

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.,

Petitioner,

v.

BARCO N.V.,

Patent Owner.

CASE: IPR2024-01436

U.S. PATENT NO. 10,762,002

DECLARATION OF MICHAEL C. BROGIOLI, Ph.D.

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I, Dr. Michael C. Brogioli, declare as follows:

1. I am over eighteen years of age, and I am competent to testify regarding the matters set forth in this declaration if called upon to do so.

2. I have been retained in this matter by K&L Gates LLP on behalf of Patent Owner, Barco NV (“Barco”).

3. I am being compensated at my standard consulting rate for my time spent on this matter through Elysium Digital LLC, who I understand charges \$950 per hour of my time. My compensation is not contingent upon the testimony I provide or the outcome of this matter. I submit this declaration at the request of K&L Gates as counsel for Patent Owner in this proceeding.

4. I understand that Yealink (USA) Network Technology Co., Ltd., and Yealink Network Technology Co., Ltd. (collectively, “Petitioner”) and its expert, Dr. Kevin C. Almeroth, have submitted papers in this proceeding arguing that Claims 1 to 3, 9 to 11, 19, 21, and 22 (the “Challenged Claims”) of U.S. Patent No. 10,762,002 (the “’002 Patent”) (Ex. 1001) are unpatentable under the United States Patent and Trademark Office’s *inter partes* review standard of a preponderance of the evidence. I provide certain technical opinions regarding the scope and content of the prior art, including how those skilled in the art as of 2011 would have understood certain references, the industry as a whole, and what factors were driving innovation

in this space. Petitioner and Dr. Almeroth have not challenged the other claims of the '002 Patent.

5. In preparing this declaration, I have analyzed the '002 Patent (Ex. 1001), its file history (Ex. 1004), the declaration of Dr. Kevin C. Almeroth (Ex. 1002), and several prior art references, including Kaplan (Ex. 1027), Maeda (Ex. 1031), Ahmed (Ex. 1014), and Deforche (Ex. 1030). I also considered the other documents or references cited in this declaration.

6. In forming the opinions expressed below, I have considered the documents listed above, the relevant legal standards as provided to me by counsel, and my own knowledge and experience. My opinions are offered from the perspective of a person of ordinary skill, as that term is defined, as of September 14, 2011.

7. I understand Dr. Almeroth has already provided his opinions in Exhibit 1002; however, if he is permitted to offer additional opinions, I reserve my right to respond to those should I be asked.

I. QUALIFICATIONS AND BACKGROUND

8. Below is a summary of my education and experience. My *curriculum vitae* ("CV"), provided as Exhibit 2005 provides additional context regarding my professional background, experience, publications, patents, and other qualifications

relevant to providing expert opinions. Here, I highlight experiences that are relevant to the technology described in the patent at issue.

9. I am currently an Adjunct Professor of Electrical and Computer Engineering at Rice University in Houston, Texas, and Managing Director of Polymathic Consulting in Austin, Texas. I received my Bachelor of Electrical Engineering from Rensselaer Polytechnic Institute in 1999, my Master of Science in Electrical and Computer Engineering from Rice University in 2003, and my Doctorate of Electrical and Computer Engineering from Rice University in 2007.

10. While at Rice University, I developed various computer architecture designs for embedded and high-performance systems, including multi-core and low power systems used in processing various workloads, including multimedia and other workloads. For example, from 1999 to 2003, I worked in the area of low-power computing, specifically focusing on dynamic power management and performance of configurable computing and memory systems with workloads, including multimedia and signal processing. From 2002 to 2004, I developed Spinach, a computer architecture design and modeling toolset, which models system components common to all programmable computing environments, including memory systems, multi-core microprocessor systems, and related hardware components. These systems targeted networking hardware and software solutions. From 2004 to 2009, I developed Spinach DSP-FPGA, a modular and composable

simulator design infrastructure for programmable and reconfigurable embedded SOC architectures specifically targeting mobile, low-power, and embedded and portable computing devices running networking and multimedia workloads. From 2005 to 2009, I developed and published a retargetable compiler infrastructure and hardware design exploration toolkit for systems microprocessor design, which facilitated the design space exploration of microprocessors and multi-core processor designs. Many of these tools have been used at United States universities in the area of electrical and computer engineering research.

11. In the late 1990s, I was a hardware and software developer at Vicarious Visions in New York, developing third-party titles for Nintendo's handheld consoles, in addition to various hardware and software interfaces and solutions. These were used for the optimization and transfer of audio and graphics streams from developer workstations (desktop computers) to the peripheral consoles, via custom hardware and software solutions. During my career, I have served as Chief Technology Officer, advisory board member, and board of directors' member, often in co-founding roles.

12. From June 2006 to August 2007, I worked as the Technical Co-Founder of Method Seven LLC in Boston, MA, working with high-performance software and hardware systems architecture. I am currently a co-founder, co-

inventor, and Chief Technology Officer of Network Native, an Internet of Things technology company as well as others that are detailed on my CV.

13. I have held the position of Adjunct Professor at Rice University since 2009 and the position of Managing Director at Polymathic Consulting since 2011. At Rice University, I instruct graduate-level curriculum in the areas of computer architecture, hardware and software systems, including multimedia processing and various codecs and optimizations for emerging architectures. I also advise on university research and various design initiatives, including the design of audio and media processing solutions for multiprocessor systems. At Polymathic Consulting, I work with a range of technologists from early-stage start-ups to Fortune 500 companies on similar technologies.

14. From 2008 to 2009, I was Senior Engineer working in high-performance compiler designs and next-generation multi-core microprocessors and architectures at Freescale Semiconductor in Austin, Texas. From November 2009 to October 2011, I was Chief Architect, Senior Member Technical Staff, at Freescale Semiconductor in Austin, Texas (formerly Motorola), responsible for management of technology, engineering roadmaps, design lead on software infrastructure, and next-generation multi-core microprocessor architectures. During my tenure at Freescale Semiconductor, I was in charge of system developer tools. These included

tools used for the programming of processors, simulation and modeling, and related technologies including digital networking and multimedia solutions.

15. I have previously worked for Texas Instruments' Advanced Architecture and Chip Technology division in Houston, Texas, in the areas of high-performance mobile and embedded systems design at the hardware and systems software level, specifically around heterogeneous computing, including solutions used in multimedia processing. I also have worked at Intel Corporation's Microprocessor Research Labs in the areas of computer architecture and compiler technologies.

16. I am recognized as an expert in the field of computer architecture, computer hardware and computer software systems as they relate to the subject matter at hand. I am a member of the Institute of Electrical and Electronics Engineers (IEEE) and Association for Computing Machinery (ACM) and have been a steering committee member for the IEEE and ACM Design Automation Conference since 2011 and have previously held the role of Program Chair of Design Automation Conference in the area of Embedded Computing. I have also been a reviewer and contributor to a number of IEEE and ACM technical conferences during the course of my career.

17. Over the past 20 plus years, I have authored numerous peer-reviewed publications, as well as engineering books in the area of computer hardware and

software design, including solutions for and optimization of codec technologies. Many of these incorporate technologies specific to the subject matter at hand. These publications are disclosed in my CV. I have previously served as an engineering consultant and testifying witness on matters related to, and including, microprocessors and multi-core technology as well as audio and video processing technology, peripherals and interfaces similar to those mentioned in the patents at suit in this matter.

18. My curriculum vitae contains more information on my background and experience, as well as the cases in which I have served as an expert witness over at least the past four years.

II. LEGAL STANDARD

19. Although I am not a lawyer, I have been advised on the relevant legal principles by counsel and have used them as a basis for my opinions.

A. Claims

20. I have been informed and understand that terms in the patent claims must be read as they would have been understood by a “person of ordinary skill in the art” (“POSITA”) at the time of the claimed invention.

21. I understand that a POSITA is a person to which the claimed subject matter pertains with the capability of understanding the scientific and engineering

principles applicable to the pertinent art. I understand that the following factors may be considered in determining the level of ordinary skill:

- the type of problems encountered in the art;
- prior art solutions to those problems;
- the speed with which innovations are made;
- the sophistication of the technology; and
- the educational level of active workers in the field.

I also understand that not every factor may be present and that one or more factors may predominate others.

22. I understand that the claims within a patent set forth what the inventors have presented as their inventions. I understand that claims can be independent or in dependent form, meaning that they depend from the identified independent claims and add requirements to those claims.

B. Specification

23. I understand that there are other parts of a patent, including the abstract, the figures of a patent, the background of the invention, the summary of the invention, and the detailed description of the invention. I understand that these portions often are collectively referred to as the “specification” of a patent. I understand that technically, the claims are part of the specification, but that referring to the “specification” typically means referring to the written description of the

inventions rather than the claims. I understand that the specification informs the understanding of the claims by, for example, describing the claimed invention and providing preferred examples of the claimed invention.

24. I have also been informed and understand that terms of a claim should be understood in the context of the claim as a whole. I also understand that the specification of the patent is relevant to the meaning of a claim term. I further understand that the claims must be read in light of the specification.

C. Prosecution History

25. I understand that the correspondence back and forth between the representative of the applicant, and the U.S. Patent and Trademark Office, leading up to the issuance of a patent is called the “file history” or “prosecution history.” It has been explained to me that, in the process of obtaining a claim of a patent, the inventors and the examiner may make statements explaining their understanding of the scope of their claimed invention. It has also been explained to me that for a statement by the inventors to narrow the scope of a claimed invention, the statement must clearly and unambiguously limit the scope of an invention. I understand this is called “prosecution disclaimer” or “prosecution disavowal.” I understand that the claim language, specification, and file history are referred to as “intrinsic evidence” or “the intrinsic record.”

D. Burden of Proof

26. I understand that, unlike at the district court, an *inter partes* review, such as this proceeding, apply a lower burden of proof to judge the patentability of challenged claims. Unlike the district court’s “clear and convincing” burden, here, a “preponderance of the evidence” burden exists.

E. Anticipation

27. I understand that a patent claim is invalid as “anticipated” by a single “prior art” reference if the reference discloses every single element of the claim with sufficient precision and detail to establish that the subject matter of the claim existed in the prior art. In particular, I understand that it is not sufficient to establish that all of the elements are collectively disclosed within the four corners of a particular document. Instead, the operative question is whether a person of ordinary skill would have understood the elements as being arranged as in the claim itself. I also understand that a prior art reference cannot “anticipate” a patent claim unless that reference enables one of ordinary skill in the art to make and use what is disclosed without undue experimentation. Thus, if the reference does not enable one of

ordinary skill to make or use each and every claim limitation, then the claim cannot be “anticipated” by the reference.¹

28. I understand that a prior art reference can disclose a given claim element actually or inherently.

29. In the case of actual disclosure, I understand that a person of ordinary skill would need to have understood that the disclosure corresponds to the claim element in question. I also understand that such disclosure may be implicit rather than explicit. For example, prior art need not use the same words as the claimed invention. However, I understand that ambiguous references do not anticipate.

30. In the case of alleged “inherent” anticipation, I understand that the claim element in question must necessarily be present when practicing the described technology even though the prior art reference itself contains no express description of the element in question. In particular, I understand that “possibilities or probabilities” are not sufficient to establish inherency. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Instead, the essence of inherency is that one of ordinary skill in the art would recognize that a reference unavoidably teaches the property in question.

¹ I understand that the Petition and Dr. Almeroth are not advancing any anticipation-based theories of unpatentability.

F. Obviousness

31. I understand that a patent claim may describe an invention that was new (*i.e.*, not anticipated by any prior art reference), but nevertheless be invalid for “obviousness” if the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention was made.²

i. *Analogous Art*

32. I understand that in order to rely on a reference to establish an obviousness theory the reference must be analogous to the claimed invention. I understand that in order to be analogous, the reference may either be part of the same “field of endeavor” or the reference may be “reasonably pertinent” to the problem addressed by the claimed invention.

33. I understand that to determine the field of endeavor of a patent, the focus should be on the subject matter of the application, including function, structure, and the claimed invention. I understand that to determine the field of endeavor of the reference, the primary focus should be on what the reference actually discloses.

² I understand that the Petition and Dr. Almeroth are advancing two “obviousness” theories with Grounds 1 and 2.

I understand to determine what is reasonably pertinent to a patent, one should consider the problem faced by the inventor as reflected in the specification, either explicitly or implicitly. A reference is only considered pertinent to that problem if a person of skill in the art would have considered it when faced with the problem the inventor was trying to solve.

ii. *Reasonable Expectation of Success*

34. I understand that an invention is not rendered obvious simply on the basis of two or more different disclosures that collectively disclose all of the claimed elements. In other words, an invention is not obvious just because all of the elements that comprise the invention may have been known in the prior art. Instead, a person of ordinary skill in the art must have had a reasonable expectation of success in pursuing the possibility that turns out to succeed and is claimed. In particular, I understand that knowledge of a goal does not itself render achievement of that goal obvious.

35. I also understand that determining whether or not a claimed invention would have been obvious requires assessing facts related to (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention, (3) the level of ordinary skill in the art, and (4) any objective evidence (“secondary considerations”) of non-obviousness. I understand that this is known as consideration of the “Graham Factors.”

iii. *Motivation to Combine*

36. I further understand that an invention is not obvious just by demonstrating that each of its elements were, independently, known in the prior art. To prove that an invention is obvious, I understand that there must be a reason or reasons, such as a teaching, suggestion, or motivation, which would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed invention does. While an express teaching, suggestion, or motivation need not be found in a reference itself, I understand that there still must be an articulated reason why a person of ordinary skill in the art would make the proposed modification or changes. I understand that this is because inventions in most (if not all) instances rely upon building blocks already known, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known; therefore, it can be important to point to such a reason or reasons. I understand that in identifying such a reason, the analysis need not require precise teachings in the prior art references themselves directed to the reason, and that the reason can come from other sources, such as the testimony of an expert.

37. I understand that it will often be necessary for a court to look to interrelated teachings of multiple patents and the background knowledge possessed by a person having ordinary skill in the art in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the

patent at issue. I understand that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. I understand that when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. I understand that the combination of familiar elements according to known methods may be obvious when it does no more than yield predictable results.

38. I also understand that a claim is not invalid as obvious if it is more than the predictable use of prior art elements according to their established functions.

39. Further, I understand that while predictability is a touchstone of obviousness, the concept of a “predictable result” under the law refers not only to the expectation that prior art elements are capable of being combined, but also that the combination would have arrived at the challenged claims.

40. I also understand that if the prior art “teaches away” from combining known elements in the manner claimed by the invention at issue, discovering a successful way to combine them is less likely to be obvious. In particular, I understand that a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant, or would understand based on the reference that the line of

development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. Likewise, I understand that similar subject matter may not be sufficient motivation for a person of skill in the art to combine references if the references have conflicting elements.

41. Further, I understand that even if a reference does not necessarily “teach away,” the reference's statements regarding preferences are relevant to a finding regarding whether a person of ordinary skill would have had reason to combine that reference with another reference.

iv. *Hindsight*

42. I also understand that one must be cautious and resist the temptation to rely on hindsight reasoning when attempting to combine references to suggest that a claim may be obvious. It is important to analyze validity based on the perspective of one of skilled in the art at the time of the invention, which for this case I have been asked to assume is September 14, 2011, and which I understand is the date Dr. Almeroth used as the priority date of the '002 Patent. Ex. 1002, ¶21 (“I have been asked to initially consider that the time of the alleged invention of the '002 patent is around September 14, 2011.”). I understand that objective indicia (or “secondary considerations”) of non-obviousness or obviousness may be particularly probative and helpful in avoiding hindsight.

v. *Secondary Considerations*

43. I understand that as part of the obviousness analysis, one must also consider “objective indicia of non-obviousness” sometimes referred to as “secondary considerations.” These include commercial success, industry praise, unexpected results, copying, industry skepticism, licensing, and long-felt but unsolved need. I further understand that secondary considerations have greater applicability when there is a sufficient “nexus” between the evidence of secondary consideration and the claimed invention. This “nexus” is established when the evidence is tied to a product that embodies the patented features and is coextensive with them. I understand that the obviousness inquiry itself, and the weighing of secondary considerations, is a question of fact left to the fact finder, as a result I am not providing any opinions on the impact of any secondary considerations on the obviousness analysis. However, I understand that Patent Owner, Barco, is making an argument tied to the commercial success of its ClickShare product. I have been asked to analyze Barco’s products and provide my opinion as to whether Barco’s product embodies the patented features and whether there are significant unpatented features in the ClickShare products; I have done so. *See* Section VI.C.

III. LEVEL OF ORDINARY SKILL IN THE ART

44. I understand that Dr. Almeroth opines 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." Ex. 1002, ¶37. I understand that Dr. Almeroth has further opined that additional experience could substitute for professional experience. Ex. 1002, ¶37.

45. Given the disclosures of the '002 Patent, the claim scope, and what I have been informed is the educational level of the inventors and their work experience, I agree that this is an appropriate level of skill in this art.

46. Accordingly, my analysis and opinions below are given from the perspective of a POSITA in this technological field in the relevant time frame, unless stated otherwise.

47. I satisfied the definition of a POSITA before the filing date of the application leading to the '002 Patent. I now consider myself an expert in the relevant field of technology for the '002 Patent.

48. In forming my opinions for this declaration, I have used the perspective of one of ordinary skill in the art as defined above. My opinions, however, would not be affected if a POSITA is defined as someone who has slightly more or slightly less experience than described above.

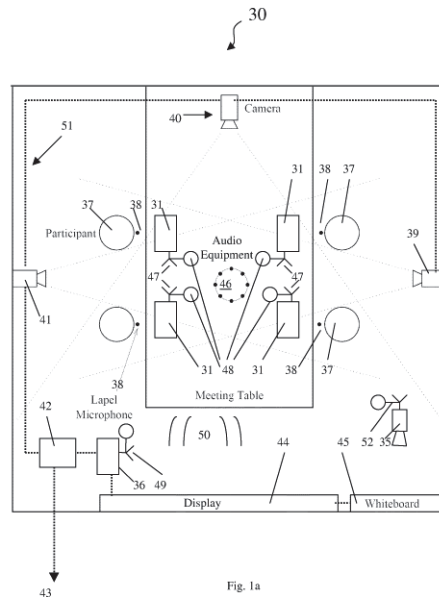
IV. SUMMARY OF THE '002 PATENT

A. Overview

49. The '002 Patent provides “electronic tools for meetings with audio including methods or devices for providing connection to a communications network.” Ex. 1001, 1:4-6. As set out by the inventors, the electronic tools of the '002 Patent improve the ability and ease of presenting content in a meeting setting. Ex. 1001, 3:12-4:62, 16:1-15. Unlike prior art systems that required cables, LAN connections, or specialized software, the '002 Patent provides a system that “advantageously use the availability of a plug and play interface such as a USB interface.” Ex. 1001, 3:12-4:9, 30:36-38. This is beneficial because computers include standard built-in support for a USB device, and thus standard generic audio drivers are also available for use. Ex. 1001, 30:39-42. Accordingly, the standard computer interfaces, including the pre-installed generic drivers, can be leveraged to provide wireless presentation functionality without requiring additional PC configuration or special driver installation. Ex. 1001, 30:42-43.

50. In one example, Figure 1a “shows a meeting room that can be used with embodiments of the present invention.” Ex. 1001, 14:50-54. As shown below, multiple participants 37 are in meeting room 30. Ex. 1001, 16:16-20. Each participant 37 has a processing device 31, which is a host device with a first connection unit 47 coupled to network 50. Ex. 1001, 16:16-26. Connection unit 47

is also coupled to input device 48. Ex. 1001, 16:24-26. Network 50 further includes base node 36 connected to display 44. Ex. 1001, 16:49-51. Thus, the base node, user processing devices, and connection units form a communication network that links with central display device 44. Ex. 1001, 18:19-23.



Ex. 1001, Figure 1a.

51. The connection unit, which is also referred to as a peripheral device, may include a plug and play interface, a processing engine, a wireless transmitter, portable application, and a button. Ex. 1001, 23:50-24:3. To display media content, the central display connects the peripheral device to a USB port. Ex. 1001, 24:55-59. The peripheral device can present itself as a USB composite device, audio device, mass storage device, or human interface device. Ex. 1001, 6:46-53, 6:65-67, 30:54-55.

52. By connecting the peripheral device to the processing device, the user can share audio data to the peripheral device's audio device, which can be streamed to the base node. Ex. 1001, 31:11-14. This sharing process is done using only standard drivers and does not require special software installation in or on the processing device. Ex. 1001, 31:20-25. Audio data is then transmitted over the communication network to the base node. Ex. 1001, 31:27-29. Once received, the audio data can be shared from the base node. Ex. 1001, 31:65-32:5.

53. The peripheral device can also share display data. Namely, the peripheral device stores a software application, which is then loaded on the processing device. Ex. 1001, 32:11-26. The software, then running on the processing device, captures the video data that is available on the processing device. Ex. 1001, 32:11-26. Because the software application is stored on the peripheral device and loaded onto the processing device when coupled, the software is implemented as a portable application thereby leaving a zero-footprint on the processing device once disconnected. Ex. 1001, 21:62-66; 32:19-22. The video encoder then encodes the video signal for a packetizer to packet and share to the peripheral device using another pre-installed generic driver. Ex. 1001, 32:35-42. In an example, the pre-installed generic driver is a human interface device driver. Ex. 1001, 32:35-42. Once received at the plug and play port, the video data is unpacked and transmitted over the communications network with the audio data. Ex. 1001, 32:43-48.

54. Then, the base node receives the audio and video data, which is unpacked and decoded, before synchronizing and sharing the data over the display and other output devices. Ex. 1001, 33:8-16. Notably, none of the cited references provide the same wireless content sharing over a peripheral device with pre-installed generic drivers. *See generally*, Ex. 1014; Ex. 1027; Ex. 1030; Ex. 1031.

B. Claim Construction

55. I do not provide an opinion on any claim construction issues in this matter. I have been asked by counsel to apply the following constructions as identified below. For any term not expressly identified below, I have applied the plain and ordinary meaning, as understood by a POSITA in view of the specification.³

Term	Applied Construction
“couple” / “coupling”	“connect[ing] two devices, either directly or indirectly”

³ I understand that Petitioner has proposed additional claim constructions which I have not identified here. My failure to response to these constructions does not mean I agree with these proposed constructions, and I reserve the right to later opine about these proposed constructions.

Term	Applied Construction
“pre-installed generic driver”	“software installed on a processing device as part of the operating system that can drive a standard class of peripheral devices coupled to or connected to the processing device without the need to install a driver specific to a given peripheral device”
“pre-installed generic audio driver”	“pre-installed generic audio driver” may be used with audio hardware
“means for audio communication”	Governed by 35 U.S.C. § 112 ¶ 6 Function: Provide audio communication between the peripheral device and the processing device Structure: “an interface using a generic communications protocol” As set forth in Ex. 2016, 10-13.
“means for data communication”	Governed by 35 U.S.C. § 112 ¶ 6 Function: Provide data communication between the peripheral device and the processing device Structure: “an interface using a generic communications protocol” As set forth in Ex. 2016, 10-13.

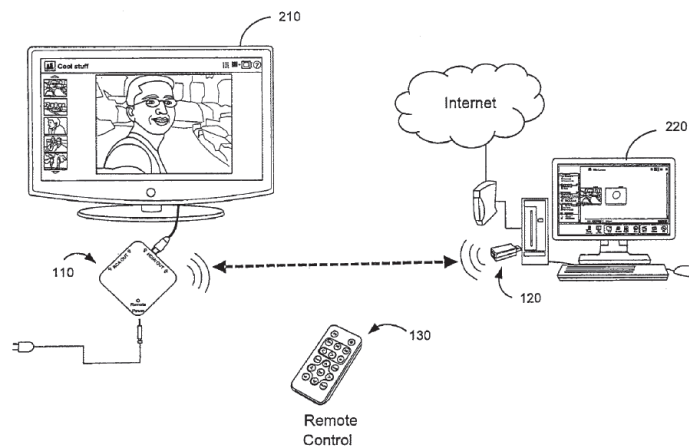
V. SUMMARY OF THE ART

A. Kaplan (Exhibit 1027)

56. Kaplan provides a “method of transmitting video content between a computing device and display device” using a data connection between a transmitter

and receiver. Ex. 1027, Abstract. In an illustrative example, Figure 1 provides a communication system having transmitter 120 and receiver 110. Ex. 1027, Figure 1, [0016]. The transmitter is a dongle with USB connector 122; the USB connector is can be inserted into a USB port of a computer. Ex. 1027, [0017]. The receiver connects to a display device and as shown below, includes one or more video outputs and one or more audio outputs. Ex. 1027, [0017], Figure 1.

57. The communication system also includes remote control 130, which is used to communicate with the receiver and control the playback of video on the display. Ex. 1027, [0019]. Collectively, the components of Figure 1 provide a system that can take footage stored on a computer and display the video footage on a display device. Ex. 1027, [0019]. Figure 2 provides an illustration example of this relationship; the receiver 110 is connected to display device and transmitter 120 is connected to computer 220. Ex. 1027, Figure 2 (reproduced below).



Ex. 1027, Figure 2.

58. To access video footage stored on a computer and thereby display such footage on a display device, the transmitter includes software. Ex. 1027, [0022]. Kaplan explains that, when the transmitter is plugged into the computer for the first time, the software is uploaded and installed onto the computer. Ex. 1027, [0022]. Then, using this installed software, a user can access the video footage stored on the computer and view the footage on the display device. Ex. 1027, [0022]. In this example, the software is automatically installed onto the computer. Ex. 1027, [0022].

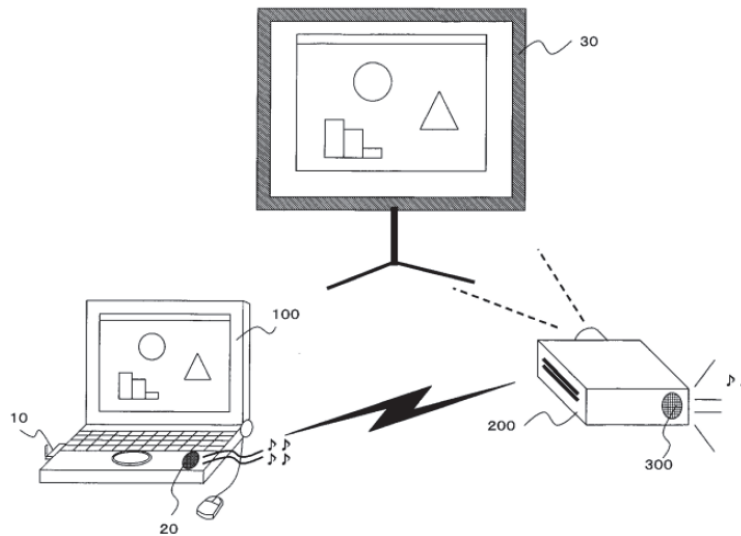
59. In other embodiments, a user can download the software from the internet. Ex. 1027, [0022]. In each embodiment, the software must be installed on the computer before the transmitter can access the footage stored on the computer. Without installation, a user would be unable to share the content on the display device. Ex. 1027, [0023] (“After the installation of software resident on the transmitter, typically only requiring an acceptance of a click-through license agreement by the family member, the family member is able to receive videos from the user and then watch them on their television.”).

60. In addition to describing its network components, Kaplan also explains the advantages to its system. Namely, because Kaplan’s system can access video content that is stored on the computer, the metadata associated with the video content stored on the computer is available, which can be used to manage and sort the content. Ex. 1027, [0029]. This differs from conventional media extenders in which

only the video content is available. Ex. 1027, [0029]. Moreover, due to Kaplan's use of "custom software solutions," the system can access "proprietary features such as user-defined channels that are not available using conventional techniques." Ex. 1027, [0029]. Again, without such software, the metadata associated with the video data and the user-defined channels are not available. Ex. 1027, [0029] ("The availability of this metadata contrasts with conventional media extenders in which only video content is available.").

B. Maeda (Exhibit 1031)

61. Maeda provides systems and methods for "transmitting images and audio from an image generating device...to an image projection device such as a projector." Ex. 1031, [0001]. Figure 1 illustrates an example of this transmission system, which uses a wireless LAN to transmit image and audio. Ex. 1031, Figure 1, [0015]. As shown below, Maeda's system includes projector 200, speaker 300 for the projector, screen 30, and wireless LAN card 10 having a wireless LAN chip attached to PC 100. Ex. 1031, Figure 1, [0017].



Ex. 1031, Figure 1.

62. Further, the PC includes various functional components: “a control unit 121, a screen generation unit 122, an image capture unit 123, an audio generation unit 124, an image output unit 125, an audio output unit 126, a PC communication unit 127, and an audio capture unit 128.” Ex. 1031, [0023]. A POSITA would have understood that these functional components include software components.

C. Ahmed (Exhibit 1014)

63. Ahmed provides “methods and systems for the wireless real time transmission of data from a source to a monitor.” Ex. 1014, Abstract. In the “Background of the Invention,” Ahmed details past attempts to integrate computing devices with a television, which have focused on “a) transforming the television into a networked computing appliance that directly accesses the Internet to obtain media, b) creating a specialized hardware device that receives media from a computing

device, stores it, and, through a wired connection, transfers it to the television, and/or c) integrating into the television a means to accept storage devices, such as memory sticks.” Ex. 1014, 2:13-21. As these attempts “suffer from having to substantially modify existing equipment,” Ahmed’s disclosure “enable[s] individuals to use existing computing devices to receive, transmit, store, and playback media and to use existing televisions to experience the media.” Ex. 1014, 3:3-9.

64. More specifically, Ahmed provides a system that includes a computing device that communicates with a remote monitor over a wireless network. Ex. 1014, 7:6-15. The system further includes a processing system on a chip; this processing system can be integrated into the remote monitor and computing device or incorporated into a standalone device. Ex. 1014, 7:18-22. However, the standalone device is in wired communication with the remote monitor or computing device. Ex. 1014, 7:18-22. To function, the computing device includes transceiver 203 and an operating system, which must be capable of running “the novel software system of the present invention 202.” Ex. 1014, 7:27-29. Ahmed explains that its novel software system includes various modules with different functions. Ex. 1014, 8:7-12. Namely, the software system “comprises a module for the real-time capture of media 301, a module for managing a buffer for storing the captured media 302, a codec 303 for compressing and decompressing the media, and a module for packaging the processed media for transmission 304.” Ex. 1014, 8:7-12.

65. To achieve the real-time capture of media, Ahmed implements software modules referred to as “a mirror display driver and a virtual display driver.” Ex. 1014, 9:17-20. Both drivers “are installed as components in the kernel mode of the operating system running on the computer.” Ex. 1014, 9:20-23. As to the specific function of each driver, the mirror display driver captures content of a computer’s display while a virtual display driver captures the contents of a secondary display device associated with the computer. Ex. 1014, 9:16-31. Additionally, one of Ahmed’s embodiments includes a virtual audio driver, which is installed and can be selected as a default playback or recording device and assist with the transfer of content. Ex. 1014, 18:27-30. In each embodiment and their respective descriptions, Ahmed’s drivers are part of the novel software solution.

66. In reference to Figure 5, which provides an overview of Ahmed’s system, content is played on the PC, the video is captured and compressed from the video buffer, the audio is captured using the audio software, and the video and audio are synced before being transmitted to the receiver. Ex. 1014, Figure 5. In turn, the receiver decompresses and plays the video and audio on the TV. Ex. 1014, Figure 5.

D. Deforche (Exhibit 1030)

67. Deforche provides a system that has a wireless modem and specifically avoids the need to install proprietary or custom software and driver. Ex. 1030, [0004]. Deforche explains that users typically need to install proprietary drivers

before they can use a USB network device. Ex. 1030, [0030]. To address this issue, Deforche provides a “Zero-Footprint” system that avoids the need for the user to have, for example, administrator rights on the computer; thus, Deforche’s system provides connectivity without interfering on the PC itself. Ex. 1030, [0028], [0029]. Deforche’s disclosure is directed to connecting a computer device to a wireless communication network via a modem rather than specific methods or system for the transmission of audio or video data. Ex. 1030, [0006].

E. Device Drivers

68. As introduced in Section IV.A, the ’002 Patent uses an operating system having a pre-installed generic driver. Ex. 1001, Cls. 1, 11, 21. While a pre-installed generic driver is considered software, these drivers significantly differ from computer applications and operating systems. Drivers act primarily as translators which allow different systems to communicate with one another.

69. Specifically, an operating system is a type of system level software that is used to manage the hardware and software resources on a computer. For example, the operating system is responsible for managing memory, file systems, computer networking functionality, and user interfaces, among other key functions. The operating system also provides the foundation for which computer applications can run. Example operating systems include Window, MacOS, Android, iOS, and Linux.

70. Software applications are specific computer programs that are designed to perform user oriented tasks. Common software applications include web browsers, media players, and productivity applications such as Microsoft Word.

71. Drivers, which may include specific drivers and pre-installed generic drivers, provide a special function. For example, drivers control hardware that is connected to a computer; this allows the operating system and computer applications to interact with the hardware. Ex. 2022. Drivers are translators for the underlying hardware and the software layers of the operating system and applications themselves. This is beneficial because the operating system and applications do not need to know that they are accessing one type of device over another (*e.g.*, a USB memory device rather than a memory disk). Ex. 2022. Instead, the driver is designed to translate commands to the specific device, and the operating system and application can be agnostic to the peripheral device it interacts with (*e.g.*, a mouse, keyboard, USB memory) and instead treats them as a device in certain classes (*e.g.*, human interface device or storage device).

72. Importantly, drivers are specific to an operating system. In other words, a driver must operate with and conform to the operating system's device driver architecture. Drivers may also be generic drivers if they are designed to work with a large variety of devices. Ex. 2022. Drivers that are available, and come by default, on commercial operating systems are commonly referred to as "pre-installed generic

drivers. USB drivers are common pre-installed generic drivers. *See* Ex. 2024. The USB standard includes different USB device classes. Ex. 2024, 1. These classes are made up of devices categorized based on their characteristics and the common functions they perform. Ex. 2024, 1. Common operating systems like Microsoft Windows for example, provide support for USB devices with their pre-installed drivers. Ex. 2024, 1. While Exhibit 2024 includes a list (pages 3-8) of drivers on the Windows operating system, other operating systems (E.g., iOS) will include a similar set of corresponding USB drivers.

73. When a device that is supported by the operating system is plugged into a port of the computer, it will automatically call the necessary class driver and the device will function without installation of additional drivers. The class drivers are designed with the purposes of the devices in the class in mind so that they can communicate the appropriate volume of data at the necessary speed. The different class drivers also provide different communications protocols and command structures as well.

74. If a device is plugged in that is not supported, or when certain capabilities of a device are not supported, a vendor may provide a custom or specific driver that may be installed on the computer to support the functionality not supported by the pre-installed generic drivers. Ex. 2024, 2. These “special purpose” drivers are often unique to the hardware they are supporting.

VI. OPINIONS

A. Ground 1: Dr. Almeroth Fails to Establish that the Combination of Kaplan, Ahmed, and Deforche Renders Obvious Any of the Challenged Claims

75. Dr. Almeroth opines that Claims 1 to 3, 9 to 11, 19, 21, and 22 of the '002 Patent are obvious over the combination of Kaplan, Ahmed, and Deforche. Ex. 1002, Section IX.A. I disagree with Dr. Almeroth for three main reasons.

76. First, Dr. Almeroth's combination does not render obvious the Challenged Claims because Dr. Almeroth fails to establish that a POSITA would have been motivated to combine Kaplan, Ahmed, and Deforche. A POSITA would not have been motivated to combine Kaplan and Ahmed with Deforche because Kaplan and Ahmed require software installation to function while Deforche specifically discourages the installation of software. *See* Section VI.A.i.

77. Second, Dr. Almeroth's combination does not render obvious the Challenged Claims because a POSITA would not have been motivated to combine Ahmed and Deforche. On one hand, Ahmed identifies a mirror display driver and audio driver as special purpose drivers. Deforche neither discloses these drivers nor provides any components with such functionality. Dr. Almeroth also fails to provide any evidence that a mirror display driver is available on general purpose computers. Thus, a POSITA would not be motivated to implement Ahmed's special purpose drivers as pre-installed generic drivers. *See* Section VI.A.ii.

78. Third, Dr. Almeroth’s combination does not render obvious the Challenged Claims because the combination fails to disclose each element of the ’002 Patent. Namely, the art relied upon in Ground 1 does not teach the use of a “generic audio driver,” as recited by the Challenged Claims. Thus, the combination likewise fails to teach the steps that require the “generic audio driver,” including “setting up, by means of a first pre-installed generic audio driver...a means for audio communication between the peripheral device and the processing device.” Ex. 1001, Cls. 1, 11, 21; *see* Section VI.A.iii.

79. For these same three reasons, Dr. Almeroth’s proposed combination in Ground 1 fails to render obvious the Challenged Claims.

i. A POSITA would not have been motivated to combine Kaplan and Ahmed with Deforche

80. Dr. Almeroth opines that a POSITA would have been motivated to combine Kaplan, Ahmed, and Deforche. Ex. 1002, Section IX.A. However, both Kaplan and Ahmed require the installation of specific software on their respective systems. *See* Section VI.A.i.a. Deforche, in contrast, discourages the installation of software. *See* VI.A.i.b. Based on this fundamental difference, a POSITA would not have been motivated to combine Kaplan or Ahmed with Deforche.

- a. Kaplan and Ahmed require software to be installed on their system in order to function

81. As introduced in Section V.A, Kaplan discloses a “method of transmitting video content between a computing device and display device.” Ex. 1027, Abstract. For several reasons, a POSITA would have understood that Kaplan requires software installation for its system and methods to function.

82. Kaplan includes software installation when describing its embodiments. For example, Figure 4 provides transmitter 120. Ex. 1027, [0013]. Kaplan explains that, when the transmitter is plugged into the computer for the first time, “the software may be uploaded to and installed to the computer (automatically in some embodiments).” Ex. 1027, [0022]. The installed software then allows a user to access footage on the computer, which can be transmitted to a receiver and viewed on a display device. Ex. 1027, [0022]. In another embodiment, a user can download the software from the internet. Ex. 1027, [0022].

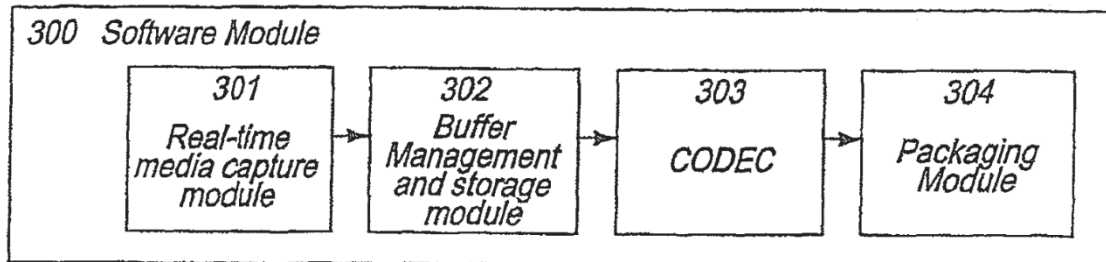
83. Kaplan explains the benefits that flow from its software. Figure 2 includes computer 220. Ex. 1027, [0026]. Metadata that is associated with video content stored on the computer is available. Ex. 1027, [0029]. The availability of metadata differs from conventional media extenders where only video content is available. Ex. 1027, [0029]. Additionally, Kaplan’s “custom software solutions...make available proprietary features such as user-defined channels that

are not available using conventional techniques.” Ex. 1027, [0029]. Kaplan also explains that its software may provide the user interface as shown in Figure 2. Ex. 1027, [0026]. With the assistance of the application, the computer in Figure 2 may perform various processing tasks. Ex. 1027, [0027]. This is advantageous because computers generally provide significant computing resources.

84. Kaplan also details a process for checking the availability of the computer’s “required software components.” Ex. 1027, [0048]. When the software components are not available, the system installs the software components in the computer. Ex. 1027, [0048] (“[T]he resident software application may check the computer 220 to determine whether required software components are available on the computer 220 and then install the software components in the computer 220 when the software components are not available on the computer 220.”).

85. Like Kaplan, a POSITA would have also understood that Ahmed requires software to be installed on its system. Ahmed provides “methods and systems for the wireless real time transmission of data from a source to a monitor.” Ex. 1014, Abstract. And, specifically, Ahmed provides a “novel software solution.” Ex. 1014, 7:26-29. In describing its system in reference to Figure 3, Ahmed explains that its software system includes (1) a module for the real-time capture of media, (2) a module for managing a buffer for storing the capture media, (3) a codec for

compressing/decompressing the media, and (4) a module for packaging the processed media for transmission. Ex. 1014, 8:7-12, Figure 3 (reproduced below).



Ex. 1014, Figure 3.

86. Moreover, Ahmed’s system provides a method for “automatically downloading, installing, and updating the novel software of the present invention on the computing device.” Ex. 1014, 29:20-22. In one embodiment, Ahmed’s software solution relies on a mirror display driver and a virtual display driver to capture video through its software modules. Ex. 1014, 9:17-19. In another embodiment, a virtual audio driver is “is installed as a normal audio driver.” Ex. 1014, 18:27-30.

87. Based on the disclosure of Kaplan and Ahmed, a POSITA would have understood that each reference requires software installation to function.

- b. A POSITA would not have combined Deforche “zero-footprint” system with Kaplan and Ahmed

88. Existing wireless modem devices cannot be used by foreign computer device when “the user has no administrator rights and installation of the appropriate driver is not allowed.” Ex. 1030, [0003]. Recognizing this disadvantage, Deforche

set out “to achieve USB (or other interface) modem functionality in any computer (Operating system independent) without leaving a footprint (Zero-Footprint).” Ex. 1030, [0028]. Deforche provides a wireless modem device while avoiding the need to install drivers or software application on the computer. Ex. 1030, [0040], [0028].

89. Specifically, Deforche uses a pre-installed generic driver, which “has the advantage that a user can use the wireless modem device on a computer device on which he has no administrator rights, *i.e.* a computer device on which his user rights are restricted so that he cannot install a specific driver for the wireless modem device.” Ex. 1030, [0009]. This embodiment of Deforche requires (and specifically avoids) the installation of specialized drivers, which is the sole embodiment that Dr. Almeroth relies on in his Ground 1 combination.

90. As Deforche explains, a switching mechanism allows its device to present itself as a USB modem device, which includes a mass storage device (*i.e.*, UMS) and a human interface device (*i.e.*, HID). Ex. 1030, [0036]. Deforche also explains that, in some embodiments, the system relies on “portable applications which run from the modem device without the need to install anything on the host.” Ex. 1030, [0015], [0050]. In each embodiment, a POSITA would have understood that Deforche specifically designed its system to avoid the need to install proprietary or custom software and drivers. Ex. 1030, [0004], [0028]. For this reason, a POSITA

would not have been motivated to combine Deforche with a system that requires the installation of software or special drivers to function.

91. As described above, both Kaplan and Ahmed require special purpose software to function, which, again, Deforche intentionally avoids. Kaplan relies on “custom software solutions” to provide “user-defined channels” that would not otherwise be available. Ex. 1027, [0022], [0029]. Ahmed uses its “novel software solution” to provide various functionalities, including real-time media capture, managing a buffer, and packaging the processed media for transmission. Ex. 1014, 8:7-12. A POSITA would have recognized the fundamental differences between the competing system and goals of Deforche and Kaplan and Ahmed. Thus, a POSITA would not have been motivated to combine Deforche with Kaplan and Ahmed, which rely on unique software implementations to function.

ii. Dr. Almeroth fails to establish a reasonable expectation of success in applying Deforche’s teachings to Ahmed

92. Dr. Almeroth opines that a POSITA would have been motivated to combine Kaplan, Ahmed, and Deforche. Ex. 1002, Section IX.A. However, a POSITA would have recognized that Deforche’s teaching could not be applied to Ahmed with a reasonable expectation of success. Thus, a POSITA would not be motivated to combine Deforche and Ahmed.

93. Specifically, Deforche’s system does not disclose or teach pre-installed generic drivers capable of the functions described by Ahmed. Deforche’s system includes “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.” Ex. 1030, [0010]. In various examples, the pre-installed generic driver can be a human interface driver (HID) or a mass storage device (MSD) driver. Ex. 1030, [0010].

94. As an HID, the pre-installed generic driver “has predetermined software components configured for driving a human interface device such as a mouse, a keyboard or other.” Ex. 1030, [0010], Ex. 1001, 14:39-46. Like an HID, the pre-installed generic driver as an MSD “has predetermined software components configured for driving mass storage devices such as USB memory sticks, external hard drives, or more generally readable and writable computer peripheral memory devices.” Ex. 1030, [0010]. In other words, the HID communicates data between a human interface device and a computer’s operating system, and an MSD is used to communicate between a mass storage device and the operating system. Depending on driver availability, Deforche’s USB modem presents itself as a composite device with USB Mass Storage Device or Human Interface Device. Ex. 1030, [0036]. This way, Deforche can achieve its zero-footprint goal. Ex. 1030, [0035], [0036].

95. Unlike Deforche, Ahmed’s “novel software system” does not rely on either on human interface devices or mass storage devices. Ahmed uses a mirror display driver and a virtual audio driver. Ex. 1014, 8:7-12, 9:27-28, 18:27-30. The mirror drive display “is used for capturing the contents of a primary display associated with the computer”; the virtual audio driver “is installed as a normal audio driver that can be selected as a default playback and/or recording device.” Ex. 1014, 8:7-12, 9:27-28, 18:27-30. Ahmed’s mirror display and virtual audio drivers do not communicate with peripheral devices, which fundamentally differ from Deforche’s human interface device and mass storage device drivers.

96. Further, a POSITA would have understood that Ahmed’s drivers provide functions that are outside of the capabilities of Deforche’s pre-installed generic drivers. *See* Ex. 2024, 3-8. These differences are aggravated because Ahmed discourages the use of specialized hardware for receiving media from a computing device and rather communicates the media through a wired connection to a television. Ex. 1014, 2:16-19 (“Prior attempts at enabling the integration of computing devices with televisions have focused on...creating a specialized hardware device that receives media from a computing device, stores it, and, through a wired connection, transfers it to the television.”).

97. Notably, Dr. Almeroth cites to the ’002 Patent and construes a “pre-installed generic driver” as meaning 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.” Ex. 1002, ¶72. It is my opinion that a mirror display driver is not available as a pre-installed generic driver. *See* Ex. 2024, 3-8. Dr. Almeroth does not opine that it is even possible to implement a mirror display driver (or functional equivalent) as a pre-installed generic driver.

98. My opinion is the same as to Ahmed’s virtual audio driver. First, Deforche does not disclose an audio driver. Second, Dr. Almeroth does not explain how it is even possible to implement a virtual audio driver (or functional equivalent) as a pre-installed generic driver. *See* Ex. 1002, ¶95 (acknowledging that “neither Kaplan nor Ahmed specifically referred to drivers as ‘pre-installed generic drivers’”). Ignoring the lack of disclosure in Ahmed, Dr. Almeroth concludes that a POSITA would have been motivated “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.” Ex. 1002, ¶95 (original emphasis).

99. However, a POSITA would have understood (1) that Ahmed and Deforche use different driver for different purposes and (2) neither Ahmed nor Deforche provide any suggestion that Ahmed’s drivers are available as pre-installed generic drivers. Thus, a POSITA would not have been motivated to combine Kaplan, Ahmed, and Deforche because there is no reasonable expectation of success.

iii. Ground 1 fails to render obvious setting up communications using a pre-installed generic audio transceiver

100. Dr. Almeroth's combination does not render obvious the Challenged Claims because the combination fails to teach the use of "a first pre-installed generic audio driver," as recited by the Challenged Claims. For the same reasons, the combination fails to teach "setting up, by means of a first pre-installed generic audio driver ... a means for audio communication between the peripheral device and the processing device." Ex. 1001, Cls. 1, 11, 21.

a. Kaplan does not disclose the claimed drivers

101. Kaplan does not disclose drivers. *See generally*, Ex. 1027. Instead, Kaplan provides a USB transmitter that "includes software that is configured to access video footage stored on a computer or on a web server accessible through the internet." Ex. 1027, [0022]. As introduced in Section V.A, the software is installed onto the system. Thus, Kaplan's custom software, which is used to provide various benefits, is not a pre-installed generic driver, but instead a custom software solution. Ex. 1027, [0022]. Dr. Almeroth appears to agree that Kaplan does not disclose pre-installed generic drivers. *See* Ex. 1002, ¶95.

b. Ahmed does not disclose the claimed drivers

102. Like Kaplan, Ahmed does not disclose the claimed drivers; thus, Dr. Almeroth opines that Ahmed's mirror display driver and an audio driver render each independent claim obvious. I disagree. Neither the mirror display driver, nor the

audio driver are pre-installed generic drivers, which are required by the '002 Patent, render obvious the claimed driver. *See also* Ex. 1014, 8:7-12, 9:27-28, 18:27-30. Moreover, neither the mirror display driver, nor the audio driver communicate “between the peripheral device and the processing device,” which is also required by the Challenged Claims of the '002 Patent. Ex. 1001, Cls. 1, 11, 21.

103. Beginning with the mirror display driver, it functions to “captur[e] the contents of the primary display associated with the computer.” Ex. 1014, 9:26-27. Additionally, Ahmed’s system renders graphics and video content on the mirror display driver. Ex. 1014, 10:1-3. Thus, media displayed on the computer is also rendered on the mirror display driver and copied into the applications memory. Ex. 1014, 10:1-8. Ahmed also explains that its application captures real-time images projected on the display “by copying the memory from the mapped video memory to locally allocated memory.” Ex. 1014, 10:9-13.

104. Dr. Almeroth does not point to any disclosure in Ahmed where the mirror display driver functions to set up “a means for audio communication between the peripheral device and the processing device.” Ex. 1001, Cl. 1. Moreover, a POSITA would have understood that Ahmed’s system discourages the type of communication recited by the Challenged Claims. Ahmed’s system communicates media through a wired connection to a television. Ex. 1014, 2:13-19 (“Prior attempts at enabling the integration of computing devices with televisions have focused

on...creating a specialized hardware device that receives media from a computing device, stores it, and, through a wired connection, transfers it to the television.”). In sum, Dr. Almeroth provides no explanation as to how Ahmed’s mirror display driver facilitates any communication, let alone the communication recited by the Challenged Claims of the ’002 Patent.

105. Again, Ahmed’s disclosure undermines Dr. Almeroth’s opinion. Namely, Ahmed’s mirror display driver captures video; it does not provide communication to a peripheral device. Ex. 1014, 9:26-27. Many of Ahmed’s various embodiments do not even involve communications between a computer and peripheral device. Ex. 1014, 7:18-22. For at least these reasons, Ahmed’s mirror display driver cannot render obvious the “pre-installed generic audio driver.” Ex. 1001, Cl. 1.

106. Ahmed’s virtual audio device also fails to render obvious the “pre-installed generic audio driver.” Again, Ahmed does not provide any disclosure that the virtual audio device functions to communicate audio data to a peripheral device. Instead, Ahmed explains that the virtual audio device “is installed as a normal audio driver that can be selected as a default playback and/or recording device.” Ex. 1014, 18:27-19:5. The virtual audio device (or VAC) “routes all the audio going to its audio output pin to its input pin. Therefore, if VAC is selected as a default playback

device, then all the audio being played on the system would go to the output pin of VAC and hence to its input pin.” Ex. 1014, 18:27-19:5.

107. A POSITA would have understood that Ahmed’s virtual audio device captures media; the virtual audio device does not set up “audio communication between the peripheral device and the processing device.” Ex. 1001, Cls. 1, 11, 21. And, after the media is captured, the media is wirelessly transmitted to a receiver. Ex. 1014, 19:10-12. Thus, Ahmed’s mirror display driver and audio driver, which capture media and are completely silent with regard to data communication, cannot render obvious the pre-installed generic audio driver.

c. Deforche does not disclose the data communication

108. Dr. Almeroth opines that Deforche “discloses the use of ‘pre-installed generic driver’ for setting up a modem/host communication interface.” Ex. 1002, ¶110. I disagree. Deforche does not describe or even reference any audio communications. Deforche uses pre-installed generic drivers to communicate IP Data in the context of its wireless modem communication. Ex. 1030, [0033], [0034]. Finally, Dr. Almeroth relies on a “video driver” without such disclosure in Deforche.

109. Accordingly, Dr. Almeroth proposed combination do not render obvious the Challenged Claims and Ground 1 fails.

B. Ground 2: Dr. Almeroth Fails to Establish that the Combination of Maeda, Ahmed, and Deforche Renders Obvious Any of the Challenged Claims

110. Dr. Almeroth opines that Claim 1, 2, 9 to 11, 19, 21, and 22 of the '002 Patent are obvious over the combination of Maeda, Ahmed, and Deforche. Ex. 1002, Section IX.B. I disagree with Dr. Almeroth for same reasons as in Ground 1.

111. First, Dr. Almeroth's combination does not render obvious the Challenged Claims because Dr. Almeroth fails to establish that a POSITA would have been motivated to combine Maeda, Ahmed, and Deforche. A POSITA would not have been motivated to combine Maeda and Ahmed with Deforche because Maeda and Ahmed require software installation to function while Deforche discourages the installation of software. *See* Section VI.B.i.

112. Second, Dr. Almeroth's combination does not render obvious the Challenged Claims because a POSITA would have recognized that Deforche's teachings would not be applied to Ahmed with a reasonable expectation of success. *See* Section VI.A.ii. Dr. Almeroth's substitution of Kaplan in Ground 1 for Maeda in Ground 2 does not affect my analysis; thus, Ground 2 also fails.

113. Third, Dr. Almeroth's combination does not render obvious the Challenged Claims because the combination fails to disclose each element of the '002 Patent. As covered in Section VI.A.iii, neither Ahmed nor Deforche render

obvious a “generic audio driver.” Maeda does not remedy this shortcoming, and Ground 2 fails to render obvious each element of the Challenged Claims.

114. For these same three reasons, Dr. Almeroth’s proposed combination in Ground 2 fails to render obvious the Challenged Claims.

i. A POSITA would not have been motivated to combine Maeda and Ahmed with Deforche

115. Dr. Almeroth opines that a POSITA would have been motivated to combine Maeda, Ahmed, and Deforche. Ex. 1002, Section IX.B. However, both Maeda and Ahmed require the installation of specific software on their respective systems. Deforche, in contrast, discourages the installation of software. Based on this fundamental difference, a POSITA would not have been motivated to combine Maeda, Ahmed, and Deforche.

116. Maeda provides systems and methods for “transmitting images and audio from an image generating device...to an image projection device such as a projector.” Ex. 1031, [0001]. Maeda’s system is not a zero-footprint system because Maeda implements “functional components” as software rather than hardware. In an example, Maeda’s system has a functional configuration that constitutes the image transmission system. Ex. 1031, [0021]. The system includes “a control unit 121, a screen generation unit 122, an image capture unit 123, an audio generation unit 124,

an image output unit 125, an audio output unit 126, a PC communication unit 127, and an audio capture unit 128 as functional components.” Ex. 1031, [0022].

117. A POSITA would have understood Maeda’s functional components as software implementations because they are “*applied* to a system that transmits images and audio from an image generation device such as a PC to an image projection device such as a projector.” Ex. 1031, [0078]. In other words, Maeda’s functional components must be installed on the PC. Moreover, Maeda does not provide any disclosure that its functional components are available on a generic computer. Accordingly, a POSITA would have understood Maeda’s functional components as software that need to be installed. A POSITA would not combine Deforche with either Maeda or Ahmed because these systems require the installation of software or drivers, which Deforche specifically sought to avoid.

ii. Dr. Almeroth fails to establish a reasonable expectation of success in applying Deforche’s teachings to Ahmed

118. Ground 2 fails for the same reason as Ground 1. Namely, a POSITA would have recognized that Deforche’s teaching could not be applied to Ahmed with a reasonable expectation of success. Thus, a POSITA would not be motivated to combine Deforche and Ahmed. *See* Section VI.A.ii.

119. Dr. Almeroth’s substitution of Kaplan in Ground 1 for Maeda in Ground 2 does not affect my analysis. Maeda does not provide any evidence or

teachings that remedy this failure. Accordingly, a POSITA would have recognized that Deforche's teaching could not be applied to Ahmed in the combination of Ground 2 with a reasonable expectation of success.

iii. Ground 2 fails to render obvious setting up communications using a pre-installed generic audio transceiver

120. Dr. Almeroth's combination does not render obvious the Challenged Claims because the combination fails to teach the use of "a first pre-installed generic audio driver." For the same reasons, the combination fails to teach "setting up, by means of a first pre-installed generic audio driver...a means for audio communication between the peripheral device and the processing device." Ex. 1001, Cls. 1, 11, 21.

121. For the reasons discussed in Section VI.A.iii, neither Ahmed nor Deforche render obvious this element. Maeda does not remedy this shortcoming as Maeda provides no discussion of drivers. Additionally, Maeda's functional configuration, which is implemented as software, is not pre-installed, but rather a custom solution that must be installed on processing device to function. Ex. 1031, [0078]. Finally, Dr. Almeroth does not opine that Maeda discloses the use of pre-installed generic drivers. Accordingly, Ground 2 fails for the same reasons as Ground 1; each fail to render obvious each element of the Challenged Claims.

C. The Barco System Embodies the Claims of the '002 Patent

122. I have been asked to analyze the Barco System and provide my opinion as to whether the Barco System embodies the claims of the '002 Patent. The Barco System refers to the combination of the ClickShare Button and a Barco Base. The Barco Base include at least the C-5, C-10, CX-20, CX-30, CX-50, CX-50 Gen2, CB Core, and CB Pro. As detailed herein, it is my opinion that the Barco System embodies at least claims 1, 2, 9 to 11, and 19 to 22 of the '002 Patent.

i. The Barco System practices Claim 1 of the '002 Patent

a. The Barco System practices 1[pre] of the '002 Patent

123. The Barco System practices 1[pre], which recites: “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.”

124. The Barco System provides a process for connecting a processing device (*e.g.*, a laptop computer) to a communication network. In one example, the ClickShare Button connects a processing device to a communication network by providing network connectivity via a wireless transmission protocol.

What is ClickShare?

ClickShare is an [award-winning wireless meeting room system](#) for easy video conferencing, collaboration and presentation. It connects your laptop to the audio and video equipment of your conference room, so you can start your meeting in under 7 seconds with one click via the ClickShare Button or App.

Ex. 2013.

General specifications

Connectors	USB-C type
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X in network integration mode
Wireless transmission protocol	IEEE 802.11 a/b/g/n/ac
Frequency band	2.4 GHZ and 5 GHz

Ex. 2014.

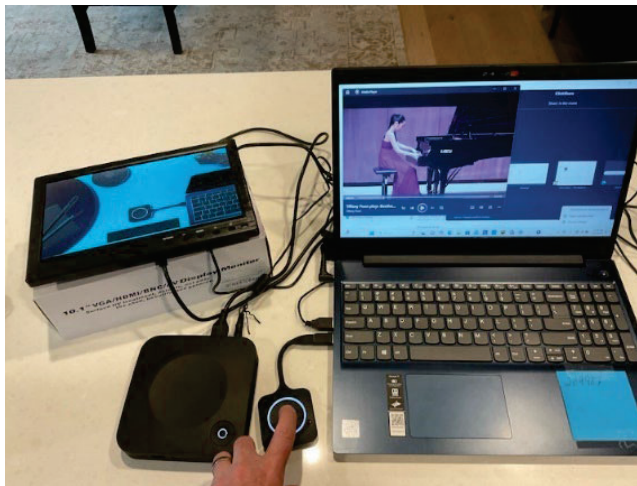
125. A laptop, as the processing device, includes a memory, display, and operating systems with pre-installed generic drivers. Moreover, the laptop communicates with a class of peripheral devices. The peripheral devices can be a USB device as a standard class of peripheral devices driven by pre-installed generic drivers. Further, USB provides a generic communication protocol for communication between the processing device and a class of peripherals. For these reasons, the Barco System practices the preamble of claim 1.

b. The Barco System practices 1[a] of the '002 Patent

126. The Barco System practices claim element 1[a], which recites: “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.”

127. The Barco System includes the ClickShare Button, which is an external peripheral device. This device is coupled to a port of the processing device (*i.e.*, the laptop). In the example shown below, the Clickshare Button includes a USB interface which plugs into a laptop as the processing device.



128. Additionally, the Clickshare Button includes both a wireless transceiver and a connector configured to couple to the port of the processing device. For example, ClickShare Button’s wireless transceiver includes Wi-Fi capabilities as its transmission protocol, and ClickShare Button’s connector includes a USB interface.

General specifications

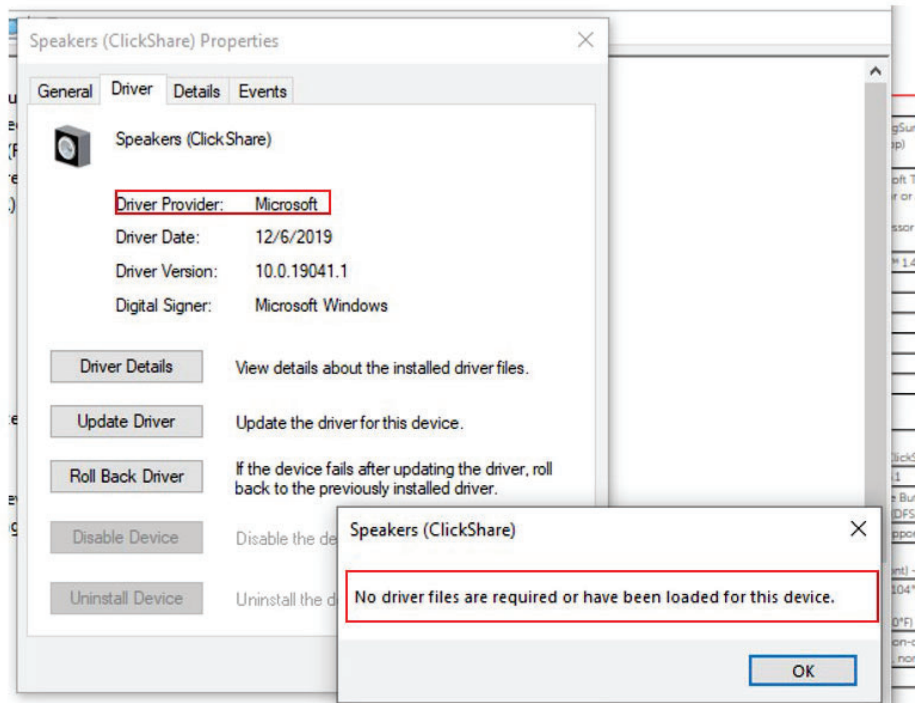
Connectors	USB-C type
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X in network integration mode
Wireless transmission protocol	IEEE 802.11 a/b/g/n/ac
Frequency band	2.4 GHZ and 5 GHz

Ex. 2014.

c. The Barco System practices 1[b] of the '002 Patent

129. The Barco System practices claim element 1[b], which recites: “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 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.”

130. As required by claim element 1[b], the Barco System relies on the processing device’s pre-installed generic audio driver of the operating system to set up a means for audio communication between Clickshare Button and the processing device. Specifically, the Clickshare Button uses the USB audio drivers on the processing device (*i.e.*, the laptop) and the audio related devices are set up by means of pre-installed generic drivers. The driver shown below is also the provider of the operating system:

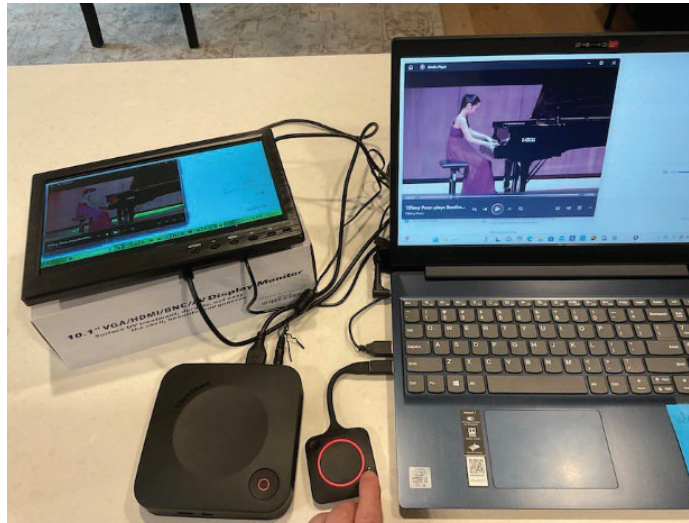


131. The pre-installed generic drivers are a means for audio communication between Clickshare Button and the processing device.

d. The Barco System practices 1[c] of the '002 Patent

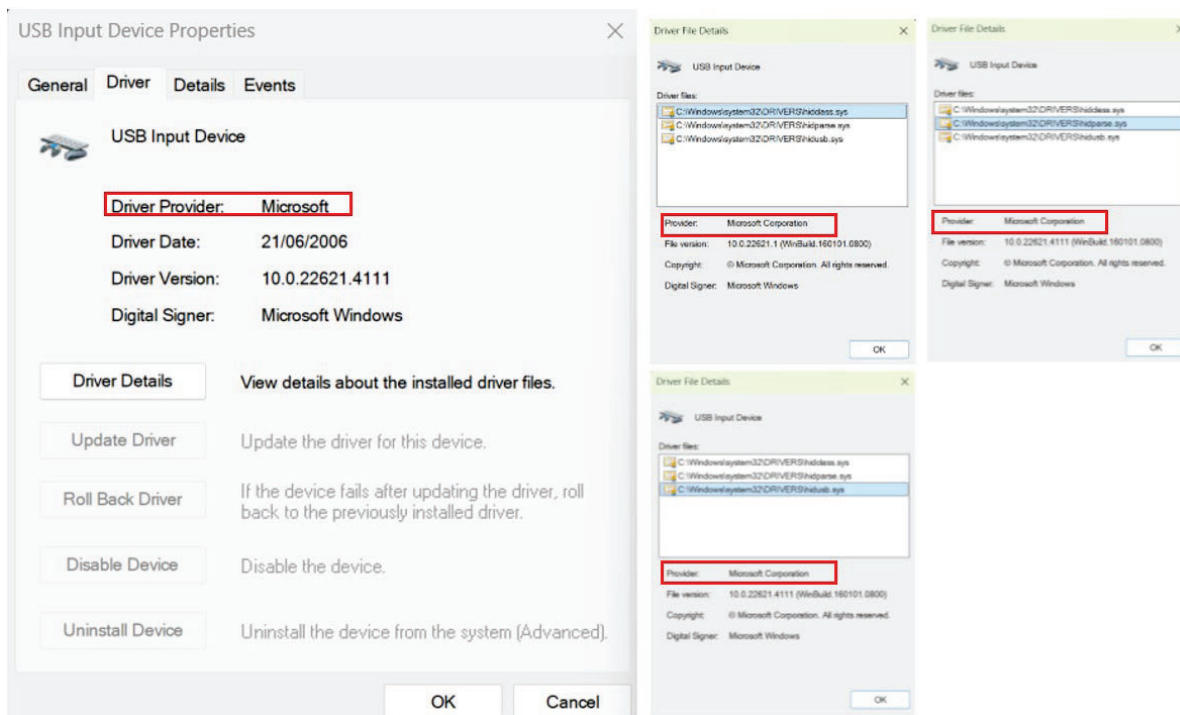
132. The Barco System practices claim element 1[c], which recites: “by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device.”

133. Specifically, the ClickShare Button is used to perform wireless presentation and video conferencing. By presenting or video conferencing, the video data is communicated between the peripheral device and the processing device:



134. Claim element 1[c] requires a second pre-installed generic driver for the video data communication between the ClickShare Button and the processing device. This requirement is satisfied because video data is screen scraped on the processing device using a portable application and then shared via the HID driver to pass the video data to the peripheral device.

135. In this example, the HID driver is a second pre-installed generic driver as a means for data communication between the ClickShare Button and the processing device. The driver provider for this HID data communication is also the provider of the operating system, Microsoft (*e.g.*, as shown in Figure below):



e. The Barco System practices 1[d] of the '002 Patent

136. The Barco System practices claim element 1[d], which recites: “c) using the peripheral device to connect the processing device to a communications network via the wireless transceiver.”

137. Specifically, the Clickshare Button connects to the processing device to a communications network via a wireless transceiver. For example, the Clickshare Button connects a processing device to a communications network via a wireless transceiver with 802.11 a/b/g/n/ac/ax capabilities, as shown below:

General specifications

Connectors	USB-C type
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X in network integration mode
Wireless transmission protocol	IEEE 802.11 a/b/g/n/ac
Frequency band	2.4 GHz and 5 GHz

Ex. 2014.

f. The Barco System practices 1[e] of the '002 Patent

138. The Barco System practices claim element 1[e], which recites: “d) 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 routing the audio data from the wireless transceiver of the peripheral device to a base node over the communications network, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device.”

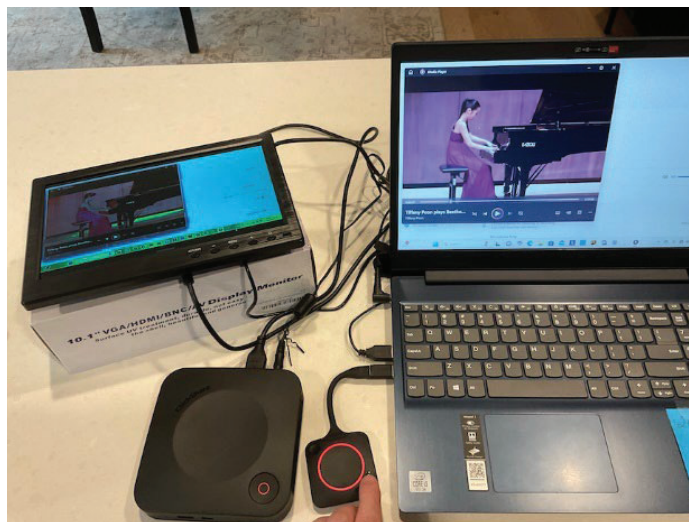
139. Specifically, the Barco System is configured to route audio data from the ClickShare Button transceiver via the connector and means for audio communication. For example, when ClickShare Button is connected to the processing device, the audio is routed via the means for audio communication to ClickShare Button via the connector. The ClickShare Button routes audio data to a ClickShare Conference, ClickShare Video Bar, or ClickShare Present (“ClickShare Room System”), over the communications network.

ii. The Barco System practices Claim 2 of the '002 Patent

140. The Barco System practices claim 2, which recites: “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.” As introduced in Section VI.C.i, the ClickShare Button presents as a human interface device wherein the pre-installed generic driver is a human interface device driver.

iii. The Barco System practices Claim 9 of the '002 Patent

141. The Barco System practices claim 9, which recites: “The method of claim 1 further comprising time-stamping synchronously the audio with the data stream.” Ex. 1001, Cl. 9. The ClickShare Button synchronizes audio and video data as evidenced by the synchronous playing of audio and video as I found during my analysis.



iv. The Barco System practices Claim 10 of the '002 Patent

142. The Barco System practices claim 10, which recites: “The method of claim 9 further comprising encoding, optionally encrypting the audio data.” Ex. 1001, Cl. 10. The Clickshare Button encodes and encrypts the audio data. In an example, which is shown below, the ClickShare button complies with the WPA2-PSK (Wi-Fi Protected Access – Pre-Shared Key) protocol. This is a widely used WiFi Security protocol:

General specifications

Connectors	USB-C type
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X in network integration mode
Wireless transmission protocol	IEEE 802.11 a/b/g/n/ac
Frequency band	2.4 GHZ and 5 GHz

Ex. 2012.

v. The Barco System practices Claim 11 of the '002 Patent

143. The Barco System practices claim 11 for the same reasons as discussed in ¶¶123 to 139.

vi. The Barco System practices Claim 19 of the '002 Patent

144. The Barco System practices claim 19 for the same reasons as discussed in ¶141

vii. The Barco System practices Claim 20 of the '002 Patent

145. The Barco System practices claim 20 for the same reasons as discussed in ¶142.

viii. The Barco System practices Claim 21 of the '002 Patent

146. The Barco System practices claim 21 for the same reasons as discussed in ¶¶123 to 139.

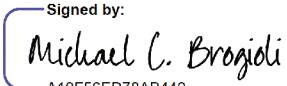
ix. The Barco System practices Claim 22 of the '002 Patent

147. The Barco System practices claim 22 for the same reasons as discussed in ¶¶129 to 131.

VII. CONCLUSION

148. 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. I also declare 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 18 U.S.C. §1001. I declare under the penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: 7/16/2025

By:  Signed by:
A19F56ED78AB449...
Michael C. Brogioli, Ph.D.