Ground 3: Mishra, Dubil, and Lambrechts (5)

A POSITA would not have combined Mishra with Lambrechts (POR at 42)

(1) Petitioner relies on "face to face" learning, which Lambrechts teaches away from (POR at 42; EX2003 (Sprenger Decl.) at ¶ 313):

As previously explained, Lambrechts describes a universal remote control capable of "learning" control codes; EX1003, ¶¶171-73. Lambrechts explains that universal remote controls were capable of learning new IR codes corresponding to new appliances. EX1011, 1:40-44, Abstract, 2:4-6. Lambrechts further teaches the learning remote embodiment described in the specification of the '389 patent. *See* EX1001, 8:51-60. Lambrechts describes the well-known process of programming a remote control by placing it and the remote control of another appliance "face to face." EX1011, 1:44-52. The universal remote control is set to "learning mode" and buttons on the other remote control are pressed. *Id*. The universal remote control then associates the received key code with a corresponding key on the universal remote control. *Id*. Thus, Lambrechts describes a learning remote control.

(Pet. at 42)

313. The Petition explains that a POSITA would have combined Mishra and Lembrechts for "programming a remote control by placing it and the remote control of another appliance 'face to face'." Petition at 42; EX1003 (Russ Decl.) at ¶ 172. However, Lambrechts specifically teaches that a "disadvantage of this method is that the remote control of the appliance has to be present and operational," which Lambrechts states "is often not the case." EX1011 (Lambrechts) at 1:44-58. Rather, the "object of the invention" in Lambrechts is "to provide a system and method, wherein *the source remote control need not be present*." EX1011 (Lambrechts) at 1:61-63 (italics added). Thus, Lambrechts itself teaches away from the exact combination the Petition suggests.

(EX2003 (Sprenger Decl.) at ¶ 313)

Ground 3: Mishra, Dubil, and Lambrechts (5)

A POSITA would not have combined Mishra with Lambrechts (POR at 42)

(2) Lambrechts requires the same process Petitioner's expert alleges a POSITA reading Mishra would want to avoid (POR at 42; EX2003 (Sprenger Decl.) at ¶ 314):

314. Additionally, Lambrechts requires a great deal of laborious effort on the part of the user. Namely, Lambrechts teaches "iteratively selecting a key on the universal remote control, *selecting a command code stored in the data processing device*, and transmitting the command code to the universal remote control" to be repeated for every key. EX1011 (Lambrechts) at 2:34-39 (italics added). But Dr. Russ asserts that a POSITA reading Mishra would want to avoid the situation where a "graphical user interface may [] ask the user to select from among the models available for the given type of device and the selected manufacturer." EX1003 (Russ Decl.) at ¶ 133. Dr. Russ states "determining the correct remote-control code set was surprisingly difficult." EX1003 (Russ Decl.)

(EX2003 (Sprenger Decl.) at ¶ 314)

The simplest way of teaching command codes to the universal remote control in accordance with the method of the invention is by iteratively selecting a key of the universal remote control, selecting a command code stored in the data processing device, and transmitting the command code to the universal remote control. For the purpose of selecting a command code, the data processing device may, for example, comprise a display screen for presenting a list of commands to the user, enabling the user to pick one of the commands from the list in order to transmit the corresponding command code to the universal remote control. Such a list may comprise text based commands or iconic representations.

(EX1011 (Lambrechts) at 2:34-46)

Ground 3: Mishra, Dubil, and Lambrechts (5)

A POSITA would not have combined Dubil with Lambrechts (POR at 42)

It is unrebutted that a POSITA would not have combined Dubil and Lambrechts (PO Sur-reply at 19-20):

317. Neither the Petition or Dr. Russ addresses the combination of Dubil and Lambrechts. There are no proposed reasons why a POSITA would want to combine them, even though the Petition relies on the combination of Mishra, Dubil, and Lambrechts.

318. Indeed, a POSITA would not have been motivated to combine Dubil with Lambrechts because Dubil has no need for Lambrechts. Dubil's set-top box transmits the entire codeset to the remote control at once. EX1006 (Dubil) at 5:6-20 ("The user requests via appliance 106 a code set"), 9:6-13 ("provide the identified control code set"). A POSITA would not have been motivated to look to a reference which suggests transmitting each key code iteratively and serially one at a time. EX1011 (Lambrechts) at 2:34-39. A POSITA certainly would not have wanted to engage in the labor intensive programming that it would take to make that iterative process automatic either, when Dubil already sends the entire codeset efficiently all at once. EX1011 (Lambrechts) at 2:39-46, 2:59-3:4. Lambrechts contains no disclosures that a POSITA reading Dubil would find useful or helpful. In fact, Lambrechts is a technological step backwards. Therefore, a POSITA would not have combined Dubil with Lambrechts.

(EX2003 (Sprenger Decl.) at ¶¶ 317-318)

Ground 3: Mishra, Dubil, and Lambrechts (5)

Mishra with Dubil and Lambrechts does not disclose claim 5 (POR at 43)

Petition relied only on Lambrechts' "face to face" learning, which Lambrechts teaches not to use (EX2003 (Sprenger Decl.) at ¶¶ 319-321; Pet. at 42):

172. Lambrechts further teaches the learning remote embodiment described in the specification of the '389 patent. The '389 patent describes an embodiment where a learning remote is placed in front of another remote so that it can "receive an IR transmission from an IR transmitter of another remote control device." EX1001, 8:59-62. Key codes are learned when keys are pressed on the other remote control device. *Id.*, 8:62-9:1. Lambrechts also teaches this functionality of a learning remote by describing the well-known process of programming a remote control by placing it and the remote control of another appliance "face to face." EX1011, 1:43-52. The universal remote control is set to "learning mode" and buttons on the other remote control are pressed. *Id.* The universal remote control then associates the received key code with a corresponding key on the universal remote control. *Id.* Thus, Lambrechts describes a learning remote control as recited in claim 5.

(EX1003 (Russ Decl.) at ¶ 172)

65. UEI argues that a POSA would not have combined Lambrechts with Mishra because Lambrechts teaches away from "face to face" learning. POR, 42. This distinction is not relevant because the Petition and my previous declaration do not rely on using a first remote control to program a second remote control. *See* Pet., 42-43; EX1003, ¶¶168-73. Rather, I explained that Mishra's STB would have been usable with a learning remote such as the one described in Lambrechts.

(EX1040 (Russ Suppl. Decl.) at ¶ 65)

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Ground 4: Caris, Skerlos, and Van Ee (2-3)

The Board correctly found that Caris does not teach "key code generator device" (POR at 48-52)

3. **[2.2]: "generating a key code within a key code generator device using the keystroke indicator signal, wherein said key code is part of a codeset that controls an electronic consumer device;"**

When the keystroke indicator signal is the dedicated button, in response to receiving the keystroke indicator signal, Caris' STB[3] identifies and downloads the appropriate control codes to control an appliance 114. EX1008, Abstract, 5:46-60. More specifically, when the IR or RF code associated with the dedicated button—the claimed keystroke indicator signal—is transmitted to the STB, the STB queries a database on server 108 based on the IR or RF code. *Id.*, 5:60-6:3. Server 108 includes "a database of control codes for most of the commercially available equipment that can be controlled via a remote." *Id.*, 2:17-20. A POSA would have understood that a database of control codes is analogous to the claimed codeset. EX1003, ¶¶184-86. When the proper code sets and accompanying UI data have been found, the codes and UI data are downloaded to the user's STB, thereby generating the key code. EX1008, 2:24-39.

(Pet. at 46-47)

identification of the corresponding structure is insufficient. That is, Petitioner asserts, without citing any supporting evidence, that the set-top box described by Caris "generates a key code, identifies a codeset usable to communicate with an electronic consumer device, and *identifies the key code corresponding to a pressed key* for that codeset as construed by the district court." Pet. 46–47 n.3 (emphasis added). But as Patent Owner observes, "[r]ather than identifying a command code corresponding to a pressed key for a codeset," in Caris, "the remote 102 is programmed with the entire code set from server 108." Prelim. Resp. 31 (citing Ex. 1008, 6:4–10). In light of this, we agree with Patent Owner that "Caris discloses programming a remote with a code set rather than a key code corresponding to a pressed key for a particular code set." *Id.* Petitioner provides insufficient explanation for its assertion that Caris "identifies the key code corresponding to a pressed key."[5]

Because claim 3 depends from claim 2, Petitioner's analysis of that claim suffers from the same deficiency. We accordingly conclude that, based on our preliminary claim construction, Petitioner does not demonstrate a reasonable likelihood of prevailing on its challenge of claims 2 or 3 as unpatentable under 35 U.S.C. § 103(a) over Caris, Skerlos, and Van Ee.

(Paper 12 (Decision) at 34-35)

Ground 4: Caris, Skerlos, and Van Ee (2-3)

A POSITA would not have combined Caris with Skerlos and Van Ee (POR at 44-48)

- A POSITA would not have combined Caris with Skerlos
- A POSITA would not have combined Caris with Van Ee
- A POSITA would not have combined Skerlos with Van Ee

Ground 4: Caris, Skerlos, and Van Ee (2-3)

A POSITA would not have combined Caris with Van Ee (POR at 47)

(1) Van Ee still requires the same step Petitioner's expert said a POSITA reading Caris would want to avoid (POR at 47):

> *First*, Petitioner bases motivation to combine on a faulty premise. Petitioner asserts that a POSITA would seek to avoid "a potential problem that would arise when users incorrectly attempt to specify a device . . . even when using Caris' dedicated button" (Petition at 52). According to Petitioner's expert, the problem is that "Caris relies on the user to enter information accurately," but "a user may be unable (or unwilling)" to do so (EX1003 at ¶¶ 200-201). However, Van Ee requires the user to enter information accurately (EX1013 at 6:3-8). Van Ee cannot be "a backup plan if other methods failed" (EX1003 at ¶ 205) because Van Ee requires the same step that Petitioner and Dr. Russ assert a POSITA would be trying to avoid (EX2003 at ¶¶ 334-336).

(POR at 47)

Ground 4: Caris, Skerlos, and Van Ee (2-3)

(2) Both experts agree that Caris has no need for the teachings of Van Ee (POR at 47):

337. Second, a POSITA would not have been motivated to combine Caris with Van Ee because Caris does not have the problem that Van Ee is designed to solve. In particular, Van Ee describes a STB that cannot receive control codes from the remote control. EX1013 (Van Ee) at 2:27-34. Van Ee explains that its STB cannot receive the range of frequencies of control codes from the remote control and therefore the control code signal must be interleaved with an identification code at a frequency that the STB can receive. EX1013 (Van Ee) at 2:34-41. On the other hand, Caris' STB can and does receive codes from the remote control without any range of frequency problem. EX1008 (Caris) at 7:2-5. Therefore, a POSITA would understand that Caris does not have the problem that is the entire focus of Van Ee, and there is no need in Caris to do the interleaving or eavesdropping that Van Ee suggests. I understand that Dr. Russ even admitted in his deposition that Caris has no need for the invention described in Van Ee. EX2010 (Russ Depo. Tr. June 18, 2020) at 139:10-20.

(EX2003 (Sprenger Decl.) at ¶ 337)

The system of Van Ee had to receive the code, because it has this unique embodiment where it sends all possible codes straight to the remote, but in a minor modification to the algorithm, the control system only sends one code at a time, it wouldn't need to snoop the control command going to the consumer electronic equipment.

Q So Caris has no need to snoop what Van Ee does, right?

A As far as I know, Caris does not need the ability to receive the code that's going out to the consumer electronic equipment.

Q Caris doesn't discuss anything like interleaving or identifier codes or anything like that?

A Right and it doesn't need to because as long as it's doing one code at a time, it always knows which codeset is being attempted.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 139:3-20)

Ground 4: Caris, Skerlos, and Van Ee (2-3)

A POSITA would not have combined Skerlos with Van Ee (POR at 48)

It is unrebutted that a POSITA would not have combined Skerlos and Van Ee (PO Sur-reply at 20):

340. First, Skerlos and Van Ee relate to very different subject matter. Skerlos "is directed to an infrared (IR) remote control detector/decoder" on an appliance, such as a TV. EX1009 (Skerlos) at 1:5-10. Van Ee relates to interleaving control codes with associated identifier codes, so that when a remote control sends a control code signal, the set-top box can eavesdrop on the transmission and enable a server to identify the codeset. EX1013 (Van Ee) at 7:38-8:8, Abst. Thus, Van Ee relates to complex interactions between a server, remote control, and a set-top box. Skerlos is not about any of these things and instead concerns modifications to the target consumer appliance to be controlled. Therefore, a POSITA would not have looked to combine Van Ee with Skerlos because they concern completely different technologies.

341. Second, a POSITA would not have been motivated to combine Skerlos with Van Ee because Skerlos does not have the problem that Van Ee is designed to solve. In particular, Van Ee describes a STB that cannot receive control codes from the remote control. EX1013 (Van Ee) at 2:27-34. Van Ee explains that its STB cannot receive the range of frequencies of control codes from the remote control and therefore the control code signal must be interleaved with an identification code at a frequency that the STB can receive. EX1013 (Van Ee) at 2:34-41. On the other hand, Skerlos does not even disclose a STB at all. Nor does Skerlos ever suggest that the remote control needs to acquire a codeset by communicating with an STB, a remote server, or anywhere else. Therefore, a POSITA would understand that Skerlos does not have the problem that is the entire focus of Van Ee, and there is no need in Skerlos to add all of the extra equipment and processing that Van Ee suggests to solve a problem Skerlos does not have.

(EX2003 (Sprenger Decl.) at ¶¶ 340-341)

Ground 4: Caris, Skerlos, and Van Ee (2-3)

Caris, Skerlos, + Van Ee fail to disclose claim 2 (POR at 48-51)

2. A method comprising:
(a) receiving a keystroke indicator signal from a remote control device, wherein the keystroke indicator signal indicates a key on said remote control device that a user has selected;
(b) generating a key code within a key code generator device using the keystroke indicator signal, wherein said key code is part of a codeset that controls an electronic consumer device;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal;
(d) transmitting said key code signal from said key code generator device; and
(e) identifying said codeset using input from a user of said remote control device, wherein said codeset is identified when said user stops pressing a key on said remote control device.

(EX1001 (389 Patent) at cl. 2)

The combination of Caris, Skerlos, and Van Ee teach this claim element. Van Ee teaches this identification in a manner similar to the '389 patent. *See* EX1001, 8:6-15; EX1003, ¶¶196-98. Specifically, van Ee's system instructs users to intermittently press a button on the remote control corresponding to the function of the selected control code, such as a TV on button. EX1013, 6:36-40. The user continues to repeatedly press this button, which repeatedly transmits a control code and a corresponding identifier code until the TV turns on. *Id.*, 6:45-52. The user "stops intermittently pressing the button . . . once the apparatus to be controlled responds, e.g., TV set 102 turns on." *Id.*, 6:50-52. The STB then identifies a corresponding codeset "[o]nce the user stops intermittently pressing the button." *Id.*, 6:50-7:10. In this manner, van Ee teaches an STB identifying a codeset when a user stops pressing a key on the remote control as recited in the claim.

(Pet. at 51-53)

Ground 4: Caris, Skerlos, and Van Ee (2-3)

Caris, Skerlos, + Van Ee fail to disclose claim 3 (POR at 52)

3. The method of claim 2, wherein said user is prompted by autoscan functionality to press said key on said remote control device.

(EX1001 (389 Patent) at cl. 3)

(EX2009 (Russ Depo. Tr. June 18, 2020) at 88:16-89:12)

Q And Van Ee itself never actually discloses that kind of instruction, correct?

A It discloses a graphical user interface and it discloses up to the point of entering the model of the TV. Beyond that it doesn't have any other disclosure. Any other express disclosure, but, again, I think it's disclosed to a person of ordinary skill.

Q So just to be clear, Van Ee does not itself in its own words describe some kind of instruction on a screen or anything that tells the user that; you're relying on a person of ordinary skill would fill that gap but Van Ee itself doesn't disclose that; is that correct?

A Van Ee discloses a user interface, Van Ee discloses asking users questions on the TV set, but it does not literally disclose press until something happens. I think that would be clear to a person of ordinary skill.

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Ground 5: Caris and Skerlos (4, 11)

REDEFINING CONTROL

Caris and Skerlos fail to disclose claims 4, 11 (POR at 52-54)

4. A remote control device comprising:

a receiver that receives a first key code signal, wherein said first key code signal is generated by modulating a key code onto a first carrier signal, said first carrier signal falling within a radio frequency band;

a transmitter that transmits a second key code signal, wherein said second key code signal is generated by modulating said key code onto a second carrier signal, said second carrier signal falling within an infrared frequency band; and

a keypad that includes a key that corresponds to said key code, wherein said key code corresponds to a function of an electronic consumer device, and wherein said remote control device is contained within a single structure.

(EX1001 (389 Patent) at Cl. 4)

6. The method of claim **1**, wherein said carrier signal is in a radio frequency band, wherein said key code signal is received by said remote control device, and wherein said method further comprises:

(e) modulating said key code onto a second carrier signal, thereby generating a second key code signal, said modulating being performed on said remote control device wherein said second carrier signal is in an infrared frequency band; and

(f) transmitting said second key code signal from said remote control device to an electronic consumer device.

(642 Patent at Cl. 6)

Ground 5: Caris and Skerlos (4, 11)

Caris and Skerlos fail to disclose claims 4, 11 (POR at 52-54)

Petitioner's expert admitted that Skerlos teaches to use IR and teaches away from RF (POR at 53-54):

Q Skerlos specifically says the frequency band to use is infrared, correct?

A Well, a little more nuance to that. It says to use infrared light and infrared light works better than ultrasound. And by the way, it's saying ultrasound because the early, early Zenith controls literally used ultrasound. It would click a crystal to create an ultrasonic sound, and that's why earlier remote controls were called clickers.

But, anyway, ultrasound doesn't work that well, so we're going to use infrared light. And

(EX2008 (Russ Depo. Tr. June 17, 2020) at 204:7-17)

Ground 5: Caris and Skerlos (4, 11)

Caris and Skerlos fail to disclose claims 4, 11 (POR at 52-54)

Petitioner's expert did not address "key code signal" requires one key code (POR at 52; PO Sur-reply at 21):

4. A remote control device comprising:
a receiver that receives a first key code signal, wherein said first key code signal is generated by modulating a key code onto a first carrier signal, said first carrier signal falling within a radio frequency band;
a transmitter that transmits a second key code signal, wherein said second key code signal is generated by modulating said key code onto a second carrier signal, said second carrier signal falling within an infrared frequency band; and
a keypad that includes a key that corresponds to said key code, wherein said key code corresponds to a function of an electronic consumer device, and wherein said remote control device is contained within a single structure.

(EX1001 (389 Patent) at Cl. 4)

that any key code or codeset is ever stored on the remote control device. Claim 2 recites transmitting a key code signal to the remote control device and does not recite transmitting a codeset to the remote control device. The motivation

(EX1007 (642 Patent File History) at 242; *see also* 75-76, 121)

127. This is further supported by the specification of the '389 patent, which distinguishes between a key code and a codeset. EX1001 ('389 patent) at 10:42-46 ("modulating ***said key code*** onto a carrier signal, thereby generating a ***key code signal***") (emphasis added), 2:36-37 ("key code from one of the codesets"), 4:33 ("key code of the codeset"), 11:16-17 ("key code is part of a codeset").

(EX2003 (Sprenger Decl.) at ¶ 127)

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Ground 6: Caris, Skerlos, and Lambrechts (5, 8)

A POSITA would not have combined Caris with Skerlos and Lambrechts (POR at 54-55)

- A POSITA would not have combined Caris with Skerlos
- A POSITA would not have combined Caris with Lambrechts
- A POSITA would not have combined Skerlos with Lambrechts

Ground 6: Caris, Skerlos, and Lambrechts (5, 8)

A POSITA would not have combined Caris with Skerlos and Lambrechts (POR at 54-55)

It is unrebutted that a POSITA would not have combined Skerlos and Lambrechts (PO Sur-reply at 21-22):

> 403. Indeed, a POSITA would not have been motivated to combine Skerlos with Lambrechts. As Dr. Russ testified in his deposition, a POSITA would not be interested in modifying a television set, as Skerlos suggests, but would rather focus on modifying the remote control only. EX2009 (Russ Depo. Tr. June 18, 2020) at 160:21-161:12.

(EX2003 (Sprenger Decl.) at ¶ 403)

Ground 6: Caris, Skerlos, and Lambrechts (5, 8)

Caris, Skerlos, and Lambrechts fail to disclose claim 5 (POR at 55-56)

A. Claim 5: "The remote control device of claim 4, wherein said remote control device is taken from the group consisting of: a learning remote control device, a cell phone, an RF-enabled personal digital assistant (PDA), an RF-enabled wrist watch, and an RF-enabled keyboard."

Lambrechts describes a universal remote control capable of "learning" control codes. EX1011, Abstract, 2:4-6. Lambrechts explains that universal remote controls were capable of learning new IR codes to control one appliance at a time or a plurality of appliances simultaneously. *Id.*, 1:40-44, 2:30-33. Thus, Lambrechts teaches that its remote control device is a learning remote control device—similar to the learning remote disclosed by the '389 patent. *See* EX1001, 8:51-9:60. Lambrechts teaches the well-known process of programming a remote control by placing it and the remote control of another appliance "face to face." EX1011, 1:44-52. The universal remote control is set to "learning mode" and buttons on the other remote control are pressed. *Id.* The universal remote control then associates the received key code with a corresponding key on the universal remote control. *Id.* Thus, Lambrechts describes a learning remote control as recited in claim 5; EX1003, ¶¶230-31.

(Pet. at 62)

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Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

Yazolino:

F. U.S. Patent No. 5,329,370 ("Yazolino")

112. Yazolino titled "Remote Control System and Method for Cable Television System" and relates generally "to cable television systems that enable users of the system's televisions to view, on demand, any one of a large number of recorded video programs." EX1012 (Yazolino) at 1:5-13. Yazolino is concerned with a "setting where the cable television system must carry television signals in two or more formats" and when "it is unacceptable to place a television converter box on top of the user's television set or anywhere else in the user's visual field." EX1012 (Yazolino) at 1:40-68. Therefore, Yazolino proposes a new type of "converter coupling the respective television to the transmission media." EX1012 (Yazolino) at 2:30-42. Yazolino is not concerned with a remote control being able to receive any transmissions or being able to be programmed at all. Accordingly, Yazolino's remote control lacks any capability to receive transmissions from another device. EX1012 (Yazolino) at Fig. 10.

(EX2003 (Sprenger Decl.) at ¶ 112)

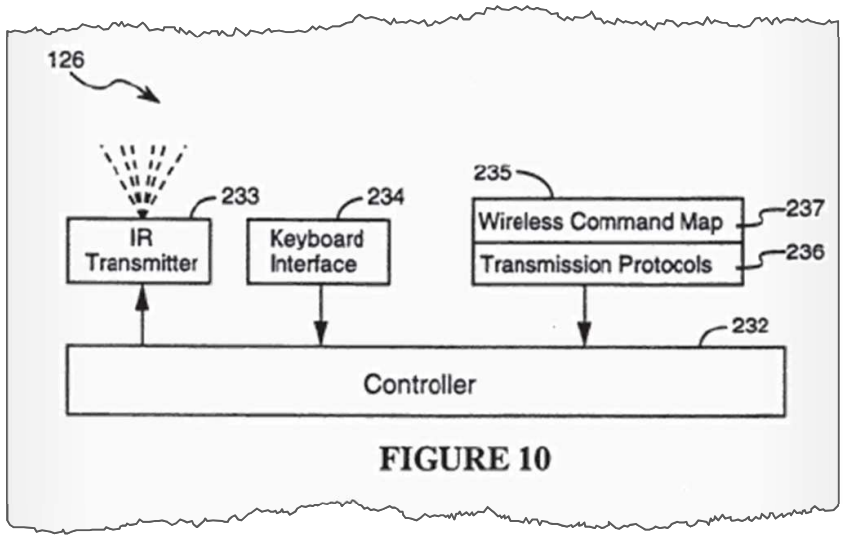


FIGURE 10

(EX1013 (Yazolino) at Fig. 10)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

A POSITA would not have combined Caris with Skerlos and Yazolino (POR at 57-58)

- A POSITA would not have combined Caris with Skerlos
- A POSITA would not have combined Caris with Yazolino
- A POSITA would not have combined Skerlos with Yazolino

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

A POSITA would not have combined Caris with Yazolino (POR at 57-58)

(1) Petitioner's and its expert's rationale for looking to Yazolino is for the circuitry of the Caris remote control (POR at 58):

> As explained with respect to claim elements [4.2], Caris' remote control identifies a key code and performs the claimed modulation as described in Skerlos. *See* Section X.A.3. While a POSA would have understood that Caris' remote control includes a microcontroller to perform this processing, Caris does not explicitly describe this circuitry. For the specific details of hardware components of conventional remote controls, a POSA would have known to look to references, such as Yazolino, which explicitly describes the circuitry of a remote control such as the one disclosed by Caris. EX1012, 15:16-30; EX1003, ¶240.

(Pet. at 66-67)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

A POSITA would not have combined Caris with Yazolino (POR at 57-58)

Yazolino does not disclose any receiver circuitry required by Caris (POR at 58-59):

21 Q And would you agree with me that there is no
22 radiofrequency receiver shown in this figure?
1 A There is not. But it would be obvious to a
2 person of ordinary skill to add one and how to add
3 one.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 143:21-144:3)

419. And for another example, the remote control in Caris must be able to receive signals in order to be programmed. EX1008 (Caris) at 6:4-9. The remote control in Yazolino, however, has no such need and therefore does not disclose any circuitry in the remote control for receiving or demodulating signals. EX1012 (Yazolino) at Fig. 10; EX2009 (Russ Depo. Tr. June 18, 2020) at 143:21-144:8. Therefore, a POSITA would not have been motivated to look to the remote control circuitry of Yazolino to understand what might be required by the remote control circuitry of Caris.

(EX2003 (Sprenger Decl.) at ¶ 419)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

A POSITA would not have combined Caris with Yazolino (POR at 57-58)

(2) Yazolino teaches away from Caris (POR at 57):

418. Moreover, because the references are focused on two very different problems, Caris and Yazolino also teach away from each other in numerous ways. For example, Caris teaches a "remote 102 for operating STB 104 via, e.g., IR (infrared) transmitter 110 and receiver 112." EX1008 (Caris) at 5:30-33. However, Yazolino teaches that the converter box is not within the user's visual field. EX1012 (Yazolino) at 1:53-59. Therefore, Caris' IR remote control cannot communicate with the set-top box (converter box) in Yazolino. For another example, Caris' "[r]emote 102 is programmed, for example, via an IR or RF blaster 122 connected to STB 104." EX1008 (Caris) at 6:4-5. More specifically, the "remote 102 is positioned close to blaster 122 and with an input 124 facing blaster 122." EX1008 (Caris) at 6:5-7. Because Yazolino teaches that its converter box is hidden behind the television, the communications methods of Caris are not possible. EX1012 (Yazolino) at 1:53-59. This why Yazolino teaches that "the only connection between the cable converter box and the television is a cable connected to the antenna or cable input port on the back of the television," which contradicts the teachings of Caris. EX1012 (Yazolino) at 1:65-68, 2:32-34.

(EX2003 (Sprenger Decl.) at ¶ 418)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

A POSITA would not have combined Skerlos with Yazolino (POR at 57-58)

It is unrebutted that a POSITA would not have combined Skerlos and Yazolino (PO Sur-reply at 22):

421. Indeed, a POSITA would not have been motivated to combine Skerlos with Yazolino because the references teach away from one another. That is, Yazolino explicitly teaches that "it is generally not possible (or economically feasible) to modify the control circuity in the television sets due to cost considerations and the age of the television sets." EX1012 (Yazolino) at 1:59-62. Yet, modification of the control circuitry of a television set is the entire focus of Skerlos. EX1009 (Skerlos) at 1:5-10, 2:23-30. A POSITA would not have combined a reference that teaches modified television circuitry with a reference that specifically teaches *not* to modify the television circuitry.

(EX2003 (Sprenger Decl.) at ¶ 421)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

Caris with Skerlos and Yazolino do not disclose claims 10, 12, 15 (POR at 58-60)

10. The remote control device of claim **4**, further comprising:

a microcontroller that determines that a user of said remote control device has selected said key and that modulates said key code onto said second carrier signal.

12. A remote control device, comprising:
a keypad;
an RF receiver;
an IR transmitter; and
means for receiving a key code from said RF receiver and for sending said key code to said IR transmitter such that said key code is modulated onto an IR carrier signal, said IR carrier signal with said key code modulated thereon being transmitted from said remote control device by said IR transmitter, wherein said remote control device is contained within a single structure.

15. The remote control device of claim **12**, wherein said means is a microcontroller.

Yazolino does not disclose a microcontroller that *receives* (POR at 60):

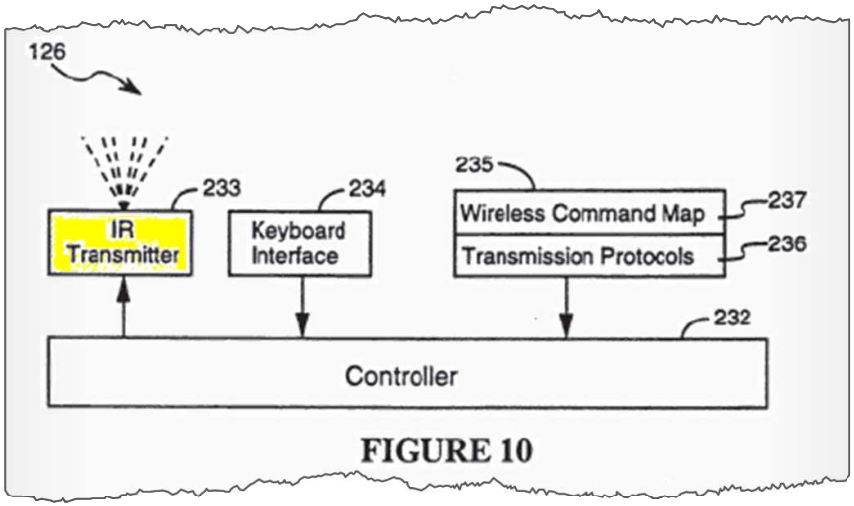
Q And would you agree with me that there is no radiofrequency receiver shown in this figure?
A There is not. But it would be obvious to a person of ordinary skill to add one and how to add one.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 143:21-144:3)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

Caris with Skerlos and Yazolino do not disclose claims 10, 12, 15 (POR at 58-60)

Skerlos and Yazolino teach IR only (POR at 59-60; EX2003 (Sprenger Decl.) at ¶ 427):



(EX1013 (Yazolino) at Fig. 10)

Q Skerlos specifically says the frequency band to use is infrared, correct?

A Well, a little more nuance to that. It says to use infrared light and infrared light works better than ultrasound. And by the way, it's saying ultrasound because the early, early Zenith controls literally used ultrasound. It would click a crystal to create an ultrasonic sound, and that's why earlier remote controls were called clickers.

But, anyway, ultrasound doesn't work that well, so we're going to use infrared light. And

(EX2008 (Russ Depo. Tr. June 17, 2020) at 204:7-17)

Ground 7: Caris, Skerlos, and Yazolino (10, 12, 15)

Caris with Skerlos and Yazolino do not disclose claims 10, 12, 15 (POR at 58-60)

12. A remote control device, comprising:
a keypad;
an RF receiver;
an IR transmitter; and
means for receiving a key code from said RF receiver and for sending said key code to said IR transmitter such that said key code is modulated onto an IR carrier signal, said IR carrier signal with said key code modulated thereon being transmitted from said remote control device by said IR transmitter, wherein said remote control device is contained within a single structure.

(EX1001 (389 Patent) at Cl. 12)

PO proposed structure	Petitioner's proposed structure
"a microcontroller that performs the **algorithms described in Step 105 of Fig. 2, as further explained in detail at 5:49-6:4, and equivalents thereof."** (POR at 16)	"a microcontroller that performs the **algorithm of receiving a key code from an RF receiver that has received a first key code signal and translating the key code so that the key code is modulated onto an infrared carrier signal resulting in a second key code signal."** (Pet. Reply at 8)

Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- Claim constructions
- Ground 1: Mishra, Dubil, and Van Ee
- Ground 2: Mishra and Dubil
- Ground 3: Mishra, Dubil, and Lambrechts
- Ground 4: Caris, Skerlos, and Van Ee
- Ground 5: Caris and Skerlos
- Ground 6: Caris, Skerlos, and Lambrechts
- Ground 7: Caris, Skerlos, and Yazolino
- **Ground 8: Caris, Skerlos, Yazolino and Lambrechts**

Ground 8: Caris, Skerlos, Yazolino, and Lambrechts (13-14)

A POSITA would not have combined Caris with Skerlos, Yazolino, and Lambrechts (POR at 60-61)

- A POSITA would not have combined Caris, Skerlos, and Lambrechts (Ground 6)
- A POSITA would not have combined Caris, Skerlos, and Yazolino (Ground 7)
- A POSITA would not have combined Yazolino with Lambrechts

Ground 8: Caris, Skerlos, Yazolino, and Lambrechts (13-14)

Caris with Skerlos, Yazolino, and Lambrechts do not disclose claims 13-14 (POR at 54-55)

13. The remote control device of claim **12**, wherein said key code is not stored on said remote control device immediately prior to said means receiving the key code.

14. The remote control device of claim **12**, wherein said key code is part of a codeset, and wherein said codeset is not stored on said remote control device.

Patent Owner's Oral Hearing Demonstratives

Case IPR2019-01614
Patent 9,911,325

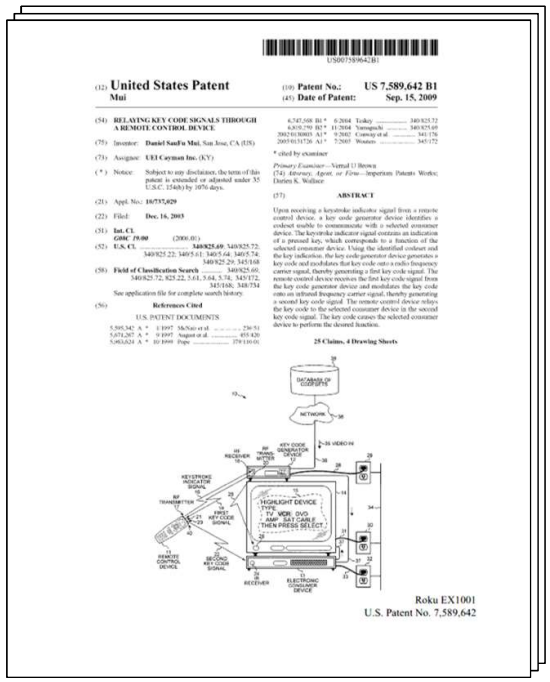
Roku, Inc. v. Universal Electronics, Inc.

REDEFINING **CONTROL**

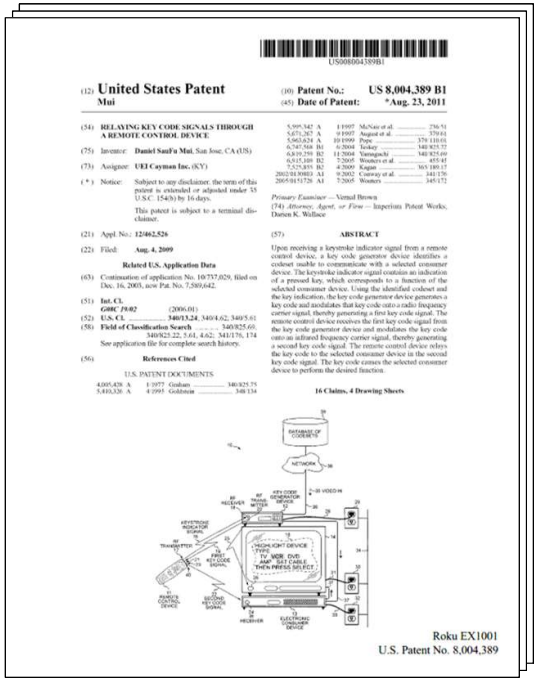
Agenda

- **Introduction to Mui Patents**
- Background: Petition and Institution
- Claim constructions
- Ground 1: Rye and Skerlos
- Ground 2: Caris and Dubil

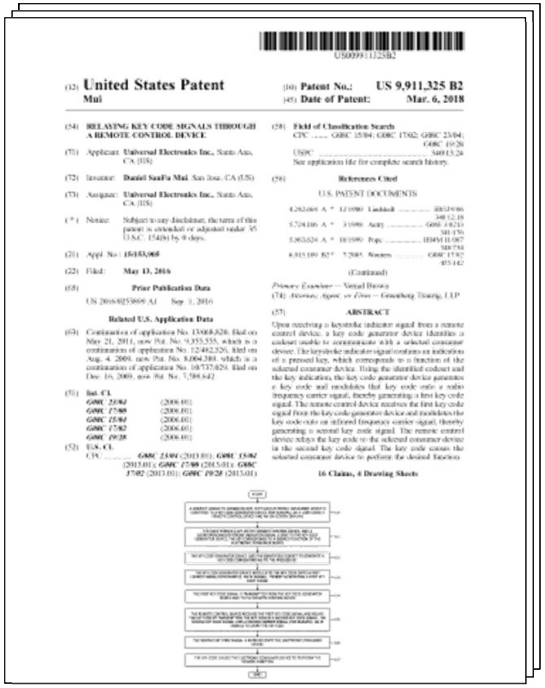
Introduction



IPR2019-01612
U.S. Patent No. 7,589,642



IPR2019-01613
U.S. Patent No. 8,004,389



IPR2019-01614
U.S. Patent No. 9,911,325

Introduction

1. A first device for transmitting a command to control a functional operation of a second device, the **first device comprising**:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

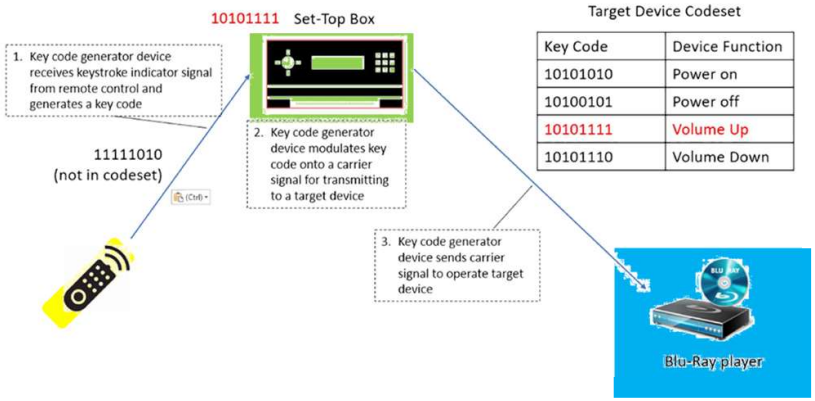
generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of **key code data stored in the codeset comprises a series of digital ones and/or digital zeros**, and wherein the **codeset further comprises time information that describes how a digital one and/or a digital zero** within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

Remote → Key Code Generator Device → Consumer Device



(EX2003 (Sprenger Decl.) at ¶ 70)

325 Patent, Claim 1 + dependents

Agenda

- Introduction to Mui Patents
- **Background: Petition and Institution**
- Claim constructions
- Ground 1: Rye and Skerlos
- Ground 2: Caris and Dubil

Petition

Petitioner asserts 2 obviousness grounds (Pet. at 3)

Ground	Prior Art	Basis	Claims Challenged
1	Rye (EX1005) Skerlos (EX1006)	35 U.S.C. § 103	1, 2, 3, 5, and 7
2	Caris (EX1007) Dubil (EX1008)	35 U.S.C. § 103	1, 2, 3, 4, and 5

(Pet. at 3)

Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- **Claim constructions**
- Ground 1: Rye and Skerlos
- Ground 2: Caris and Dubil

Claim constructions

Parties do not dispute the preliminary claim constructions (Paper 7 (Decision) at 10-11)

"key code"	"code corresponding to the function of an electronic device, optionally including timing information"
"keystroke indicator [signal]"	"a signal, distinct from a key code, corresponding to a pressed key [on a remote control]."
"key code signal"	"a signal containing a modulated key code"

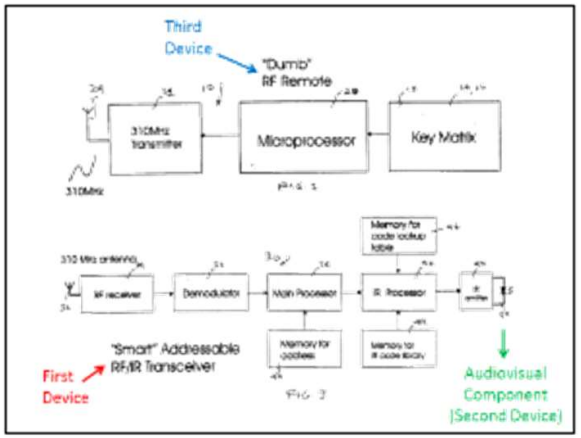
Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- Claim constructions
- **Ground 1: Rye and Skerlos**
- Ground 2: Caris and Dubil

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

The asserted combination must apply the transmissions from Skerlos' *remote control* to Rye's *transceiver* (POR 20, 30; EX1003 (Russ Decl.) at ¶¶ 109-110):



EX1005, FIGs. 2, 3 (annotated).

(EX1003 (Russ Decl.) at ¶ 102)

This invention generally relates to remote control receivers and more specifically is directed to an infrared (IR) remote control detector/decoder providing improved noise immunity particularly adapted for use with a television receiver.

(EX1006 (Skerlos) at 1:5-10)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(1) Petitioner and its expert fail to offer any reasons *why* a POSITA reading Rye would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 17-19)

104. While Rye describes the transmission of a key code from a key code generator device to an electronic consumer device, such as a VCR, as described in Embodiment 2, Rye does not explicitly provide operational details explaining how this transmission would occur. *See* EX1007, ¶27. For example, Rye does not explicitly describe the formatting of a key code for transmission. A POSA would have understood, however, that the key code transmission would have been performed by modulating the control code onto a carrier frequency using timing information and that this process would teach the claimed formatting. A POSA

(EX1003 (Russ Decl.) at ¶ 104)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(1) Petitioner and its expert fail to offer any reasons *why* a POSITA reading Rye would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 17-19)

> code from would look to references describing different protocols for transmitting control codes from a remote control. One well-known protocol is modulating the control code onto an IR signal as described in Skerlos.

(EX2011 (Russ Decl.) at ¶ 236)

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(1) Petitioner and its expert fail to offer any reasons *why* a POSITA reading Rye would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 17-19)

Q Sure. With the timing, then you agree, yes, I can transmit data with an unmodulated signal?
A Yes.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 86:1-3)

Q Would you agree that this burst or intermediary signal is not the only way to modulate a signal. You could modulate a signal in other ways besides that; is that correct?
A That's correct.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 70:16-20)

modulation as do RF and IR transmission. There is -- any time there is a wired connection just like, you know, if there is a wireless consideration there is a consideration that's made as to whether or not to employ modulation and if so what modulation to use.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 69:2-7)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(1) Petitioner and its expert fail to offer any reasons *why* a POSITA reading Rye would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 17-19)

32. Further, Dr. Sprenger also acknowledges in the Background section of his declaration that a POSA would have been motivated to use a modulation technique to avoid interference. EX2003, ¶¶50-51, 132. For example, Dr. Sprenger explains that:

> When deciding whether to modulate data for transmission, and if so what type of modulation to use, engineers must consider the cost and complexity of each approach as compared to the requirements of the desired application. . . . Modulation increases the cost and complexity, but ***may end up ultimately being more effective due to the increased resiliency to signal interference***. And modulation using an intermediate carrier frequency may increase the cost and complexity further, but may provide more signal reliability suitable for a particular application.

EX2003, ¶51.

(EX1030 (Russ Suppl. Decl.) at ¶ 32)

51. When deciding whether to modulate data for transmission, and if so what type of modulation to use, engineers must consider the cost and complexity of each approach as compared to the requirements of the desired application. For example, unmodulated data may be the simplest and lowest cost approach but may need data redundancies in order to reduce signal interference. Modulation increases the cost and complexity, but may end up ultimately being more effective due to the increased resiliency to signal interference. And modulation using an intermediate carrier frequency may increase the cost and complexity further, but may provide more signal reliability suitable for a particular application.

(EX2003 (Sprenger Decl.) at ¶ 51)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(1) Petitioner and its expert fail to offer any reasons *why* a POSITA reading Rye would have been motivated to add "modulating onto a carrier signal" (POR at 17-19)

A I mean, part of user friendliness is how much a product costs, and so it's not necessarily the case. Again, these are all implementation decisions that an engineer would make as a product was being designed, and it depends on the requirements of a product that's being designed. Is it required to be low cost? Is it required to be user friendly? I mean, again, remote controls are notoriously low cost in the industry. Even the system that they make for the buttons for the remote control are amazingly cost effective.

So the amount of storage is a major consideration for the remote controls, probably more so than almost anything else I can think of at the moment. Very, very cost sensitive.

control that do the same thing. I mean, remote controls are famously inexpensive in the art. I mean, if you were to add five cents to the cost of a remote control, you would get fired.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 114:1-4)

(EX2009 (Russ Depo. Tr. June 18, 2020) at 123:3-17)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(2) Rye teaches away from making modifications that "add[] to the cost and complexity of the system" (e.g., adding a modulator to the transceiver) (POR at 20-21; PO Sur-reply at 21)

140. As another example, Rye teaches away from modifications "which add[ ] to the cost and complexity of the system." EX1007 (Rye) at [0009]. But Rye does not teach having a modulator on the transmit side, as would be necessary to modulate onto a carrier signal. EX1007 (Rye) at Fig. 3. Therefore, Rye teaches away from adding any modulating onto a carrier signal as Petitioner and Dr. Russ suggest because that would add cost and complexity to the system. Petition at 26; EX1003 (Russ Decl.) at ¶ 142. I understand that Dr. Russ stressed that remote control systems were "[v]ery, very cost sensitive," as well as very sensitive to any increase in memory usage. EX2009 (Russ Depo. Tr. June 18, 2020) at 123:3-124:6, 113:21-114:4.

(EX2003 (Sprenger Decl.) at ¶ 140)

[0009] The control or command codes for the various brands of audiovisual components in the user's system are stored in a code library included in the receiver. Thus, for example, when the PC interface transmits an RF signal corresponding to "VCR Play" the receiver looks up in the receiver code library the code for the user's brand of VCR and then transmits an infrared coded signal for "Play" for that brand of VCR This system, although reliable and effective, does, however, require the use of a PC and accompanying additional software as well as the interface, which adds to the cost and complexity of the system.

(EX1005 (Rye) at [0009])

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(3) Both experts agree that a POSITA would not have wanted to add additional detector circuitry (POR at 21)

This invention generally relates to remote control receivers and more specifically is directed to an infrared (IR) remote control detector/decoder providing improved noise immunity particularly adapted for use with a television receiver.

(EX1006 (Skerlos) at 1:5-10)

Figs. 3-4. A POSITA would have understood that Rye's goal was to control consumer electronic appliances *without* having to modify those appliances. EX1007 (Rye) at Abst. ("in accordance with the brands or manufacturers of the audiovisual components"). Therefore, a POSITA would not have looked to Skerlos, which teaches to modify the appliances. Skerlos teaches to modify the detector of the consumer electronic appliance so that the remote control can communicate directly with the appliance. That is contrary to the teachings of Rye, in which the remote control is specifically designed *not* to communicate directly with the appliance. Indeed, I understand that Dr. Russ testified in his deposition

(EX2003 (Sprenger Decl.) at ¶ 141)

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(3) Both experts agree that a POSITA would not have wanted to add additional detector circuitry (POR at 21)

Now, to the extent a person of ordinary skill needs more details about how television sets generally work, I have references like Dubil and Skerlos and I have the knowledge of a person of ordinary skill in the art in the background section of my report that explained how these previously installed television sets work. And they all -- they're all centered around the theme of not changing what the television set is doing and making sure the remote control operates in a way the television set understand.

Q So that's just to make sure I've got that right is you're saying a person of ordinary skill is not going to go and try to modify the control circuitry of the television set, they're going to work on the remote control; that's what all the effort is about? Is that what you're saying?

A They're going to work on the remote control, yes, so that they work the same way the television set works.

Q So they don't have to modify the control circuitry on the television, right?

A Right. They don't have to modify the television set. They sync up and operate and matches the way the television set already works.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 160:10-161:12)

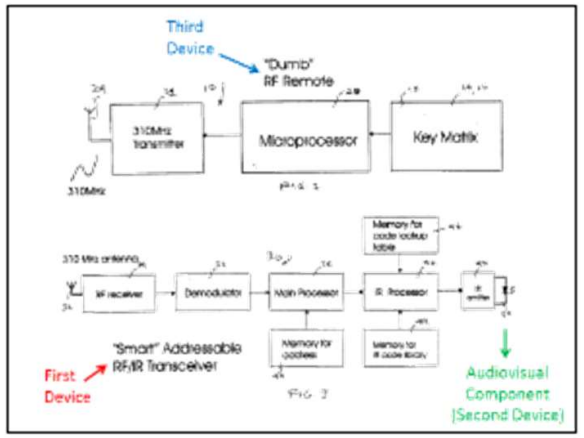
Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(4) Rye teaches that the "dumb" RF remote control does *not* transmit to the electronic consumer device, which is the opposite of Skerlos' IR remote (POR at 19-20)

136. Second, a POSITA would not have combined Rye and Skerlos because the subject matter of the references is very different. Rye relates to a "Dumb RF Remote" that requires a transceiver to convert and transmit a signal to an electronic device, but Skerlos relates to "an infrared (IR) remote control detector/decoder with improved noise immunity particularly adapted for use with a television receiver." EX1007 (Rye) at Fig. 2, [0022]-[0023]; EX1009 at Abst. Therefore, Rye requires the use of a transceiver intermediary, whereas Skerlos is designed such that no such intermediary is necessary.

(EX2003 (Sprenger Decl.) at ¶ 136)



EX1005, FIGs. 2, 3 (annotated).

(EX1003 (Russ Decl.) at ¶ 102)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

(5) Both experts agree that Skerlos teaches away from RF (POR at 20-21)

143. And for another example, Skerlos teaches away from the remote control using the radio-frequency band as taught in Rye. Rye teaches that the remote control only transmits in the radio-frequency band because the transceiver converts the radio-frequency signal to an infrared signal. EX1007 (Rye) at Figs. 2-3. By contrast, Skerlos teaches that the remote control should only transmit in the infrared frequency band, which precludes the radio-frequency band taught in Rye. EX1009 (Skerlos) at Abst., Fig. 3. Skerlos even specifically says only the higher end of the IR spectrum should be used by the remote control. EX1009 (Skerlos) at 3:37-52; Petition at 26; EX1003 (Russ Decl.) at ¶ 142.

(EX2003 (Sprenger Decl.) at ¶ 143)

Q Skerlos specifically says the frequency band to use is infrared, correct?
A Well, a little more nuance to that. It says to use infrared light and infrared light works better than ultrasound. And by the way, it's saying ultrasound because the early, early Zenith controls literally used ultrasound. It would click a crystal to create an ultrasonic sound, and that's why earlier remote controls were called clickers.
But, anyway, ultrasound doesn't work that well, so we're going to use infrared light. And

(EX2008 (Russ Depo. Tr. June 17, 2020) at 204:7-17)

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

Petitioner's expert's approach is legally impermissible (POR 18, 29, 34):

"As the ALJ recognized, prior art references before the tribunal **must be read as a whole and consideration must be given where the references diverge and teach away** from the claimed invention. W*. L. Gore & Associates, Inc. v. Garlock*, 721 F.2d 1540, 1550, 220 U.S.P.Q. (BNA) 303, 311 (Fed. Cir. 1983), cert. denied, 469 U.S. 851, 83 L. Ed. 2d 107, 105 S. Ct. 172 (1984). Moreover, appellants **cannot pick and choose among individual parts of assorted prior art references "as a mosaic to recreate a facsimile of the claimed invention."** 721 F.2d at 1552, 220 U.S.P.Q. (BNA) at 312. In this case, the ALJ found that Akzo's expert witnesses could not show how the prior art patents could be brought together to render the Blades '756 invention obvious without reconstructing the teachings of those patents assisted by hindsight." *Akzo N.V. v. United States ITC*, 808 F.2d 1471, 1481, (Fed. Cir. 1986).

Ground 1: Rye + Skerlos (1-3, 5, 7)

A POSITA would not have combined Rye with Skerlos (POR at 17-22)

Petitioner's expert's approach is legally impermissible (POR 18, 29, 34):

"But that reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they ***could be*** **combined. And that is not enough**: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention." *Personal Web Techs. v. Apple Inc.*, 848 F.3d 987, 993-994 (Fed. Cir. 2017)

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

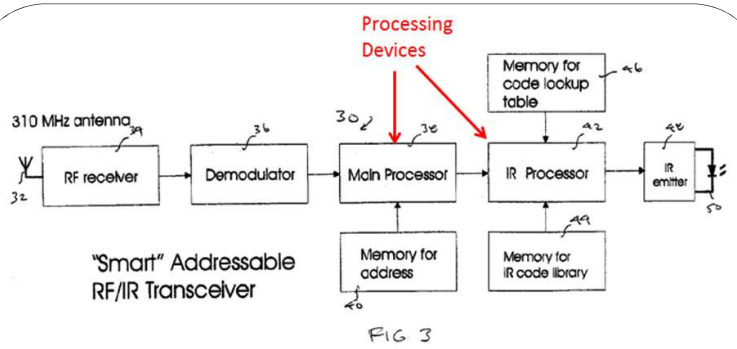
Ground 1: Rye + Skerlos (1-3, 5, 7)

Petition fails to assert how Rye + Skerlos disclose "a processing device . . ." (POR at 22)

Petition relies only on Rye and offers no explanation how either of the processors performs the claim limitations (POR at 22)

4. [1.3] "a processing device coupled to the receiver and the transmitter; and"

Rye describes two processors coupled to the RF receiver and the IR emitter: main processor 38 and IR processor 42. EX1005, ¶¶23-25. These processors teach the claimed processing device coupled to the receiver and transmitter and are depicted in Figure 3 as annotated below. EX1003, ¶¶116-118.



EX1005, FIG. 3 (annotated).

(Pet. at 16-17)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

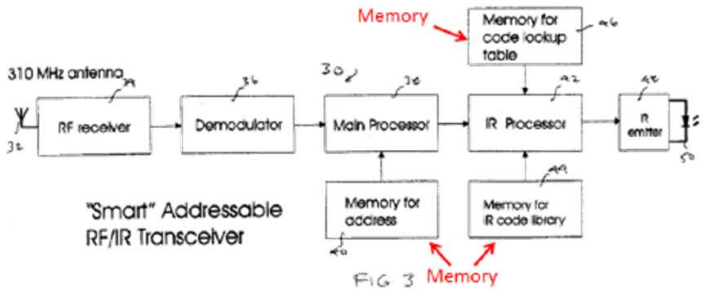
(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Petition fails to assert how Rye + Skerlos disclose "a memory storing instructions . . . " (POR at 22-24)

Petition relies only on Rye and never even alleges how any of the memories performs "format the key code for transmission" (POR at 22-23):

Rye's processing device is coupled to a memory storing instructions that are executable by the processing device as would have been understood by a POSA. EX1003, ¶¶119-125. Rye describes its transceiver as having memory such as address memory 40, "memory for code lookup table 46," and "code library memory 44" as depicted in Figure 3 annotated below. EX1005, ¶¶23-25.



EX1005, FIG. 3

As seen in Rye, it was well-known prior to the '325 patent to use memory in devices such as transceivers or set-top boxes configured to communicate with audiovisual devices. EX1003, ¶¶120-125. Further, as Dr. Russ explains, it was also well-known to use such memory devices to store instructions executable by the processing devices to generate and transmit key codes. *Id.*

(Pet. at 18-19)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Petition fails to assert how Rye + Skerlos disclose "a memory storing instructions . . . " (POR at 22-24)

Petitioner's expert relies on Bayley but still never alleges which of the memories performs "format the key code for transmission" (POR at 23-24):

121. For example, Figure 2 from the Bayley reference depicts a well-known memory device including a database as well as an OS (operating system), volume control application, and driver for operating volume controls. EX1018, 6:41-48; *see also id.*, 1:56-58, FIG. 2.

122. "The memory system 230 may include any one or combination of volatile memory elements (e.g., random access memory (RAM), dynamic RAM (DRAM), static RAM (SRAM), synchronous DRAM (SDRAM), magnetic RAM (MRAM), etc.) and nonvolatile memory elements (e.g., read only memory (ROM), hard drive, tape, compact disk ROM (CD-ROM), etc.)." EX1018, 3:40-46. Further, Bayley explains that "OS 231 controls the execution of other software and provides management and control services including, for example, scheduling, input-output control, file and data management, memory management, and ***communication control***, among others." *Id.*, 3:64-4:1.

(EX1003 (Russ Decl.) at ¶¶ 121-122)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Petition fails to assert how Rye + Skerlos disclose "a memory storing instructions . . . " (POR at 22-24)

Bayley equally suggests memories that are not on the "first device" as required (POR at 23-24; PO Sur-reply at 5):

157. Nevertheless, even if considering Bayley too, a POSITA would understand that instructions would not have to be stored on any of these memories identified in Rye. As Dr. Russ' own citation to Bayley explains, there are also "tape, compact disk ROM (CD-ROM), etc." EX1003 (Russ Decl.) at ¶ 122; EX2010 (Russ Depo. Tr. June 19, 2020) at 51:16-53:2. A POSITA would also recognize that executable instructions could even be stored on a processor itself. EX1001 ('325 patent) at 7:5-10 ("read only memory (ROM) on a microcontroller integrated circuit"); EX2010 (Russ Depo. Tr. June 19, 2020) at 48:19-49:20. Therefore, neither the Petition or Dr. Russ identifies which, if any, of the memories in Rye would store executable instructions or any rationale for why any of these memories would need to.

(EX2003 (Sprenger Decl.) at ¶ 157)

17 Q Why can't the instructions be on the CD rom
18 is? Isn't that what Bailey is saying?
19 A Well, they could be. It's not how I picture
20 Rye, but, yeah, they could be.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 52:17-20)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "keystroke indicator having data that indicates an input element of the third device that has been activated" (POR at 27)

As depicted in Figure 2, Rye describes a remote control that includes a "key matrix" with "an array of pushbuttons 14" (i.e., keys). EX1005, FIG. 2, ¶21. When a button is pressed by the user, the remote control "produce[s] the appropriate binary coded commands or control signals that are transmitted from [remote control] unit 10…" *Id.*, ¶21. The selection of a key results in the transmission of a "radio-frequency binary coded signal…by an antenna 24 included in unit 10 to an addressable transceiver generally designated 30…" *Id.*, ¶¶22-23. This signal corresponds to the claimed "keystroke indicator signal," which is received by Rye's transceiver. *Id.* In particular, this signal corresponds to the pressed key and is distinct from the "key code" which Rye's transceiver subsequently generates. *See infra,* Section VI.C.9; *see also* EX1003, ¶128.

(Pet. at 20-21)

127. As seen from the remote control decpited in Figure 2, Rye describes a remote control that includes a "key matrix" with "an array of pushbuttons 14" (i.e., keys). EX1005, ¶21, FIG. 2. When a button is pressed by the user, the remote control "produce[s] the appropriate binary coded commands or control signals that are transmitted from [remote control] unit 10…" *Id.* The selection of a key results in the transmission of a "radio-frequency binary coded signal…by an antenna 24 included in unit 10 to an addressable transceiver generally designated 30…" *Id.*, ¶¶22-23. This signal teaches the claimed "keystroke indicator signal," which is received by Rye's transceiver. *Id.* In particular, this signal corresponds to the pressed key and is distinct from the "key code" which Rye's transceiver subsequently generates using the keystroke indicator signal.

EX1003 (Russ Decl.) at ¶ 127)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "keystroke indicator having data that indicates an input element of the third device that has been activated" (POR at 27)

Petitioner's new argument in Reply still fails to explain how any data "indicates an input element of the third device that has been activated" (PO Sur-reply at 6-7):

UEI also argues that Rye's "binary coded control signal" does not include "data" indicating that a particular key has been pressed. POR, 27. But Rye explains that its "binary control codes" (i.e., "data") are transmitted on the "binary coded signal generated by the microprocessor 20, in response to the user operation of one of the pushbuttons 14." EX1005, ¶22; Pet., 20-21. Thus, Rye's binary control code included in its binary coded signal discloses the claimed "data." EX1030, ¶29.

(Pet. Reply at 10)

29. UEI also argues that Rye's "binary coded control signal" does not include "data" indicating that a particular key has been pressed. POR, 27. But Rye explains that its "binary control codes" (i.e., "data") are transmitted on the "binary coded signal generated by the microprocessor 20, in response to the user operation of one of the pushbuttons 14." EX1005, ¶22; Pet., 20-21. Thus, Rye's binary control codes included in its binary coded signal disclose the claimed "data." EX1003, ¶¶126-32.

EX1030 (Russ Suppl. Decl.) at ¶ 29)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "generate a key code using a keystroke indicator" (POR at 24-27)

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "generate a key code using a keystroke indicator" (POR at 24-27)

Petitioner relies on Rye's *converting* received codes into IR format (POR at 24-27):

Figure 3 is a schematic diagram of addressable transceiver 30, which receives binary coded signals transmitted by antenna 24 of Figure 2. *Id.* "In overview, those signals are converted in transceiver 30 to corresponding binary coded infrared (IR) signals, which are then transmitted over-the-air to the selected audiovisual component to control its operation." *Id.* ¶ 23.

(Paper 7 (Decision) at 14; *see also* Pet. at 10)

[0016] To this end, the addressable transceiver includes a memory for IR code library that stores the remote control codes for the commercial brands of audiovisual components, and a lookup table that stores the remote control codes for all the audiovisual components in the user's home. The library and lookup table are connected to a microprocessor in which the brand or product codes are combined with the received binary coded control signals. The thus processed and modified coded control signals are converted to corresponding coded infrared control signals which are transmitted to the selected audiovisual component.

(EX1005 (Rye) at [0016])

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "generate a key code using a keystroke indicator" (POR at 24-27)

Rye's "lookup table" values are never transmitted, but are only used to convert the received key code into the IR format (POR at 26-27):

172. Additionally, a POSITA would understand that Rye does not disclose "generate a key code" because Rye discloses that the transceiver "***converts the input control signal*** so that it is ***compatible with*** the operating binary code for the selected audiovisual component whose ***IR remote control code is obtained from the look-up table 46***." EX1007 (Rye) at [0027] (emphasis added). Thus, a POSITA would understand that the IR remote control code in the look-up table is IR protocol information, and Rye teaches using this information to *convert* the received control code into an IR compatible signal, and not to create an entirely new signal with the code obtained from the look-up table. The code from the look-up table itself is not actually transmitted by the transceiver in Rye.

(EX2003 (Sprenger Decl.) at ¶ 172)

[0027] IR processor **42** converts the input control signal so that it is compatible with the operating binary code for the selected audiovisual component whose IR remote control code is obtained from the look-up table **46**. That is, if the control operation that is to be performed is to Play the VCR, the IR processor **42** looks up the "VCR-Play" code from the code library **44** for the user's particular brand of VCR. That control code for "VCR-Play" is selected in IR processor **42** and is then applied to IR emitter **48** to, in turn, cause LED **50** to transmit to the addressed or selected VCR, in the example given, the selected control signal in the form of an IR binary signal that is compatible with the user's brand and model of VCR.

(EX1005 (Rye) at [0027])

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

Rye + Skerlos fail to disclose "format the key code for transmission" (POR at 28-31)

Skerlos does not describe modulating onto a carrier signal *from* the transceiver (Rye's first device) as required by claim 1 (POR at 30):

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

(EX1001 (325 Patent) at Cl. 1)

Q And my question is in Skerlos by itself, the IR transmitter it's talking about is on the remote control, right?

A Right. The IR transmitter in the embodiment in Skerlos is on a remote control, a handheld remote control, and the receiver is embedded in a television set but, again, it would be clear to a person of ordinary skill that that embodiment could be put multiple places.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 55:12-20)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "key code data stored . . . digital ones and/or digital zeros" (POR at 31-32)

Petitioner and its expert rely on simple "binary" and not "digital ones and/or zeros" (PO sur-reply at 9; POR at 31-32):

37. UEI argues that Rye does not disclose "digital ones and/or digital zeros" because Rye's disclosure of a binary number is insufficient. POR, 31-32. UEI continues by arguing that "a digital one and digital zero means that there is a more complex pattern than simply a one is on and a zero is off." POR, 32. But UEI ignores the plain language of the claim as well as the '325 patent's specification. First, as written in claim 1, digital ones and/or digital zeros refers to "key code data." That is, the claim recites "key code data stored in the codeset comprises a series of digital ones and/or digital zeros." As seen from FIG. 3 of the '325 patent, this means that a binary number is sufficient.

(EX1030 (Russ Suppl. Decl.) at ¶ 37)

In the embodiment of FIG. **5**, the 12-bit key code is modulated onto key code signal **19** using pulse width modulation. Digital ones and zeros are characterized by pairs of marks and spaces. The period between successive leading edges of the bursts in a mark is the period of an intermediary signal. The intermediary signal has an intermediary frequency. In a space, there are no bursts.

FIG. **6**A shows a digital zero and a digital one in key code signal **19** of FIG. **5** in more detail. A "mark/space" pair represents a digital zero and another "mark/space" pair represents a digital one. The marks and spaces of each pair have predetermined lengths. In the embodiment of FIG. **5**, the mark length of a digital zero is 490 microseconds, and the mark length of a digital one is 3940 microseconds. The space length of a digital zero is 950 microseconds, and the space length of a digital one is 2000 microseconds.

(EX1001 (325 Patent) at 5:21-36;
see also EX2003 (Sprenger Decl.) at ¶ 198)

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "codeset further comprises time information" (POR at 32-34)

Petitioner's expert admitted neither Rye nor Skerlos disclosed key codes or codesets comprising timing information (POR at 33):

But would you agree that Rye does not disclose that a key code comprises timing information?

A Rye doesn't say one way or the other.

BY MR. TSUI:

Q And would you agree that Rye does not disclose a code set comprising timing information?

A Rye doesn't disclose that, but a person of ordinary skill would understand that a code set or a modulation scheme like RC5 has timing information.

Q Like we discussed earlier, using is one thing. How it's stored is a different question, correct?

A Correct.

Would you agree that Skerlos does not say anything about how codes or code sets are stored on the transmitter device?

A Figure 1-B is talking about, for example, sending 1s and 0s, transmitting bits of coded information, and so there has to be at least some storage of that sequence of information, which I think is 10101011010. That code has to be stored in there somewhere.

Q The -- code you're saying; is that right?

A Yes.

Q But it doesn't tell us any more about what else that key code might be storing or whether the codes might be storing other information; do you agree with that?

A Yes. I think the way we put it is it does not explicitly disclose any to a person of ordinary skill in the art. It would be a variety of methods

(EX2008 (Russ Depo. Tr. June 17, 2020) at 183:19-184:12, 206:5-22)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "codeset further comprises time information" (POR at 32-34)

Petitioner's expert relies on "timing information *used* for modulating a key code onto a carrier signal" (POR at 33; PO Sur-reply at 10):

(emphasis added); *see also* EX1005, ¶¶24, 38; Pet., 27-29. In my previous declaration, I explained that code library 44 stores the claimed codeset, which comprises key codes. EX1003, ¶¶149-56. I also explained that Skerlos discloses timing information used for modulating a key code onto a carrier signal. *Id.* Based on this teaching, a "POSA would have easily implemented the techniques of Skerlos ***within the system described in Rye*** because both describe the transmission of the same type of key codes." *Id.*, ¶156. UEI does not address that this specific combination of Rye and Skerlos rendering obvious a codeset that comprises time information. *Id.*, ¶¶149-56.

(EX1030 (Russ Suppl. Decl.) at ¶ 40)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose "codeset further comprises time information" (POR at 32-34)

USPTO already rejected for a related patent that merely using timing information to transmit a signal discloses "a codeset comprising timing information" (POR at 29):

> We are persuaded of error in the rejection of claim 34. The Examiner does not provide sufficient explanation, or direct us to sufficient supporting evidence, demonstrating that Pope's infrared code comprising a train of pulses with each pulse being 1.6 microseconds long, and indicating a one or a zero (Pope 3:45–47), combined with Teskey's remote control signal format characteristics including overall signal timing information (Teskey 3:60–4:8), teaches or suggests a codeset comprising timing information that describes a digital one and a digital zero. Specifically, it is not clear how Pope's train of 1.6 microsecond pulses, with each pulse indicating a high ("1") or low ("0") bit, as modified in view of Teskey's general teaching of signal timing information, teaches or suggests that it is the timing information of the codeset pulses or signals that describes digital ones and digital zeroes.

(EX2006 (553 Patent File History) at ¶ 256)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose the dependent claims (POR at 34-36)

2. The first device as recited in claim **1**, wherein the receiver comprises an RF receiver.

3. The first device as recited in claim **1**, wherein the transmitter comprises an IR transmitter.

5. The first device as recited in claim **1**, wherein the formatted key code is transmitted from the first device to the second device via a wireless connection between the first device and the second device.

7. The first device as recited in claim **1**, wherein the generated key code controls at least one of a power on, power off, volume up, and volume down functional operation of the second device.

Ground 1: Rye + Skerlos (1-3, 5, 7)

REDEFINING CONTROL

Rye + Skerlos fail to disclose claim 2 (POR at 34-35)

Petitioner and its expert assert that the Rye/Skerlos combination would use *Skerlos' IR protocol*, not RF (POR at 34-35):

¶23; EX1006, 3:20-36; EX1003, ¶141. While Skerlos describes the transmission of control codes from a remote control, a POSA would have understood that Rye's transceiver would have just as easily implemented the same wireless transmission protocol using the same IR emitter technology to transmit control codes in the same manner described in Skerlos. EX1003, ¶142. Both devices transmit control

(Pet. at 26)

Q Okay. And by the same wireless transmission protocol in Skerlos, it's talking about that infrared -- I can't remember if I say it right -- with the infrared range with the 40 kilohertz square wave. Is that the wireless transmission protocol?

MR. KENTON: Objection. Form.

BY THE WITNESS:

A That's from Skerlos, yes.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 208:5-12)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose claim 2 (POR at 34-35)

Skerlos teaches away from RF in a Rye/Skerlos combination (POR at 33-34):

> 43. UEI states that "Petitioner cites only to Rye for the 'RF receiver'" but then alleges that Skerlos teaches away from using radio-frequency. POR, 34-35. This statement does not address the specific combination of Rye and Skerlos presented in the Petition and in my previous declaration. EX1003, ¶157. UEI incorrectly focuses on Skerlos rather than addressing Rye's actual teaching of its transceiver having an RF receiver as I explained in my previous declaration and as depicted below. EX1003, ¶157; EX1005, ¶23, FIG. 3. In this manner, UEI has not refuted Rye's clear teaching of an RF receiver.

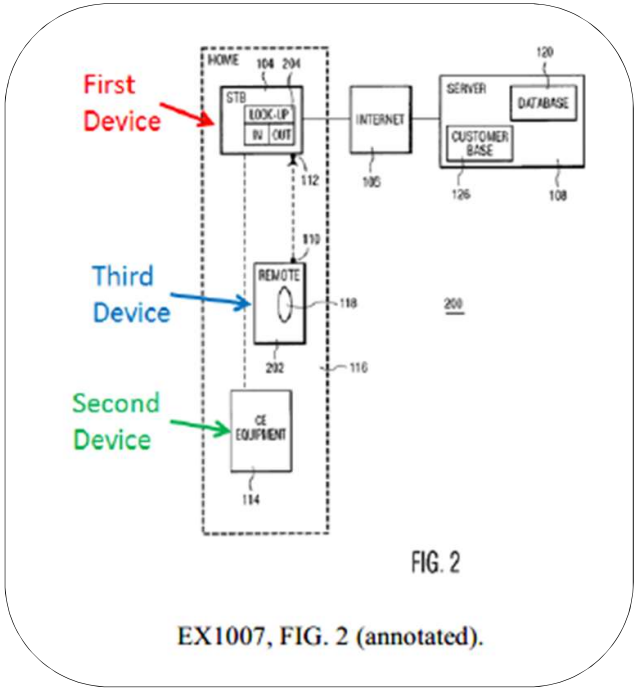
(EX1030 (Russ Suppl. Decl.) at ¶ 43;
see also Pet. Reply at 14)

Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- Claim constructions
- Ground 1: Rye and Skerlos
- **Ground 2: Caris and Dubil**

Ground 2: Caris + Dubil (1-5)

Petitioner relies on the second embodiment of Caris (Pet. at 36-38):



EX1007, FIG. 2 (annotated).

(Pet. at 36)

FIG. **2** illustrates an alternative system **200** according to the invention. System **200** comprises in this example a remote control device **202** that is a pre-programmed. That is, remote **202** uses a fixed protocol to communicate with STB **104** for control of apparatus **114** via STB **104**. STB **104** uses a wired or wireless link with apparatus **114**. In order to use this configuration with any kind of controllable apparatus **114**, the user connects STB **104** to server **108** on the Internet **106** in response to the user activating a dedicated hard button **118** (or softkey **118** if remote **202** has an LCD touch screen functionality such as the PRONTO™) on remote **202**. The user then specifies to server **108** what apparatus **114** he/she would like to control via remote **202**, as in the example mentioned in the description of FIG. **1**. Server **108** then downloads to STB **104** data representative of a control code for control of apparatus **114**, the control being established via STB **102** in operational use. The data gets programmed into a look-up table **204** that associates an input received from remote **202** with an output as programmed. The output is now the data for the control command required for control of apparatus **114** via STB **104**.

(EX1007 (Caris) at 6:53-7:5)

Ground 2: Caris + Dubil (1-5)

REDEFINING CONTROL

A POSITA would not have combined Caris with Dubil (POR at 39-42)

The asserted combination of Caris and Dubil applies the transmissions from Dubil's *remote control* to Caris' *set-top box* (EX1003 (Russ Decl.) at ¶¶ 168-169):

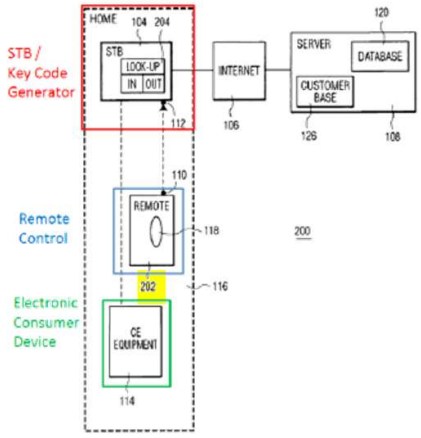
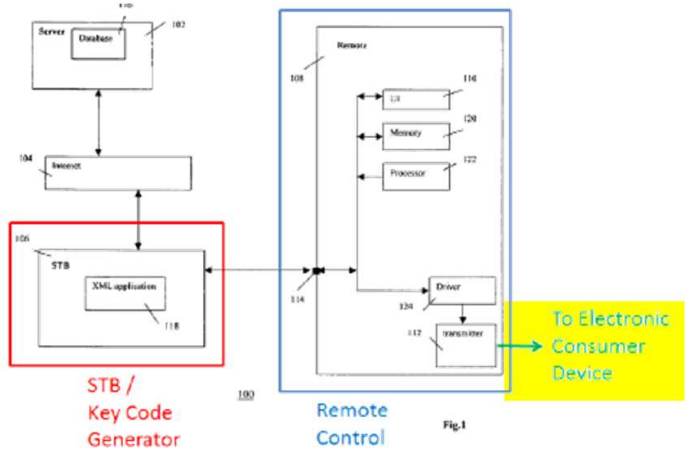


FIG. 2

EX1007, FIG. 2 (annotated).

(EX1003 (Russ Decl.) at ¶ 164)



EX1006, FIG. 1 (annotated).

(EX2011 (Russ Decl.) at ¶ 109)

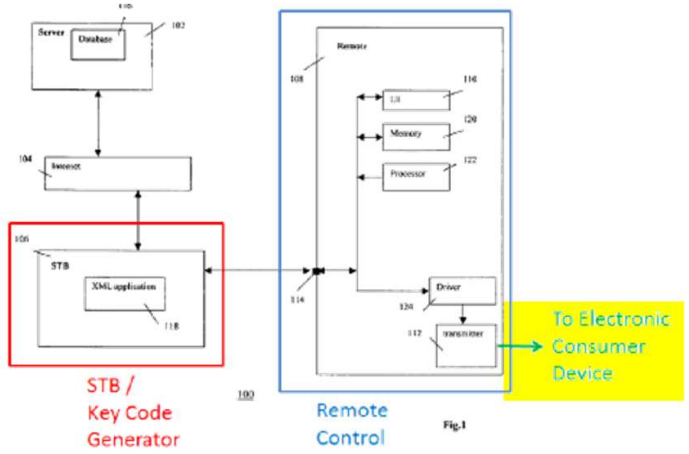
Ground 2: Caris + Dubil (1-5)

A POSITA would not have combined Caris with Dubil (POR at 39-42)

A POSITA would not have combined Caris Fig. 2 with Dubil Fig. 1 (POR at 40-42)

226. For example, Caris teaches that the set-top box can communicate directly with a consumer electronic device. EX1007 (Caris) at Fig. 2. In contrast, Dubil teaches that the set-top box does not communicate directly with a consumer electronic device, but rather communicates to a remote control; it is the remote control that then communicates with the consumer electronic device. EX1008 (Dubil) at Fig. 1; EX2008 (Russ Depo. Tr. June 17, 2020) at 143:2-8. The remote control in Dubil is necessary to communicate with the consumer electronic device because only the remote control has the components and circuitry to produce and transmit the signals that the consumer electronic device can receive. EX1008 (Dubil) at Fig. 1, 5:20-26.

(EX2003 (Sprenger Decl.) at ¶ 226)



EX1006, FIG. 1 (annotated).

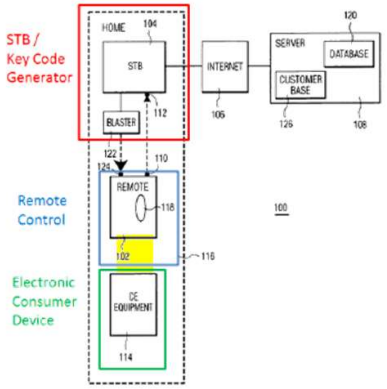
(EX2011 (Russ Decl.) at ¶ 109)

Ground 2: Caris + Dubil (1-5)

REDEFINING CONTROL

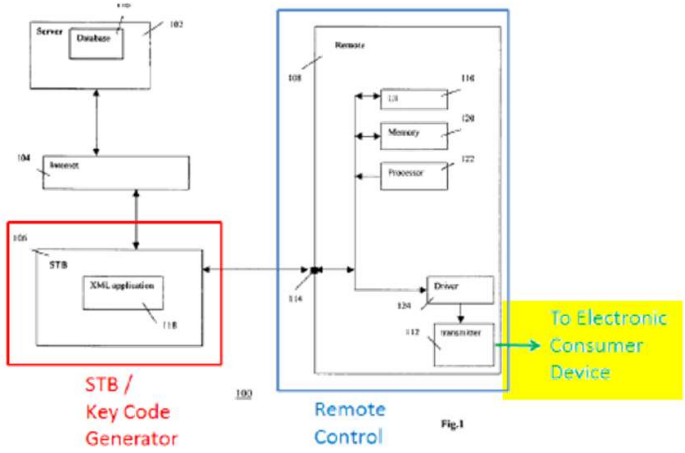
A POSITA would not have combined Caris with Dubil (POR at 39-42)

A POSITA would not have combined Caris Fig. 2 with Dubil Fig. 1 (EX2003 (Sprenger Decl.) at ¶ 227)



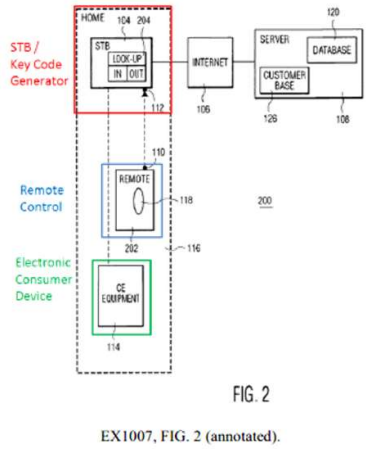
EX1008, FIG. 1 (annotated).

(EX2011 (Russ Decl.) at ¶ 201)



EX1006, FIG. 1 (annotated).

(EX2011 (Russ Decl.) at ¶ 109)



EX1007, FIG. 2 (annotated).

(EX1003 (Russ Decl.) at ¶ 164)

Ground 2: Caris + Dubil (1-5)

REDEFINING CONTROL

A POSITA would not have combined Caris with Dubil (POR at 39-42)

A POSITA would not have combined Caris Fig. 2 with Dubil Fig. 1 (POR at 39-40); EX2003 (Sprenger Decl.) at ¶ 227)

228. As another example, in the embodiment the Petition and Dr. Russ rely on in Caris, the remote control transmits to the set-top box for each remote button press. EX1007 (Caris) at 7:2-5; Petition at 40; EX1003 (Russ Decl.) at ¶¶ 166-170. By contrast, in Dubil, key codes are stored at the remote control so that the remote control never has to transmit to an intermediary, like a set-top box, for each button press during operation. EX1008 (Dubil) at 5:18-23. A POSITA would not have been motivated to consider a remote control that has to transmit to an intermediary device (set-top box) for each button press in combination with remote control that never needs to do so. Rather, A POSITA would have recognized that Caris and Dubil teach away from each other in this fundamental way.

(EX2003 (Sprenger Decl.) at ¶ 228)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a processing device . . ." (POR at 42-43)

Petitioner admits that Caris does not disclose a processing device but asserts it would have been obvious to use a processing device "to perform the functions *described in Caris*" (Pet. at 42-43; POR at 42-43):

While Caris describes the functionality of an STB as well as a receiver and a transmitter, Caris does not explicitly illustrate the processing device of the STB that is used for generating a key code and transmitting the key code as will be further described below. However, in view of the STB functionality described in Caris, a POSA would have found it obvious that this functionality would have been performed using a processing device coupled to the receiver and the transmitter. EX1003, ¶173.

As explained by Dr. Russ, STBs using processing devices to process received commands and to transmit key codes were well-known in the art prior to the earliest priority date of the '325 patent. *Id.*, ¶¶173-176. For example, in response to receiving a command from a remote control, the processing device would interpret the command and identify a corresponding key code and potential parameters used to transmit the key code to another device. *Id.*, ¶¶174-175. A processing device would be used to access memory and retrieve the corresponding key code. *Id.*, ¶176. Thus, a POSA would have understood that Caris' STB would include a processing device in order to perform the functions described in Caris. *Id.*

(Pet. at 42-43)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a processing device . . ." (POR at 42-43)

Petitioner admits that Caris does not disclose "format the key code" as required by claim 1 (Pet. at 52; POR at 42-43):

> As explained with reference to claim element [1.4.4], Caris does not explicitly describe the format of the key codes or the operational details for transmitting the key codes. *See* Section VII.C.9. For example, Caris does not explicitly describe the operational details explaining how the binary numbers are modulated onto an IR carrier signal to produce the key code signals. EX1003, ¶201.

(Pet. at 52)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Petition fails to assert how Caris + Dubil disclose "a processing device . . ." (POR at 42-43)

> Similar to Rye, UEI also argues that Caris does not disclose the claimed functional limitations and therefore does not disclose the claimed "processing device." POR, 42-43. But UEI mischaracterizes Ground as presented in the Petition. *See* Pet., 42, 44-49. Caris in view of Dubil renders obvious all of the claimed functional limitations, which are performed by Caris's STB. *See* Sections III.B.2-4. Caris's description of an STB further renders obvious that this functionality would have been performed using a "processing device" coupled to a receiver and a transmitter. Pet., 42 (citing EX1003, ¶¶173-176). STBs commonly included processing devices. EX1003, ¶¶173-176. Thus, a POSA would have understood that Caris's STB would include a processing device in order to perform the functions described in Caris and the functions in the Caris/Dubil combination. *Id.*; EX1030, ¶44.

(Pet. Reply at 15)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a memory storing instructions . . ." (POR at 43-44)

Petitioner admits that Caris does not disclose a memory storing instructions but asserts only that it would have been obvious "to perform the functions of identifying and transmitting a key code" (Pet at 43; POR at 43-44):

> While Caris does not explicitly describe memory used to store instructions executable by the processing device, a POSA would have found it obvious that for Caris to perform the functions of identifying and transmitting a key code, the STB would include memory with instructions executed by a processing device. *Id.*,¶178. As Dr. Russ explains, STBs typically included processing device with corresponding memory such as read-only memory (ROM) that would store instructions executed by the processing device to perform STB operations. *Id.*, ¶¶179-183. Thus, a processing device executing instructions from memory in an STB was a well-known STB configuration. *Id.*, ¶179-183.

(Pet. at 43)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a memory storing instructions . . ." (POR at 43-44)

Petition fails to explain how any of the memories on the first device perform "format the key code for transmission" (POR at 43-44):

> As explained with reference to claim element [1.4.4], Caris does not explicitly describe the format of the key codes or the operational details for transmitting the key codes. *See* Section VII.C.9. For example, Caris does not explicitly describe the operational details explaining how the binary numbers are modulated onto an IR carrier signal to produce the key code signals. EX1003, ¶201.

(Pet. at 52)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a memory storing instructions . . ." (POR at 43-44)

Petitioner's expert relies on Bayley but still never alleges any memory that stores instructions to perform "format the key code for transmission" (POR at 44):

178. While Caris does not explicitly describe memory used to store instructions executable by the processing device, a POSA would have found it obvious that for Caris to perform the functions of identifying and transmitting a key code, the STB would include memory with instructions executed by a processing device. For example, as described above, Bayley depicts a well-known memory device including a database as well as an OS (operating system), volume control application, and driver for operating volume controls. EX1018, 6:41-48; *see also id.*, 1:56-58, FIG. 2.

(EX1003 (Russ Decl.) at ¶ 178)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Petition fails to assert how Caris + Dubil disclose "a memory storing instructions . . ." (POR at 43-44)

Bayley equally suggests memories that are not on the "first device" as required (POR at 44):

246. Nevertheless, even if considering Bayley too, a POSITA would understand that instructions would not have to be stored on the look-up table in Caris. As Dr. Russ' own citation to Bayley explains, there are also "tape, compact disk ROM (CD-ROM), etc." EX1003 (Russ Decl.) at ¶ 179; EX2010 (Russ Depo. Tr. June 19, 2020) at 51:16-53:2. A POSITA would also recognize that executable instructions could even be stored on a processor itself. EX1001 ('325 patent) at 7:5-10 ("read only memory (ROM) on a microcontroller integrated circuit"); EX2010 (Russ Depo. Tr. June 19, 2020) at 48:19-49:20. Therefore, neither the Petition or Dr. Russ identifies any memory in Caris that would store executable instructions or any rationale for why any such memory would need to.

(EX2003 (Sprenger Decl.) at ¶ 246)

17 Q Why can't the instructions be on the CD rom
18 is? Isn't that what Bailey is saying?
19 A Well, they could be. It's not how I picture
20 Rye, but, yeah, they could be.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 52:17-20)

Ground 1: Caris + Dubil (1-5)

Petition fails to assert how Caris + Dubil disclose "a memory storing instructions . . ." (POR at 43-44)

Petitioner's Reply still fails to explain how any of the memories *on the first device* performs "format the key code for transmission" (PO Sur-reply at 12):

> Similarly, despite UEI's assertions, for Caris to perform the functions of identifying and transmitting a key code, it would have been obvious that its STB would include memory with instructions executed by a processing device. POR, 43-44; Pet., 43 (citing EX1003, ¶178). STBs typically included a processing device

(Pet. Reply at 15)

> 45. Similarly, despite UEI's assertions, for Caris to perform the functions of identifying and transmitting a key code, a POSA would have found it obvious for the STB to include memory with instructions executed by a processing device. POR, 43-44; EX1003, ¶178. As I explained in my previous declaration, STBs

(EX1030 (Russ Decl.) at ¶ 45)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "keystroke indicator having data that indicates an input element of the third device that has been activated" (POR at 46-47)

Petitioner and its expert never attempt to explain how any data "indicates an input element of the third device that has been activated" (POR at 46-47):

261. For Petitioner's first keystroke indicator theory, the dedicated hard button, the Petition fails to identify any data included in the "IR or RF code to the STB [*keystroke indicator signal*] to indicate that the button has been pressed." Petition at 44 (emphasis in original). Likewise, Dr. Russ simply makes the same statement without any explanation as to how or what data inside the IR or RF code indicates that the button on the remote control has been pressed. EX1003 (Russ Decl.) at ¶ 184.

262. For Petitioner's second keystroke indicator theory, the "input received from remote 202," the Petition again fails to identify any data included in "this input [that] would also indicate that an 'input element' of the remote control had been activated." Petition at 45. The Petition cites to its expert, but Dr. Russ merely states that "the input described in Caris may correspond to a 'channel up' button." EX1003 (Russ Decl.) at ¶ 186. Dr. Russ does not even assert that the input includes data to indicate that a button has been pressed.

(EX2003 (Sprenger Decl.) at ¶¶ 261-262)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "generate a key code using a keystroke indicator signal" (POR at 45-47)

Petition asserts two theories: "dedicated hard button" and "input received from remote 202" (POR at 45):

Caris teaches this claim element in two ways. First, Caris describes a remote control [*third device*] having a dedicated hard button 118 that, when selected by the user, causes the remote to transmit a command to the STB [*first device*]. *See* EX1007, 6:58-66. When a user activates the dedicated button on the remote control, the remote control transmits an "IR or RF code" to the STB [*keystroke indicator signal*] to indicate that the button has been pressed. *Id.*, 5:41-60; EX1003, ¶184.

(Pet. at 44)

Alternatively, Caris teaches the keystroke indicator as being an "input received from remote 202." *Id.*, 7:2-4. A POSA would have understood that this input refers to commands corresponding to other buttons on the remote control and would also indicate that an "input element" of the remote control had been activated. EX1003, ¶186. The claimed "keystroke indicator" is thus taught by both the dedicated hard button and the input received from the remote. *Id.*, ¶¶186-187.[4]

(Pet. at 45)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "generate a key code using a keystroke indicator signal" (POR at 45-47)

Theory one: "dedicated hard button" cannot satisfy the other claim elements POR at 45)

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

. . .

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator

. . .

(EX1001 (325 Patent) at Cl. 1)

252. First, the Petition points to "the dedicated hard button" on Caris' remote control. Petition at 44; EX1003 at ¶¶ 184-185. But Caris teaches that this dedicated hard button ("SmartConnect (SM) button") results in downloading entire codesets to the set-top box. EX1007 (Caris) at 2:28-39 ("When the proper code sets and accompanying UI data have been found, the codes and UI data are downloaded to the user's STB"), 3:65-4:4, 9:15-39; EX2008 (Russ Depo. Tr. June 17, 2020) at 188:2-7, 194:12-16, 190:10-191:13.

253. As explained in Sections XI.C.2 and XI.A.3, an entire codeset is not the claimed "key code signal" (required for later limitation [1.4.3]) because the specification distinguishes between a key code signal and a codeset (e.g., EX1001 ('325 patent) at 2:44-45, 4:45), and the prosecution history expressly disclaimed transmission of an entire codeset. Claim 1 itself even states that "the generated key code comprises a one of a plurality of key code data stored in a codeset." EX1001 ('325 patent) at 10:61-62; EX2008 (Russ Depo. Tr. June 17, 2020) at 57:2-17.

(EX2003 (Sprenger Decl.) at ¶¶ 252-253)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "generate a key code using a keystroke indicator signal" (POR at 45-47)

Petitioner's Expert on Reply fails to address the claim language itself (PO Sur-reply at 12-13):

46. UEI argues that the operation of Caris's "dedicated hard button" and downloading of key code data does not teach the claimed "generate a key code" because Caris teaches downloading the entire codeset rather than an individual key code. POR, 45. But UEI ignores the fact that downloading a codeset would also include downloading a key code because a codeset is a superset of a key code. EX1003, ¶¶184-87. I also understand that the Board interpreted Caris operating in this manner in the parallel IPR2019-01613 proceeding, stating that "the fact that the entire codeset may be generated by Caris with a signal that corresponds to the recited keystroke indicator signal merely suggests that additional key codes that are also part of the recited 'codeset' may be generated." EX1036, DI, IPR2019-01613, 36. Therefore, Caris discloses generating a key code as claimed in the '325 patent.

(EX1030 (Russ Suppl. Decl.) at ¶ 46)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "generate a key code using a keystroke indicator signal" (POR at 45-47)

Theory two: Petitioner never explains how "input received from remote" is "distinct from a key code" and/or that it is not merely translated or converted into a key code because Caris does not disclose what the "input" is (POR at 45-46):

187. Caris also teaches generating a key code in response to receiving an "input" from the remote. *See id.*, 7:2-4. In particular, after receiving the input, Caris describes retrieving a key code from "look-up table 204" corresponding to the input to generate a corresponding output "control command." *See id.* A POSA would have understood that this retrieval of this control command would also teach the claimed generating of a key code using the keystroke indicator signal.

(EX1003 (Russ Decl.) at ¶ 187)

However, Caris never discloses that this "input received from remote 202" is distinct from a key code, nor does the Petition or Dr. Russ provide any reason to believe that it is. EX2008 (Russ Depo. Tr. June 17, 2020) at 195:3-196:10. As explained in Section IX.A.2, the keystroke indicator must be distinct from a key code. So Petitioner's second theory also fails to disclose that Caris' set-top box will "generate a key code using the keystroke indicator."

(EX2003 (Sprenger Decl.) at ¶ 255)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "generate a key code using a keystroke indicator signal" (POR at 45-47)

Petitioner's Expert on Reply fails to address how the "input" is "distinct from a key code" and/or that it is not merely translated or converted into a key code (PO Sur-reply at 12-13):

47. UEI also argues that Caris's alternative embodiment depicted in Figure 2 also does not disclose the claim limitation. POR, 45-47. But UEI does not address the specific operation of Caris's look-up table "that associates an input received from remote 202 with an output as programmed." EX1003, ¶185; EX1007, 6:58-7:5. As I explained in my previous declaration, after Caris's STB has downloaded a codeset, Caris may operate in the manner depicted in Figure 2 where the STB generates a key code in response to the user selecting other buttons on the remote control. EX1003, ¶186. Specifically, a particular key code stored in the look-up table is retrieved in response to "input received from remote 202." EX1007, 7:2-4. In this manner, the "input" described in Caris with reference to Figure 2 discloses the claimed keystroke indicator. EX1003, ¶¶186-87. Caris's use of the look-up table further discloses generating a key code as I explained in my previous declaration. *Id.*

(EX1030 (Russ Suppl. Decl.) at ¶ 47)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "format the key code for transmission" (POR at 47-50)

Both experts agree that Dubil does not describe modulating onto a carrier signal *from* the STB (Caris' first device) as required by claim 1 (POR at 49-50):

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

. . .

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

. . .

(EX1001 (325 Patent) at Cl. 1)

272. Second, even if a POSITA did look to Dubil to modulate a key code onto a carrier signal, Dubil only describes any potential modulation for the signal transmitted by the remote control. Dubil does not describe modulating onto a carrier signal any transmissions *from the set-top box*, as required by the claims.

(EX2003 (Sprenger Decl.) at ¶ 272)

146. Dubil describes several well-known modulation protocols ("FSK, biphase, PWM") that existed to transmit IR control codes from a remote control.

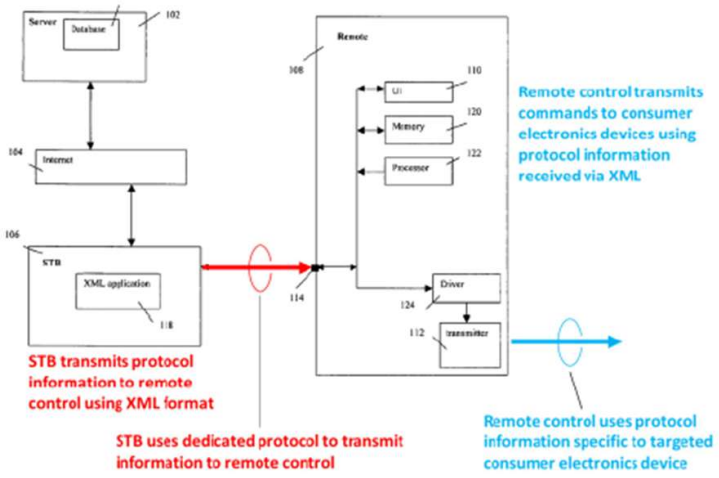
(EX2011 (Russ Decl.) at ¶ 146)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "format the key code for transmission" (POR at 47-50)

Dr. Sprenger explained how Dubil's set-top box *cannot* modulate onto a carrier signal as required by claim 1 (POR at 49-50):



EX1006 (Dubil) at Fig. 1.

275. It is important to note that the XML tags cannot describe transmission from the set-top box to the remote because the remote control does not have access to the information in the XML tags prior to communicating with the set-top box. That is, the XML tags will inform the remote control how to format and transmit the signal that the remote control sends to a consumer electronics device. Hence, the signal from the set-top box to the remote control that contains the information in the XML tags cannot already use the protocols that the remote control is waiting to receive. Without a dedicated protocol suitable to transfer XML code, the remote

(EX2003 (Sprenger Decl.) at ¶ 275)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "format the key code for transmission" (POR at 47-50)

Neither Petitioner nor its expert explain *why* a POSITA would have applied Dubil's remote control transmissions to Caris' set-top box rather than Caris' remote control (POR at 50):

279. Neither the Petition nor Dr. Russ provides any explanation why a POSITA would have applied the remote control transmissions in Dubil to the set-top box in Caris, rather than simply to the remote control in Caris. In my opinion, if a POSITA was combining Caris and Dubil, the combination would use the first embodiment of Caris (STB transmits back to the remote) and not the second embodiment (STB transmits to the consumer appliance) because Dubil only discloses the set-top box sending the codeset to the remote control for the remote control to transmit to the consumer appliance, just like the first embodiment of Caris. EX1008 (Dubil) at Fig. 1; EX1007 (Caris) at Fig. 1.

(EX2003 (Sprenger Decl.) at ¶ 279)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "key code data stored . . . digital ones and/or digital zeros" (POR at 51-53)

Petitioner and its expert incorrectly rely on simple "binary" and not "digital ones and/or zeros" (POR at 51-52; PO Sur-reply at 15-16):

51. UEI argues that the combination of Caris and Dubil does not render obvious "digital ones and/or digital zeros" because Dubil's disclosure of a "bit pattern of the command code" and "on/off times" is insufficient. POR, 51-52. UI continues by arguing that "a digital one and digital zero means that there is a mo complex pattern than simply a one is on and a zero is off." POR, 52. These statements, however, do not address the plain language of the claim, the specification, or the specific combination of Caris and Dubil presented in the Petition and in my previous declaration. EX1003, ¶¶195-200. Further, as I

(EX1030 (Russ Suppl. Decl.) at ¶ 51)

In the embodiment of FIG. **5**, the 12-bit key code is modulated onto key code signal **19** using pulse width modulation. Digital ones and zeros are characterized by pairs of marks and spaces. The period between successive leading edges of the bursts in a mark is the period of an intermediary signal. The intermediary signal has an inter-mediary frequency. In a space, there are no bursts.

FIG. **6**A shows a digital zero and a digital one in key code signal **19** of FIG. **5** in more detail. A "mark/space" pair represents a digital zero and another "mark/space" pair represents a digital one. The marks and spaces of each pair have predetermined lengths. In the embodiment of FIG. **5**, the mark length of a digital zero is 490 microseconds, and the mark length of a digital one is 3940 microseconds. The space length of a digital zero is 950 microseconds, and the space length of a digital one is 2000 microseconds.

(EX1001 (325 Patent) at 5:21-36;
see also EX2003 (Sprenger Decl.) at ¶ 286)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "key code data stored . . . digital ones and/or digital zeros" (POR at 51-53)

Petitioner and its expert incorrectly rely on simple "binary" and not "digital ones and/or zeros" (POR at 51-52; PO Sur-reply at 15-16):

287. Under Petitioner and Dr. Russ' interpretation, the terms binary, "on/off times of the signal," "duty cycle," and digital one/zero all mean the same thing. Petition at 52-53; EX1003 (Russ Decl.) at ¶ 203. This is not how a POSITA would understand these terms, and this contradicts how the '325 patent itself uses these terms. I understand that Dr. Russ even admitted this difference during his deposition. EX2010 (Russ Depo. Tr. June 19, 2020) at 73:8-74:3, 75:16-76:3, 76:13-22). Even the claim itself distinguishes between digital one/zero and time information. EX1001 ('325 patent) at 11:1-2 ("time information that describes how a digital one and/or digital zero . . . is to be represented").

288. Indeed, even Dubil, upon which Petitioner and Dr. Russ rely, lists "duty cycle" and "on/off times" and "bit pattern of the command code" all as different parameters, which indicates that Dubil did not mean for these terms to mean the same thing. EX1008 (Dubil) at 4:35-41.

(EX2003 (Sprenger Decl.) at ¶¶ 287-288)

Ground 1: Caris + Dubil (1-5)

REDEFINING CONTROL

Caris + Dubil fail to disclose "key code data stored . . . digital ones and/or digital zeros" (POR at 51-53)

Petitioner and its expert do not show any references that disclose the more complex pattern of "digital ones and zeros" described in the specification (POR at 51-53; PO Sur-reply at 15-16):

4:60-5:5; Pet., 50-51; EX1003, ¶¶197-99. Dubil's teachings demonstrate that it was obvious for key codes to be binary numbers, which therefore teaches the claimed "digital ones and digital zeros." Pet., 51. Therefore, despite UEI's position requiring "digital ones and digital zeros" to have additional complexity, Caris in view of Dubil still discloses "digital ones and/or digital zeros."

(EX1030 (Russ Suppl. Decl.) at ¶ 51)

In the embodiment of FIG. **5**, the 12-bit key code is modulated onto key code signal **19** using pulse width modulation. Digital ones and zeros are characterized by pairs of marks and spaces. The period between successive leading edges of the bursts in a mark is the period of an intermediary signal. The intermediary signal has an intermediary frequency. In a space, there are no bursts.

FIG. **6**A shows a digital zero and a digital one in key code signal **19** of FIG. **5** in more detail. A "mark/space" pair represents a digital zero and another "mark/space" pair represents a digital one. The marks and spaces of each pair have predetermined lengths. In the embodiment of FIG. **5**, the mark length of a digital zero is 490 microseconds, and the mark length of a digital one is 3940 microseconds. The space length of a digital zero is 950 microseconds, and the space length of a digital one is 2000 microseconds.

(EX1001 (325 Patent, 5:21-36);
see also EX2003 (Sprenger Decl.) at ¶ 286)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "key code data stored . . . digital ones and/or digital zeros" (POR at 51-53)

USPTO already rejected using "timing information" to transmit a signal teaches or suggests "codeset comprising timing information that describes a digital one and a digital zero" (POR at 53):

We are persuaded of error in the rejection of claim 34. The Examiner does not provide sufficient explanation, or direct us to sufficient supporting evidence, demonstrating that Pope's infrared code comprising a train of pulses with each pulse being 1.6 microseconds long, and indicating a one or a zero (Pope 3:45–47), combined with Teskey's remote control signal format characteristics including overall signal timing information (Teskey 3:60–4:8), teaches or suggests a codeset comprising timing information that describes a digital one and a digital zero. Specifically, it is not clear how Pope's train of 1.6 microsecond pulses, with each pulse indicating a high ("1") or low ("0") bit, as modified in view of Teskey's general teaching of signal timing information, teaches or suggests that it is the timing information of the codeset pulses or signals that describes digital ones and digital zeroes.

(EX2007 (553 Patent File History) at ¶ 256)

Ground 1: Rye + Skerlos (1-3, 5, 7)

Rye + Skerlos fail to disclose limitations of claim 1

1. A first device for transmitting a command to control a functional operation of a second device, the first device comprising:

a receiver;

a transmitter;

a processing device coupled to the receiver and the transmitter; and

a memory storing instructions executable by the processing device, the instructions causing the processing device to:

generate a key code using a keystroke indicator received from a third device in communication with first device via use of the receiver, the keystroke indicator having data that indicates an input element of the third device that has been activated;

format the key code for transmission to the second device; and

transmit the formatted key code to the second device in a key code signal via use of the transmitter;

wherein the generated key code comprises a one of a plurality of key code data stored in a codeset, wherein the one of the plurality of key code data is selected from the codeset as a function of the keystroke indicator received from the third device, wherein each of the plurality of key code data stored in the codeset comprises a series of digital ones and/or digital zeros, and wherein the codeset further comprises time information that describes how a digital one and/or a digital zero within the selected one of the plurality of key code data is to be represented in the key code signal to be transmitted to the second device.

(EX1001 (325 Patent) at Cl. 1)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "codeset further comprises time information . . . " (POR at 53-54)

Petitioner never asserts that the codeset comprises time information, only that the key codes would *use* timing information during transmission (POR at 53):

> Moreover, Petitioner admits that Caris does not teach a codeset comprises time information, and neither Petitioner nor Dr. Russ provide any reasoning why a POSITA would specifically have chosen to have the codeset comprise timing information (Petition at 52; EX1003 at ¶¶ 201-205; EX2011 at ¶ 203; EX2008 at 197:17-198:4). Indeed, Petitioner never asserts that the combination of Caris with Dubil teaches that the *codeset* comprises time information (Petition at 52-53).

(POR at 53)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose "codeset further comprises time information . . . " (POR at 53-54)

Petitioner's expert admitted that Dubil disclosed the "bit pattern of the command code" is stored *separately* from the "duty cycle, repetition time, and on/off times" relied on for timing information (Pet. at 54; EX2003 (Sprenger Decl.) at ¶ 294):

codes and for the GUI. The codes can be described using a number of parameters defined by XML tags. Examples have been mentioned above: carrier frequency, duty cycle, protocol type (FSK, biphase, PWM, etc.), repetition time, on/off times of the signal, bit pattern of the command code, meaning of the code, type and brand of the device for which it is intended (CD, VCR, TV, etc.), the name of the specific control protocol, etc. Some of these data fields are used to enable to

(EX1006 (Dubil) at 4:34-41)

13 Q My question is that Dubil explains that
14 these different XML tags, the protocol type, on off
15 times of the signal, the bit pattern of the command
16 code, it's describing these as separate XML tags
17 that are stored in the set-top box, right?
18 A In the implementation at Dubil. Of course,
19 the XML could be stored anywhere, but in Dubil it's
20 stored in the set-top box, yes.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 65:13-20)

Ground 1: Caris + Dubil (1-5)

Caris + Dubil fail to disclose the dependent claims (POR at 54-56)

2. The first device as recited in claim **1**, wherein the receiver comprises an RF receiver.

3. The first device as recited in claim **1**, wherein the transmitter comprises an IR transmitter.

4. The first device as recited in claim **1**, wherein the formatted key code is transmitted from the first device to the second device via a wired connection between the first device and the second device.

5. The first device as recited in claim **1**, wherein the formatted key code is transmitted from the first device to the second device via a wireless connection between the first device and the second device.

Expert Witness – Dr. Michael Sprenger (EX2100)

- B.S., Electrical Engineering from Swiss Federal Institute of Technology (1988)
- M.S. and **Ph.D., Electrical Engineering** from University of Colorado (1998)
- **30 years of experience** in engineering, communications, and consumer electronics, including set-top box technologies, networking, transmission protocols, and circuit design
- **10 issued U.S. patents** and 9 pending applications in the area of home networking
- 2013 CenturyLink Government Services Award

Petitioner's POSITA: "a **bachelor's degree in electrical engineering** or equivalent degree with **two years of work experience** relating to communications and consumer electronics" (Pet. at 12-13).

PO's POSITA: "a **bachelor's degree** which involved computer programming coursework, for example, **electrical engineering**, computer engineering, computer science, cognitive science, mechanical engineering, industrial engineering, or a similar degree, and at least **one year of work experience** in software programming, user interfaces, or human factors. Additional education might substitute for some of the experience, and substantial experience might substitute for some of the educational background" (POR at 10).