that “despite the plethora of electronic aids to meetings, fundamental problems in handling meetings have not been solved.” (Ex-1001, 2:12-16.)

55. The '002 patent acknowledges the known desirability for tools allowing greater participation in a meeting and tools addressing that need, such as the audience response system described in US 2010/0087139 (Ex-1020 (“Glass”)). (Ex-1001, 2:18-35.) The approach taken by Glass uses a USB dongle to effectively turn an electronic device into an audience participation device. (Ex-1020, abstract.) As illustrated below, an embodiment of the Glass system includes linkable response

units 12b coupled by a connector (e.g., a USB plug) to a port in electronic devices 24 (e.g., a laptops). (See, e.g., Ex-1020, ¶¶18, 30.) Linkable response unit 12b wirelessly transfers information via a wireless transceiver 30 to a base station 14, which in turn may be displayed on a screen. (See, e.g., Ex-1020, ¶¶13, 20.) Linkable response unit 12b may also include a keypad/buttons 46 to trigger transmission of the information. (Ex-1020, ¶33.) A program 42 stored on response unit 12b enables communication between the various devices. (Ex-1020, ¶¶21, 24-26.)

Ex. 1020 (Glass)

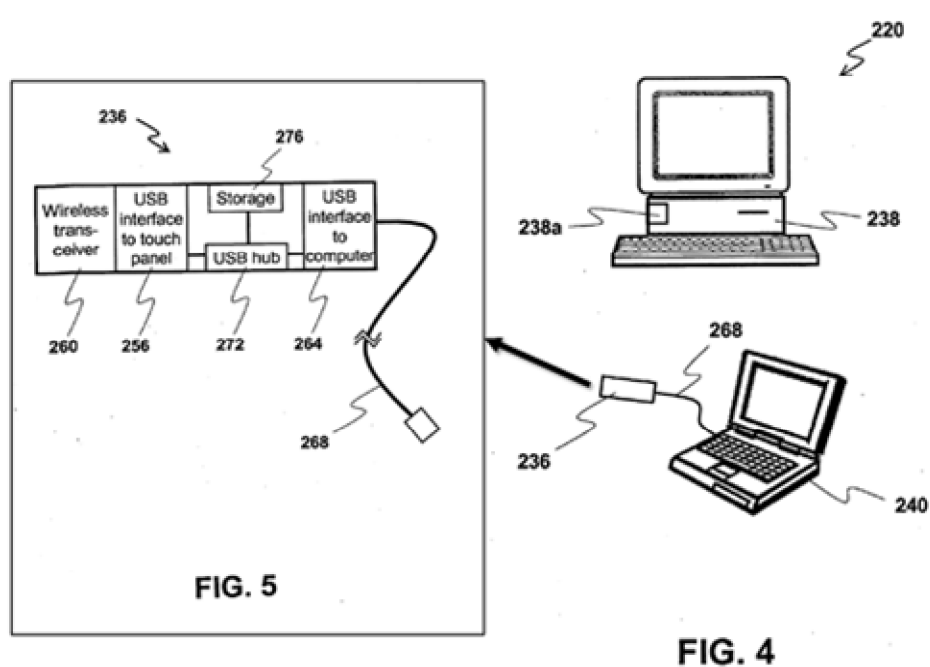


(Ex-1020, FIGs. 2, 3.)

56. The '002 patent also recognizes three common techniques for transferring content of a computer to a projector. (Ex-1001, 3:3-15.) According to the '002 patent, “[t]he most common ways are to use a cable that connects the display

adapter of the graphics card to the video input of the projector [method 1] or to use a software that captures the display contents and sends it over a wired or wireless network to a remote base unit connected to the projector [method 2].” (*Id.*, 3:3-9.) A known alternative to these techniques was “to use a special device connected to the display adapter of the graphics card that captures, encodes and streams the display content over a wired or wireless network [method 3].” (*Id.*, 3:12-15.)

57. As examples of prior art techniques, the '002 patent identifies US Patent Application Publication No. 2009/0198839 (Ex-1021 (“Banerjee”)) and US Patent Application Publication No. 2011/0115689 (Ex-1022 (“Sugiyama”). (*Id.*, 3:65-4:5.) The '002 patent admits that these publications describe the use of the “well-known USB interface of the computer for extracting the display content of the computer” and transferring to a projector. (*Id.*) Indeed, Banerjee describes, according to one embodiment illustrated in Figures 4 and 5 (below), a plug-and-play device 236 that physically connects to remote computer 240 and communicates with the master computer 238 over a wireless communications link. (Ex-1021, ¶39.) In this embodiment, “plug-and-play device 236 captures and compresses screen display data generated at the remote computer 240 and allows screen sharing between the remote computer 240 and the master computer 238 by automatically launching software stored on the plug-and-play device 236.” (*Id.*)



(Ex-1021, FIGs. 4, 5.)

58. Although Figure 4 of Banerjee shows a master computer 238 communicating with a single remote computer 240, Banerjee contemplates that communication can be made to multiple remote computers via respective plug-and-play devices. (Ex-1021, ¶52.) Additionally, the master computer 238 may act as a node for transfer of the screen display data to a projection device 244 for display. (Ex-1021, ¶54.)

B. The Purported Invention

59. The '002 patent purports to improve problems associated with previous meeting technologies such as the “high demands of technical expertise” and “barriers to the use of complicated technology” and the “lack of, or restriction of

participation by members of the meeting.” (Ex-1001, 4:40-53.) Yet, the claims of ’002 patent are simply directed to electronic meeting tools that wirelessly communicate media content between an electronic device and a display via a peripheral device and base node—much like the acknowledged prior art discussed in the previous subsection. (*See id.*, 3:65-4:9, 33:41-36:29; Section VI.A.)

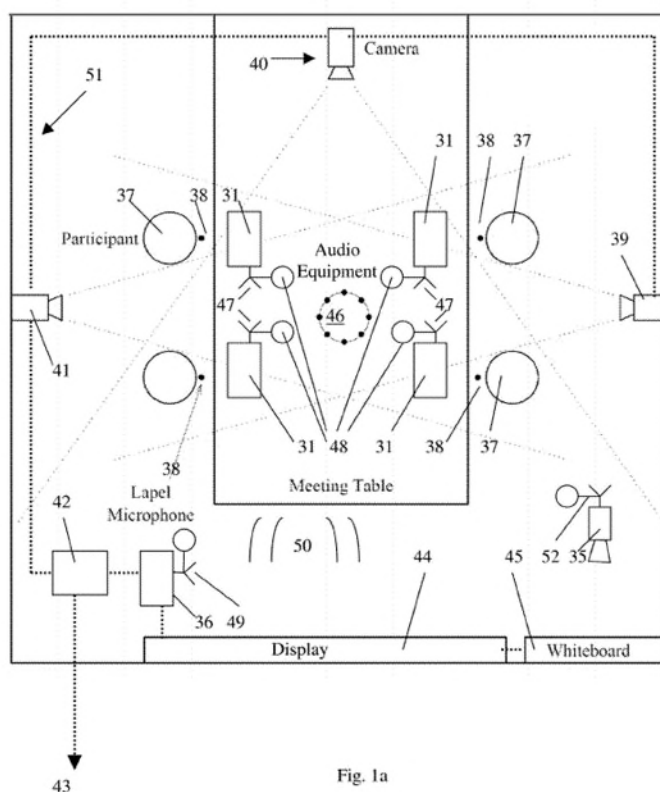


Fig. 1a

(Ex-1001, FIG. 1a)

60. Although described as an alternative method, the '002 patent fails to explain any concrete distinction between these prior art methods. Instead, the '002 patent asserts that the prior art method “usually requires special drivers and even

special hardware.” (*Id.*, 4:5-6.) However, this statement seems to acknowledge that at least some prior art USB-based content sharing methods did not require special drivers and hardware. The content sharing described in the '002 patent employs, for example, plug-and-play devices such as a wireless USB dongle. (*Id.* at 17:67-18:3, 20:21-37.)

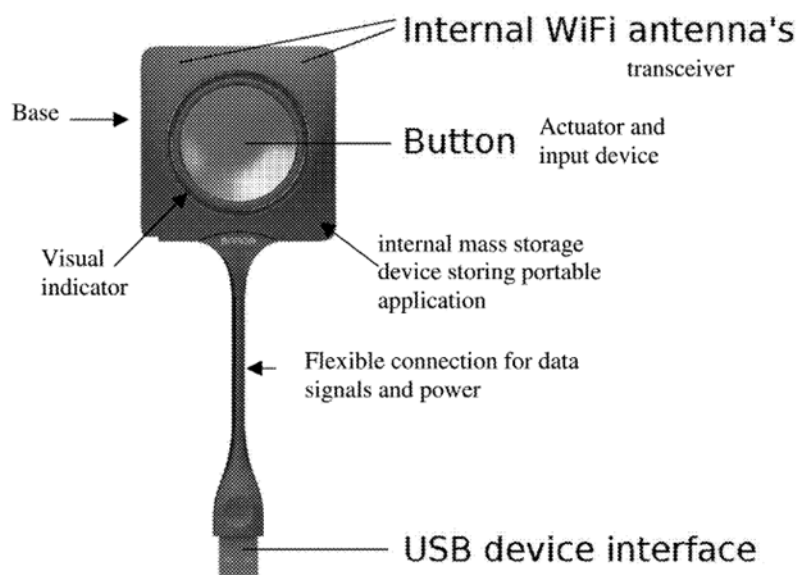


Fig. 10

(Ex-1001, FIG. 10.)

61. Notably, the examiner stated the reason for allowance was that “routing audio data between the processing device and communication ... to a base node.” (Ex-1004, 601-06 (emphasis removed).) However, routing audio data from a processing device to a wireless transceiver and from the wireless transceiver of the

peripheral device to a base node was well known in the art. (Ex-1026, ¶¶3, 10). But the challenged claims are therefore not meaningfully different from these prior art wireless networking techniques, including, for instance, the methods and systems described in Kaplan, Maeda, Deforche, and others discussed here. As I discuss above and in further detail below, all features recited in the challenged claims were already known.

C. Prosecution History

62. I have reviewed the prosecution history and noted that the examiner rejected the initial claims examined under pre-AIA 35 U.S.C. § 102. (Ex-1004, 1423-28.)¹ In response, Patent Owner amended the independent claims multiple times until the examiner issued a Notice of Allowance, specifically, in regard to Patent Owner's added limitations, in relevant part, of: (1) "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node", and (2) "wherein the peripheral device comprises an audio adapter." (Ex-1004, 601-06, 850-54 (underline in original).) The examiner stated the reason for allowance was that the "routing audio data between the processing device and communication... to a base

¹ Various dependent claims were rejected based on 35 U.S.C. § 103(a). (See Ex-1004, 1429-30.)

node; ... Wherein the peripheral device comprises an audio output device.” [sic] in combination with the corresponding claimed structure is not taught by the cited prior art on record.” (Ex-1004, 601-06 (underline in original).)

63. Thereafter, Patent Owner amended its claims to remove the “wherein the peripheral device comprises an audio output adapter.” (Ex-1004, 571-75.) However, through this, and other amendments after the examiner’s initial Notice of Allowance, Patent Owner did not alter the substance of routing audio data from a processing device “to a base node” (Patent Owner, instead, only changed the requirement that the audio data be routed from “between the processing device and the communications network ... to a base node” to audio data be routed “from the processing device to the wireless transceiver ... [and] from the wireless transceiver of the peripheral device to a base node”). (Ex-1004, 571-75, 542-47.) The examiner again allowed the claims based on this language.² (Ex-1004, 340-41.)

64. However, as I discuss above and further herein, routing audio data from a processing device to a wireless transceiver and from the wireless transceiver of the peripheral device to a base node was well known in the art. (See Sections IV, VII-

² The examiner issued a rejection prior to the second notice of allowance, but which only addressed a minor 35 U.S.C. § 112 issue. (Ex-1004, 476–78.)

VIII.) Further, the examiner did not discuss on the record the prior art nor grounds asserted in this petition. The prior art discussed by the examiner focused on different problems in the art than the '002 patent and does not discuss external peripheral devices physically connected to a processing device for transferring media between the processing device and a wireless communications network.

VII. CLAIM CONSTRUCTION

65. I understand that claim terms are typically given their ordinary and customary meanings, as would have been understood by a POSITA at the time of the alleged invention, which, as I explained above, I have been asked to assume is around September 14, 2011.

66. In considering the meaning of the claims, however, I understand that one must consider the language of the claims, the specification, and the prosecution history of record. In general, I have been asked to consider the claim terms under their plain and ordinary meanings and thus considered the claims, specification, and prosecution history for the '002 patent in doing so in support of my opinions concerning the '002 patent and the prior art discussed herein.

67. However, I have also been asked to consider the following descriptions for the terms below. Where the terms appear in the claims, I have read the terms in light of their corresponding descriptions from the '002 patent in so far it was

necessary to apply them to the prior art. I have accounted for these descriptions in forming my opinions whether or not I have specifically addressed those descriptions in further detail in the following sections.

68. Further, I understand the claim construction process has not yet begun in the EDTX case, and thus Patent Owner has not provided a position on the various “means” recited in the challenged claims. I understand some of the terms below presumably invoke 35 U.S.C. § 112(f) (“§ 112(f)”), i.e., is a “means-plus-function” limitation, because each “means” limitation does not recite sufficient structure for performing the recited function in the claims. I understand the Petitioner is obligated to identify the “specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function” for any limitations that invoke § 112(f).

69. As set forth below, whether construed as a means-plus function limitation or not, the limitations requiring “means for”, or similar language invoking means plus, captures at least the expressly described structure associated with the claimed function and equivalents. But even if these limitations were found to not evoke § 112(f), the claimed “means” must be construed broadly enough to capture the specifically disclosed examples and equivalents. Thus, my understanding of the

terms, as described in the specification, and the analysis herein also applies to any term regardless of the analysis under § 112(f).

A. “couple” / “coupling” (claims 1, 11, 21)

70. The '002 patent states that:

the term “coupled”, also used in the description or claims, should not be interpreted as being restricted to direct connections only. Thus, the scope of the expression “a device A coupled to a device B” should not be limited to devices or systems wherein an output of device A is directly connected to an input of device B. It means that there exists a path between an output of A and an input of B which may be a path including other devices or means. (Ex-1001, 15:44-52.)

B. “wireless” (claims 1, 11)

71. The '002 patent states that:

[a] “wireless communication network” can be any network that does not use cable links between nodes, e.g. uses RF, optical or InfraRed for communication purposes, such as IrDA, diffuse infra-red, WLAN, WiMax, WiFi, WiFi Direct, Bluetooth or any other wireless communication network known to the person skilled in the art. (*Id.*, 14:14-19.)

C. “pre-installed generic driver” (claims 1-3, 11, 21)

72. The '002 patent states that:

[t]he term “pre-installed generic driver” is intended to mean a driver which is installed on a processing device such as a computer as a standard driver, e.g. is installed with the installation of the operating system. Such a driver is standard for the operating system and can drive a standard class of peripheral devices coupled to or connected to the processing device. The installation of a specific driver for such a peripheral device is not required. Such a generic driver can be a human interface driver (HID) or a mass storage device driver, which has predetermined software components configured for driving mass storage, a CD-ROM, a keyboard etc. or combinations of these. Such devices can be readable and writable computer peripheral memory devices such as USB memory sticks, flash memories, external hard drives, or more. (*Id.*, 14:32-46.)

D. “pre-installed generic audio driver” (claims 1, 11)

73. This limitation is similar to the “*pre-installed generic driver*”; however, this limitation is specific to audio hardware as opposed to other hardware, such as human-interface devices. (*See id.*, 14:32-46, 30:38-43.)

E. “means of a first pre-installed generic audio driver of the operating system” (claims 1, 11)

74. This limitation is similar to the “*pre-installed generic driver*.” The structure of the limitation is the software used to allow software to communicate with audio hardware. (*See id.*, 14:32-46, 30:38-43.)

F. “means of a second pre-installed generic driver of the operating system” (claims 1, 11)

75. This limitation is similar to the “*pre-installed generic driver.*” The structure of the limitation is the software used to allow software to communicate with hardware. (*Id.*, 14:32-46.)

G. “means for coupling” (claim 11)

76. The term “*means for coupling*” presumably invokes means-plus-function language and encompasses at least a connector of the external peripheral device that physically connects to a port of the processing device. The “means for coupling” appears to relate to the following passages in the specification:

An external peripheral device compris[es] a connector adapted to couple to a port of a user processing device 31. (Ex-1001, 18:6-7; *see also id.*, Abstract, 6:6-8.)

The coupling can be by a plug and play interface such as a USB interface that has generic drivers installed on the processing device. For example the peripheral device 32 can be physically inserted into a USB port on the processing device 31. (Ex-1001, 31:45-50.)

H. “means for audio communication between the peripheral device and the processing device” (claim 1, 11, 21)

“a means for data communication between the peripheral device and the processing device” (claims 1, 11)

77. The term “*means for audio communication*” and “*means for data communication*” presumably invokes means-plus-function language and refers to the structure of an interface using the “*generic communications protocol*” of claim 11. The “means for audio communication” and “means for data communication” appears to relate to the following passages in the specification:

[O]ne of the pre-installed generic drivers of the operating system on the relevant computer 31, 36 is exploited for setting up communication from the computer device 31, 36 to the network 50 via the connection unit 47 (optionally 49)...the connection unit 47, (optionally 49) operated as a peripheral device communicates with the relevant processing device 31, 36 by using a generic communication protocol provided by the pre-installed generic driver. (Ex-1001, 19:50-20:12.)

I. “means for setting up... a means for audio communication between the peripheral device and the processing device and ... a means for data communication between the peripheral device and the processing device” (claim 11)

“a first software code portion for setting up ... a means for audio communication between the peripheral device and the processing device” (claim 21)

78. The term “*means for setting up*” presumably invokes means-plus-function language. However, claim 11 also states that the means for accomplishing the setup, *i.e.*, “by means of a first pre-installed generic audio driver of the operating system” and “by means of a second pre-installed generic driver of the operating

system.” Thus, it would appear that no further structure is required to perform the setting up.

79. The phrase “*a first software code portion for setting up*” recites a nonce word followed by a function. However, similar to the phrase, “*means for setting up*” of claim 11, claim 21 also recites structure to perform that function, *i.e.*, “*means of a first pre-installed generic driver.*” Thus, no further structure is required.

J. “means for routing” (claim 11)

“a third software code portion for routing audio data from the processing device to the peripheral device via the connection and the means for audio communication and for routing the audio data from the peripheral device to the base node over the communications network, wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device” (claim 21)

80. The term “*means for routing*” presumably invokes means-plus-function language and, to the extent any structure can be identified as corresponding to the routing function, appears to refer to at least one channel of the “communications network” of claim 11. The “*means for routing*” appears to relate to the following passages in the specification:

Having been routed over a communications network to the base unit 33, the incoming stream is read from the communications interface (Ex-1001, 32:50-52; *see also id.*, 29:30-55 (“there is at least one channel from the peripheral device to the base node”).)

81. Although the phrase, “*third software code portion for routing*,” does not use the term “means,” it nevertheless could constitute means-plus-function language. However, claim 21 also recites structure to perform that function, *i.e.*, “*wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device.*” Thus, no further structure is required. Therefore, for purposes of this petition, the structure for this term is software for performing the *routing* function.

K. “a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device” (claim 21)

82. Although the phrase, “*second software code portion for connecting*,” does not use the term “means,” it nevertheless constitutes means-plus-function language. “Software code” is simply a generic description for software that performs a specified function and tantamount to using the word “means” because it “typically do not connote sufficiently definite structure.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1350 (Fed. Cir. 2015) (*en banc*). However, for purposes of this petition, the structure for this term is software for performing the *connecting* function.

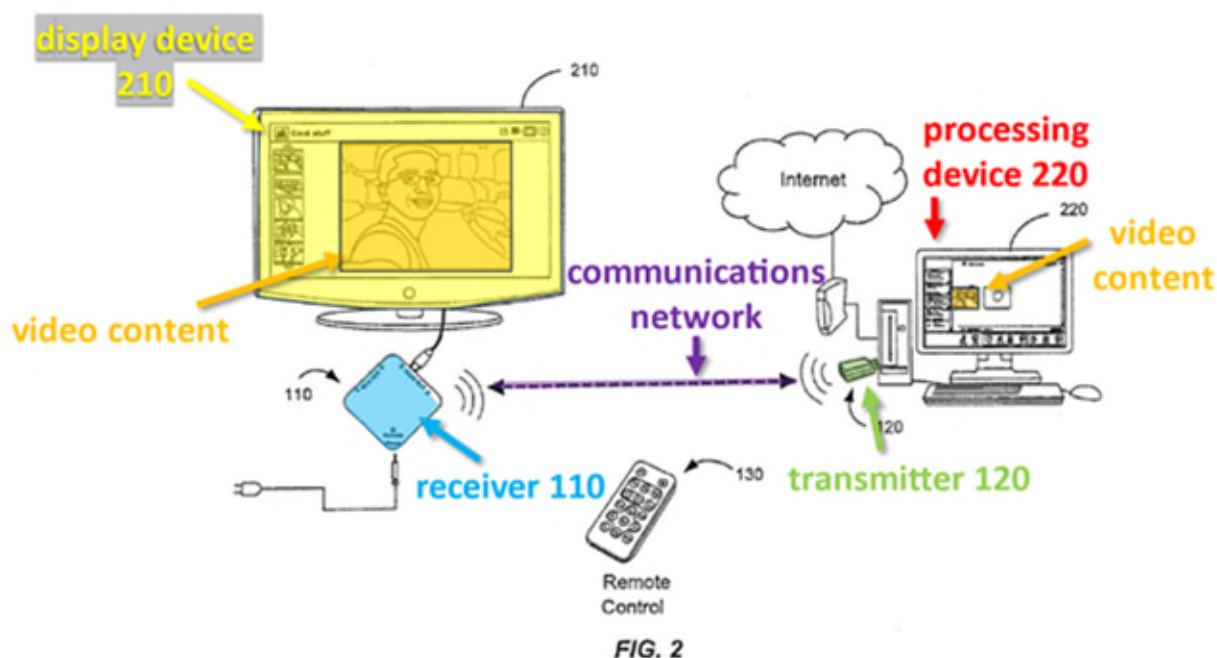
83. I understand that no terms of the ’237 patent have been construed by a court at this point.

VIII. OVERVIEW OF THE PRIOR ART

A. Kaplan (Ex-1027)

84. Like the '002 patent, Kaplan discloses methods for transmitting video content between a computing device and display device. (Ex-1027, abstract). In particular, Kaplan recognized the problem that setting up wireless network configurations was a “complicated process that many users find difficult and frustrating.” (*Id.*, ¶3.) In fact, Kaplan discloses that the difficulty in setting up and operating 802.11-based networks was a contributing factor to the high level of customer returns of wireless networking equipment. (*See id.*) In that regard, Kaplan’s methods sought to “provide a user with the ability to conveniently view video footage ... without having to perform any wireless network setup procedure.” (*Id.*, ¶9.)

85. Kaplan, therefore, describes a communications system 100 in which a computer 220 is wirelessly connected to a display device 210 via a USB transmitter 120. (*See, e.g.*, Ex-1027, ¶¶16-18 and FIG. 2, reproduced below.) The transmitter 120 is pre-paired with a receiver 110 which is connected to the display device 210, such that a user does not need to configure the wireless connection. (Ex-1027, ¶18). In this system, “the user may select a video to be played and the selected video footage may be transmitted from the computer 220 through the transmitter 120 to the receiver 110 and then displayed on the display device 210.” (Ex-1027, ¶28).



(Ex-1027, FIG. 1.)

86. The method disclosed by Kaplan provided numerous benefits, including: “(1) no cables between the TV and the computer, (2) no need for wireless network setup or configuration by the user; (3) no complex software installation or online setup; (4) no long delays, video download, or general ‘wait time;’ and/or (5) completely secure (e.g., no one else can view personal videos).” (Ex-1027, ¶40).

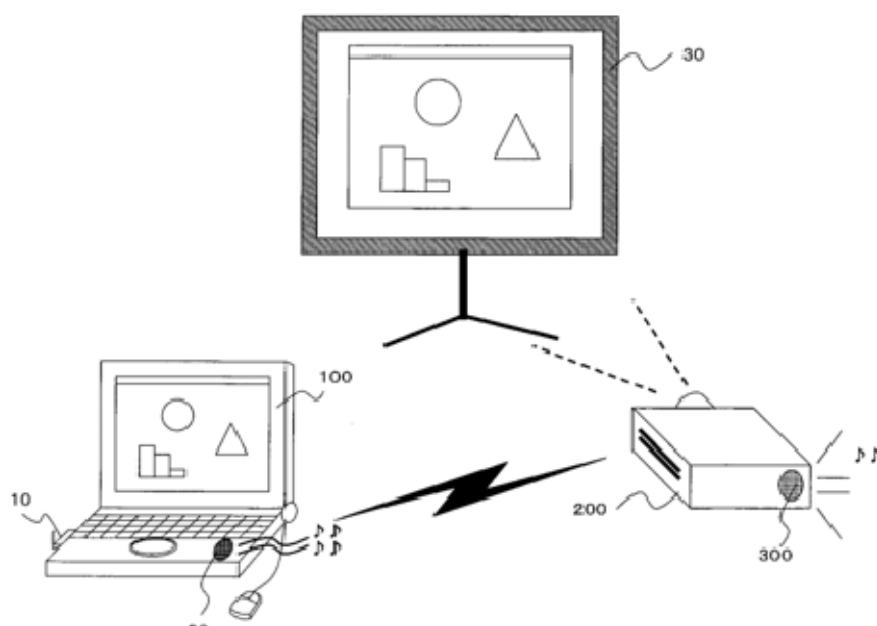
B. Maeda (Ex-1031³)

87. Like the '002 patent, Maeda recognized the issues regarding a physical connection between the computing device and a projector, such as it being a “time-consuming process” and having “to reconnect the PC and projector each time” you want to switch to a new user.” (Ex-1031, ¶3.) Maeda also recognized that “wireless image transmission systems have been proposed” to “improve the usability of projectors.” (Ex-1031, ¶4). To demonstrate, Maeda discussed prior systems for wireless image transmission, including a transmission system (as FIG. 12 of Maeda) that has multiple PCs as image generation devices and a projector and screen for displaying projected images from the PCs, where each PC and the projector is provided with a wireless communications module for wireless connection to each other. (Ex-1031, ¶6.)

88. The system of Maeda, thereafter, discloses using a PC as an image generation device to generate images and audio, to be transmitted to a projector using a wireless local area network (LAN). (Ex-1031, ¶15.) In operation, the “screen

³ This is the English Translation (Ex-1031) to JP Patent Application Publication No. 2008-165007 (Ex-1055). All citations are to the English Translation (Ex-1031). Ex-1056 is the corresponding certificate of certified translation.

displayed on the display of PC 100 is transmitted from PC 100 to projector 200 and the screen received by projector 200 is projected onto a screen 30. A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN.” (Ex-1031, ¶17.)



(Ex-1031, FIG. 1)

C. Ahmed (Ex-1014)

89. Like the '002 patent, Ahmed's disclosure is directed to a system and method for the wireless, real-time transmission of data from a source to a monitor and the automatic configuration of a wireless device. (Ex-1014, abstract.) Ahmed discloses a computing device 101 (such as a PC) which communicates through a wireless network 102 to a remote monitor 103 (such as a TV) using a “processing

system on a chip capable of wirelessly transmitting and receiving graphics, [and] audio” and which may be “incorporated into a standalone device that is in wired communication with the remote monitor 103 or computing device 101.” (Ex-1014, 7:6-22.)

90. Ahmed further discloses a software module 301 captures media in real time while it is playing on the computing device and temporarily stores it in the buffer before compressing it and preparing it for transmission. (Ex-1014, 8:18-22.) Thereafter, a receiver 400, comprising a transceiver 401, a display device 403 for rendering the video media and an audio device 404 for rendering the audio data, receives the transmitted video and audio media. (Ex-1014, 8:24-29.) The system preferably uses a hybrid TCP/UDP transmission protocol to separately transmit the video and audio data, although the data can be sent in a single data stream. (Ex-1014, 19:16-19.)

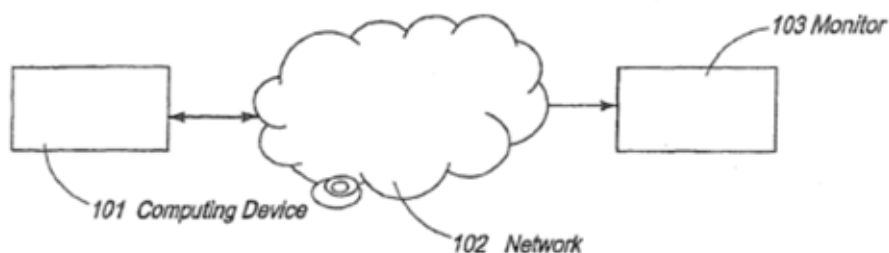


FIG. 1

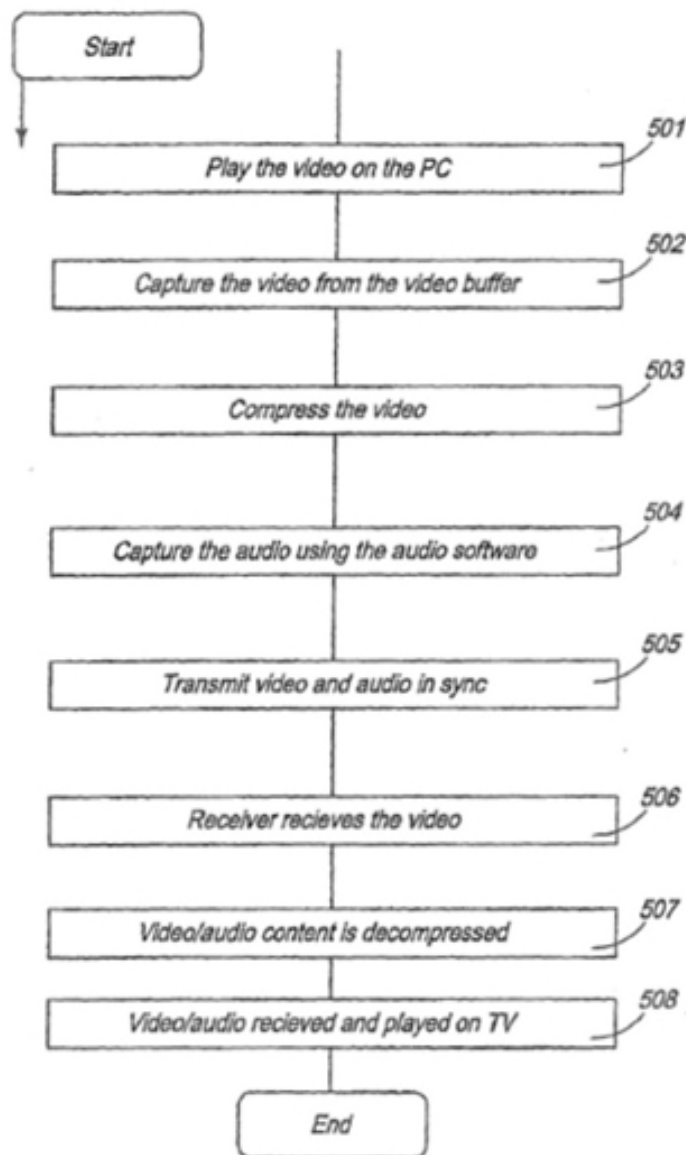


FIG. 5

(Ex-1014, FIGs. 1, 5)

D. Deforche (Ex-1030)

91. Similar to the '002 patent, Deforche discloses a method of connecting a host computer to a wireless communication network by means of “at least one pre-

installed generic driver providing a generic communications protocol (7) for communication between the host computer device and a standard class of computer peripheral devices.” (Ex-1030, abstract). In particular, Deforche defined a “pre-installed generic driver” as “a driver which is installed on the computer device along with the installation of the operating system, *i.e.* a driver which is standard for the operating system and which is capable of driving a standard class of computer peripheral devices connected to the computer device without requiring installation of a specific driver....[such as] a human interface device (HID)....[or] a mass storage device (MSD) driver.” (*Id.*, ¶10). These “HID and MSD drivers [were] known *per se* in the art.” (*Id.*).

92. In operation, the “[d]ata traffic from the computer device towards the wireless communication network and vice versa is routed over this modem/host communication interface and uses the generic communication protocol provided by the pre-installed generic driver.” (*Id.*, ¶9). Deforche recognized that this method provided an advantage to users of avoiding the “need for a specific driver for the communication between the wireless modem device and the computer device” to be downloaded/installed, increasingly important for users with restricted user rights, *i.e.*, user rights do not allow for installation of the necessary driver to the device (*Id.*). A further advantage noted by Deforche in its disclosed method is that

the method leaves “zero footprint, *i.e.* the wireless modem device “leaves no trace ... on the computer device.” (Ex-1030, ¶16).

IX. THE PRIOR ART DISCLOSES AND/OR SUGGESTS THE RECITED FEATURES OF CLAIMS 1-3, 9-11, 19, and 21-22 OF THE '002 PATENT

A. Ground I – Claims 1-3, 9-11, 19, and 21-22 are obvious in view of Kaplan, Ahmed, and Deforche

1. Motivation and Rationale to Combine

93. Kaplan, Ahmed, and Deforche all relate to systems/methods for wireless transmission of data/multimedia through a wireless network. (Ex-1027, ¶21, FIG. 2; Ex-1014, 7:6-25; Ex-1030, abstract.) For example, Kaplan discusses in detail a system and method that can remotely display video content, including its audio content, through the use of a peripheral wireless device physically attached to the computing device. (Ex-1027, ¶¶6-8, 21.) However, Kaplan’s system does not disclose the granular details regarding its use of a device’s drivers for how the transmission of audio/visual content between a computer and its USB wireless transmitter is achieved.

94. However, a POSITA would have found that Ahmed discloses a method that uses two separate drivers—a “mirror display driver” and a “audio driver”—to transmit its audio/visual data using an integrated transceiver 203. (Ex-1014, 18:26-19:21, *see also* 17:13-16.) Moreover, Ahmed discloses that the use of two separate

drivers is a “preferred” method such that, at the least, the system provides better syncing between the audio/video data streams. (Ex-1014, 18:26-19:21, *see also* 27:1-27.) A POSITA would have been motivated to combine the teachings of Ahmed with the system of Kaplan because the combined system would provide, at least, a better/higher quality transmission of the audio/visual data. A POSITA would have, likewise, recognized the combination as a simple application of known techniques—applying Ahmed’s driver-level specifics (separate drivers for separate data streams) for communication between Kaplan’s host computer and the USB-attached transmitter to achieve Kaplan’s transmission of audio/video data. A POSITA would have further recognized that the modification would achieve the predictable result of Kaplan’s audio/visual transmission using two separate data streams.

95. Similarly, Deforche discusses in detail methods and device for the wireless transmission of data. (Ex-1030, abstract, ¶¶9-11.) For example, and similar to the ’002 patent, Deforche’s disclosure discusses a method that includes connecting a host computer to a wireless communication network, such as by “setting up, by means of a pre-installed generic driver of an operating system on the computer device, a modem/host communication interface [] for communication between the wireless modem device and the computer device.” (*Id.*, abstract.)

Although well-known in the art at the time of the invention, neither Kaplan nor Ahmed specifically referred to drivers as “pre-installed generic drivers.” However, a POSITA would have recognized that Deforche discloses that using such drivers “has the advantage that the need for a specific driver for the communication between the wireless modem device and the computer device can be avoided.” (*Id.*, ¶9.) Thus, a POSITA would have been motivated, and found it obvious based on the above disclosures, to modify the Kaplan-Ahmed combination to further use Deforche’s teachings of “*pre-installed generic audio driver*” because, at least, the combination would result in a system that easier and more efficient for the user. Further, the combination applies known techniques to improve a similar device in the same way. A POSITA would have recognized that the combination of Kaplan, Ahmed, and Deforche would yield the predictable result of a system designed to wirelessly transmit audio/visual data streams using two separate, pre-installed generic drivers to communicate audio/visual data streams between a host computer and a peripheral wireless device.

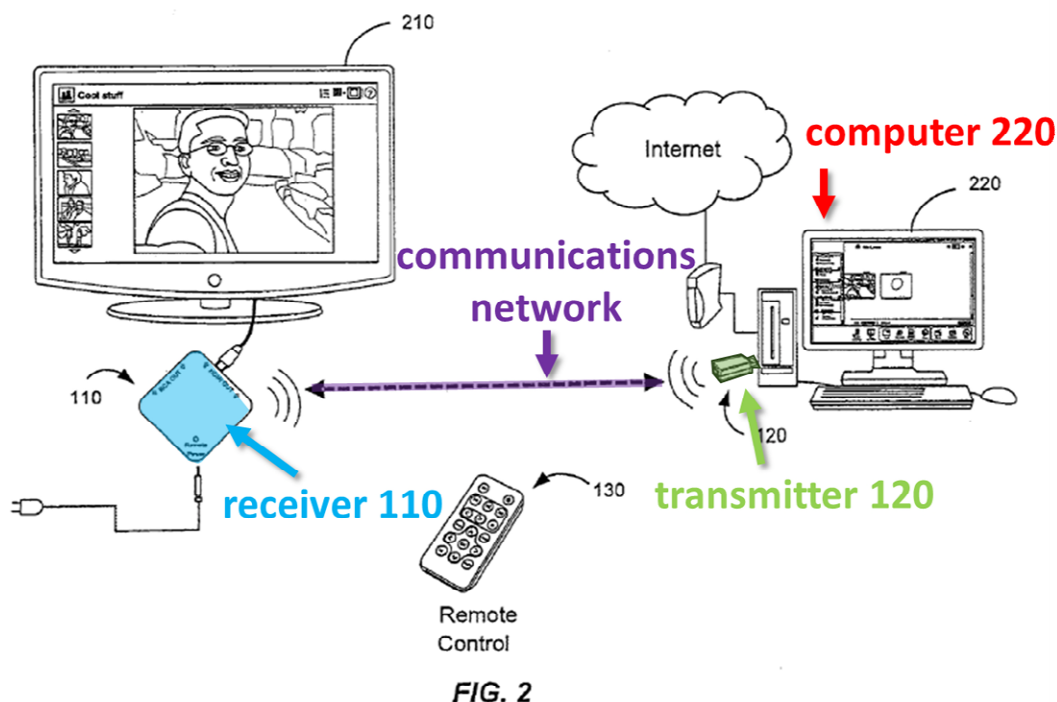
2. Claim 1

96. The teachings of Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 1 as a whole.

- a. **Limitation 1(pre): A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a communications protocol for communication between the processing device and a class of peripheral devices, the method comprising**

97. I have been asked to assume the preamble of claim 1 is limiting for the purposes of my analysis. If the preamble is not limiting, it would not affect my analysis for the limitations below.

98. Kaplan discloses a method for connecting a processing device (*e.g.*, a “computer 220”) to a communications network via a transmitter 120. (*See, e.g.*, Ex 1027, ¶¶5-9, 16-18, 23, 31-32, 57-61, FIGs. 2 (reproduced below) and 6.) Kaplan explains that setting up and operating 802.11 wireless networks “is a challenging endeavor for many users.” (Ex 1027, ¶3.) This is at least in part due to the need for the user to “set the Service Set Identifier (SSID), password, and/or parameters that enable the various networks elements to communicate.” (Ex 1027, ¶18.) To address this issue and alleviate that burden, Kaplan’s transmitter and receiver come with such settings pre-set. (*Id.*) As a result, the user is provided with a fully functioning communication system when the user first installs the equipment. (*Id.*)



(Ex-1027, FIG. 2)

99. Kaplan also discloses computer 220 includes a memory (“non-volatile memory 420), a display (illustrated in Figure 2 above) and an operating system (such as Windows®). (See, e.g., Ex-1027, ¶¶47-49, 59, FIG. 2.) A POSITA would have understood that an operating system (such as Windows®) would have been installed with standard drivers (pre-installed generic drivers) that provide a communications protocol for communication between the computer and a class of peripheral devices (such as peripheral mass storage devices), which was well known in the art. (See, e.g., Ex 1027, ¶¶45 (explaining that USB is a ubiquitous set of communication standards and protocols), 50-52 (“[D]uring an initial connection, the transmitter 120 may identify itself to the computer 220 as a mass storage device.”); see also Ex-

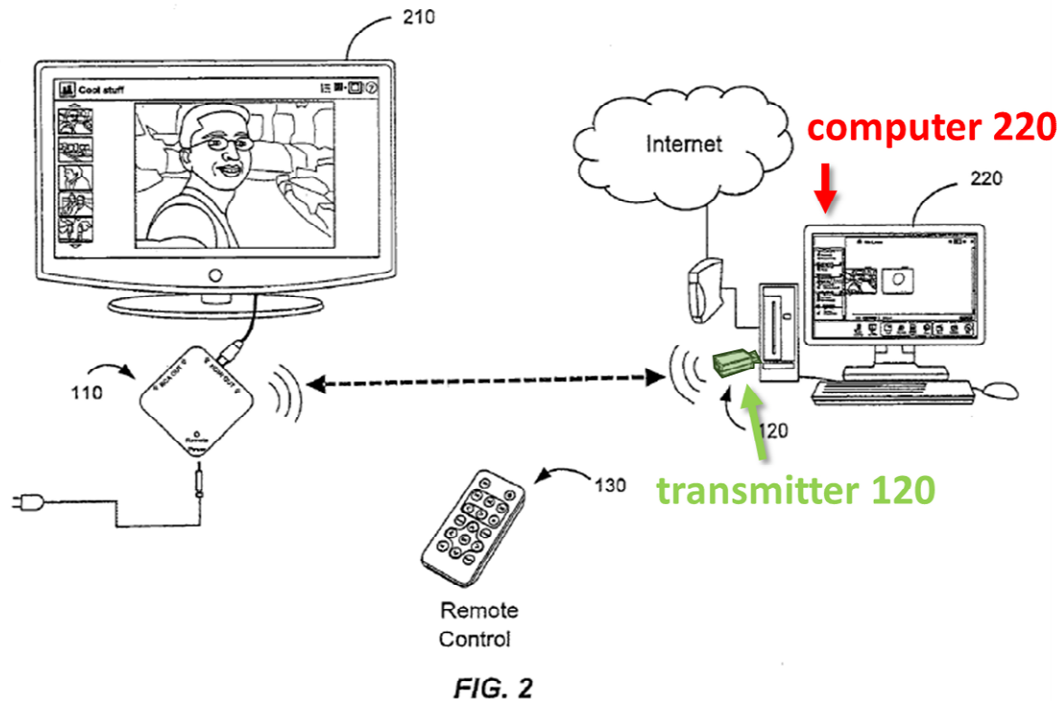
1021, ¶¶3-4 (“Many operating systems possess a number of pre-loaded drivers for generic plug-and-play classes, such as USB mass storage, a two-button mouse, etc.”); Ex-1026, ¶1 (“Universal Serial Bus (USB) standard provides communication protocols for interfacing between a host and its peripheral devices. For example, a personal computer implementing the Microsoft Windows® operating system may use the USB standard for communicating with a key board, a compact disc (CD) player, or a USB flash drive.”); Ex-1030, ¶10 (defining “pre-installed generic drivers” and disclosing that human interface device (HID) and mass storage device drivers are examples known “per se” in the art.) Further, the ’002 patent itself admits that “such a driver is standard for the operating system and can drive a standard class of peripheral devices coupled to or connected to the processing devices.” (Ex-1001, 14:35-38; *see also* 5:58-60.)

100. For further example, Mardiks explains that “[t]he USB standard specifies how a peripheral device identifies itself to its host. When a USB peripheral device is connected to a host, it receives power from the host, and the host recognizes that the USB peripheral device is attached. The host then reads the peripheral device’s class, subclass, etc. according to the USB standard to determine how to interface appropriately. For example, if the host determines that the peripheral

device is a keyboard, the host associates the appropriate driver software with data sent from the keyboard.” (Ex-1026, ¶2.)

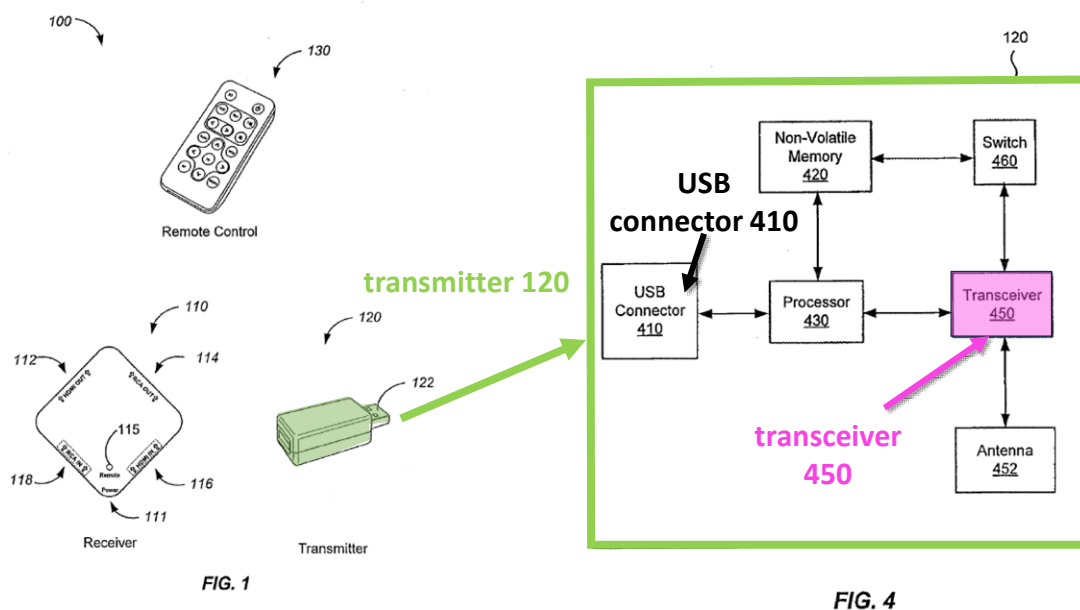
b. Limitation 1(a): coupling an external peripheral device physically to a port of the processing device, wherein the peripheral device comprises a wireless transceiver and a connector, said connector configured to couple to the port of the processing device

101. Kaplan discloses coupling an external peripheral device (*e.g.*, “transmitter 120”) physically to a port of the processing device (*e.g.*, the USB port of computer 220). (*See, e.g.*, Ex-1027, ¶¶21 (“[T]ransmitter 120 is inserted into the USB port of a computer.”), 45, FIG. 2 (reproduced below).)



(Ex-1027, FIG. 2.)

102. Kaplan also discloses that the peripheral device (*e.g.*, the “transmitter 120”) includes a wireless transceiver 450 and a connector 122 (also USB connector 450) configured to couple to the USB port of the computer 220. (*See, e.g.*, Ex-1027, ¶¶19 (“[T]he transmitter 120 includes a wireless transceiver 450 that is operable to transmit data from the computer to the receiver 110”), 16-17 (“In a particular embodiment, the transmitter 120 is a dongle including a connector 122 compliant with the Universal Serial Bus (USB) standard and operable to be inserted into a USB port of a computer, for example, a personal computer. As described in greater detail in FIG. 4, the transmitter 120 includes a wireless transceiver 450 that is operable to transmit data from the computer to the receiver 110.”), 45 (“The transmitter 120 includes a USB connector 410 connected to processor 430.... The transmitter 120 also includes transceiver 450.”), FIGs. 1 and 4 (reproduced below).)



(Ex-1027, FIGs. 1 and 4.)

- c. **Limitation 1(b): setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device**

103. Kaplan discloses a method that includes setting up ... a means for audio communication between the peripheral device and the processing device” (to transmit audio data, *e.g.*, “video footage may be transmitted from the computer 220 through the transmitter 120.”) (Ex-1027, ¶58, FIG. 6; *see also id.*, ¶¶8, 17 (“[D]ata may include video **and audio data** for display on the display device”), 22, 47-52.) A POSITA would have understood that this connection extends through USB interface 410 based on the particular USB driver of computer 220 that recognizes the transmitter—thus providing a means for data communication.

104. Kaplan discloses that, when connected to the USB port of the computer 220, the transmitter 120 presents itself, at least initially, to the computer as a mass storage device. (Ex-1027, ¶¶46-52, 58-60). This is done to avoid the need for a special driver to be installed on the computer prior to establishing the connection between transmitter and computer. (Ex-1027, ¶¶21, 40.) In essence, Kaplan describes a plug-and-play device. As Kaplan puts it, “the user just plugs-in the devices and [they] operate as intended.” (Ex-1027, ¶21.) By utilizing the plug-and-play feature to install software, the system of Kaplan is able to use the transmitter 120 and begin to operate as a “wireless transmitter” to send, for example, “video footage.” (*Id.*, ¶¶50-51.)

105. Plug-and-play devices were well known, with the most common being universal serial bus (“USB”). (Ex-1021, ¶3.) Plug-and-play devices have a set of functionality provided by generic drivers according to pre-defined device classes, such as USB mass storage devices, image capturing devices, audio input and output devices, human interface devices, *etc.* (*Id.*) Notably, among these was a USB audio driver, which was a generic driver that did not require separate installation. (*See, e.g.*, Ex-1061, ¶43 (“The USB HID Driver 605 and USB Audio Driver 604 driver allow for bidirectional transfers without writing a custom operating system level device driver.”); Ex-1001, 30:39-43 (“For example, on every PC-like platform, there

is standard built-in support for a USB audio device. Thus, there is a standard generic audio driver available.”), 31:52-54.)

106. Once a plug-and-play device is connected to a computer, the operating system detects the connection and polls the device to determine what functionality is available. (*Id.*) Specifically, the operating system would look for a pre-installed driver for the device class of the plug-and-play device. If available, the operating system loads the appropriate driver and sets up an interface between the computer and plug-and-play device so that the computer can access the functionality of the plug-and-play device. (*Id.*) Otherwise, the system would typically prompt the user to install an appropriate driver.

107. As Kaplan and others recognize, it was desirable to avoid the need to install drivers—so as to not burden the user, particularly if the user does not have administrative rights or it is otherwise impracticable. (Ex-1027, ¶¶21, 40; Ex-1021, ¶7; Ex-1030, ¶¶9, 28, 30.) Although Kaplan’s transmitter 120 initially presents itself as a mass storage device to take advantage of a mass storage device drivers installed on the operating system (and its autorun functionality), the transmitter then switches back to operating as a wireless transmitter. (Ex-1027, ¶¶46-48, 58-61.) Kaplan wirelessly transmits audio and video data when acting as a transmitter, but Kaplan does not specifically

disclose the drivers used to set up the interface for the transmission of data between the computer and transmitter, such as “pre-installed generic audio driver.”

108. However, Ahmed discloses sending the audio portion of a audio stream using “*a first ... audio driver*”:

a virtual audio driver, referred to as a virtual audio cable (VAC), is installed as a normal audio driver that can be selected as a default playback and/or recording device. A feature of VAC is that, by default, it routes all the audio going to its audio output pin to its input pin (Ex-1014, 18:26-19:15 (emphasis added).)

109. Ahmed discloses another embodiment where “audio is captured using Microsoft Windows Multimedia API,” (*id.*, 17:10-12), which a POSITA would have understood to be implemented by an audio driver. “A Microsoft Windows Multimedia Library provides an interface to the applications to play audio data on an audio device using waveOut calls.” (*Id.*, 17:13-16 (emphasis added).) Thus, a POSITA would have understood Ahmed discloses a setting up and interface and thus communication by means of an audio driver as an example of “a first pre-installed generic audio driver of the operating system ... for audio communication.” (Ex-1014, 27:4-27; *see also id.*, FIG. 12.)

110. Deforche, additionally, discloses the use of “pre-installed generic driver” for setting up a modem/host communication interface for communication between a wireless modem device and a computer device to which it is connected (e.g., through a USB port) to wirelessly exchange any IP data. (*See, e.g.*, Ex-1030, abstract, ¶¶9-11; *see also* my summary of Deforche above in Section VIII.D.) The ’002 patent also explains that this limitation was “well-known.” (Ex-1001, 3:65-4:9 (citing US 2011/0115689 (*see* Ex-1022, ¶39 (“[T]he OS searches its own files for the driver software.”))).) Deforche explains that typically a “user needs to install proprietary drivers before he/she can use a USB network device.” (Ex-1030, ¶27.) To avoid this, Deforche proposes the use of other USB class drivers. (*Id.*) Similar to Kaplan’s approach, Deforche’s connection method begins with the user plugging in a wireless USB modem device into a computer. (Ex-1030, ¶34; Ex-1027, ¶¶46-48.) Assuming the modem drivers are not installed, the USB modem device presents itself as a mass storage device to take advantage of the autorun feature, again similar to Kaplan. (*Id.*) Then the USB modem device sets a USBGo interface enabling communication between the USB modem and the computer. (Ex-1030, ¶¶34, 37.) The USBGo uses USB-HID (human interface device driver) “to avoid having to install a specific driver for the modem.” (Ex-1030, ¶37.) Thus, Deforche describes a technique where:

one of the pre-installed generic drivers of the operating system on the computer device is exploited for setting up the modem/host communication interface, i.e. the generic driver is used in connection with a computer peripheral device for which it is not actually intended. In other words, the wireless modem device of the invention does not belong to the standard class of computer peripheral devices for which the generic driver is foreseen in the operating system. (Ex-1030, ¶11.)

111. Given the similarities in techniques between Kaplan, Ahmed, and Deforche, discussed above, and the common goal disclosed in avoiding the need for an installation of a special driver to set up communications between a wireless USB modem/transmitter, a POSITA would have been motivated to look to the teachings of Deforche in implementing a system like that of Kaplan to use a “pre-installed generic audio driver” because “[t]his has the advantage that the need for a specific driver for the communication between the wireless modem device and the computer device can be avoided.” (Ex-1030, ¶9.). Further, a POSITA would have been motivated to select a suitable pre-installed generic driver, such as a USB audio driver capable of communicating audio data for setting up a means for communication (such as an interface using a generic communication protocol provided by the driver) between a transmitter and computer (similar to Kaplan and Deforche) for the transfer of audio data across the interface. (See, e.g., Ex-1061, ¶¶6, 29, 43, FIGs. 1, 3, 4, and

6.) A POSITA would have also had a reasonable expectation of success in implementing such standard software, particularly given the teachings of Deforche.

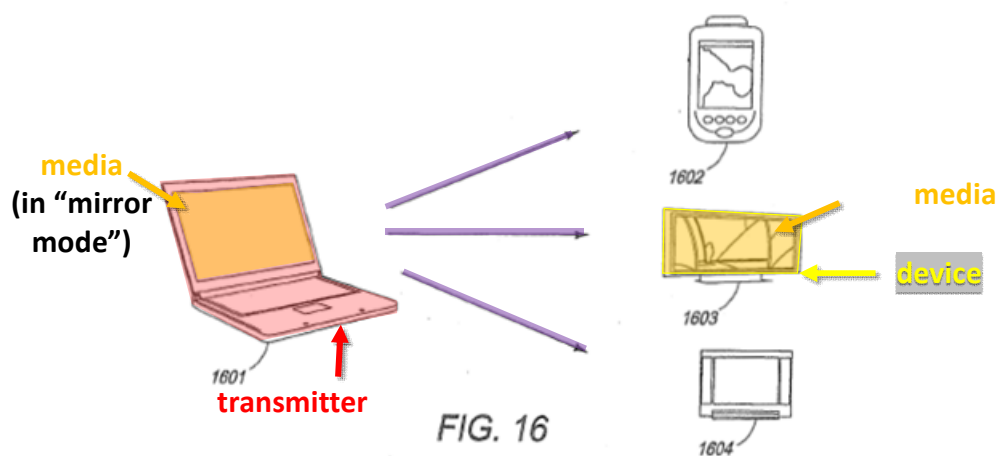
d. Limitation 1(c): setting up...by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device

112. Similar to the discussion in the preceding section, Kaplan discloses “*setting up ... a means for data communication between the peripheral device and the processing device*” (to transmit data, *e.g.*, “video footage may be transmitted from the computer 220 through the transmitter 120”) between the transmitter 120 and computer 220. (Ex-1027, ¶31, FIG. 6; *see also id.*, ¶¶8, 17 (“[D]ata may include **video** and audio **data** for display on the display device.”), 22, 31, 47-52, 58.) However, Kaplan does not explain whether it uses “a second pre-installed generic driver of the operating system” for non-audio data.

113. Ahmed discloses using “*a second ... driver*” as a “*a means for data communication between the peripheral device and the processing device*” (*e.g.*, “while the various media streams may be multiplexed and transmitted in a single stream, it is preferred to transmit the media data streams separately in a synchronized manner.”) (Ex-1014, 27:1-4.) Ahmed also sets up “*data communication*” using “*a second preinstalled generic driver of the operating system*” by using a “mirror display driver” and a “first socket 1202 for transmitting video.” (See, *e.g.*, Ex-1014,

Abstract and 27:4-27, *see also id.*, FIG. 12, 8:7-22, 9:12-13, 9:24-31, 10:9-13, 16:7-14, 4:3-5.) Therefore, Ahmed discloses the use of a video driver for capturing video data. (Ex-1014, 3:26-28.) Thus, Ahmed describes using separate drivers for audio and video.

114. Further, and as described with respect to limitation 1(b), Deforche suggests Ahmed's drivers can be "second pre-installed generic driver[s] of the operating system." *See* Section IX.A.2(c). Ahmed further suggests the use of two such drivers—one audio (normal audio driver) and one for video ("mirror display driver")—in setting up communication between the wireless device and the computer. (Ex-1014, abstract, 18:26-19:15.)



(Ex-1014, FIG. 16.)

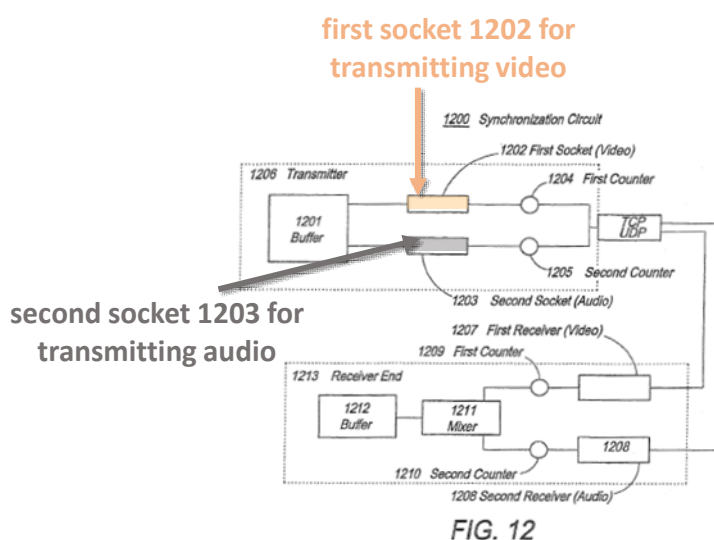
115. Ahmed also teaches providing a separate communication channel for audio data and display data. For example, Ahmed indicates “while the various media streams may be multiplexed and transmitted in a single stream, it is preferred to transmit the media data streams separately in a synchronized manner.” (Ex-1014, 27:1-4.) In Ahmed, a “second socket 1203 for transmitting audio” is an example of a means for audio data communication. (Ex-1014, 27:4-27, *see also id.*, FIG. 12.)

116. Ahmed discloses that “audio is captured using through an interface used by conventional computer-based audio players to play audio data,” such as “using Microsoft Windows Multimedia API, which is a software module compatible with Microsoft Windows and NT operating systems.” (Ex-1014, 17:8-12.) A Microsoft Windows Multimedia Library provides interfaces to record audio data from an audio device. (Ex-1014, 17:13-16.) In another embodiment a virtual audio driver is used. (Ex-1014, 18:26-19:15.)

117. As with audio capture and communication (*see* limitation 1(b) discussed above), Ahmed also sets up graphics capture and communication using a driver. (*See, e.g.*, Ex-1014, Abstract (“capturing the video data using a mirror display driver”), 8:7-22, 9:12-13, 9:24-31, 10:9-13, 16:7-14, 4:3-5.) In Ahmed, a “first socket 1202 for transmitting video” acts as a means for data communication. (Ex-1014, 27:4-27, *see also id.*, FIG. 12 (reproduced below).) Hence, Ahmed

discloses the use of a video driver for capturing video data. (Ex-1014, 3:26-28.)

Thus, Ahmed describes using separate drivers for audio and video.



Ex-1014, FIG. 12.)

118. A POSITA looking to implement a system like Kaplan's communication system would have been motivated by Ahmed to provide separate drivers for separate audio and video streams as suggested by Ahmed and employ those drivers to set up a communications interfaces for each for the reasons discussed above by Deforche and known in the art. Further, a POSITA would have been motivated to select a suitable pre-installed generic driver, such as a USB-HID driver capable of communicating audio data for setting up a means for data communication (such as an interface using a generic communication protocol provided by the driver)

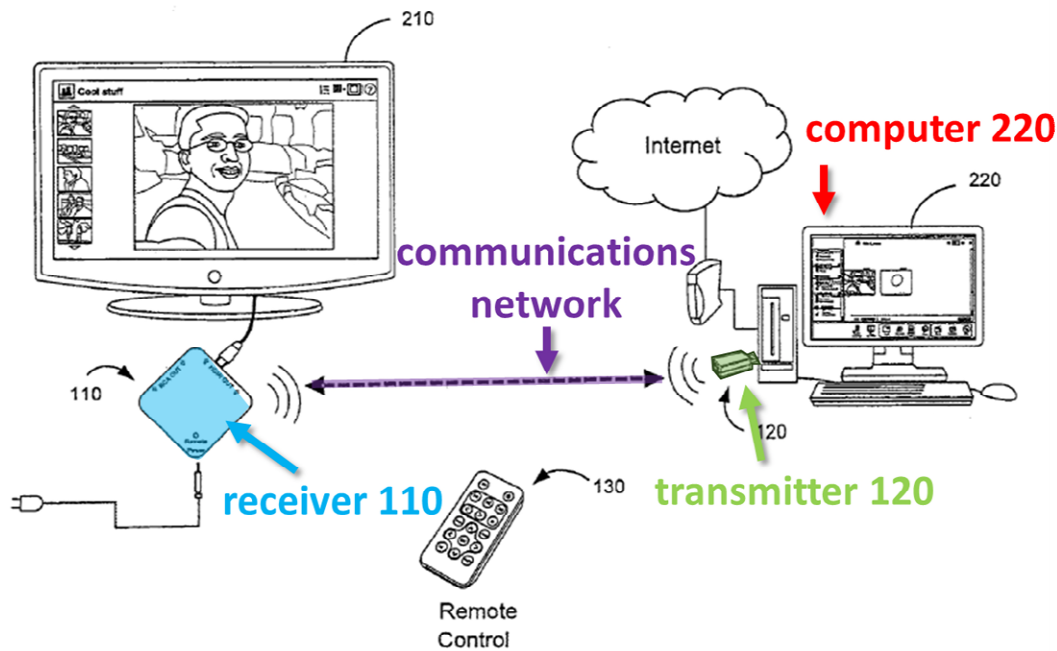
between a transmitter and computer (similar to Kaplan and Deforche) for the transfer of data across the interface. (*See, e.g.*, Ex-1030, ¶¶34-39.) A POSITA would have also had a reasonable expectation of success in implementing such standard software, particularly given the teachings of Deforche.

e. Limitation 1(d): using the peripheral device to connect the processing device to a communications network via the wireless transceiver

119. Kaplan discloses using the peripheral device (*e.g.*, the “transmitter 120”) to connect the processing device (*e.g.*, the “computer 220”) to a communications network via the wireless transceiver. (*See, e.g.*, Ex-1027, ¶¶6, 9, 18, 23 (“It should be noted that various methods for identifying the receiver 110 as a network element may be used.”), 25, 31, 45, FIG. 2 (reproduced below).)

120. For example, Kaplan’s transmitter 120 is pre-paired with the receiver 110 to form the communications network to which the computer 220 is connected. (*See, e.g.*, Ex-1027, ¶¶18 (“[T]he receiver 110 and the transmitter 120 are pre-paired during the manufacturing process. Thus, when a user first sets up the communications systems, there is no need for the user to pair or define settings associated with the communication that occurs between the receiver 110 and the transmitter 120. This embodiment contrasts with conventional wireless networking equipment, for which a user typically needs to manually pair the various devices

prior to use. As an example, in a conventional 802.11-based network, a user needs to set the Service Set Identifier (SSID), password, and/or other parameters that enable the various network elements to communicate. In the embodiments described herein, such settings are pre-set at the time of manufacturing as part of the manufacturing process or at other time prior to delivery to the user. Thus, when the user first installs the equipment, the parameters necessary for two-way communications between the receiver 110 and the transmitter 120 are already set. As a result, the user is provided with a fully functioning communications system straight “out-of-the-box.”), 53, 54; *see also* Section VIII.A and IX.A.2.a.)



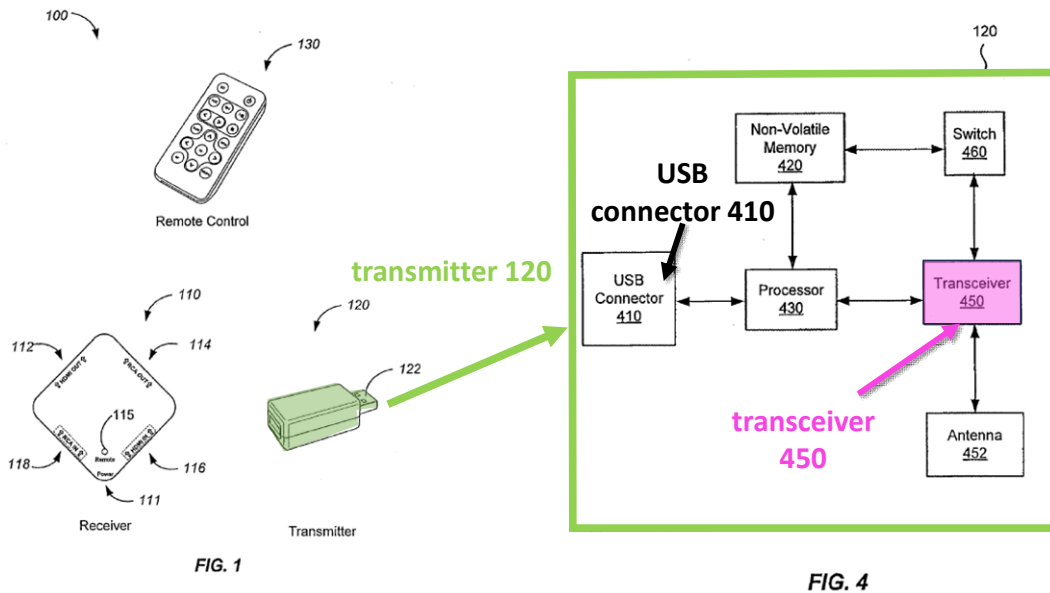
(Ex-1027, FIG. 2)

121. Note that Kaplan discloses that its system works “without ... a wireless network” already set up. (*Id.*, ¶23.) This refers to Kaplan’s desire to simplify setup so that the receiver and transmitter “provide a user with the ability to conveniently view video footage stored on a computer or a web server on a television without having to perform any wireless network setup procedures.” (*Id.*, ¶¶9, 21, 40, 54-55.) Therefore, Kaplan’s system uses a “*communications network*” but does not require that the user connect the receiver and transmitter to a pre-existing wireless network.

f. Limitation 1(e): routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication

122. Kaplan discloses routing audio data from processing device (*e.g.*, the “computer 220”) to the peripheral device (*e.g.*, “transmitter 120”) via the connector 410 and the means for audio communication as explained for limitation 1(b). (*See, e.g.*, Ex-1027, ¶¶17 (“[T]he transmitter 120 includes a wireless transceiver 450 that is operable to transmit data from the computer to the receiver 110. For example, the data may include video and audio data for display on the display device.”), 28 (“[T]he user may select a video to be played and the selected video footage may be transmitted from the computer 220 through the transmitter 120 to the receiver 110 and then displayed on the display device 210.”), 45, 58 (“The method 600 also

includes establishing a connection between a transmitter and a computer (612).”),
FIGs. 4, 6.)



(Ex-1027, FIGs. 1 and 4.)

123. A POSITA would have understood from Kaplan that all data (both video and audio) is routed from the computer 220 through the USB port and USB connector 450 to the transceiver 450 of transmitter 120 via a communications channel, over a wireless communication channel to paired transceiver 350 of receiver 110, and finally out the receiver 110's video and audio outputs to a display/television. (See, e.g., Ex-1027, ¶¶5, 8, 17-18, 42-44, 57-61. FIG. 2-4, 6.)

g. Limitation 1(f): routing the audio data from the wireless transceiver of the peripheral device to a base node over the communications network

124. Kaplan discloses routing audio data from the wireless transceiver (*e.g.*, the “transceiver 450”) of the peripheral device (*e.g.*, “transmitter 120”) to a base station (*e.g.*, “receiver 110”) over the communications network, for example. (See, *e.g.*, Ex-1027, Abstract, ¶¶2-6, 16-17 (“[T]he transmitter 120 includes a wireless transceiver 450 that is operable to transmit data from the computer to the receiver 110. For example, the data may include video and audio data for display on the display device.”), 18, 28 (“[V]ideo footage may be transmitted from the computer 220 through the transmitter 120 to the receiver 110 and then displayed on the display device 210), 44, FIG. 2 (reproduced below).)

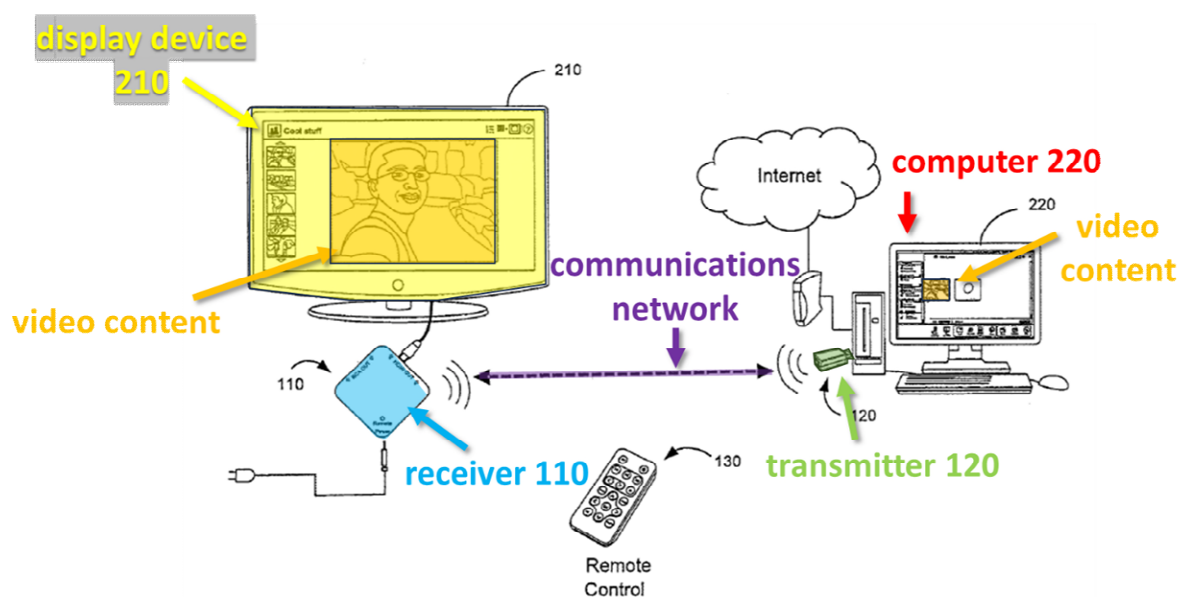


FIG. 2

(Ex-1027, FIG. 2.)

125. Again, a POSITA would have understood from Kaplan that all data (both video and audio) is routed from the computer 220 through the USB port and USB connector 450 to the transceiver 450 of transmitter 120, over a wireless communication channel to paired transceiver 350 of receiver 110, and finally out the receiver 110's video and audio outputs to a display/television. (See, e.g., Ex-1027, ¶¶5, 8, 17-18, 42-44, 57-61. FIG. 2-4, 6.)

h. Limitation 1(g): wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device

126. Kaplan, Deforche, and Ahmed disclose and/or suggest this limitation for reasons similar to those discussed above regards limitation 1(b) supra. Deforche suggests the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device. (Ex-1030, abstract (“The generic communication protocol (7) is used in the modem/host communication interface (6) for transferring the data traffic (8-9) between the host computer device and the wireless modem device.”); See Section IX.A.2.c.) A POSITA would have been motivated to implement this aspect of Deforches techniques for at least the reason discussed above regarding limitation 1(b). (Section IX.A.2.c.)

3. **Claim 2: The method of claim 1 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.**

127. The teachings of Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 2 as a whole. For example, Deforche discloses presenting the peripheral device (*e.g.*, a “wireless modem peripheral device”) to the processing device (*e.g.*, host computer device) as a human interface device (HID), such that the pre-installed mass storage device driver of the computer can communicate with the peripheral device without the need to install special device drivers. (*See, e.g.*, Ex-1030, ¶¶33 (“The USB device can thus expose its USB interface in different ways: (1) A composite device with USB HID and USM Mass Storage Unit (UMS) device with UMS and HID USB ID; (2) UMS device with 3G USB ID”), 34 (“The USBGo uses USB-HID as a lower layer to avoid having to install a specific driver for the modem”), 9-10 (“a pre-installed generic driver of an operating system installed on the computer device is used for setting up a modem/host communication interface by means of which the wireless modem device and the computer device can communicate with each other” and an “example of such a generic driver is a human interface driver (HID).”)

4. Claim 3: The method of claim 1 wherein step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver

128. The teachings of Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 3 as a whole. For example, Kaplan discloses presenting the peripheral device (*e.g.*, “transmitter 120”) to the processing device (*e.g.*, “computer 220”) as a mass storage device, such that a pre-installed mass storage device driver can be used to communicate with the transmitter 120. (*See, e.g.*, Ex-1027, ¶¶46 (“[T]he transmitter may identify itself to the computer 220 as a mass storage device.”), 50-52, 59-60; *see also* Ex-1030, ¶¶31, 33.)

5. Claim 9: The method of claim 1 further comprising time-stamping synchronously the audio with the data stream

129. The teachings of Kaplan, Ahmed, and Deforche disclose and/or suggest the limitations of claim 9. For example, a POSITA would have appreciated that the processing time for audio tends to be shorter than for video data. Therefore, it was known in the art to be useful to provide an independent way to synchronize the audio and video data so that they reflect the original audiovisual content. Ahmed, for example, discloses synchronously time-stamping audio data and video data. (*See, e.g.*, Ex-1014, 29:6-18 (“Referring to Figure 14, another embodiment of the audio and video synchronization circuit is depicted. The synchronization circuit 1400 at the transmitter end 1401 comprises buffer 1402 having media data, multiplexer 1403

for combining the media data signals, such as graphics, text, audio, and video signals, and a clock 1404 for providing the timestamps to the media content for synchronization. At the receiver end 1405 the demultiplexer 1406 using clock 1407 devolves the data stream into the individual media data streams. The timestamps provided by the clocks help synchronize the audio and video at the receiver end. The clock is set at the same frequency as that of receiver. The audio and video, which is demultiplexed, is routed to the speakers 1408 and display device 1409 for rendering.”), FIG. 14.) A POSITA, therefore, would have been motivated to implement this or another well-known synchronization technique such that the user in a system like that of Kaplan is able to view video footage with synchronized audio output. Such techniques were well-known and well established by the time of the purported inventions and would have been a simple application of a known technique to apply Ahmed’s synchronous time stamping method between audio and data streams to the system of Kaplan. Thus, a POSITA would have had a reasonable expectation of success in implementing such conventional techniques.

6. Claim 10: The method of claim 9 further comprising encoding, optionally encrypting the audio data

130. The teachings of Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 10 as best understood. A POSITA would have understood that wirelessly sent data was conventionally encoded and encrypted for transmission.

For example, Ahmed discloses encoding audio data. (*See, e.g.*, Ex-1014, 7:11-15 (“Preferably, the computing device 101 and remote monitor 103 further comprise a processing system on a chip capable of wirelessly transmitting and receiving graphics, audio, text, and video encoded under a plurality of standards”), 22:9-12 (“The block that corresponds to the best checking point is the block of the reference frame, which matches best with the block of the current frame that is to be encoded”), 27:30-32 (“Initially, the receiver receives 1301 a stream of encoded video data and encoded audio data wirelessly”), FIG. 13; *see additionally*, Ex-1030, ¶54.) A POSITA would have been motivated to implement such standard encoding and/or encrypting techniques for a variety of reasons, such as to make use of standard wireless protocols and component that utilize such standards. Such techniques were well-known and well established by the time of the purported invention and would have been a simple application of a known technique to apply Ahmed’s method of encryption to the system of Kaplan. Further a POSITA would have a reasonable expectation of success in implementing such conventional techniques and achieving the claimed invention.

7. Claim 11

131. Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 11, for all the reasons stated above with respect to Claim 1. (*See* Section IX.A.2.)

- a. **Limitation 11(pre): A system for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the system comprising:**

132. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(pre). (See Section IX.A.2.a.)

- b. **Limitation 11(a): means for coupling an external peripheral device physically to a port of the processing device, the peripheral device comprising a wireless transceiver and a connector, said connector configured to couple to the port of the processing device**

133. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(a). (See Section IX.A.2.b.)

- c. **Limitation 11(b): means for setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and**

134. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(b). (See Section IX.A.2.c.)

- d. **Limitation 11(c): means for setting up...by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device**

135. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(c). (See Section IX.A.2.d.)

- e. **Limitation 11(d): wherein the peripheral device is configured in a way to connect the processing device to a communications network via the transceiver**

136. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(d). (See Section IX.A.2.e.)

- f. **Limitation 11(e): means for routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and**

137. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(e). (See Section IX.A.2.f.)

- g. **Limitation 11(f): means for routing the audio data from the wireless transceiver of the peripheral device to a base node over the communications network**

138. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(f). (See Section IX.A.2.g.)

- h. **Limitation 11(g): wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device**

139. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(g). (See Section IX.A.2.h.)

8. Claim 19: The system of claim 11 further comprising time-stamping synchronously the audio stream with the data stream

140. Kaplan, Ahmed, and Deforche disclose and/or suggest the limitations of claim 19 for the reasons stated with respect to claim 9. (See Section IX.A.5.)

9. Claim 21

141. Kaplan, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 21, for all the reasons stated above with respect to Claim 1. (See Section IX.A.2.)

- a. Limitation 21(pre): A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device**

142. To the extent limiting, Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(pre)-(a). (See Section IX.A.2.a-b.)

- b. Limitation 21(a): said executable software code comprising: a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device**

143. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(b). (See Section IX.A.2.c.)

- c. Limitation 21(b): a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device**

144. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(b)-(d). (See Section IX.A.2.c-e.)

- d. Limitation 21(c): a third software code portion for routing audio data from the processing device to the peripheral device via the connection and the means for audio communication and for routing the audio data from the peripheral device to the base node over the communications network**

145. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(e)-(f). (See Section IX.A.2.f-g.)

- e. Limitation 21(d): wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device**

146. Kaplan, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(g). (See Section IX.A.2.h.)

10. Claim 22: The method of claim 1, wherein the audio driver is a generic audio driver

147. Kaplan, Ahmed, and Deforche disclose and/or suggest limitation of claim 22 for the reasons stated with respect to claim 1, which already recites a “generic audio driver.” (See Section IX.A.2.)

B. Ground II – Claims 1-2, 9-11, 19, and 21-22 are obvious in view of Maeda, Ahmed, and Deforche

1. Motivation and Rationale to Combine

148. Maeda, Ahmed, and Deforche are all related to connecting wireless peripherals to PCs. (See Ex-1031, ¶17, FIG. 2; Ex-1014, 7:6-25; Ex-1030, abstract.) For example, like the '002 patent, Maeda discusses a system and method that remotely displays video content with audio from a personal computing device (PC). (Ex-1031, ¶17.) The disclosed system uses a PC as an image generation device—generating images and audio—and transmitting the image/audio data to a projector using a wireless local area network (LAN) (*i.e.* a wirelessly connected system). (Ex-1031, ¶15.) Maeda, however, does not disclose the granular details regarding its use of a device’s drivers for how the transmission of audio/visual content between a PC and its LAN card is achieved.

149. However, a POSITA would have found that Ahmed discloses a method that uses two separate drivers—a “mirror display driver” and a “audio driver”—to transmit its audio/visual data using an integrated transceiver 203. (Ex-1014, 18:26-

19:21, *see also* 17:13-16.) Moreover, Ahmed discloses that the use of two separate drivers is a “preferred” method such that, at the least, the system provides better syncing between the audio/video data streams. (Ex-1014, 18:26-19:21, *see also* 27:1-27.) A POSITA would have been motivated to combine the teachings of Ahmed with the system of Maeda because the combined system would provide, at least, a better/higher quality transmission of the audio/visual data. A POSITA would have, likewise, recognized the combination as a simple substitution of Ahmed’s known techniques—applying Ahmed’s driver-level specifics (separate drivers for separate data streams) for transmission of audio/visual data—to Maeda’s communication between a host computer and the attached LAN card to achieve Maeda’s remote transmission of audio/visual data. A POSITA would have further recognized that the modification would achieve the predictable result of Maeda’s audio/visual transmission using two separate data streams.

150. Similarly, Deforche discusses in detail methods and device for the wireless transmission of data. (Ex-1030, abstract, ¶¶9-11.) For example, and similar to the ’002 patent, Deforche’s disclosure discusses a method that includes connecting a host computer to a wireless communication network, such as by “setting up, by means of a pre-installed generic driver of an operating system on the computer device, a modem/host communication interface [] for communication

between the wireless modem device and the computer device.” (*Id.*, abstract.) Although well-known in the art at the time of the invention, neither Maeda nor Ahmed specifically referred to drivers as “pre-installed generic drivers.” However, a POSITA would have recognized that Deforche discloses that using such drivers “has the advantage that the need for a specific driver for the communication between the wireless modem device and the computer device can be avoided.” (*Id.*, ¶9.) Thus, a POSITA would have been motivated, and found it obvious based on the above disclosures, to modify the Maeda-Ahmed combination to further use Deforche’s teachings of “*pre-installed generic audio driver*” because, at least, the combination would result in a system that easier and more efficient for the user. Further, the combination applies known techniques to improve a similar device in the same way. A POSITA would have recognized that the combination of Maeda, Ahmed, and Deforche would yield the predictable result of a system designed to wirelessly transmit audio/visual data streams using two separate, pre-installed generic drivers to communicate audio/visual data streams between a PC (host computer) and a LAN card (peripheral wireless device).

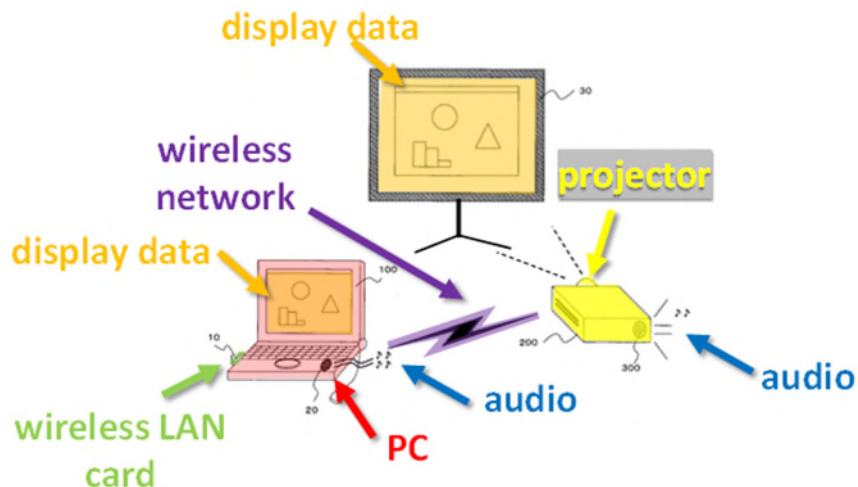
2. Claim 1

151. The teachings of Maeda, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 1 as a whole.

- a. **Limitation 1(pre): A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a communications protocol for communication between the processing device and a class of peripheral devices, the method comprising**

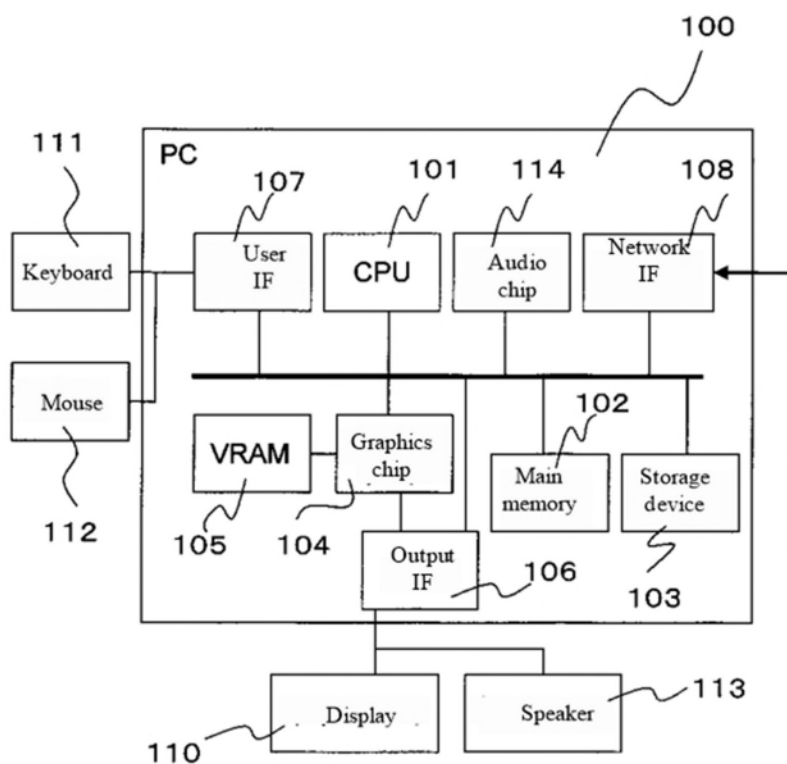
152. I have been asked to assume the preamble of claim 1 is limiting for the purposes of my analysis. If the preamble is not limiting, it would not affect my analysis for the limitations below.

153. Maeda discloses a method for connecting a personal computer (PC 100) (*e.g.*, a “processing device”) to a communications network. (*See, e.g.*, Ex-1031, ¶¶15 (“[A] PC is used as an image generation device that generates images and audio, and the images and audio are transmitted to a projector, which is an image projection device, using a wireless LAN.”), 17 (“This transmission system is a system in which a screen displayed on the display of PC 100 is transmitted from PC 100 to projector 200 and the screen received by projector 200 is projected onto a screen 30. A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN.”), 19, 76; *see also id.*, FIG. 1.)



(Ex-1031, FIG. 1.)

154. Maeda also discloses that the PC 100 has a main memory 102 and storage device 103 and a display 110. (See, e.g., Ex-1031, ¶19, FIG. 2 (reproduced below).)



(Ex-1031, FIG. 2 (excerpted.))

155. A POSITA would have understood PC 100 to include an operating system as fundamental software to manage components of the PC. (*See, e.g.*, Ex-1058, ¶0125.) Meada describes several components of the PC (graphics chip 104, a VRAM 105, an audio chip 114, an output IF 106 that outputs to a display 110 and a speaker 113, a user IF 107 for acquiring instruction signals based on user operations from input devices such as a keyboard 111 and a mouse 112, and a network IF 108 which is an interface for communicating with projector 200, and so on). (*See, e.g.*, Ex-1031, ¶¶17-19.) A POSITA would have understood such components would have been managed by an operating system (Windows®, Macintosh OS, Linux, etc.), including communication with a class of devices, such as human interface devices, as was known in the art. (*See, e.g.*, Ex-1030, ¶¶9-12; Ex-1027, ¶47; Ex-1026, ¶¶1-3.)

156. Further, Ahmed and Deforche disclose “pre-installed generic drivers providing a communications protocol for communication between the processing device and a class of peripheral devices.” For example, Ahmed sends the audio portion of a video stream using an “audio driver”:

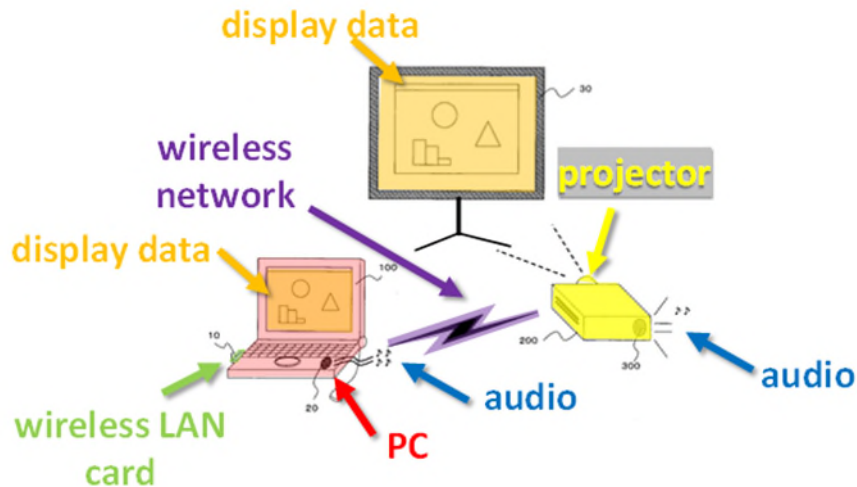
a virtual audio driver, referred to as a virtual audio cable (VAC), is installed as a normal audio driver that can be selected as a default playback and/or recording device. A feature of VAC is

that, by default, it routes all the audio going to its audio output pin to its input pin (Ex-1014, 18:26-19:15 (emphasis added))

157. Ahmed discloses that “[a] Microsoft Windows Multimedia Library provides an interface to the applications to play audio data on an audio device using waveOut calls.” (*Id.*, 17:13-16 (emphasis added).) Ahmed discloses a “second socket 1203 for transmitting audio” is an example of “*pre-installed generic driver.*” (Ex-1014, 27:4-27; *see also id.*, FIG. 12.) Further, Deforche discloses using “*pre-installed generic driver*” to wirelessly exchange any IP data. (Ex-1030, abstract, ¶¶9-11.)

b. Limitation 1(a): coupling an external peripheral device physically to a port of the processing device, wherein the peripheral device comprises a wireless transceiver and a connector, said connector configured to couple to the port of the processing device

158. Maeda, Ahmend, and Deforche disclose and/or suggest this limitation. For example, Maeda discloses coupling a wireless LAN (Local Area Network) card 10 (*e.g.*, an “external peripheral device”) physically attached to PC 100 (*e.g.*, a “processing device”). (*See, e.g.*, Ex-1031, ¶17 (“A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN”), FIG. 1 (reproduced below).) For this network connection, PC 100 includes a network interface, network IF 18 (*e.g.*, a “port”). (*See* Ex-1031, ¶19.)



(Ex-1031, FIG. 1.)

159. A POSITA would have understood that a wireless LAN card, such as wireless LAN card 10 of Maeda contains a wireless LAN chip (*e.g.*, a wireless transceiver) for sending and receiving data from external devices and a connector to plug into the PC for communication with the PC. (*See, e.g.*, Ex-1031, ¶¶17, 53-54; Ex-1059, ¶¶5-6 (explaining that wireless LAN cards (which were also referred to as wireless PC card and wireless network adapters) contain transceivers for wireless communication); Ex-1062, ¶5-6; Ex-1063, 1:6-9, 1:25-29, 5:7-9; Ex-1064, 5:19-52, 5:59-64, 6:22-39; Ex-1065, 1:21-28, 1:34-39; Ex-1024, ¶16, FIG. 3; Ex-1007, ¶¶18-21, 30, FIG. 1, 47; Ex-1060, 1:64-2:3 (“The wireless communication system includes a dongle and a transceiver.”), 3:42-64, FIG. 1; Ex-1027, ¶¶17, 45.)

160. Further, Deforche discloses a wireless modem device that is “a computer peripheral device which has an electronic interface for connection to a

complementary electronic interface of a computer device (host) and which comprises electronic components for establishing communication between said computer device to which it is connected and a remote device over a wireless communication network.” (Ex-1030, ¶6.) Deforche’s wireless modem device is configured to communicate in a wireless LAN (WLAN). (Ex-1030, ¶8.) Accordingly, Deforche’s wireless modem device is similar to the wireless LAN card 10 of Maeda. (See, e.g., Ex-1030, Abstract, ¶¶6-8.) The electronic interface of the wireless modem device can be a USB interface that couples via a standard connector to a port of the host computer. (See, e.g., Ex-1030, ¶7.) As illustrated in Figure 2, the USB modem component of the wireless modem device includes a radio interface (IF), which is indicative of a transceiver. (See Ex-1030, Abstract, ¶¶6-8, 34 (describing transmitting and receiving data from the network).)

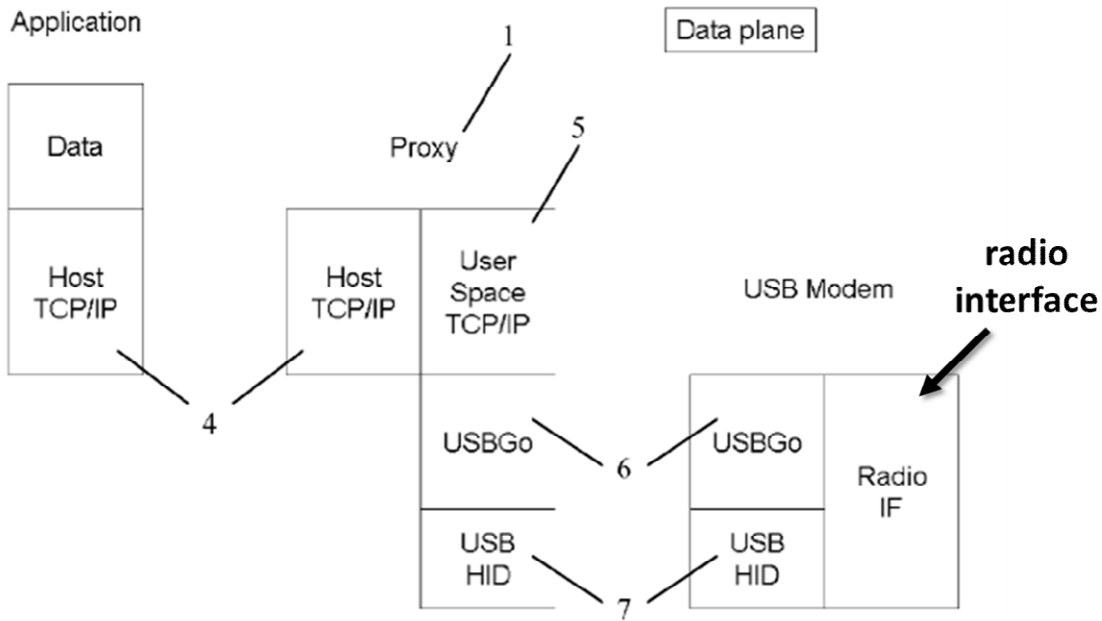


Figure 2

(Ex-1030, FIG. 2)

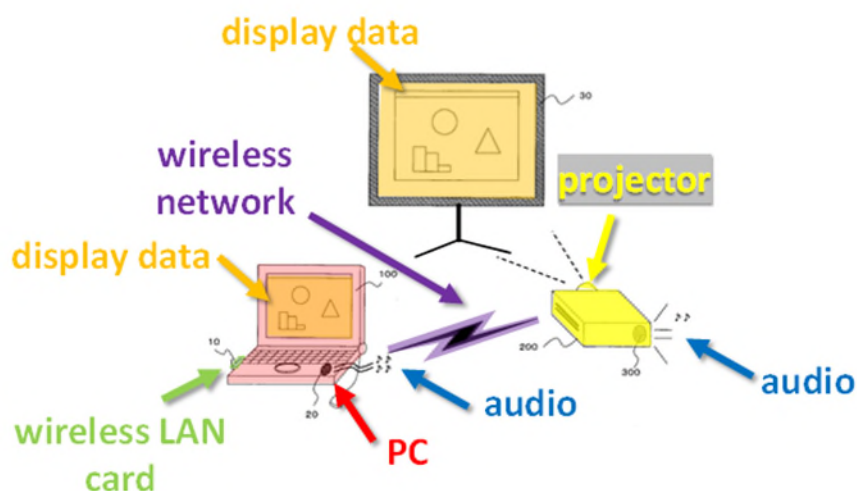
161. Further, a POSITA would have been motivated to implement a image projection system like that of Maeda with a wireless device that provide at least the same functionality as wireless LAN card 10 in transmitting and receiving communications as part of a wireless network by utilizing known or conventional wireless adapter components. Although the old PCMCIA standard used with LAN cards were supplanted by the USB standard, a POSITA would have understood that wireless USB adapters/dongles were similarly well known and able to be implemented to provide at least the same functionality using conventional components and conventional techniques. Therefore, a POSITA would have been

motivated to incorporate a transceiver and connector into a peripheral device (like the LAN card of Maeda or a similar wireless USB dongle) to couple to a port of a processing device using well-known components and conventional techniques to into a wireless device and thereby provide the functionality described by Maeda. (See, e.g., Ex-1059, ¶¶1-6; Ex-1022, FIG. 2; Ex-1024, ¶16, FIG. 3; Ex-1007, ¶¶18-21, 30, 47, FIG. 1; Ex-1060, 1:64-2:3, 3:42-64, FIG. 1; Ex-1027, ¶¶17, 45.) A POSITA would have had a reasonable expectation of success in implementing such well-known, routine, and predictable technology.

c. Limitation 1(b): setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and

162. The combined teachings of Maeda, Ahmed, and Deforche disclose and/or suggest this limitation. For example, Maeda discloses setting up communication for and communicating audio data from PC 100 (e.g., the “processing device”) to wireless LAN card 10 (e.g., the “external peripheral device”) via network IF [interface]108. (See, e.g., Ex-1031, ¶¶15 (“[A] PC is used as an image generation device that generates images and audio, and the images and audio are transmitted to a projector, which is an image projection device, using a wireless LAN”), 17 (“A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via

the wireless LAN”), 19 (“[A] network IF 108 which is an interface for communicating with projector 200 via a LAN or the like”), FIG. 1 (reproduced below).)



(Ex-1031, FIG. 1.)

163. A POSITA looking to implement an image projection system like that of Maeda would have had to consider the specific method in which data is transferred from the computer to the wireless LAN device through the port and connector. As I mentioned, at the time of the alleged invention, the USB standard had become widely-adopted as a way to connect a peripheral device to a computer. For more details on this see my discussion of USB and standard drivers in Section V, IX.A.2.b.) One aspect known feature of the USB standard is its support for plug-and-play capability, which offered the opportunity to insert the peripheral device and quickly be able to use the functionality of the device without having to install a

special driver for the peripheral device. (See Section IX.B.2.b.) For example, by simply plugging in a mouse or keyboard, the operating system would recognize the device setup communication with the device seamlessly and the user could almost immediately begin using its functionality.

164. Because of the ease of use of plug-and-play devices, there was a well-known incentive to design peripheral devices to avoid the need for a specialized driver to be installed on the computer prior to establish the connection between transmitter and computer. (See, e.g., Ex-1027, ¶¶21, 40; see also Section V.)

165. A POSITA would have been aware of standard audio drivers resident on a computer, such as a USB audio driver, and which did not require user installation. (See, e.g., Ex-1061, ¶43 (“The USB HID Driver 605 and USB Audio Driver 604 driver allow for bidirectional transfers without writing a custom operating system level device driver.”); Ex-1001, 30:39-43 (“For example, on every PC-like platform, there is standard built-in support for a USB audio device. Thus, there is a standard generic audio driver available.”), 31:52-54.)

166. Maeda does not specifically disclose using a “pre-installed generic audio driver.” However, Ahmed discloses sending the audio portion of a video stream using “a first ... audio driver”:

a virtual audio driver, referred to as a virtual audio cable (VAC), is installed as a normal audio driver that can be selected as a default

playback and/or recording device. A feature of VAC is that, by default, it routes all the audio going to its audio output pin to its input pin (Ex-1014, 18:26-19:15 (emphasis added))

167. Ahmed discloses that “[a] Microsoft Windows Multimedia Library provides an interface to the applications to play audio data on an audio device using waveOut calls.” (*Id.*, 17:13-16 (emphasis added).) Ahmed disclosure of a “second socket 1203 for transmitting audio” is an example of “a first pre-installed generic audio driver of the operating system ... for audio communication.” (Ex-1014, 27:4-27; *see also id.*, FIG. 12.)

168. Further, other techniques were also designed to implement plug-in wireless dongles that did not require the installation of drivers. In other words, one could simply make use of the drivers already resident on the computer. As discussed above in Section IX.B.2(b), Deforche illustrates one exemplary approach. Deforche suggests the use of pre-installed generic drivers for setting up a modem/host communication interface for communication between a wireless modem device and a computer device to which it is connected to wirelessly exchange any IP data (*e.g.*, through a USB port/interface). (*See, e.g.*, Ex-1030, abstract, ¶¶9-11; *see also* my summary of Deforche above in Section VIII.D.) The '002 patent also explains that this limitation was “well-known.” (Ex-1001, 3:65-4:9 (citing US 2011/0115689 (*see* Ex-1022, ¶39 (“the OS searches its own files for the driver software.”)))) Deforche

explains that typically a “user needs to install proprietary drivers before he/she can use a USB network device.” (Ex-1030, ¶27.) To avoid this, Deforche proposes the use of other USB class drivers. (*Id.*) Deforche’s connection method begins with the user plugging in a wireless USB modem device into a computer. (Ex-1030, ¶34; Ex-1027, ¶¶46-48.) Assuming the modem drivers are not installed, the USB modem device presents itself as a mass storage device to take advantage of the autorun feature. (*Id.*) Then the USB modem device sets a USBGo interface enabling communication between the USB modem and the computer. (Ex-1030, ¶¶34, 37.) The USBGo uses USB-HID (human interface device driver) “to avoid having to install a specific driver for the modem.” (Ex-1030, ¶37.) Thus, Deforche describes a technique where:

one of the pre-installed generic drivers of the operating system on the computer device is exploited for setting up the modem/host communication interface, i.e. the generic driver is used in connection with a computer peripheral device for which it is not actually intended. In other words, the wireless modem device of the invention does not belong to the standard class of computer peripheral devices for which the generic driver is foreseen in the operating system. (Ex-1030, ¶11.)

169. Given the incentives known in the art and disclosed by Deforche in avoiding the need for an installation of a special driver to set up communications between a wireless USB modem/transmitter, a POSITA would have been motivated

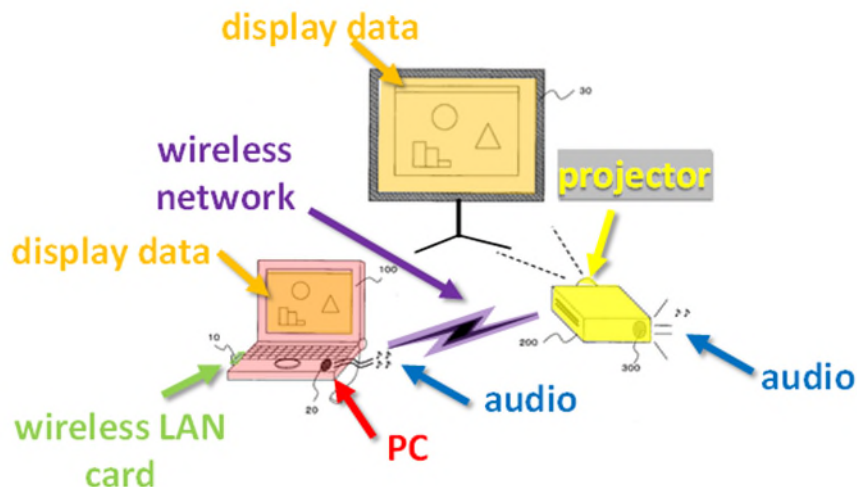
to look to the teachings of Deforche in implementing a system like that of Maeda. Further, a POSITA would have been motivated to select a suitable pre-installed generic driver, such as a USB audio driver capable of communicating audio data for setting up an interface between a transmitter and computer (similar to Deforche) for the transfer of audio data across the interface using a generic communications protocol. (See, *e.g.*, Ex-1030, abstract, ¶¶11, 34-37.) A POSITA would have also had a reasonable expectation of success in implementing such standard software, particularly given the teachings of Deforche and other developer tools available at the time.

170. As described above (*see* limitation 1(pre)), the wireless LAN/modem device may be presented as standard device class peripheral (*e.g.*, as suggested by Deforche), such that a pre-installed generic driver for the device class can be used to set up the communication of audio data from the computer to the wireless device. (See, *e.g.*, Ex-1030, ¶¶32-39, 52.) For example, the USB audio driver was known, could be used, and would avoid the installation of a specialized driver for the same purpose. Therefore, a POSITA would have been motivated in light of the desire to avoid a driver installation requirement (for plug-and-play devices) and the teachings of the Deforche, to setting up, by means of a pre-installed generic audio driver (such as a USB audio driver) of the operating system, a means for data communication

(such as an interface using a generic communication protocol provided by a USB audio driver) between the peripheral device and the processing device. A POSITA would have also had a reasonable expectation of success in implementing such standard software, particularly given the teachings of Deforche.

d. Limitation 1(c): setting up...by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device

171. Maeda, Ahmed, and/or Deforche disclose and/or suggest this limitation for similar reasons to those I described above for limitation 1(b). For example, Maeda discloses setting up communication for and communicating data from PC 100 (*e.g.*, the “processing device”) to wireless LAN card 10 (*e.g.*, the “external peripheral device”) via network IF [interface]108. (*See, e.g.*, Ex-1031, ¶¶15 (“[A] PC is used as an image generation device that generates images and audio, and the images and audio are transmitted to a projector, which is an image projection device, using a wireless LAN”), 17 (“A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN”), 19 (“[A] network IF 108 which is an interface for communicating with projector 200 via a LAN or the like”), FIG. 1 (reproduced below).)



(Ex-1031, FIG. 1.)

172. As described above (see limitations 1(pre) and 1(b)), the wireless LAN card/wireless modem device may be presented as a human interface device or other device class (*e.g.*, as suggested by Deforche), such that a pre-installed generic driver for the device class can be used to set up the communication of data from the computer to the wireless LAN card/wireless modem device. (See, *e.g.*, Ex-1030, ¶¶32-39, 52.) However, Maeda does not explain whether it uses “a second pre-installed generic driver of the operating system.”

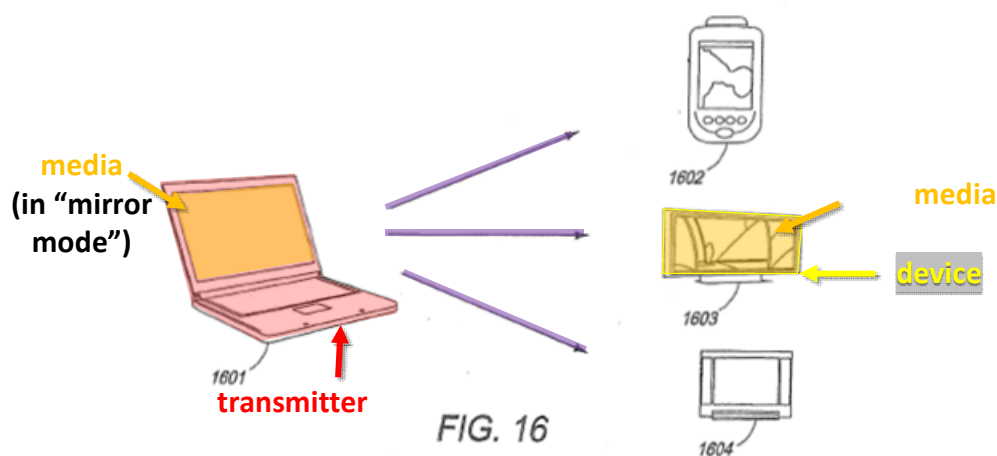
173. Ahmed discloses using “a second ... driver” as a “a means for data communication between the peripheral device and the processing device” (*e.g.*, “while the various media streams may be multiplexed and transmitted in a single stream, it is preferred to transmit the media data streams separately in a synchronized manner.”) (Ex-1014, 27:1-4.) Ahmed also sets up “data communication” using “a

second preinstalled generic driver of the operating system” by using a “mirror display driver” and a “first socket 1202 for transmitting video.” (*See, e.g.*, Ex-1014, Abstract and 27:4-27, *see also id.*, FIG. 12, 8:7-22, 9:12-13, 9:24-31, 10:9-13, 16:7-14, 4:3-5.) Therefore, Ahmed discloses the use of a video driver for capturing video data. (Ex-1014, 3:26-28.) Thus, Ahmed describes using separate drivers for audio and video.

174. As discussed in the preceding section, Deforche suggests setting up by means of a pre-installed generic driver (such as an audio driver) of the operating system, an interface for data communication between wireless peripheral device and a computer. (*See* Section IX.B.2.c.) Ahmed further suggests the use of additional drivers—one audio and another for video—in setting up communication between the wireless device and the computer including using different communication protocols. (Ex-1014, 19:10-20:11.)

175. Similar to Deforche and the '002 patent, Ahmed relates to “methods and systems for the wireless real time transmission of data from a source to a monitor” and “generally to the substantially automatic configuration of wireless devices.” (Ex-1014, 1:8-12.) Ahmed “enables the real-time transmission of media from a computing device to one or more remote monitoring devices or other computing devices.” (Ex-1014, 33:28-31; *see also id.*, FIG. 16 reproduced below.)

Ahmed sets up audio capture and subsequent communication of captured audio.
(*See, e.g.*, Ex-1014, Abstract (“capturing the audio data from an input source”), 3:21-28, 8:7-22, 17:8-19:9.)

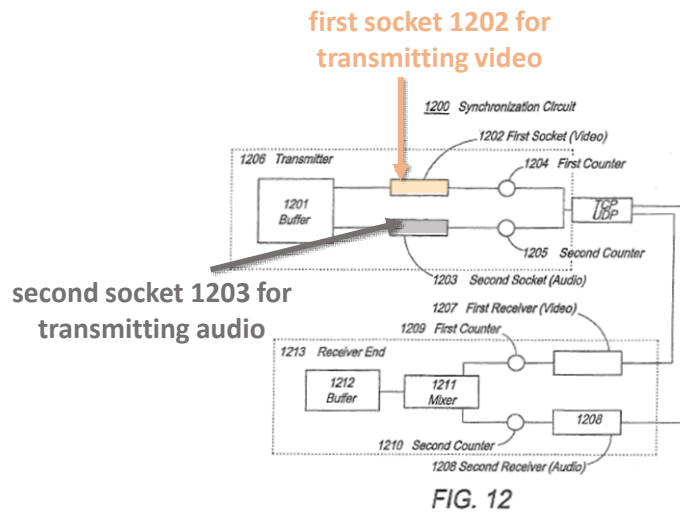


(Ex-1014, FIG. 16.)

176. Ahmed also teaches providing a separate communication channels for audio data and display data and transferring them using different protocols. For example, Ahmed indicates “while the various media streams may be multiplexed and transmitted in a single stream, it is preferred to transmit the media data streams separately in a synchronized manner.” (Ex-1014, 27:1-4.) In Ahmed, a “second socket 1203 for transmitting audio” is an example of a means for audio data communication. (Ex-1014, 27:4-27, *see also id.*, FIG. 12.)

177. Ahmed discloses that “audio is captured using through an interface used by conventional computer-based audio players to play audio data,” such as “using Microsoft Windows Multimedia API, which is a software module compatible with Microsoft Windows and NT operating systems.” (Ex-1014, 17:8-12.) A Microsoft Windows Multimedia Library provides interfaces to record audio data from an audio device. (Ex-1014, 17:13-16.) In another embodiment a virtual audio driver is used. (Ex-1014, 18:26-19:15.)

178. As with audio capture and communication (see limitation 1(b) discussed above), Ahmed also sets up graphics capture and communication using a driver. (See, e.g., Ex-1014, Abstract (“capturing the video data using a mirror display driver”), 8:7-22, 9:12-13, 9:24-31, 10:9-13, 16:7-14, 4:3-5.) In Ahmed, a “first socket 1202 for transmitting video” acts as a means for data communication. (Ex-1014, 27:4-27, *see also id.*, FIG. 12 (reproduced below).) Hence, Ahmed discloses the use of a video driver for capturing video data. (Ex-1014, 3:26-28.) Thus, Ahmed describes using separate drivers for audio and video and synchronizing each data stream. In other words, Ahmed suggests the use of a dedicated audio driver for audio data transmission and at least one other driver for data transmission, For example a video driver.



(Ex-1014, FIG. 12.)

179. A POSITA looking to implement a system like Maeda's system would have been motivated by Ahmed to provide separate drivers for separate audio and video streams as suggested by Ahmed and employ those drivers to set up a communications interfaces for each for the reasons discussed above by Deforche and known in the art. Further, a POSITA would have been motivated to select a suitable pre-installed generic driver, such as a USB-HID driver capable of communicating audio data for setting up a means for data communication (such as an interface using a generic communication protocol provided by the driver) between a transmitter and computer (similar to Deforche) for the transfer of data across the interface. (See, e.g., Ex-1030, ¶¶34-39.) A POSITA would have also had a reasonable expectation

of success in implementing such standard software, particularly given the teachings of Deforche.

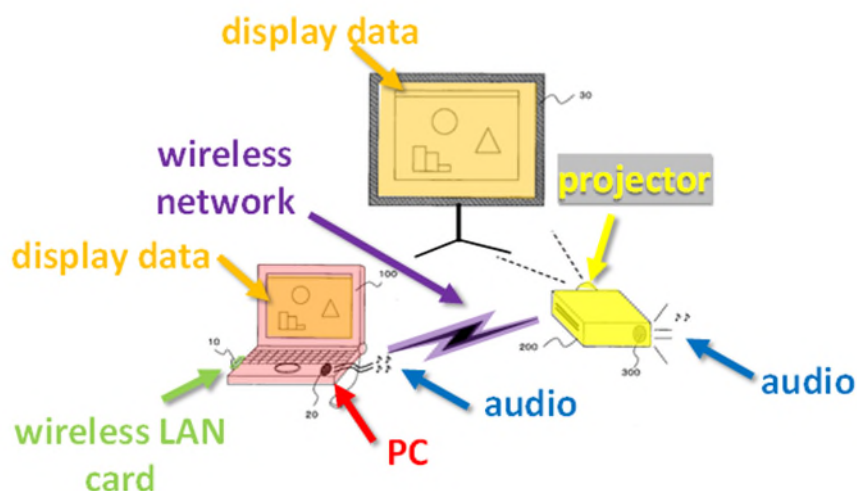
e. Limitation 1(d): using the peripheral device to connect the processing device to a communications network via the wireless transceiver

180. Maeda, Ahmend, and Deforche disclose and/or suggest this limitation. For example, Maeda discloses using the wireless LAN card 100 to connect the PC 100 to a communications network. (See, e.g., Ex-1031, ¶17 (“A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN.”). As described above (see limitation 1(a)), this connection may be achieved through the wireless LAN card’s transceiver chip, or other transceiver that enables two-way communication as known in the art. (See my discussion in Section IX.B.2.b regarding why a POSITA would have understood Maeda to disclose a transceiver and also why a POSITA would have been motivated to include such a conventional component.)

f. Limitation 1(e): routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and

181. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation. For example, Maeda discloses routing audio data from PC 100 (e.g., the “processing

device”) to wireless LAN card 10 (*e.g.*, the “external peripheral device”) via network IF [interface]108. (See, *e.g.*, Ex-1031, ¶¶15 (“[A] PC is used as an image generation device that generates images and audio, and the images and audio are transmitted to a projector, which is an image projection device, using a wireless LAN”), 17 (“A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN”), 19 (“[A] network IF 108 which is an interface for communicating with projector 200 via a LAN or the like”), FIG. 1 (reproduced below).) As described above, the wireless LAN card/wireless modem device may be presented as a human interface device or other class of peripheral device (*e.g.*, as suggested by Deforche), such that the audio data is routed using audio communication provided by and set up using a pre-installed generic audio driver (see limitation 1(b) above and 1(g) below). (See, *e.g.*, Ex-1030, ¶¶32-39, 52.)



(Ex-1031, FIG. 1.)

182. As described above (*see* limitation 1(a)), this connection may be achieved through the wireless LAN card's transceiver chip, or other transceiver that enables two-way communication as known in the art. (*See* my discussion in Section IX.B.2.b regarding why a POSITA would have understood Maeda to disclose a transceiver and also why a POSITA would have been motivated to include such a conventional component.)

g. Limitation 1(f): routing the audio data from the wireless transceiver of the peripheral device to a base node over the communications network

183. Maeda discloses and/or suggests this limitation. For example, Maeda discloses that audio data is routed from the PC to a projector 200 via the wireless LAN. (*See, e.g.*, Ex-1031, ¶17 (“This transmission system is a system in which a screen displayed on the display of PC 100 is transmitted from PC 100 to projector 200 and the screen received by projector 200 is projected onto a screen 30. A wireless LAN card 10 containing a wireless LAN chip is attached to PC 100, thereby transmitting image signals and audio signals to projector 200 via the wireless LAN. The PC 100 also has a built-in speaker 20 that can play audio generated by the PC 100. The projector 200 is also equipped with a speaker 300, which can play audio when an audio signal is received from the PC 100.”).) As described above (*see* limitation 1(a)), this connection may be achieved through the wireless LAN card's

transceiver chip, or other transceiver that enables two-way communication as known in the art. (See my discussion in Section IX.B.2.b regarding why a POSITA would have understood Maeda to disclose a transceiver and also why a POSITA would have been motivated to include such a conventional component.)

h. Limitation 1(g): wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device

184. The combination of Maeda, Deforche, and Ahmed further suggests this limitation. (See limitations 1(pre), 1(b), and 1(c); Section IX.B.2.a, c, d.) As discussed regarding limitation 1(e), the combination also suggests routing audio data from the processing device to the peripheral device. (Section IX.B.2.f.) A POSITA would have been further motivated to use the first pre-installed generic audio driver to transfer the audio data between the processing device and the peripheral device. First, Maeda discloses transferring the audio data between computer 220 and the wireless LAN card 10. (See, e.g., Ex-1031, ¶¶17, 19, 53-54.) Second, Deforche suggests using a pre-installed generic driver to transfer data between a computer processing device and a peripheral wireless device. (See, e.g., Ex-1030, ¶¶32-39, 52.) Third, Ahmed suggests the use of a dedicated audio driver for transmitting audio data. (Ex-1014, 27:1-4.) Thus, the combination proposed above suggests a first pre-installed generic audio driver (such as a USB audio driver) is used (as

suggested by Deforche) for transferring audio data between a processing device (such as computer 220) and a peripheral device (such as a wireless LAN device) (as taught by Meada, Doforche, and known in the art). (See Sections IX.B.2.a, c, d.)

185. A POSITA would have been motivated to make use of a first pre-installed generic audio driver for transferring audio data between a processing device and a peripheral device for the advantages discussed by Deforche and Ahmed as already discussed above Sections IX.B.2.c-d.

3. Claim 2: The method of claim 1 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver

186. The teachings of Maeda, Ahmed, and/or Deforche disclose and/or suggest all the limitations of claim 2. For example, Deforche discloses presenting a wireless modem peripheral device (*e.g.*, a “peripheral device”) to a computer’s operating system as a human interface device (HID), such that the pre-installed mass storage device driver of the computer can communicate with the peripheral device without the need to install special device drivers. (See, *e.g.*, Ex-1030, ¶¶33 (“The USB device can thus expose its USB interface in different ways: (1) A composite device with USB HID and USM Mass Storage Unit (UMS) device with UMS and HID USB ID; (2) UMS device with 3G USB ID”), 34 (“The USBGo uses USB-HID as a lower layer to avoid having to install a specific driver for the modem”), 9-10 (“a

pre-installed generic driver of an operating system installed on the computer device is used for setting up a modem/host communication interface by means of which the wireless modem device and the computer device can communicate with each other” and an “example of such a generic driver is a human interface driver (HID).”)

4. **Claim 3: The method of claim 1 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.**

187. The teachings of Maeda, Ahmed, and/or Deforche disclose and/or suggest all the limitations of claim 2. For example, Deforche discloses presenting a wireless modem peripheral device (*e.g.*, a “peripheral device”) to a computer’s operating system as a mass storage device, such that the pre-installed mass storage device driver of the computer can communicate with the peripheral device without the need to install special device drivers. (*See, e.g.*, Ex-1030, ¶¶33 (“The USB device can thus expose its USB interface in different ways: (1) A composite device with USB HID and USM Mass Storage Unit (UMS) device with UMS and HID USB ID; (2) UMS device with 3G USB ID”), 34 (“The USBGo uses USB-HID as a lower layer to avoid having to install a specific driver for the modem”).)

5. **Claim 9: The method of claim 1 further comprising time-stamping synchronously the audio with the data stream**

188. The teachings of Maeda, Ahmed, and/or Deforche disclose and/or suggest the limitations of claim 9. For example, a POSITA would have appreciated

that the processing time for audio tends to be shorter than for video data. Therefore, it is known to be useful to provide an independent way to synchronize the audio and video data so that they reflect the original audiovisual content. For example, Meada discloses that “[g]enerally, audio has a smaller capacity than images and can therefore be transmitted faster,” which may be addressed by a delay in the audio buffer. (Ex-1031, ¶57.) Ahmed further discloses synchronously time-stamping audio data and video data. (See, e.g., Ex-1014, 29:6-18 (“Referring to Figure 14, another embodiment of the audio and video synchronization circuit is depicted. The synchronization circuit 1400 at the transmitter end 1401 comprises buffer 1402 having media data, multiplexer 1403 for combining the media data signals, such as graphics, text, audio, and video signals, and a clock 1404 for providing the timestamps to the media content for synchronization. At the receiver end 1405 the demultiplexer 1406 using clock 1407 devolves the data stream into the individual media data streams. The timestamps provided by the clocks help synchronize the audio and video at the receiver end. The clock is set at the same frequency as that of receiver. The audio and video, which is demultiplexed, is routed to the speakers 1408 and display device 1409 for rendering.”), FIG. 14.)

189. A POSITA, therefore, would have been motivated to implement this or another well-known synchronization technique such that the user in a system like

that of Maeda is able to view video footage with synchronized audio output. Such techniques were well-known and well established by the time of the purported inventions and would have been a simple application of a known technique to apply Ahmed's synchronous time stamping method between audio and data streams to the system of Maeda. Thus, a POSITA would have had a reasonable expectation of success in implementing such conventional techniques.

6. Claim 10: The method of claim 9 further comprising encoding, optionally encrypting the audio data

190. The teachings of Maeda, Ahmed, and/or Deforche disclose and/or suggest the limitations of claim 10 as best understood. A POSITA would have understood that wirelessly sent data was conventionally encoded and encrypted for transmission. For example, Ahmed discloses encoding audio data. (*See, e.g.*, Ex-1014, 7:11-15 ("Preferably, the computing device 101 and remote monitor 103 further comprise a processing system on a chip capable of wirelessly transmitting and receiving graphics, audio, text, and video encoded under a plurality of standards", 22:9-12 ("The block that corresponds to the best checking point is the block of the reference frame, which matches best with the block of the current frame that is to be encoded"), 27:30-32 ("Initially, the receiver receives 1301 a stream of encoded video data and encoded audio data wirelessly"), FIG. 13.) A POSITA would have been motivated to implement such standard encoding and/or encrypting

techniques for a variety of reasons, such as to make use of standard wireless protocols and components that utilize such standards. Such techniques were well-known and well established by the time of the purported invention and would have been a simple application of a known technique to apply Ahmed's method of encryption to the system of Kaplan. Further a POSITA would have a reasonable expectation of success in implementing such conventional techniques and achieving the claimed invention.

7. Claim 11

191. Maeda, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 11, for all the reasons stated above with respect to Claim 1. (See Section IX.B.2.)

- a. Limitation 11(pre): A system for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the system comprising**

192. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(pre). (See Section IX.B.2.a.)

- b. Limitation 11(a): means for coupling an external peripheral device physically to a port of the processing device, the peripheral device comprising a wireless transceiver and a connector, said connector configured to couple to the port of the processing device**

193. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(a). (See Section IX.B.2.b.)

- c. Limitation 11(b): means for setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and**

194. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(b). (See Section IX.B.2.c.)

- d. Limitation 11(c): means for setting up...by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device**

195. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(c). (See Section IX.B.2.d.)

- e. Limitation 11(d): wherein the peripheral device is configured in a way to connect the processing device to a communications network via the transceiver**

196. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(d). (See Section IX.B.2.e.)

- f. Limitation 11(e): means for routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and**

197. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(e). (See Section IX.B.2.f.)

- g. Limitation 11(f): means for routing the audio data from the wireless transceiver of the peripheral device to a base node over the communications network**

198. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(f). (See Section IX.B.2.g.)

- h. Limitation 11(g): wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device**

199. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(g). (See Section IX.B.2.h.)

- 8. Claim 19: The system of claim 11 further comprising time-stamping synchronously the audio stream with the data stream**

200. Maeda, Ahmed, and Deforche disclose and/or suggest the limitations of claim 19 for the reasons stated with respect to claim 9. (See Section IX.B.5.)

- 9. Claim 21:**

201. Maeda, Ahmed, and Deforche disclose and/or suggest all the limitations of claim 21, for all the reasons stated above with respect to Claim 1. (See

Section X.B.2.)

- a. **Limitation 21(pre): A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device**

202. To the extent limiting, Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(pre)-(a).
(See Section IX.B.2.a-b.)

- b. **Limitation 21(a): said executable software code comprising: a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device**

203. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(b). (See Section IX.B.2.c.)

- c. **Limitation 21(b): a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device**

204. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(b)-(d). (See Section IX.B.2.c-e.)

- d. Limitation 21(c): a third software code portion for routing audio data from the processing device to the peripheral device via the connection and the means for audio communication and for routing the audio data from the peripheral device to the base node over the communications network**

205. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitations 1(e)-(f). (See Section IX.B.2.f-g.)

- e. Limitation 21(d): wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device**

206. Maeda, Ahmed, and Deforche disclose and/or suggest this limitation for the reasons stated with respect to limitation 1(g). (See Section IX.B.2.h.)

10. Claim 22: The method of claim 1, wherein the audio driver is a generic audio driver

207. Maeda, Ahmed, and Deforche disclose and/or suggest limitation of claim 22 for the reasons stated with respect to claim 1, which already recites a “generic audio driver.” (See Section IX.B.2.)

X. CONCLUSION

208. My opinions are based upon the information that I have considered to date. I am unaware of any evidence of secondary considerations with respect to the

'002 patent that would render any of the asserted claims non-obvious. I reserve the right, however, to supplement my opinions in the future to respond to any arguments raised by the owner of the '002 patent and to consider new information that becomes available to me.

209. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and 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.

By: 
Kevin C. Almeroth, Ph.D.

Date: September 12, 2024