Patent Owner's Demonstrative Exhibit
Not Evidence

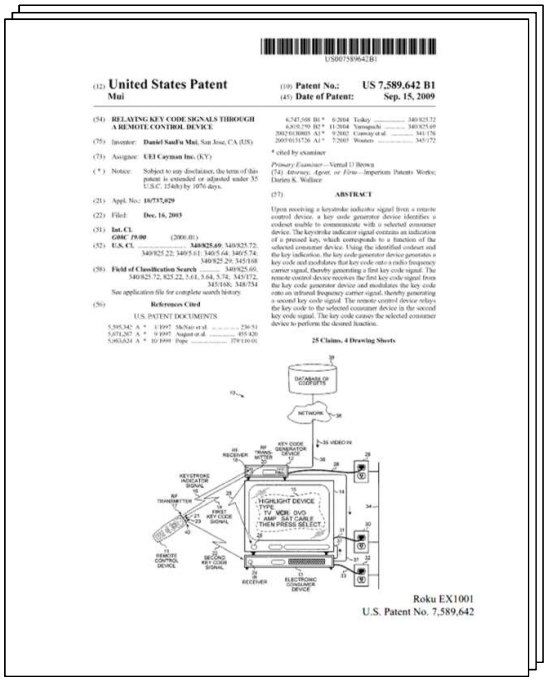
Agenda

- **Introduction to Mui Patents**
- Background: Petition and Institution
- Claim constructions
- Ground 1: Mishra and Dubil
- Ground 2: Rye and Dubil
- Ground 3: Caris and Skerlos

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction

REDEFINING CONTROL



US007589642B1

(12) **United States Patent**
Mui

(10) **Patent No.: US 7,589,642 B1**
(45) **Date of Patent: Sep. 15, 2009**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(75) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **UEI Cayman Inc.** (KY)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1076 days.

(21) Appl. No.: **10/737,029**

(22) Filed: **Dec. 16, 2003**

(51) **Int. Cl.**
G08C 19.00 (2006.01)

(52) **U.S. Cl.** **340/825.69**; 340/825.72; 340/825.22; 340/5.61; 340/5.64; 340/5.74; 340/825.29; 345/168

(58) **Field of Classification Search** 340/825.69, 340/825.72, 825.22, 5.61, 5.64, 5.74; 345/172, 345/168; 348/734

See application file for complete search history.

(56) **References Cited**

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2005/0151726 A1 * 7/2005 Wouters 345/172

* cited by examiner

Primary Examiner—Vernal U Brown
(74) *Attorney, Agent, or Firm*—Imperium Patent Works; Darien K. Wallace

(57) **ABSTRACT**

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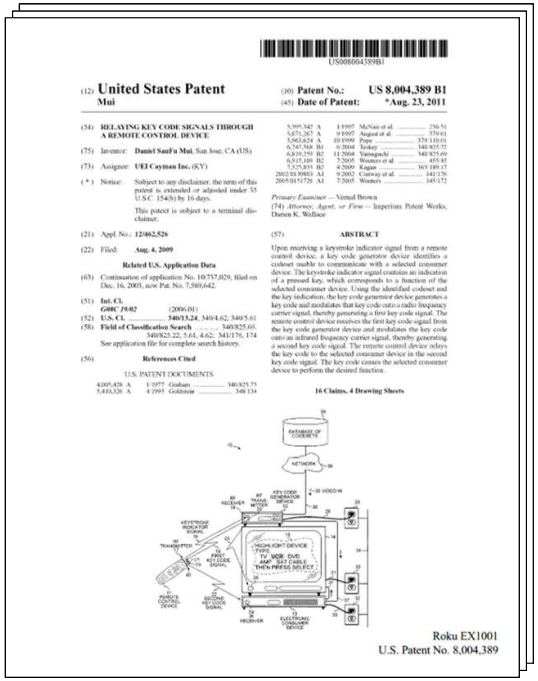
25 Claims, 4 Drawing Sheets

Roku EX1001
U.S. Patent No. 7,589,642

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



US008004389B1

(12) **United States Patent**
Mui

(10) **Patent No.: US 8,004,389 B1**
(45) **Date of Patent: *Aug. 23, 2011**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(75) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **UEI Cayman Inc.** (KY)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/462,526**

(22) Filed: **Aug. 4, 2009**

Related U.S. Application Data

(63) Continuation of application No. 10/737,029, filed on Dec. 16, 2003, now Pat. No. 7,589,642.

(51) **Int. Cl.**
G08C 19.02 (2006.01)

(52) **U.S. Cl.** **340/13.24**; 340/4.62; 340/5.61

(58) **Field of Classification Search** 340/825.69, 340/825.22, 5.61, 4.62; 341/176, 174

See application file for complete search history.

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Primary Examiner—Vernal Brown
(74) *Attorney, Agent, or Firm*—Imperium Patent Works; Darien K. Wallace

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16 Claims, 4 Drawing Sheets

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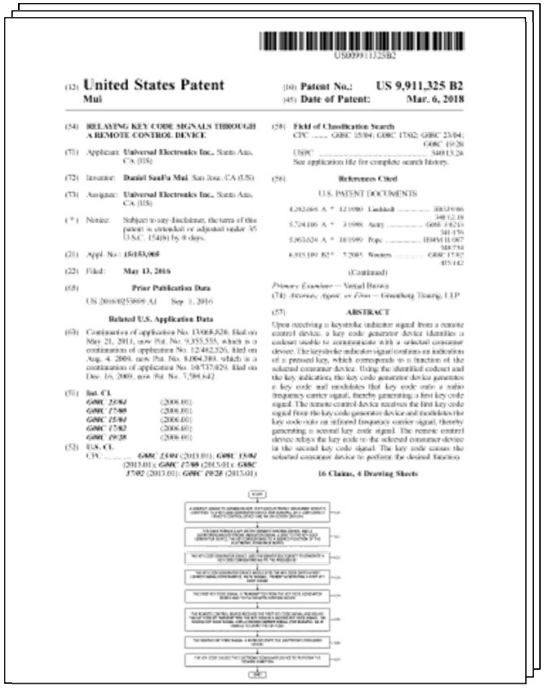
U.S. Patent No. 8,004,389



US009911325B2

(12) **United States Patent**
Mui

(10) **Patent No.: US 9,911,325 B2**
(45) **Date of Patent: Mar. 6, 2018**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(71) Applicant: **Universal Electronics Inc.**, Santa Ana, CA (US)

(72) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **Universal Electronics Inc.**, Santa Ana, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/153,065**

(22) Filed: **May 13, 2016**

(65) **Prior Publication Data**

US 2016/0253899 A1 Sep. 1, 2016

Related U.S. Application Data

(63) Continuation of application No. 13/468,820, filed on May 21, 2011, now Pat. No. 9,355,555, which is a continuation of application No. 12/462,526, filed on Aug. 4, 2009, now Pat. No. 8,004,389, which is a continuation of application No. 10/737,029, filed on Dec. 16, 2003, now Pat. No. 7,589,642.

(51) **Int. Cl.**
G08C 23/02 (2006.01)
G08C 17/00 (2006.01)
G08C 15/06 (2006.01)
G08C 17/02 (2006.01)
G08C 19/28 (2006.01)

(52) **U.S. Cl.**
CPC ***G08C 23/04*** (2013.01); ***G08C 15/06*** (2013.01); ***G08C 17/00*** (2013.01); ***G08C 17/02*** (2013.01); ***G08C 19/28*** (2013.01)

(58) **Field of Classification Search**
CPC G08C 23/04; G08C 17/02; G08C 23/04; G08C 19/28
USPC 340/13.26
See application file for complete search history.

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6,915,109 B2 * 7/2005 Wouters G08C 17/02 455/41.2

(Continued)

Primary Examiner—Vernal Brown
(74) *Attorney, Agent, or Firm*—Greenberg Traurig, LLP

(57) **ABSTRACT**

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16 Claims, 4 Drawing Sheets

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction

REDEFINING CONTROL

Petitioner's expert admitted UEI was a major manufacturer and that no other commercial devices performed all of the limitations (POR at 1)

Q Had you ever heard of Universal Electronics, Incorporated before this case?

A Definitely. They were one of the major manufacturers of remote controls when I worked at Scientific Atlanta from 2000 to 2007.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 11:11-15)

Q In all of those roughly 35 pages, would you agree with me that you don't identify any single commercial product that practices every limitation of any of the claims in the '642 patent?

MR. KENTON: Objection. Form.

BY THE WITNESS:

A In the background section, I don't believe that I do. I identify -- excuse me. I identify prior -- I identify devices and data sheets that certainly carry out pieces of the claimed invention, but, you know, I don't think I identify -- anyway, I don't think I identify one that satisfies all the limitations in the background section.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 111:9-21 ('642 Patent); EX2009 (Russ Depo. Tr. June 18, 2020) at 49:16-50-5 ('389 Patent); EX2010 (Russ Depo. Tr. June 19, 2020) at 40:4-10 ('325 Patent))

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction

Petitioner's expert admitted needing hindsight for the obviousness combinations (POR at 1)

A I think we're -- I was answering a slightly different set of questions. My point was if someone wanted to put together all the elements of the '642 invention, it would have been obvious how to do so in 2002.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 116:10-14)

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction

REDEFINING CONTROL

Petitioner's expert admitted needing hindsight for the obviousness combinations (POR at 1)

Each of the commercial products that you present here have a piece of the claims of the '389 patent, correct?

A Have pieces of it, and, you know, and then the references that I use further in my analysis, for example, which are actually patents, contain nearly all of the, you know, limitations in the '389 patent, which is why, you know, I make the combinations that I do. I think that's clear from the report.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 49:6-12)

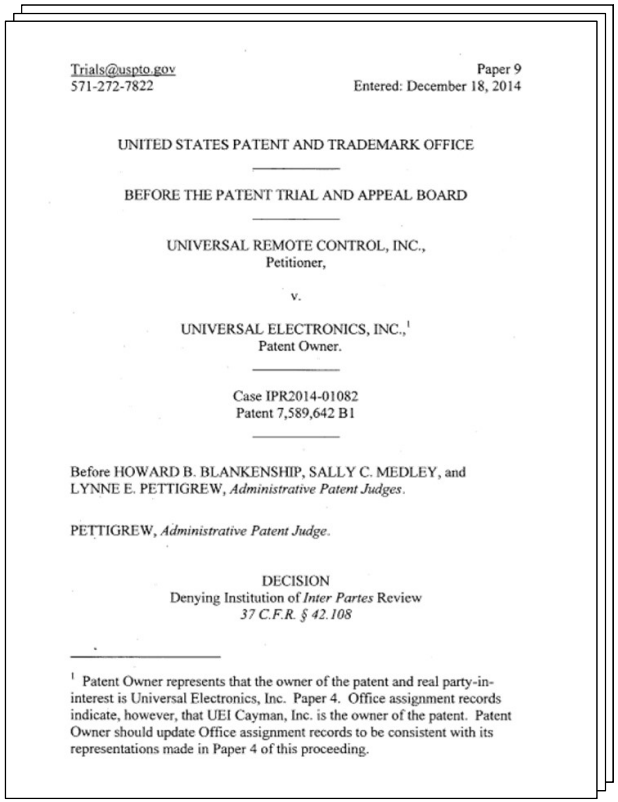
combinations of learning remotes and all that. So if someone wanted to put together the unique set of features in '325, it would have been very easy to do so, I'll put it that way and the list of the '325 features is -- the list of features that '325 supports in my opinion are unremarkable. There's not a startling combination in there in my opinion.

(EX2010 (Russ Depo. Tr. June 19, 2020) at 40:15-41:5)

Patent Owner's Demonstrative Exhibit
Not Evidence

IPR2014-01082 – Petition Denied

Claims 2, 22 and 23 have been unsuccessfully challenged before (POR at 9-10)



Trials@uspto.gov
571-272-7822

Paper 9
Entered: December 18, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIVERSAL REMOTE CONTROL, INC.,
Petitioner,

v.

UNIVERSAL ELECTRONICS, INC.,[1]
Patent Owner.

Case IPR2014-01082
Patent 7,589,642 B1

Before HOWARD B. BLANKENSHIP, SALLY C. MEDLEY, and LYNNE E. PETTIGREW, *Administrative Patent Judges*.

PETTIGREW, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

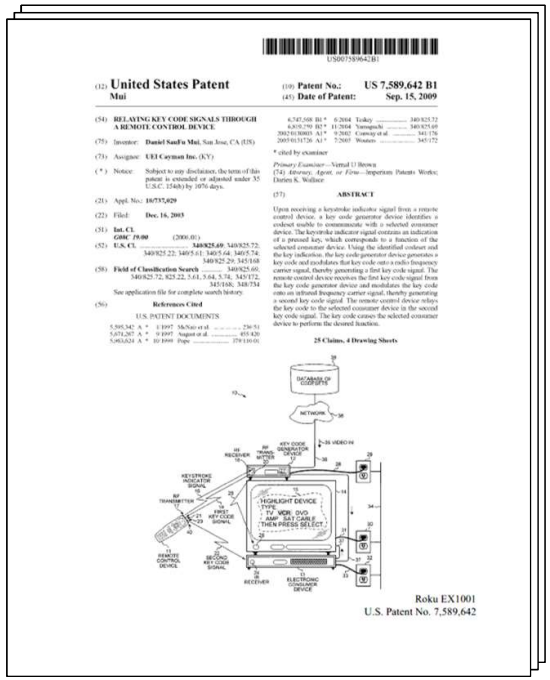
[1] Patent Owner represents that the owner of the patent and real party-in-interest is Universal Electronics, Inc. Paper 4. Office assignment records indicate, however, that UEI Cayman, Inc. is the owner of the patent. Patent Owner should update Office assignment records to be consistent with its representations made in Paper 4 of this proceeding.

> Upon consideration of the Petition and the Preliminary Response, we conclude the information presented does not show there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of claims 2, 5, 22, and 23. Accordingly, we do not authorize an *inter partes* review.

(EX1002 (642 Patent File History) at 370)

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction



(12) **United States Patent**
Mui

(10) **Patent No.: US 7,589,642 B1**
(45) **Date of Patent: Sep. 15, 2009**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(75) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **UEI Cayman Inc.** (KY)

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G08C 19.00 (2006.01)

(52) **U.S. Cl.** **340/825.69**; 340/825.72; 340/825.22; 340/5.61; 340/5.64; 340/5.74; 340/825.29; 345/168

(58) **Field of Classification Search** 340/825.65, 340/825.72, 825.22, 5.61, 5.64, 5.74; 345/172, 345/168; 348/734

See application file for complete search history.

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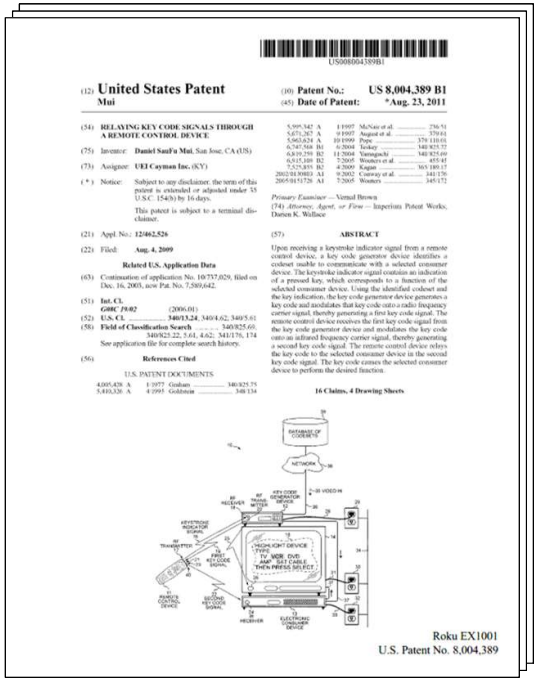
25 Claims, 4 Drawing Sheets

Roku EX1001
U.S. Patent No. 7,589,642

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



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G08C 19.02 (2006.01)

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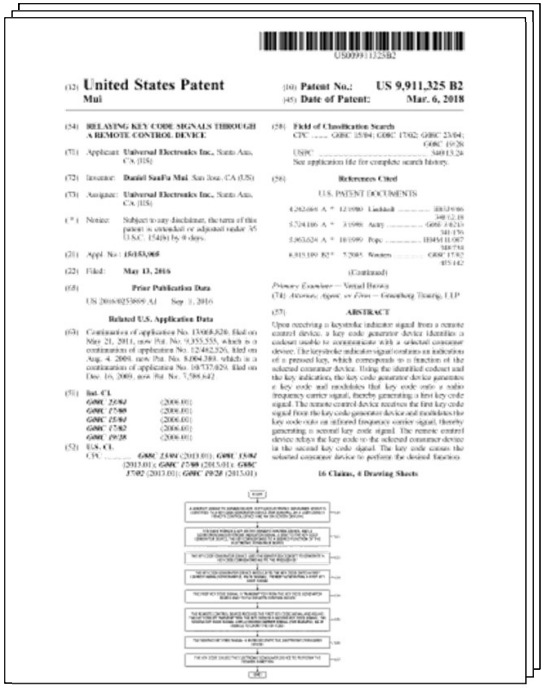

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(10) **Patent No.: US 9,911,325 B2**
(45) **Date of Patent: Mar. 6, 2018**

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G08C 23/02 (2006.01)
G08C 17/00 (2006.01)
G08C 15/06 (2006.01)
G08C 17/02 (2006.01)
G08C 19/28 (2006.01)

(52) **U.S. Cl.**
CPC ***G08C 23/04*** (2013.01); ***G08C 15/06*** (2013.01); ***G08C 17/00*** (2013.01); ***G08C 17/02*** (2013.01); ***G08C 19/28*** (2013.01)

(58) **Field of Classification Search**
CPC G08C 23/04; G08C 17/02; G08C 23/04; G08C 19/28
USPC 340/13.26
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U.S. Patent No. 9,911,325

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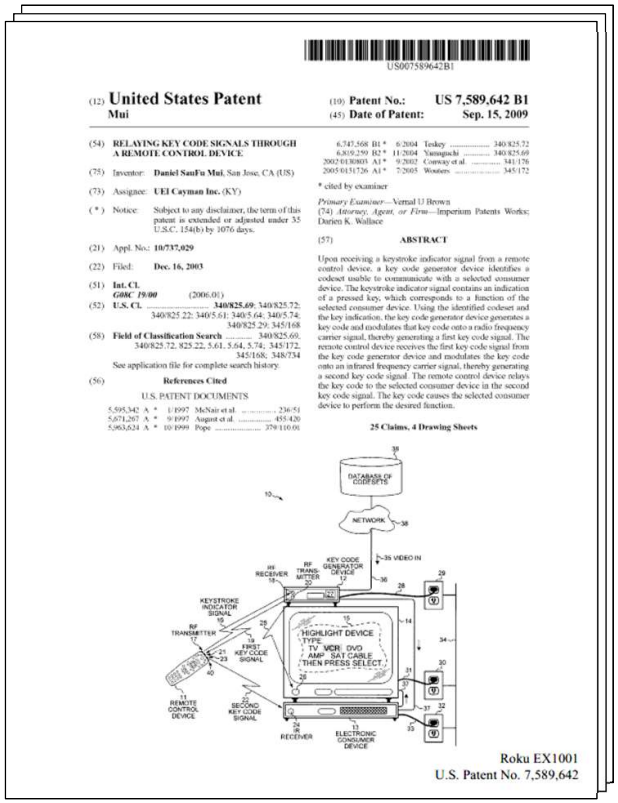
642 Patent



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25 Claims, 4 Drawing Sheets

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U.S. Patent No. 7,589,642

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

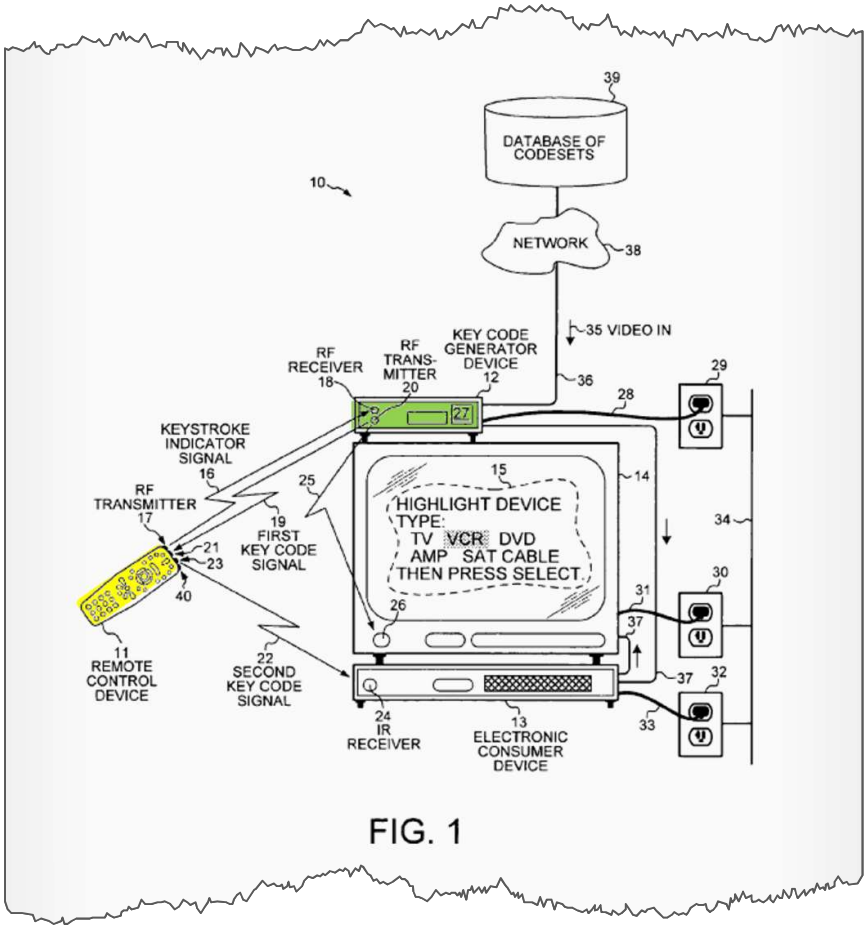
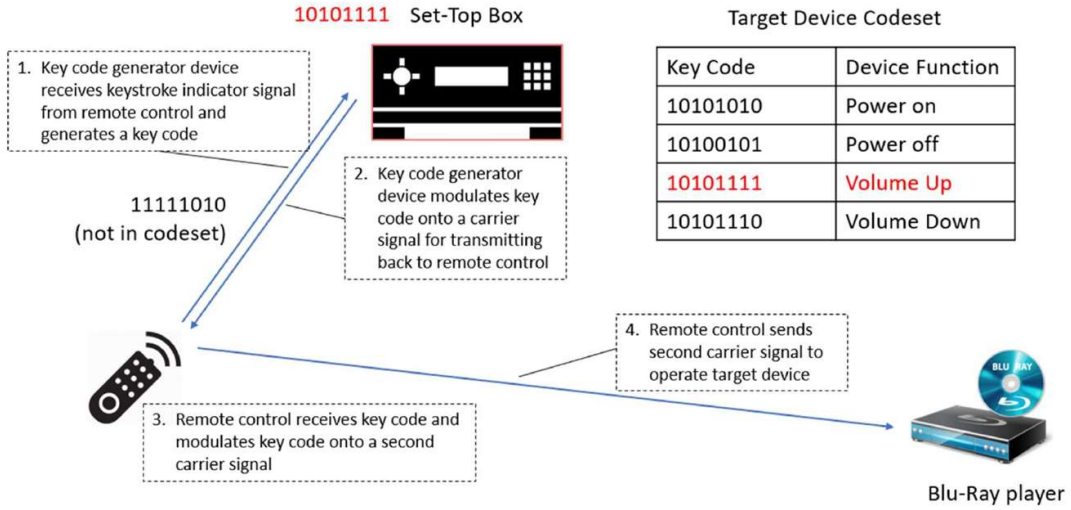


FIG. 1

Patent Owner's Demonstrative Exhibit
Not Evidence

642 Patent



Target Device Codeset

Key Code	Device Function
10101010	Power on
10100101	Power off
10101111	Volume Up
10101110	Volume Down

(EX2003 (Sprenger Decl.) at ¶ 68)

1. 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 indictor signal;

(c) **modulating said key code onto a carrier signal**, thereby generating a key code signal; and

(d) **transmitting said key code signal** from said key code generator device **to said remote control device**.

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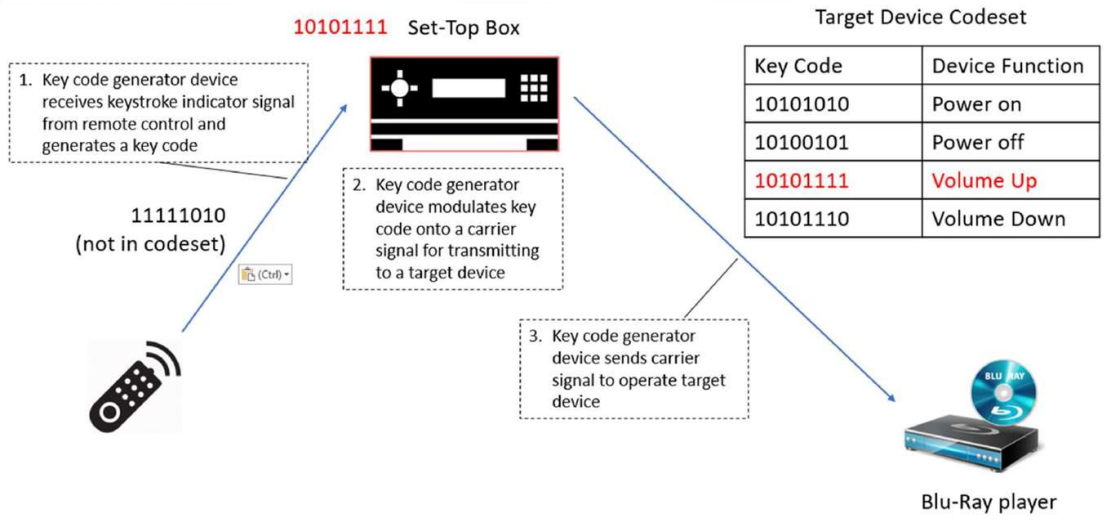
642 Patent



(EX2003 (Sprenger Decl.) at ¶ 70)

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 indictor signal;

(c) **modulating said key code onto a carrier signal**, thereby generating a key code signal; and

(d) **transmitting said key code signal** from said key code generator device **to an electronic consumer device**.

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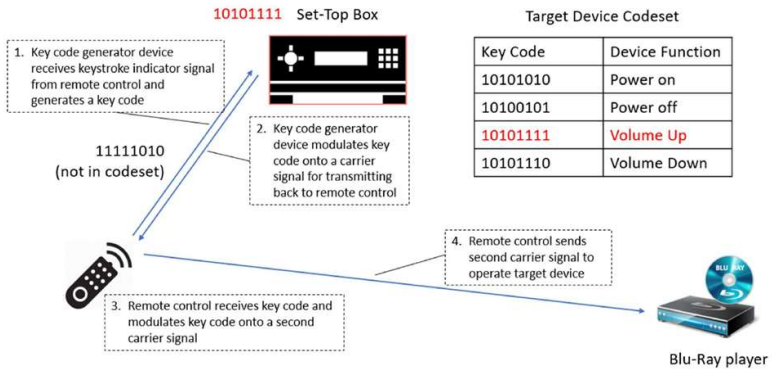
642 Patent

REDEFINING CONTROL

Remote → Key Code Generator Device → Remote → Consumer Device



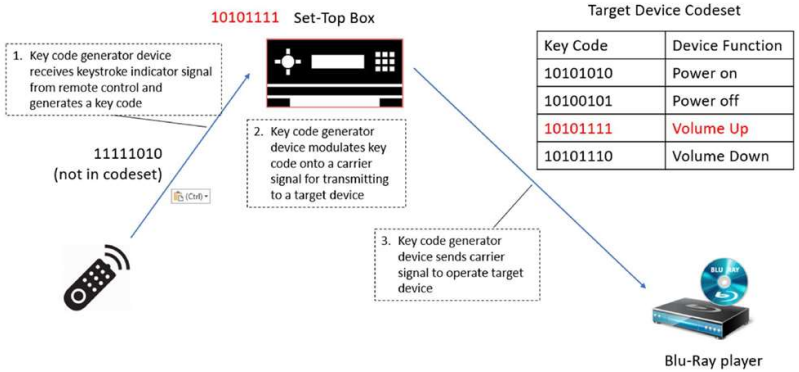
Target Device Codeset

Key Code	Device Function
10101010	Power on
10100101	Power off
10101111	Volume Up
10101110	Volume Down

(EX2003 (Sprenger Decl.) at ¶ 68)

642 Patent, Claim 1 + dependents

Remote → Key Code Generator Device → Consumer Device



Target Device Codeset

Key Code	Device Function
10101010	Power on
10100101	Power off
10101111	Volume Up
10101110	Volume Down

(EX2003 (Sprenger Decl.) at ¶ 70)

642 Patent, Claim 2 + dependents

Patent Owner's Demonstrative Exhibit
Not Evidence

Agenda

- Introduction to Mui Patents
- **Background: Petition and Institution**
- Claim constructions
- Ground 1: Mishra and Dubil
- Ground 2: Rye and Dubil
- Ground 3: Caris and Skerlos

Patent Owner's Demonstrative Exhibit
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Grounds

Petitioner asserts 3 obviousness grounds (Pet. at 3)

Ground	Prior Art	Basis	Claims Challenged
1	Mishra (EX1005) Dubil (EX1006)	35 U.S.C. § 103	1, 3, 4, 6, 8, 9
2	Rye (EX1007) Dubil (EX1006)	35 U.S.C. § 103	2, 22-25
3	Caris (EX1008) Skerlos (EX1009)	35 U.S.C. § 103	1, 2, 3, 4, 6, 8, 9, 22-25

(Pet. at 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

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- Introduction to Mui Patents
- Background: Petition and Institution
- **Claim constructions**
- Ground 1: Mishra and Dubil
- Ground 2: Rye and Dubil
- Ground 3: Caris and Skerlos

Patent Owner's Demonstrative Exhibit
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Claim constructions

Parties do not dispute the preliminary claim constructions (Paper 7 (Decision) at 11-15)

"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"
"key code generator device"	Function: "to generate a key code" Structure: "a set-top box, television, stereo radio, digital video disk player, video cassette recorder, personal computer, set-top cable television box or satellite box . . . performing the steps of (1) identifying a codeset usable to communicate with an electronic consumer device . . . and (2) identifying the key code corresponding to a pressed key for that codeset . . . and equivalents thereof."

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Claim constructions

- **“key code generator device”**
- “generating a key code within a key code generator device using the keystroke indicator”
- “key code signal”

(POR at 11-16)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Board requested the Parties address "autoscan functionality" from IPR2019-01613 (POR at 13-14)

> Nevertheless, we note that in a related proceeding, namely IPR2019-01613, which challenges claims of a related patent having substantially the same disclosure as the '642 patent, we identify a potential inconsistency in a concurrently issued decision. In particular, one of the challenged independent claims in IPR2019-01613 recites a limitation that appears to embrace the "autoscan" embodiment described in the Specification of the '642 patent. In IPR2019-01613, we ask the parties to take specific positions on the proper construction of "key code generator device" in light of our observation. Although the same issue does not appear to arise in the context of the claims challenged in this proceeding, in the interest of consistency between the two proceedings, we similarly ask the parties to take specific positions on the proper construction of the phrase. In addition, if the parties propose different constructions in the two proceedings, we ask that the parties justify such different constructions.

(Paper 7 (Decision) at 15)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Parties agree that there is no inconsistency (POR at 13-14)

B. "key code generator device"

UEI argues that there is no inconsistency between the District Court's construction and the autoscan functionality claimed in the '389 patent. POR, 13-14. Roku agrees. Under the District Court's construction, the "key code generator

(Pet. Reply at 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

Claim constructions

- "key code generator device"
- **"generating a key code within a key code generator device using the keystroke indicator"**
- "key code signal"

(POR at 11-16)

Patent Owner's Demonstrative Exhibit
Not Evidence

"generating a key code…"

The Board suggested claim construction of "generating a key code . . ." was needed to explain why "translates" is insufficient (POR at 24)

In particular, Petitioner contends that the "generating" limitation is disclosed by Mishra's determination of a corresponding control code through translation of a command signal received from remote control unit 18 by system 12 into a format appropriate for controlling device 16: "Specifically, upon receipt of the keystroke indicator signal, Mishra's set top box translates the keystroke indicator signal into a format appropriate for controlling a particular device, thereby *generating a key code*." Pet. 23. Patent Owner disputes this contention, arguing that "[t]he Petition and Russ declaration fail to provide any insight into what Mishra means by 'translate,' and fail to provide any explanations as to how *translating* and *using* a keystroke indicator signal to generate a key code are the same thing." Prelim. Resp. 12. In a similar argument, Patent Owner disputes Petitioner's identification of Mishra's system 12 as corresponding to a "key code generator device" because "it does not disclose the function of generating a key code." *Id.* at 13. But Patent Owner has not, at this time, proposed any construction of "generating" that is inconsistent with Petitioner's position.

(Paper 7 (Decision) at 20-21)

Patent Owner's Demonstrative Exhibit
Not Evidence

"generating a key code…"

The file history and the Patent show that "generating a key code . . ." excludes "translating" or "converting" (POR at 15-16)

E. "generating a key code within a key code generator device using the keystroke indicator signal"

UEI proposes that this term can be understood by its plain and ordinary meaning, except that it excludes receiving an appliance control code and merely translating or converting the code into another format, such as an infrared signal.

(POR at 15)

Patent Owner's Demonstrative Exhibit
Not Evidence

"generating a key code…"

REDEFINING CONTROL

The Patent describes what is intended by "translating" or "converting" (POR at 15-16)

Next (step **105**), remote control device **11** receives first key code signal **19** and relays the key code communicated by first key code signal **19** to VCR **13** in the form of a second key code signal **22**. Remote control device **11** is a slave to key code generator device **12**. Remote control device **11** relays the key code by receiving first key code signal **19** in RF form and translating the communicated key code so that the key code is modulated onto a second carrier signal resulting in second key code signal **22**. In this example, the second carrier signal is an infrared signal with a frequency in the range between three hundred gigahertz and three hundred terahertz. Second key code signal **22** is transmitted by an IR transmitter **23** on remote control device **11** to VCR **13**. In the embodiment of FIG. **5**, key code signal **19** is converted into key code signal **22** by forming the bursts of the intermediary signal using the second carrier signal with an infrared frequency in the place of the first carrier signal with a radio frequency. For both key code signal **19** and key code signal **22**, digital ones and digital zeros are modulated using the same timing for "mark/space" pairs. The waveform diagram of key code signal **22** appears the same as the waveform diagram shown in FIG. **5** for key code signal **19**; only the frequency of the carrier signal that forms the bursts is different.

(EX1001 (642 Patent) at 5:41-63)

140. The '642 patent specification confirms this when it uses the terms "translating" and "converted" when describing the remote control receiving the key code in a first carrier signal and merely modulating that key code onto a second carrier signal. EX1001 ('642 patent) at 5:41-63. According to the claims,

(EX2003 (Sprenger Decl.) at ¶ 140)

Patent Owner's Demonstrative Exhibit
Not Evidence

"generating a key code…"

The file history shows that "generating a key code . . ." excludes "translating" or "converting" (POR at 15-16)

The appliance control codes are not generated within the base unit 12 of Pope. Instead, the appliance control codes are transmitted from the handset 10/50 to the base unit 12, where they are translated to control signals. Base unit 12 of Pope does not receive a keystroke indicator and then generate a key code. Pope states, "Once an appliance control code is received by the base unit, the base unit will know to transfer the control code to an appliance" (Pope, col. 4, lines 49-51) (emphasis added).

(EX1002 (642 Patent File History) at 72)

Base unit 12 does not generate the appliance control codes. Instead, base unit 12 receives the appliance control codes, which were stored in memory 66 of handset 10, and then translates the appliance control codes into infrared control signals. Thus, Pope does not teach that handset 10 does not store a codeset.

(EX1002 (642 Patent File History) at 120)

139. A POSITA would therefore understand that the Applicant expressly excluded a device that "receives the appliance control codes and then ***translates*** them into infrared control signals" from the claim limitation "generating a key code within a key code generator" because the key code is actually received rather than generated (EX1002 ('642 patent Prosecution History, Applicant's Response dated Aug. 4, 2006) at 74 (bold and italics added); *see also* EX1002 ('642 patent Prosecution History, Applicant's Response dated Dec. 26, 2006) at 117-118, 120; EX1002 ('642 patent Prosecution History, Applicant's Appeal Brief dated July 26, 2007) at 237-238).

(EX2003 (Sprenger Decl.) at ¶ 139)

Patent Owner's Demonstrative Exhibit
Not Evidence

Claim constructions

- “key code generator device”
- “generating a key code within a key code generator device using the keystroke indicator”
- **“key code signal”**

(POR at 11-16)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code signal"

Petitioner clarifies that a "key code signal" excludes a codeset (POR at 12-13)

"key code signal"	"a signal containing a modulated key code"

(Paper 7 (Decision) at 11-15)

C. "key code signal"

UEI agrees with the Board's preliminary finding that "key code signal" is "a signal containing a modulated key code" (Paper 7 at 12).

UEI additionally clarifies that "a signal containing a modulated key code" excludes a codeset from the same signal. Not only is that the plain meaning, the

(POR at 12)

The '642 patent "relates generally to remote control devices and, more specifically, to relaying key code signals through a remote control device to operate an electronic consumer device." Ex. 1001, 1:6–9. Each of such key code signals "corresponds to a function of the selected electronic device, such as power on, power off, volume up, volume down, play, stop, select, channel up, channel down, etc." *Id.* at 1:25–28. A set of key codes associated with a particular electronic device is referred to as a "codeset."

(Paper 7 (Decision) at 2)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code signal"

File History demonstrates that "key code signal" excludes transmitting a codeset (POR at 12-13)

"key code signal"	"a signal containing a modulated key code"

(Paper 7 (Decision) at 11-15)

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

(EX1002 (642 Patent File History) at 242; *see also* 75-76, 121)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code signal"

REDEFINING CONTROL

Patent demonstrates that "key code signal" excludes transmitting a codeset (POR at 12-13)

129. This is further supported by the specification of the '642 patent, which distinguishes between a key code and a codeset. EX1001 ('642 patent) at 10:18-19 ("modulating ***said key code*** onto a carrier signal, thereby generating a ***key code signal***") (emphasis added), 10:65-66 ("wherein said key code generated in (b) is part of a codeset"), 2:27-28 ("key code from one of the codesets"), 4:25 ("key code of the codeset").

130. Transmitting an entire codeset is not the equivalent of transmitting a single key code in a key code signal because transmitting an entire codeset cannot operate a consumer electronic device. This is readily apparent from claim 2 of the '642 patent, where the key code generator device directly transmits the key code signal to an electronic device without relaying through the remote control. If the key code signal included the entire codeset, the electronic device would not respond to any particular key code and the entire point of the invention would be lost.

(EX2003 (Sprenger Decl.) at ¶¶ 129-130)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code signal"

REDEFINING CONTROL

Petitioner's expert agreed that "key code signal" excludes transmitting a codeset (POR at 12-13)

Q Do you agree that the key code signal contains one key code, in this case, the power on key code?

A In this example here on Line 35 and following, yes.

Q Now, more generally then -- still in the context of this patent, of course -- would you agree that the key code signal contains one key code?

MR. KENTON: Objection, form.

BY THE WITNESS:

A My recollection is that's the construction that we're using.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 57:2-17)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code signal"

Petitioner offers no evidence to dispute "key code signal" excludes transmitting a codeset (PO Sur-reply at 2-3)

So, first of all, counsel said that Roku took a position on claim construction for key code signal in the IPR. And what Your Honor can actually see in Complainant's Exhibit 6 at page 14, which is the petition, under the term "key code signal," Roku's petition said petitioner does not set forth or advocate for any specific construction.

So, contrary to counsel's argument, Roku simply informed the PTAB of what the various constructions were, they provided both UEI's proposed construction as well as the District Court's construction, but they did not advocate to the PTAB a particular construction.

(EX2011 (Markman transcript) at 58:23-59:8)

Patent Owner's Demonstrative Exhibit
Not Evidence

Grounds

Each of the grounds fails to disclose limitations of claims 1-2 (POR at 22-27, 38-43, 50-53, 58-59)

	Ground 1: Mishra + Dubil	**Ground 2: Rye + Dubil**	**Ground 3: Caris + Skerlos**
"generating a key code . . . using the keystroke indicator signal"	FAIL	FAIL	FAIL
"key code generator device"			FAIL
"key code signal"	FAIL		FAIL
"modulating said key code onto a carrier signal"	FAIL	FAIL	FAIL

Patent Owner's Demonstrative Exhibit
Not Evidence

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Patent Owner's Demonstrative Exhibit
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Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra

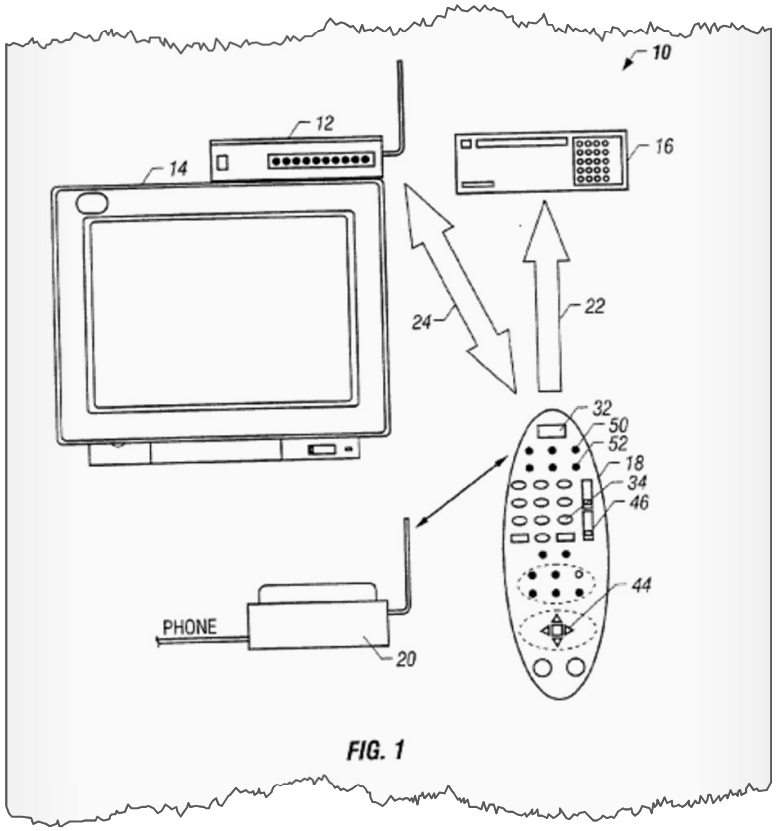


FIG. 1

(EX1005 (Mishra) at Fig. 1)

examples. The RF transceiver **30** may send radio frequency voice information to the telephone base station **20** or to the system **12**. The transceiver, in one embodiment of the invention, uses an internal antenna **29** that may be built into the RCU **18**. The IR transceiver **28** may be used to communicate with the system **12** using a bidirectional infrared protocol such as the IrDA-C protocol in one embodiment of the invention. The IR transmitter **35** may be used to communicate with legacy devices **16** using a unidirectional protocol in one embodiment.

(EX1005 (Mishra) at [0022])

103. While Mishra includes both RF as well as IR functionality, the use of either transmission technology is clearly separated, depending on the particular application: RF communication is used for the telephone function, while IR communication is used to remotely controlling other electronic devices. EX1005 (Mishra) at [0019], [0022] ("The RF transceiver 30 may send radio frequency voice information to the telephone base station 20 or to the system 12. . . . The IR transmitter 35 may be used to communicate with legacy devices 16 using a unidirectional protocol in one embodiment.").

(EX2003 (Sprenger Decl.) at ¶ 103)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra

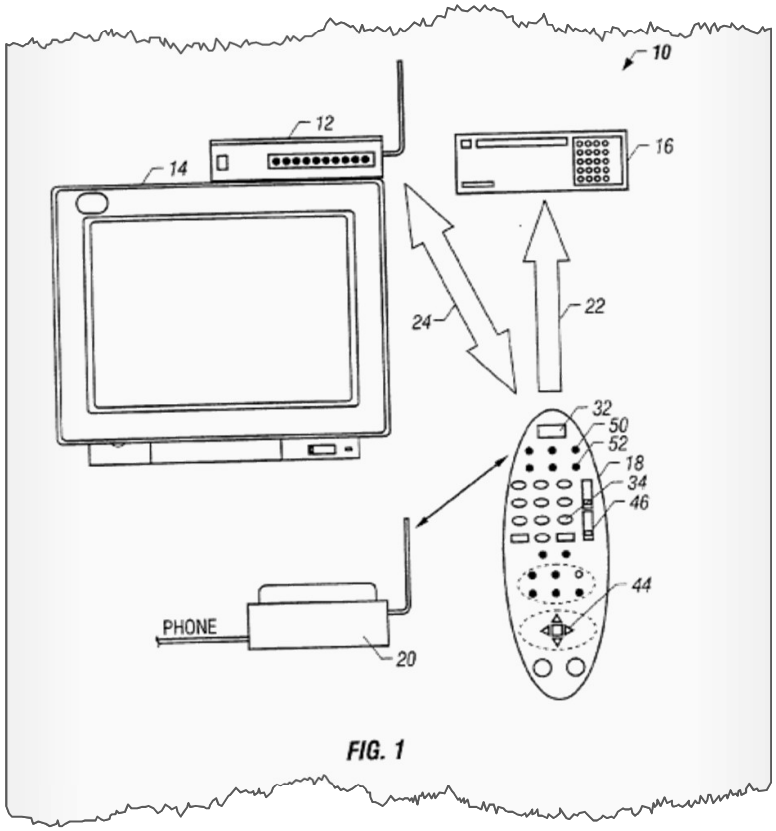


FIG. 1

(EX1005 (Mishra) at Fig. 1)

[0020] Having received a command signal from the RCU **18**, the system **12** can translate the command into a format appropriate for controlling a particular device **16**. That is, it is not necessary to program the RCU **18** independently. Instead, a variety of codes may be stored in the system **12**. The user may be called upon to indicate the type of devices which need to be controlled. When the RCU transmits a signal corresponding to a known function (which signal may not be particularly adapted to work any particular device), the system **12** can translate that signal and send information back to the RCU **18** to enable the RCU **18** to control the particular device the RCU **18** is to operate.

(EX1005 (Mishra) at [0020])

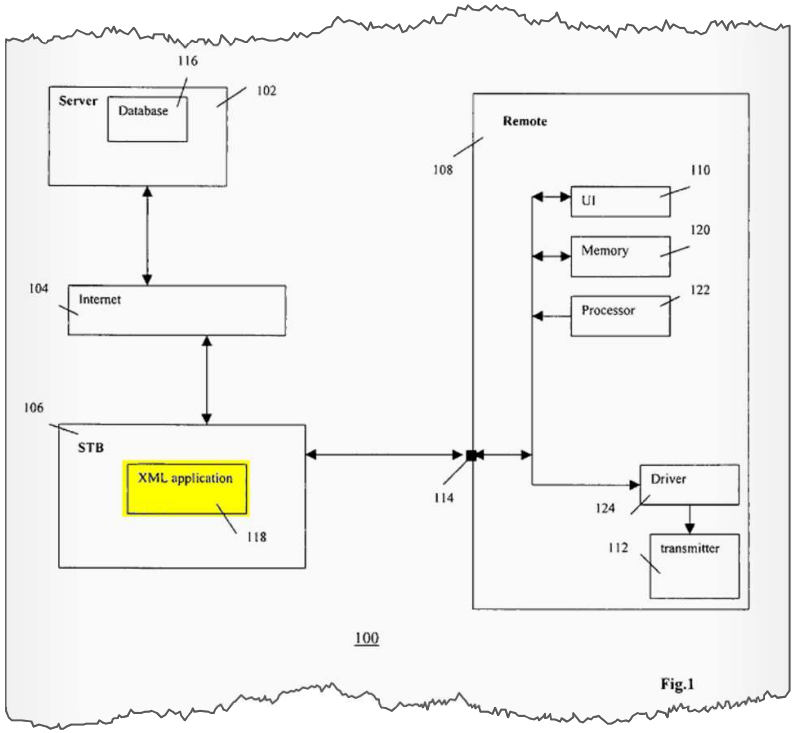
explaining how this transmission would occur. While a POSA would have understood that Mishra would accomplish transmissions using a well-known modulation process, Mishra does not explicitly describe the modulation of a control code onto a carrier frequency. If a POSA sought to use Mishra to

(EX1003 (Russ Decl.) at ¶ 108)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Dubil



(EX1006 (Dubil) at Fig. 1)

More specifically, the IR or RF codes are described using XML. A number of parameters can be defined using XML tags, for example, carrier frequency, duty cycle, protocol type (FSK, biphase, PWM, etc.), repetition time, on/off times of the signal, bit pattern of the command code, semantic meaning of the code, type of device for which it is intended (CD, VCR, TV, DVD, etc.), the brand name of the specific protocol,

(EX1006 (Dubil) at 2:61-67)

The user requests via appliance **106** a code set from server **102** for control of the apparatus, type, brand, serial no., etc., as specified by the user and to be controlled via remote **108**. This is achieved, e.g., by having the user fill out an electronic template at the service's web site and returning the template's information to server **102**. Server **102** runs a query and, assuming that there is a match, supplies the associated set of codes via Internet **104** to appliance **106** as an XML document. Appliance **106** has an XML application **118** that extracts the data based on the relevant tags and interprets the data according to the semantics of the tags in order to generate the control codes and/or the GUI panels for remote **108**. The GUI panel is preferably, but not necessarily, an HTML page. The control codes and/or GUI panels are then supplied to remote **108** via input **114** for being installed. For example, remote **108** is set

(EX1006 (Dubil) at 5:6-20)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

The combination of Mishra and Dubil must apply the transmissions from Dubil's *remote control* to Mishra's *set-top box* to meet the claims (EX1003 (Russ Decl.) at ¶ ¶ 146, 128):

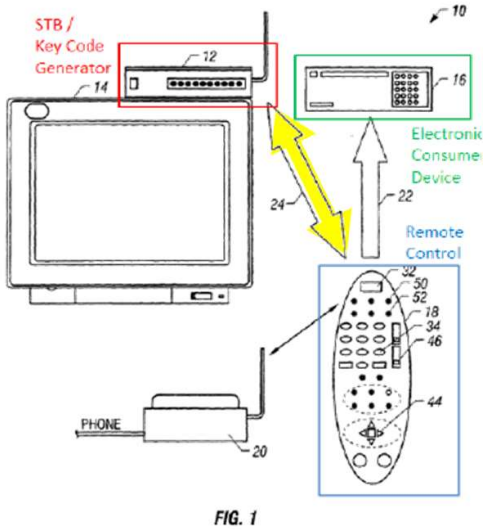
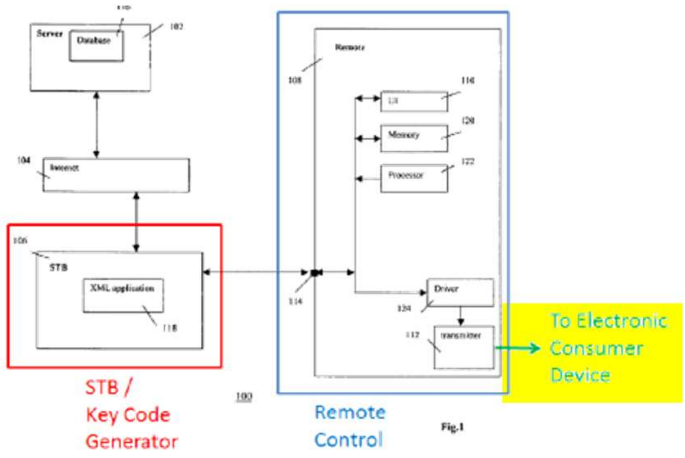


FIG. 1

(EX1003 (Russ Decl.) at ¶ 105)



EX1006, FIG. 1 (annotated).

(EX1003 (Russ Decl.) at ¶ 109)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner and its expert fail to offer any reasons *why* a POSITA reading Mishra would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 18-19)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner and its expert fail to offer any reasons *why* a POSITA reading Mishra would have been motivated to add "modulating onto a carrier signal" (POR at 18-19)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner and its expert fail to offer any reasons *why* a POSITA reading Mishra would have been motivated to modify it to add "modulating onto a carrier signal" (POR at 18-19)

> "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).

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

A POSITA would not have combined Mishra with Dubil because they teach away from one another in multiple incompatible ways (POR at 20-22):

EX1006 (Dubil) at 8:50-54. Dubil explains that processing at the server offers the advantage that "[o]nly that data required to have the remote send the particular control code is stored at the remote itself, or at an intermediate device such as the user's PC or set-top box." EX1006 (Dubil) at 4:42-45.

153. Thus, a POSITA would understand that Dubil teaches away from Mishra where "a list of common manufacturers of the type of device selected usin a database provided with the system 12" irrespective of whether the user even has such equipment. EX1005 (Mishra) at [0030], [0020]. A POSITA would therefore consider Mishra and Dubil to be fundamentally incompatible regarding which operations should occur at a server instead of a set-top box and which codesets should be stored at the set-top box. EX2008 (Russ Depo. Tr. June 17, 2020) at

(EX2003 (Sprenger Decl.) at ¶¶ 152-153)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

A POSITA would not have combined Mishra with Dubil because they teach away from one another in multiple incompatible ways (POR at 20-22):

Q Right. So Mishra and Dubil are suggesting different approaches; is that right?

MR. KENTON: Objection. Form.

BY THE WITNESS:

A Right.

BY MR. TSUI:

Q Thank you for your clarification.

A I'm sorry. Let me be more accurate.

Dubil is suggesting one way to do it. Mishra is suggesting another, but I think all of them, whether the remote stores zero code sets, one code set or a number of code sets, are a mere implementation decisions, and it would be obvious to a person of ordinary skill in the art.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 158:12-159:3)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

A POSITA would not have combined Mishra with Dubil because they teach away from one another in multiple incompatible ways (POR at 20-22):

154. Moreover, combining Mishra and Dubil would contradict Dr. Russ' explanation in the related IPR of the '389 patent (IPR2019-01613) that a user would seek to modify Mishra in order 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." EX2011 (IPR2019-01613, EX1003 (Russ Decl.)) at ¶¶ 133-134; EX2008 (Russ Depo. Tr. June 17, 2020) at 57:2-60:19. Dubil does not avoid this situation; rather, it teaches the very process Dr. Russ states that a POSITA would want to avoid. EX1006 (Dubil) at 5:6-11 ("by having the user fill out an electronic template at the service's website"), 3:25-29 ("user notifies a dedicated server on the Internet of the purchase of the type, brand, serial number, etc., of a new CE apparatus'), 2:5-6.

(EX2003 (Sprenger Decl.) at ¶ 154)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner and its expert never address incompatibilities (POR at 21).

14 Q So there are disclosures in Dubil that you
15 didn't analyze and you didn't study because you
16 weren't going to rely on them; is that correct?
17 MR. KENTON: Objection. Form.
18 BY THE WITNESS:
19 A I think the point is the elements of Dubil
20 that I relied on in my obviousness combination is
21 clear in the report, and unless it's called out in
22 my report, I did not rely on it.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 146:14-22)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner's expert's approach is legally impermissible (Pet. at 23-25):

"'"When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself." *Interconnect Planning Corp. v. Feil*, 774 F. 2d 1132, 1143 (Fed. Cir. 1985). Otherwise, **we "cannot use hindsight reconstruction to *pick and choose among isolated disclosures* in the prior art to deprecate the claimed invention**.' *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988). Here, the Examiner's selection of just the removable plate feature of Finch to the exclusion of the accompanying and interrelated driving mechanism and follower smacks of hindsight reasoning." *Ex Parte Creed Taylor*, No. 2017-009744, 2018 Pat. App. LEXIS 6083, at *7-9 (P.T.A.B. Aug. 1, 2018) (emphasis added).

"We hold that the district court's finding that there would not have been a motivation to combine is not clearly erroneous. The district court correctly acknowledged that **it is not enough for Toro to merely demonstrate that elements of the claimed invention were independently known in the prior art. Often, every element of a claimed invention can be found in the prior art**. *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000). Moreover, Toro merely identifies a problem that Henriksson sought to solve. However, "**knowledge of a problem and motivation to solve it are entirely different from motivation to combine particular references**." *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1373 (Fed. Cir. 2008)." *Metalcraft of Mayville, Inc. v Toro*, 848 F.3d 1358, 1367 (Fed. Cir. 2017).

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner's expert's approach is legally impermissible (Pet. at 23-25):

"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).

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

A POSITA would not have combined Mishra with Dubil (POR at 18-22)

Petitioner's argument of "finite number of predictable choices" should be disregarded as new, and it ignores the cost considerations that Petitioner's expert stressed (PO Sur-reply at 6-7):

> as well. *See* EX2003, ¶¶49-54; EX1033, 135:12-21; EX1032, ¶33. Regardless, the finite number of predictable choices for wireless transmission (i.e., modulated vs. unmodulated) still demonstrates that using a modulation technique would have been obvious. *See Geo. M. Martin Co. v. Alliance Machine Sys's Intern. LLC*, 618 F.3d 1294, 1302 (Fed. Circ. 2010) (A "'finite number of identified, predictable solutions' [] justifies a legal conclusion that the result [] is 'the product not of innovation but of ordinary skill and common sense.'")

(Pet. Reply at 10)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 1 (POR at 22-27)

	Ground 1: Mishra + Dubil
"generating a key code . . . using the keystroke indicator signal"	FAIL
"key code signal"	FAIL
"modulating said key code onto a carrier signal"	FAIL

1. 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 indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to said remote control device.

(EX1001 (642 Patent) at Cl. 1)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

1 Mishra + Dubil fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 24)

Petitioner relies on "translating" a received command code (POR at 24; Pet. at 23):

In particular, Petitioner contends that the "generating" limitation is disclosed by Mishra's determination of a corresponding control code through translation of a command signal received from remote control unit 18 by system 12 into a format appropriate for controlling device 16: "Specifically, upon receipt of the keystroke indicator signal, Mishra's set top box translates the keystroke indicator signal into a format appropriate for controlling a particular device, thereby *generating a key code*." Pet. 23. Patent Owner disputes this contention, arguing that "[t]he Petition and Russ declaration fail to provide any insight into what Mishra means by 'translate,' and fail to provide any explanations as to how *translating* and *using* a keystroke indicator signal to generate a key code are the same thing."

(Paper 7 (Decision) at 20-21)

[0020] Having received a command signal from the RCU **18**, the system **12** can translate the command into a format appropriate for controlling a particular device **16**. That is, it

(EX1005 (Mishra) at [0020])

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

REDEFINING CONTROL

1 Mishra + Dubil fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 24)

Petitioner only relies on Mishra's "translating" the format (POR Sur-reply ay 4):

[0020] Having received a command signal from the RCU **18**, the system **12** can translate the command into a format appropriate for controlling a particular device **16**. That is, it is not necessary to program the RCU **18** independently. Instead, a variety of codes may be stored in the system **12**. The user may be called upon to indicate the type of devices which need to be controlled. When the RCU transmits a signal corresponding to a known function (which signal may not be particularly adapted to work any particular device), the system **12** can translate that signal and send information back to the RCU **18** to enable the RCU **18** to control the particular device the RCU **18** is to operate.

(EX1005 (Mishra) at [0020])

EX1005, ¶¶37, 39. The user can press, for example, the channel up button which "causes the appropriate command [*keystroke indicator signal*] to be sent to the master [*set top box*] telling it, for example, that the user wishes to go to the next highest channel." *Id.*, ¶37. "The master in turn ***sends the RCU the necessary codes*** to increment the channel on the TV. The RCU then takes these codes and sends them . . . to the TV. . ." *Id.* Here, "the master feeds the information to the RCU each time the RCU needs information." *Id.*, ¶39. UEI ignores Mishra's operations in this regard.

(Pet. Reply at 8)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

2

Mishra + Dubil fail to disclose "a key code signal" (POR at 25)

Mishra discloses transmitting a *codeset* (EX2003 (Sprenger Decl.) at 176-178, 187):

known information (block **342**). From the database, the required remote control codes can be determined by the system. If there is no user selection and a time period has elapsed (diamond **344**), a check at diamond **346** determines whether to provide a prompt (block **348**).

[**0034**] If each of the selections matches an existing database entry (diamond **350**), the appropriate signal information is sent to the RCU **18** by the system **12** (block **353**). In other words, the RCU **18** may be provided with protocols to control a given device. Referring to **FIG. 1**, the information

(EX1005 (Mishra) at [0033]-[0034])

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

2

Mishra + Dubil fail to disclose "a key code signal" (POR at 25)

Petitioner misreads the difference between the embodiments: it is how often the codeset is transmitted, not that a single key code is ever transmitted the embodiments of Mishra (POR sur-reply at 4-5):

> [0039] The difference between the two approaches is that in the first case, the master feeds the information to the RCU each time the RCU needs information. In the second case, the master feeds the information needed to do all the different controls for a given device initially, and then the device handles those protocols on its own. In one embodiment of the invention, the information may be provided from the master to the RCU each time the system is operated so that it is not necessary to discard the information when it is desired to switch controlled devices.

(EX1005 (Mishra) at [0039])

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

3 Mishra + Dubil fail to disclose "modulating said key code onto a carrier signal" (POR at 25-27)

Dubil does not describe modulating onto a carrier signal *from* the set-top box as required by claim 1 (POR at 25-27):

1. 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 indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to said remote control device.

(EX1001 (642 Patent) at Cl. 1)

196. Furthermore, 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 *to the remote control*, as required by the claims.

(EX2003 (Sprenger Decl.) at ¶ 196)

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

(EX1003 (Russ Decl.) at ¶ 146)

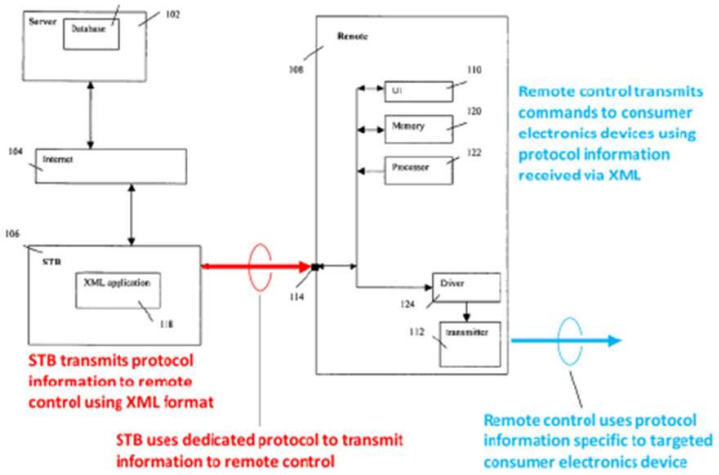
Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

REDEFINING CONTROL

3 Mishra + Dubil fail to disclose "modulating said key code onto a carrier signal" (POR at 25-27)

Dr. Sprenger explained how Dubil's set-top box *cannot* modulate onto a carrier signal as required by claim 1 (POR at 26-27):



EX1006 (Dubil) at Fig. 1.

199. 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 ¶ 199)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 4

4. The method of claim **1**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

(EX1001 (642 Patent) at Cl. 4)

Petition relies only on Dubil, and Petitioner's expert admits Mishra does not disclose a "key code comprises . . . timing information" (Pet. at 27-29):

Q You agreed at that time that we were having that discussion that the protocols had the time information, not the key codes?

MR. KENTON: Objection.

BY THE WITNESS:

A I said that Mishra was silent on whether or not the key codes also included timing information.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 137:3-12)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 4

4. The method of claim **1**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

(EX1001 (642 Patent) at Cl. 4)

Petitioner's expert relies on Dubil "that timing parameters would be used to transmit" and "an XML-based system for organizing and storing this information" (POR at 28-29):

how to transmit the key codes using a carrier signal. Dubil describes this formatting as using a binary number and explains that timing parameters would be used to transmit the binary number on a carrier signal. *See* EX1006, 2:61-3:8, 4:33-47, 4:60-5:5. Dubil further describes an XML-based system for organizing and storing this information. Thus, a POSA would have known and understood that the format of Mishra's key codes would have included a binary number and would be modulated onto a carrier signal using corresponding timing information, as disclosed by Dubil. *See also* Sections VI.A, VI.B. Because both Mishra and Dubil

(EX1003 (Russ Decl.) at ¶ 139)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 4

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 (POR at 29; EX2003 (Sprenger Decl.) at ¶ 214):

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)

Q My question is that Dubil explains that these different XML tags, the protocol type, on off times of the signal, the bit pattern of the command code, it's describing these as separate XML tags that are stored in the set-top box, right?

A In the implementation at Dubil. Of course, the XML could be stored anywhere, but in Dubil it's stored in the set-top box, yes.

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 6

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.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 6

Petition relies on Mishra's "radiofrequency links" for receiving a key code on the radio frequency band (Pet. at 29-30; POR at 30):

> remote control. *See* Section VI.C.4. Mishra also teaches the use of the well-known technique of using radio frequency band links to transmit a key code to a remote control device. EX1005, ¶18. Mishra explains that system 12 may communicate with RCU 18 "using wireless communication such as… radiofrequency links." *Id.*

(Pet. at 29)

Mishra's "radiofrequency links" are for the telephone application, not for controlling other electronic devices (POR at 30):

> may enter a powered down mode when not in use. For example, the internal IR repeater modules **28** and **35** (if provided) may be powered down during RF (telephone) communications and vice versa.

(EX1005 (Mishra) at [0022]-[0023])

> examples. The RF transceiver **30** may send radio frequency voice information to the telephone base station **20** or to the system **12**. The transceiver, in one embodiment of the invention, uses an internal antenna **29** that may be built into the RCU **18**. The IR transceiver **28** may be used to communicate with the system **12** using a bidirectional infrared protocol such as the IrDA-C protocol in one embodiment of the invention. The IR transmitter **35** may be used to communicate with legacy devices **16** using a unidirectional protocol in one embodiment.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

REDEFINING CONTROL

Mishra + Dubil fail to disclose limitations of claim 6

Mishra does not describe using RF signals for the non-telephone electronic devices (POR at 30-31):

224. However, as explained previously, Mishra only teaches using the RF band for the telephone functions. EX1005 (Mishra) at [0016]-[0017]. IR, instead of RF, is used when controlling other electronic devices. EX1005 (Mishra) at [0019], [0022]; EX2008 (Russ Depo. Tr. June 17, 2020) at 124:20-125:1. Mishra

(EX2003 (Sprenger Decl.) at ¶ 224)

20 Q And Mishra does not describe using an RF
21 signal in televisions and VCRs, right?
22 A To control televisions and VCRs, I do not
1 believe that it does.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 124:20-125:1)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 6

Dubil also only describes using IR between the set-top box and remote control (POR at 30):

> 231. Critically, Dubil teaches only using IR between the set-top box and the remote control. EX1006 (Dubil) at 4:53-59. While remote control "[d]evice 108 has a transmitter 112 for sending an IR-code or an RF-control code *to electronics equipment*," the "[r]emote control device 108 has an input 114, e.g., a serial or parallel port or an IR sensor or transceiver, for communicating *with appliance 106*," which is the set-top box. EX1006 (Dubil) at 4:53-59 (italics added). Therefore, a POSITA would understand that any combination of Mishra and Dubil would use only IR for signals received by the remote control device from a set-top box.

(EX2003 (Sprenger Decl.) at ¶ 231)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose limitations of claim 6

Neither Mishra nor Dubil discloses receiving a key code via RF and then transmitting that key code via IR (POR at 30-31):

> 235. However, a POSITA would understand that the disclosed repeater receives the same signal that it intends to repeat, hence the namesake. A POSITA would not understand Mishra to teach receiving a signal in the RF band and then re-transmitting that signal in the IR band. Indeed, Mishra specifically describes that the IR modules "be powered down during RF (telephone) communications and vice versa." EX1005 (Mishra) at [0023]; EX2008 (Russ Depo. Tr. June 17, 2020) at 127:3-12, 122:6-16. In Mishra, signals never get converted or cross over from the RF to the IR domain or vice versa. That is, telephone signals are never transmitted via IR or converted from (or into) IR signals. Likewise, remote control signals are never are never transmitted via RF or converted from (or into) RF signals.

(EX2003 (Sprenger Decl.) at ¶ 231)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose the limitations of claims 8-9

8. The method of claim **1**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

9. The method of claim **8**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

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Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose claim 9

9. The method of claim **8**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

Neither Mishra nor Dubil discloses a digital one or digital zero (POR at 32-34):

43. UEI also argues that the combination of Mishra and Dubil does not render obvious timing information describing a digital one and digital zero. POR, 33-34. As explained in my previous declaration, however, Dubil describes its parameters including a "bit pattern of the command code." EX1003, ¶151. This "bit pattern" discloses a digital one and a digital zero as recited in claim 9. In my previous declaration, I also explained that Dubil describes timing information used to wirelessly transmit the "bit pattern." EX1003, ¶151; EX1006, 2:61-3:8; 4:33-47; 4:60-5:5. This timing includes a "repetition time" or "on/off times of the signals" that teaches the claimed "digital one and digital zero." As I explained in my

(EX1032 (Russ Suppl. Decl.) at ¶ 43;
See also Pet. at 33 ("Mishra does not explicitly describe the format of key codes as including timing information")

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.

FIG. **6**B shows the bursts of the first carrier signal that comprise the intermediary signal in more detail. In the embodiment of FIG. **5**, the bursts that comprise the intermediary signal occur every ten microseconds, resulting in an intermediary frequency of 100 kilohertz. The duty cycle of the intermediary signal is characterized by an "on time" of four microseconds and an "off time" of six microseconds. There are forty-nine bursts of the carrier signal within each mark length of 490 microseconds.

(642 Patent at 5:6-23;
see also EX2003 (Sprenger Decl.) at ¶ 255)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

Mishra + Dubil fail to disclose claim 9

USPTO already found that "signal timing information" does not teach or suggest a digital one and a digital zero (POR at 33):

> 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)

Patent Owner's Demonstrative Exhibit
Not Evidence

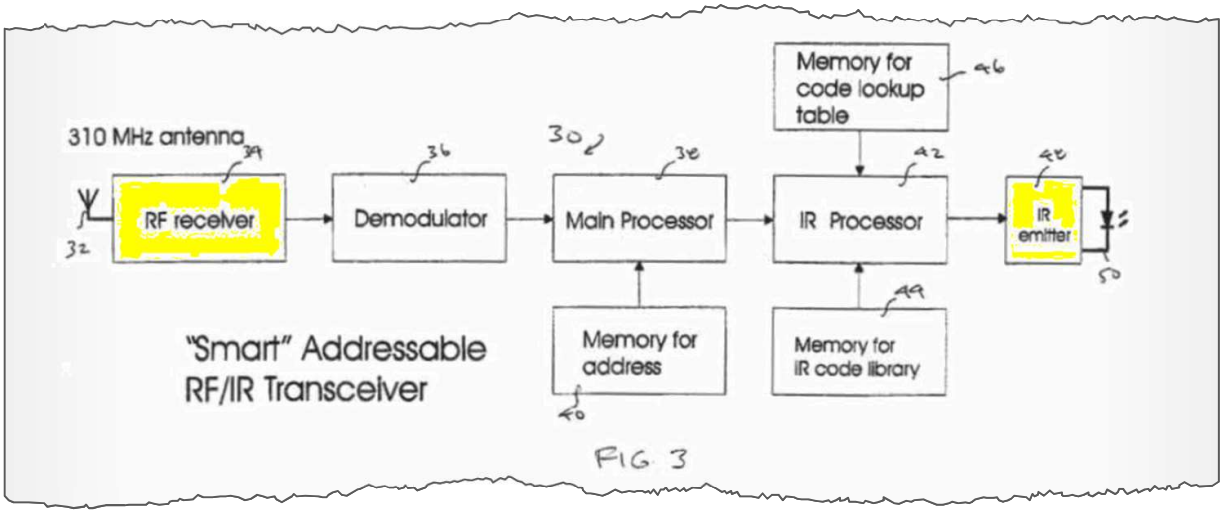
Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- Claim constructions
- Ground 1: Mishra and Dubil
- **Ground 2: Rye and Dubil**
- Ground 3: Caris and Skerlos

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

Rye



(EX1007 (Rye) at Fig. 3)

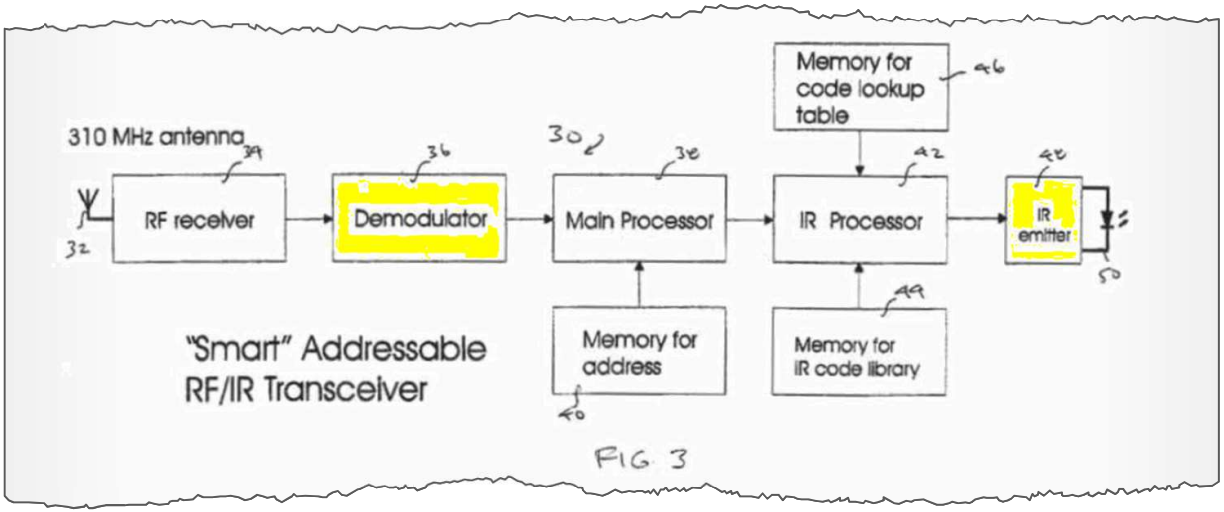
[0023] As therein shown, transceiver **30** receives the binary coded address and function control rf signal from the remote control unit **10**. In overview, those signals are converted in transceiver **30** to corresponding binary coded infrared (IR) signals, which are then transmitted over-the-air to the selected audiovisual component to control its operation. To this end, as shown in **FIG. 3**, transceiver **30** includes

(EX1007 (Rye) at [0023])

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

Rye



(EX1007 (Rye) at Fig. 3)

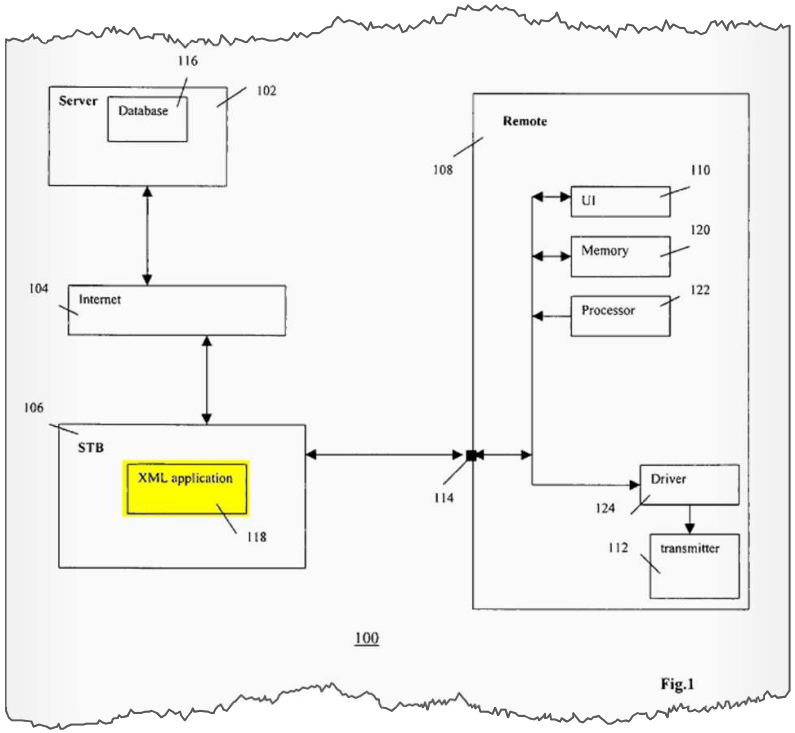
112. While Rye describes the transceiver receiving and demodulating the RF signal from the remote control, it does not include any modulator or modulating any codes onto a carrier signal for transmission to an electronic device. EX1007 (Rye) at [0022]-[0023], [0025]-[0027]. Furthermore, unlike the '642

(EX2003 (Sprenger Decl.) at ¶ 112)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

Dubil



(EX1006 (Dubil) at Fig. 1)

More specifically, the IR or RF codes are described using XML. A number of parameters can be defined using XML tags, for example, carrier frequency, duty cycle, protocol type (FSK, biphase, PWM, etc.), repetition time, on/off times of the signal, bit pattern of the command code, semantic meaning of the code, type of device for which it is intended (CD, VCR, TV, DVD, etc.), the brand name of the specific protocol,

(EX1006 (Dubil) at 2:61-67)

The user requests via appliance **106** a code set from server **102** for control of the apparatus, type, brand, serial no., etc., as specified by the user and to be controlled via remote **108**. This is achieved, e.g., by having the user fill out an electronic template at the service's web site and returning the template's information to server **102**. Server **102** runs a query and, assuming that there is a match, supplies the associated set of codes via Internet **104** to appliance **106** as an XML document. Appliance **106** has an XML application **118** that extracts the data based on the relevant tags and interprets the data according to the semantics of the tags in order to generate the control codes and/or the GUI panels for remote **108**. The GUI panel is preferably, but not necessarily, an HTML page. The control codes and/or GUI panels are then supplied to remote **108** via input **114** for being installed. For example, remote **108** is set

(EX1006 (Dubil) at 5:6-20)

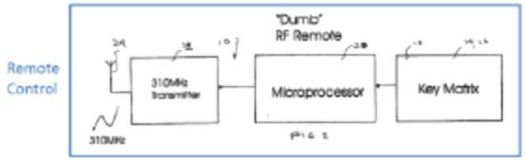
Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

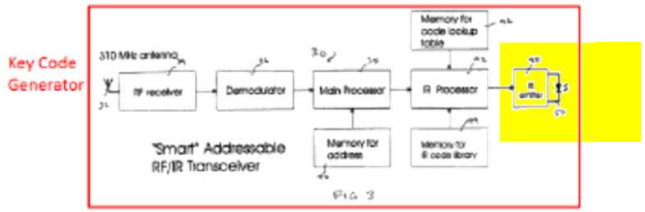
REDEFINING CONTROL

A POSITA would not have combined Rye with Dubil (POR at 35-38)

The combination of Rye and Dubil must apply the transmissions from Dubil's *remote control* to Rye's *transceiver* to meet the claims (EX1003 (Russ Decl.) at ¶¶ 173-176):

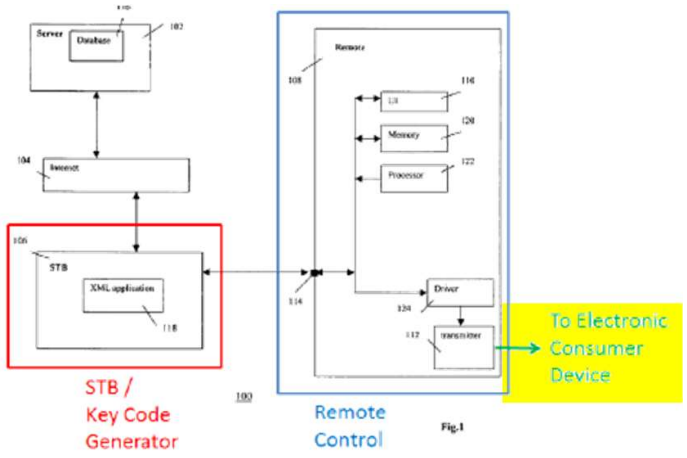


EX1007, FIG. 2 (annotated).



EX1007, FIG. 3 (annotated).

(EX1003 (Russ Decl.) at ¶ 153)



EX1006, FIG. 1 (annotated).

(EX1003 (Russ Decl.) at ¶ 109)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

REDEFINING CONTROL

A POSITA would not have combined Rye with Dubil (POR at 35-38)

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 35-36):

> 174. As previously described in Sections VI.A, VI.C, VI.D, VI.E, it was well-known to use the emitters to modulate control codes onto an infrared carrier signal. While Rye does not explicitly describe this modulation, a POSA would have understood that the wireless transmission of a control code using an "IR emitter" would use a modulation technique to modulate a key code onto an infrared carrier signal. If a POSA sought to use Rye to wirelessly transmit control codes and did not immediately understand these operational details, the POSA would look to references— such as Dubil —describing protocols for performing this transmission.

(EX1003 (Russ Decl.) at ¶ 174)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

A POSITA would not have combined Rye with Dubil (POR at 35-38)

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 35-36):

310. As explained in Sections IX.B.1, IX.B.1.c, and IX.C.1, Dr. Russ does not address the fact that there are other options for transmitting a remote control command or explain why a POSITA would have selected any specific technique among others that were also known at the time. Dr. Russ does not even perform the analysis "as to whether or not to employ modulation and if so what modulation to use," that he testified would be necessary. EX2010 (Russ Depo. Tr. June 19, 2020) at 69:2-7.

(EX2003 (Sprenger Decl.) at ¶ 310)

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.

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

A POSITA would not have combined Rye with Dubil (POR at 35-38)

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 36-37):

275. As yet 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 signals as Petitioner and Dr. Russ suggest because that would add cost and complexity to the system. Petition at 40; EX1003 at ¶ 176. I understand that Dr. Russ repeatedly stressed during his deposition the importance of minimizing costs. EX2009 (Russ Depo. Tr. June 18, 2020) at 113:21-114:4 ("if you were to add five cents to the cost of a remote control, you would get fired"), 123:3-22 ("Very, very cost sensitive").

(EX2003 (Sprenger Decl.) at ¶ 275)

[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.

(EX1007 (Rye) at [0009])

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

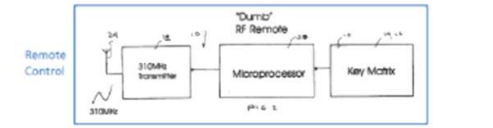
REDEFINING CONTROL

A POSITA would not have combined Rye with Dubil (POR at 35-38)

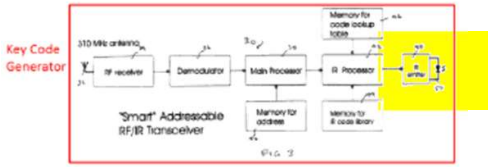
Rye teaches that the "dumb" remote control does *not* transmit to the electronic consumer device, which is the opposite of Dubil (POR at 36):

273. And third, a POSITA would not have combined Rye and Dubil because each reference teaches away from the other in multiple ways. For example, Rye teaches that a remote *does not* transmit signals to a consumer electronic device because it needs a transceiver intermediary, while Dubil teaches that a remote *does* transmit signals to a consumer electronic device. EX1007 (Rye) at Fig. 2, [0022]-[0023]; EX1006 (Dubil) at Fig. 1). A POSITA would not have wanted to combine a reference that teaches a remote control does not transmit to a consumer electronic device with a reference that teaches the exact opposite.

(EX2003 (Sprenger Decl.) at ¶ 273)

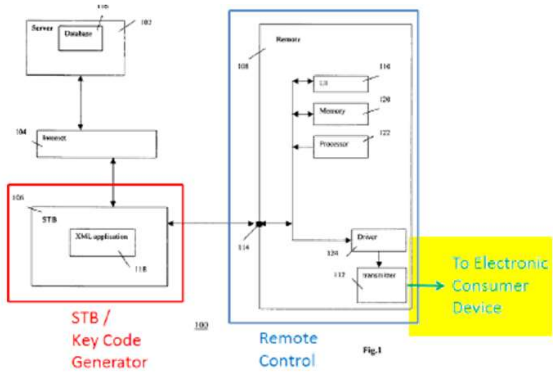


EX1007, FIG. 2 (annotated).



EX1007, FIG. 3 (annotated).

(EX1003 (Russ Decl.) at ¶ 153 (Rye Figs. 2-3))



EX1006, FIG. 1 (annotated).

(EX1003 (Russ Decl.) at ¶ 109 (Dubil Fig. 1)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

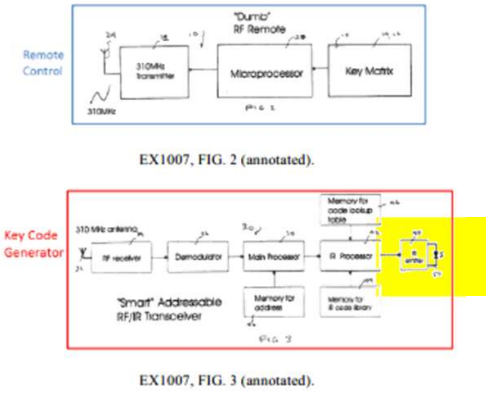
REDEFINING CONTROL

A POSITA would not have combined Rye with Dubil (POR at 35-38)

Rye teaches that the "dumb" remote control does *not* transmit to the electronic consumer device, which is the opposite of Dubil (POR at 36):

(Russ Depo. Tr. June 17, 2020) at 143:2-8. In Dubil, much of the intelligence of the system is located in the remote control itself – it is anything but a "dumb RF remote" that is key to Rye's patent. Dubil's remote control needs to be capable of receiving, storing, and processing remote control codesets represented in XML, thus requiring sufficient processing and storage capacity to handle such a task.

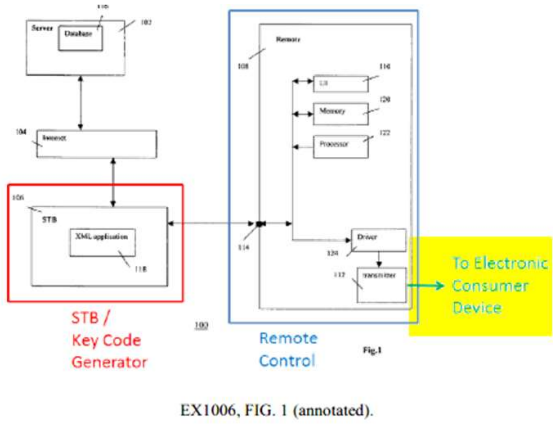
(EX2003 (Sprenger Decl.) at ¶ 271)



EX1007, FIG. 2 (annotated).

EX1007, FIG. 3 (annotated).

(EX1003 (Russ Decl.) at ¶ 153 (Rye Figs. 2-3))



EX1006, FIG. 1 (annotated).

(EX1003 (Russ Decl.) at ¶ 109 (Dubil Fig. 1)

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Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

Rye + Dubil fail to disclose limitations of claim 2 (POR at 38-43)

	Ground 2: Rye + Dubil
"generating a key code . . . using the keystroke indicator signal"	FAIL
"modulating said key code onto a carrier signal"	FAIL

2. A method comprising:
(a) receiving a keystroke indicator signal from a remote control device, wherein the keystroke indicator signal indicates a keV on said remote control device that a user has selected;
(b) generating a key code within a key code generator device using the keystroke indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to an electronic consumer device.

(EX1001 (642 Patent) at Cl. 2)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

REDEFINING CONTROL

1 Rye + Dubil fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 40)

Petitioner relies on Rye's converting received codes into IR format (Paper 7 (Decision) at 25; Pet. at 35):

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.

(EX1007 (Rye) at [0016])

[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

(EX1007 (Rye) at [27])

The "lookup table" values are never transmitted, but are only used to convert the received key code into the IR format (POR at 41; EX2003 at ¶ 297)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

REDEFINING CONTROL

1 Rye + Dubil fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 40)

The appliance control codes are not generated within the base unit 12 of Pope. Instead, the appliance control codes are transmitted from the handset 10/50 to the base unit 12, where they are translated to control signals. Base unit 12 of Pope does not receive a keystroke indicator and then generate a key code. Pope states, "Once an appliance control code is received by the base unit, the base unit will know to transfer the control code to an appliance" (Pope, col. 4, lines 49-51) (emphasis added).

(EX1002 (642 Patent File History) at 72)

Base unit 12 does not generate the appliance control codes. Instead, base unit 12 receives the appliance control codes, which were stored in memory 66 of handset 10, and then translates the appliance control codes into infrared control signals. Thus, Pope does not teach that handset 10 does not store a codeset.

(EX1002 (642 Patent File History) at 120)

139. A POSITA would therefore understand that the Applicant expressly excluded a device that "receives the appliance control codes and then ***translates*** them into infrared control signals" from the claim limitation "generating a key code within a key code generator" because the key code is actually received rather than generated (EX1002 ('642 patent Prosecution History, Applicant's Response dated Aug. 4, 2006) at 74 (bold and italics added); *see also* EX1002 ('642 patent Prosecution History, Applicant's Response dated Dec. 26, 2006) at 117-118, 120; EX1002 ('642 patent Prosecution History, Applicant's Appeal Brief dated July 26, 2007) at 237-238).

(EX2003 (Sprenger Decl.) at ¶ 139)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

REDEFINING CONTROL

1 Rye + Dubil fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 40)

Next (step **105**), remote control device **11** receives first key code signal **19** and relays the key code communicated by first key code signal **19** to VCR **13** in the form of a second key code signal **22**. Remote control device **11** is a slave to key code generator device **12**. Remote control device **11** relays the key code by receiving first key code signal **19** in RF form and translating the communicated key code so that the key code is modulated onto a second carrier signal resulting in second key code signal **22**. In this example, the second carrier signal is an infrared signal with a frequency in the range between three hundred gigahertz and three hundred terahertz. Second key code signal **22** is transmitted by an IR transmitter **23** on remote control device **11** to VCR **13**. In the embodiment of FIG. **5**, key code signal **19** is converted into key code signal **22** by forming the bursts of the intermediary signal using the second carrier signal with an infrared frequency in the place of the first carrier signal with a radio frequency. For both key code signal **19** and key code signal **22**, digital ones and digital zeros are modulated using the same timing for "mark/space" pairs. The waveform diagram of key code signal **22** appears the same as the waveform diagram shown in FIG. **5** for key code signal **19**; only the frequency of the carrier signal that forms the bursts is different.

(EX1001 (642 Patent) at 5:41-63)

140. The '642 patent specification confirms this when it uses the terms "translating" and "converted" when describing the remote control receiving the key code in a first carrier signal and merely modulating that key code onto a second carrier signal. EX1001 ('642 patent) at 5:41-63. According to the claims,

(EX2003 (Sprenger Decl.) at ¶ 140)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

REDEFINING CONTROL

2 Rye + Dubil fail to disclose "modulating said key code onto a carrier signal" (POR at 40-43)

Dubil does not describe modulating onto a carrier signal *from* the set-top box as required by claim 1 (POR at 41-43):

1. 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 indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to said remote control device.

(EX1001 (642 Patent) at Cl. 1)

313. Third, 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 *to the remote control*, as required by the claims.

(EX2003 (Sprenger Decl.) at ¶¶ 313-314)

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

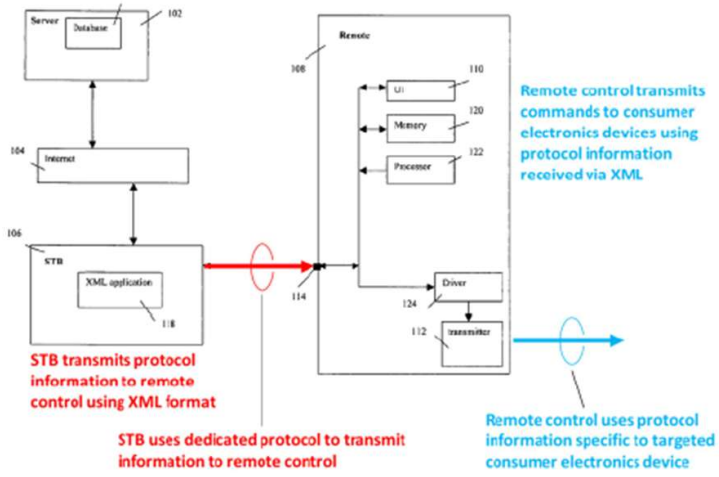
(EX1003 (Russ Decl.) at ¶ 146)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra + Dubil (1, 3-4, 6, 8-9)

2 Rye + Dubil fail to disclose "modulating said key code onto a carrier signal" (POR at 40-43)

Dr. Sprenger explained how Dubil's set-top box *cannot* modulate onto a carrier signal as required by claim 1 (POR at 41-43):



EX1006 (Dubil) at Fig. 1.

199. 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 ¶¶ 199, 315)

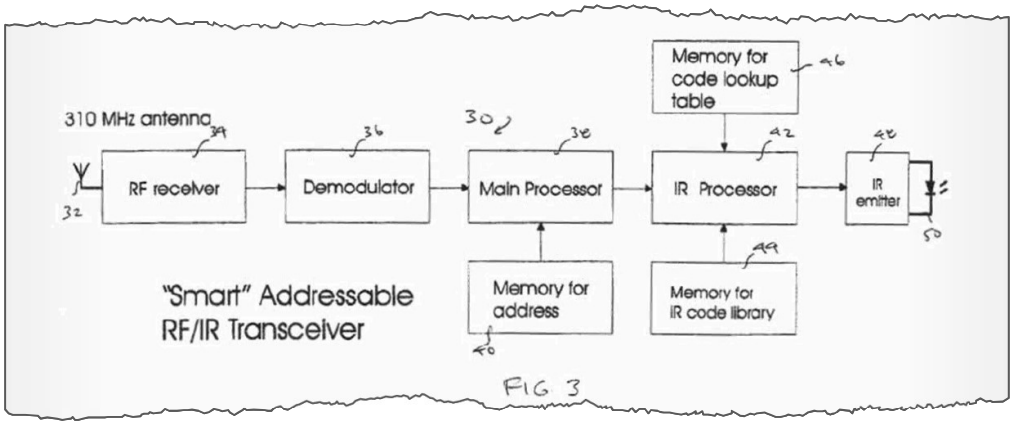
Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

2

Rye + Dubil fail to disclose "modulating said key code onto a carrier signal" (POR at 40-43)

Rye's transceiver does not have a modulator (POR at 42-43; EX2003 (Sprenger Decl.) at ¶ 316):



(EX1007 (Rye) at Figs. 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Rye + Dubil (2, 22-25)

Rye + Dubil fail to disclose limitations of dependent claims 22-25

3. The method of claim **1**, wherein said key code consists of a binary number.

4. The method of claim **1**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

8. The method of claim **1**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

9. The method of claim **8**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

22. The method of claim **2**, wherein said key code consists of a binary number.

23. The method of claim **2**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

24. The method of claim **2**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

25. The method of claim **24**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

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Not Evidence

Agenda

- Introduction to Mui Patents
- Background: Petition and Institution
- Claim constructions
- Ground 1: Mishra and Dubil
- Ground 2: Rye and Dubil
- **Ground 3: Caris and Skerlos**

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris:

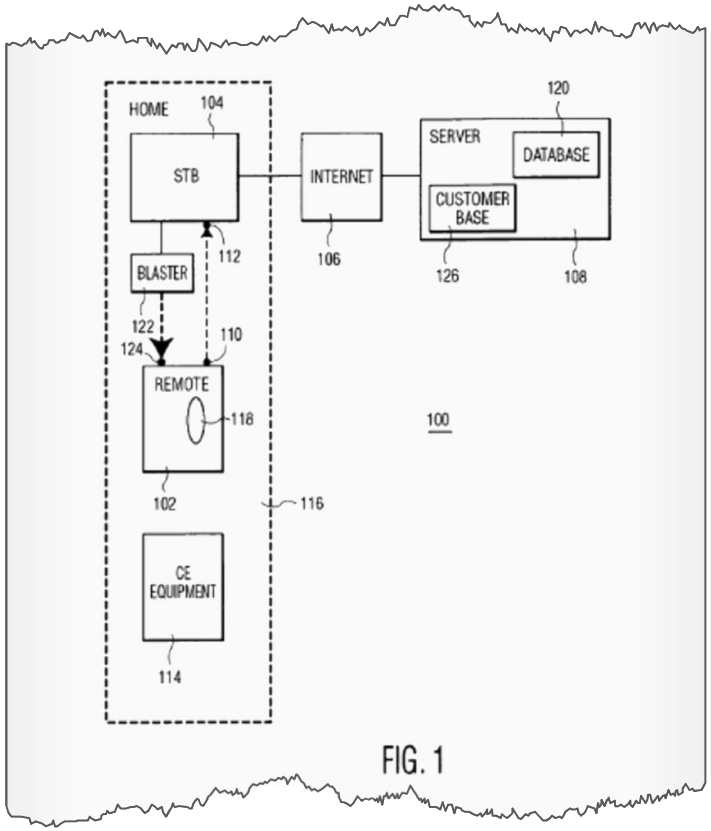


FIG. 1

(EX1008 (Caris) at Fig. 1, 2:12-39)

equipment with respect to the end-users. To this end, the inventors propose to market a programmable, remote control device together with IP-connected consumer electronics (CE) equipment, e.g., a set-top box. This remote has a SmartConnect (SM) button for connection via the set-top box to the SmartConnect (SM) service site on the Web. The SmartConnect (SM) server has a database of control codes for most of the commercially available equipment that can be controlled via a remote. The server can also contain information regarding the remote's user-interface (UI's) to the equipment, e.g., button names, graphical user interface panels for a touch screen remote, and other features that support user-interaction with the remote. The user provides to the server information about further equipment he/she has available and would like to be controllable through a single remote. The database is queried based on the user's input. When the proper code sets and accompanying UI data have been found, the codes and UI data are downloaded to the user's STB. Preferably, the server or STB enables the user to configure the code and data, e.g., for causing a single action at the remote to execute multiple activities of the user's appliances. This configuration can be formed prior to the transfer of the code and UI data to the remote. The STB enables programming its remote with the downloaded codes and/or UI data, e.g., through an IR or RF transmitter/blaster or a serial cable connecting the STB to a serial port of the remote for unidirectional communication with the STB, or through any other suitable means and procedures.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris:

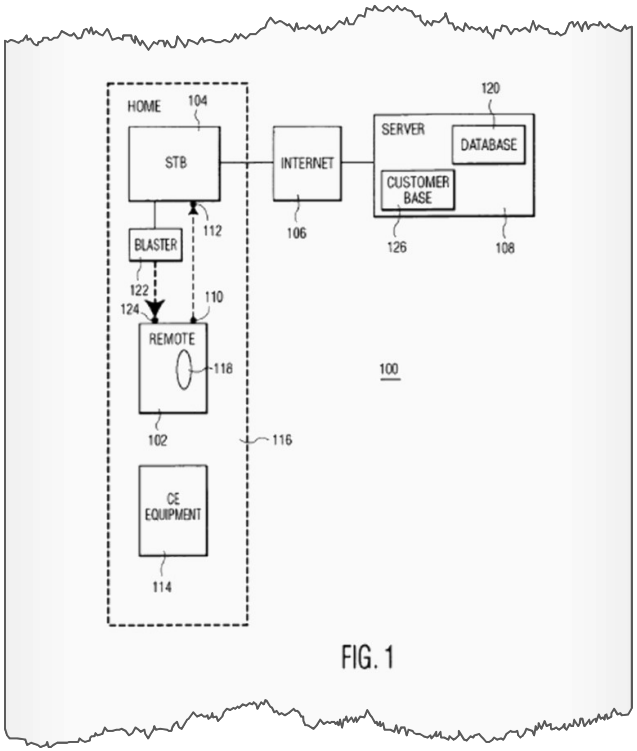


FIG. 1

Petitioner alleges for claims 1, 3, 4, 6, 8, 9 (Pet. at 48-49)

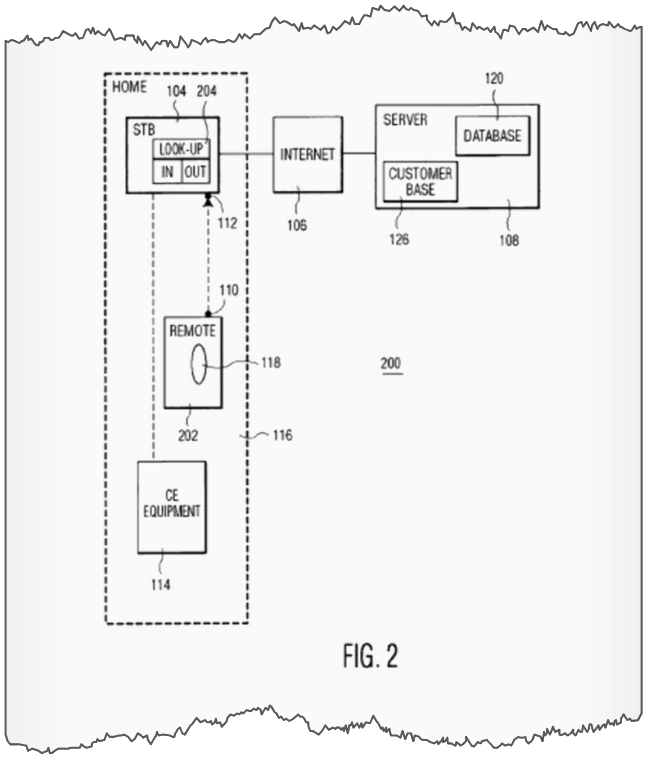


FIG. 2

Petitioner alleges for claims 2, 22-25 (Pet. at 49-50)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Skerlos:

> 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.

(EX1009 (Skerlos) at 1:5-10)

> Skerlos describes a well-known binary modulation scheme known as "pulse code modulation (PCM)" used to transmit control codes. EX1009, 2:12-20, 2:68-3:8. Skerlos describes an IR remote control that uses the PCM technique to transmit control codes to achieve a desired control function. *Id.*, Abstract. As

(Pet. at 50)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

A POSITA would not have combined Caris with Skerlos (POR at 47-50)

The combination of Caris and Skerlos must apply the transmissions from Skerlos' *remote control* to Caris's *STB* to meet the claims (EX1003 (Russ Decl.) at ¶¶ 206-207):

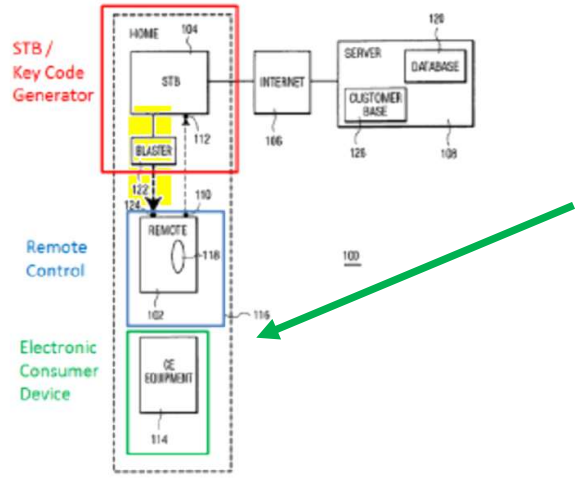


FIG. 1

EX1008, FIG. 1 (annotated).

(EX1003 (Russ Decl.) at ¶ 201)

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.

(EX1009 (Skerlos) at 1:5-10)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

A POSITA would not have combined Caris with Skerlos (POR at 47-50)

Both experts agree that a POSITA reading Caris would not have wanted to modify the television set, which is the entire subject of Skerlos (POR at 49-50):

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.

(EX1009 (Skerlos) at 1:5-10)

363. For another example, Caris is designed to operate known commercially available appliances, such as TV. EX1008 (Caris) at 2:17-24. Caris does not assume or address any modifications to the way that those appliances would receive signals. The type of receiver modification described in Skerlos would risk incompatibility of both devices. A POSITA would not have been motivated to make a combination that would render both references inoperable.

(EX2003 (Sprenger Decl.) at ¶ 363)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

A POSITA would not have combined Caris with Skerlos (POR at 47-50)

(2) Both experts agree that a POSITA reading Caris would not have wanted to modify the television set, which is the entire subject of Skerlos (POR at 49-50):

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

A POSITA would not have combined Caris with Skerlos (POR at 47-50)

Caris and Skerlos are directed to entirely different problems and solutions (POR at 48-49):

> 361. Second, a POSITA would not have combined Caris and Skerlos because they teach very different subject matter. Caris relates to the interactions between a remote control, a set-top box, and a web service on a remote server. EX1008 (Caris) at 2:8-39. Skerlos, on the other hand, relates to just "an infrared (IR) remote control detector/decoder with improved noise immunity particularly adapted for use with a television receiver." EX1009 (Skerlos) at Abst. A POSITA would not have looked to combine a reference primary concerned with the interactions and capabilities of a web service on a remote server with a reference describing a new type of television receiver. The two references concern entirely different problems and entirely different issues.

(EX2003 (Sprenger Decl.) at ¶ 361)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose limitations of claim 1 (POR at 50-54)

	Ground 3: Caris + Skerlos
"key code generator device"	FAIL
"key code signal"	FAIL
"modulating said key code onto a carrier signal"	FAIL

1. 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 indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to said remote control device.

(EX1001 (642 Patent) at Cl. 1)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

1 Caris + Skerlos fail to disclose "a key code generator device" for claim 1 (POR at 50-51)

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." *Id.* (emphasis added). Patent Owner contends that "Petitioner fails to show that the [set-top box] of Caris discloses the algorithm under the proper claim construction" because "Petitioner failed to show that the [set-top box] 104 'identif[ies] the key code corresponding to a pressed key for that codeset' as required by the proper claim construction of a 'key code generator device.'" Prelim. Resp. 36 (alteration in original).

On the record before us, we agree with Patent Owner that the Petition insufficiently addresses this aspect of independent claim 1. Petitioner provides insufficient explanation for its assertion that Caris "identifies the key code corresponding to a pressed key."

(Paper 7 (Decision) at 33)

Caris' STB wirelessly transmits the downloaded control codes to the remote control using, for example, an "IR or RF transmitter/blaster." EX1008, 2:32-39, 3:65-4:4, 6:4-18. Upon receiving the control codes, the remote control uses the control codes to control other IR-or-RF-controllable equipment, e.g., appliance

(Pet. at 55)

201. Similar to the '642 patent, Caris describes a *key code generator device*, such as a set-top box (STB), that (1) receives a *keystroke indicator signal* from a remote control and (2) in response, transmits control codes (*key codes*) to the remote control. *See* EX1008, Caris, Abstract. Further, just like the '642 patent,

(EX1003 (Russ Decl.) at ¶ 201)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

1 Caris + Skerlos fail to disclose "a key code generator device" for claim 1 (POR at 50-51)

Caris does not disclose "identifying the key code corresponding to a pressed key for that codeset" in the embodiment for claim 1 (POR at 50-51):

369. But Caris' STB does not perform "(2) identifying *the key code* corresponding to a pressed key for that codeset" because Caris downloads and transmits an entire codeset without identifying any single, particular key code. EX1008 (Caris) at 2:27-39 ("When the proper code sets and accompanying UE data have been found, the codes and UI data are downloaded to the user's STB . . . The STB enables programming its remote with the downloaded codes"), 3:65-4:4 ("the proper codes and UE features is downloaded and programmed into the remote"), 9:15-39.

(EX2003 (Sprenger Decl.) at ¶ 369)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

2 Caris + Skerlos fail to disclose "key code signal" (POR at 51)

Caris and Skerlos do not disclose the set-top box "generating a key code signal" rather than an entire codeset in the embodiment for claim 1 (POR at 50-51):

377. Transmitting an entire codeset is not the equivalent of transmitting a single key code because transmitting an entire codeset cannot operate a consumer electronic device. If the key code signal included the entire codeset, the electronic device would not respond to any particular key code and the entire point of the invention would be lost.

378. Since Caris teaches transmitting the entire codeset (and Skerlos teaches nothing of a key code generator device), Caris and Skerlos do not disclose "thereby generating a key code signal," as required by the claim.

(EX2003 (Sprenger Decl.) at ¶¶ 377-378)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

3 Caris + Skerlos fail to disclose "modulating said key code onto a carrier signal" (POR at 51-53)

Both experts agree that Skerlos does not describe modulating onto a carrier signal *from* the set-top box as required by claim 1 (POR at 52):

1. 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 indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to said remote control device.

(EX1001 (642 Patent) at Cl. 1)

385. Furthermore, even if a POSITA did look to Skerlos to modulate a key code onto a carrier signal, Skerlos only describes any potential modulation for the signal transmitted by the remote control. Skerlos does not describe modulating onto a carrier signal any transmissions from a set-top box *to the remote control*, as required by the claims, because Skerlos does not disclose any transmissions other than from a remote control to a TV receiver. EX1009 (Skerlos) at Abst., Fig. 3.

(EX2003 (Sprenger Decl.) at ¶ 385)

Q Skerlos did not ever describe a set-top box, correct?
A No. And it does not need to for all the reasons I just explained.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 204:3-6)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose the limitations of dependent claims 3-4, 6, 8-9 (POR at 53-58)

3. The method of claim **1**, wherein said key code consists of a binary number.

4. The method of claim **1**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

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.

8. The method of claim **1**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

9. The method of claim **8**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose the limitations of claim 4 (POR at 53-54)

4. The method of claim 1, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

Claim 4 requires the "key code comprises;" therefore, it is not sufficient that a *key code signal* merely uses timing information (POR at 54):

398. However, Skerlos does not disclose anything about how key codes or codesets may be stored at the remote control or any transmitter. I understand that Dr. Russ agreed during his deposition. EX2010 (Russ Depo. Tr. June 19, 2020) at 57:8-16. The Petition only asserts that Skerlos "explains that timing information is utilized" for transmission, but this has nothing to do with whether timing information is in the key code. Petition at 60. In fact, I understand that Dr. Russ admitted during his deposition that neither Caris nor Skerlos discloses a key code or codeset comprising timing information. EX2008 (Russ Depo. Tr. June 17, 2020) at 197:17-198:4, 206:5-207:1.

(EX2003 (Sprenger Decl.) at ¶ 398)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

REDEFINING CONTROL

Caris + Skerlos fail to disclose the limitations of claim 4 (POR at 53-54)

Petitioner's expert admitted neither Caris nor Skerlos disclosed key codes or codesets comprising timing information (POR at 53-54):

Q You would agree that Caris does not disclose that a key code comprises timing information?

A Not explicitly. Although, again, multiple ways of storing that information would be clear to a person of ordinary skill in the art.

Q You would agree that Caris does not disclose that a code set comprises timing information?

A Right. But, again, to a person of ordinary skill in the art, there are ways of storing that information.

Q 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 197:17-198:4, 206:5-207:1; *see also* EX1003 (Russ Decl.) at ¶ 203)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose the limitations of claim 6 (POR at 54-56)

Skerlos teaches away from RF transmissions (POR at 54-56):

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.

(EX1001 (642 Patent) at cl. 6)

406. However, neither the Petition nor Dr. Russ properly considers or even addresses the teachings of Skerlos for this limitation. In particular, both the Petition and Dr. Russ ignore that they earlier admitted that Skerlos teaches to use the higher end of the IR spectrum because the "higher frequency would remove the signal from a noisy portion of the electromagnetic spectrum caused by incandescent lamps and sunlight." Petition at 57; EX1003 (Russ Decl.) at ¶ 222; EX1009 (Skerlos) at 3:39-45. Thus, Skerlos expressly teaches to use the IR spectrum and not the RF spectrum. Therefore, Dr. Russ is wrong that given the teachings of Skerlos, "IR and RF devices would be used interchangeably to transmit." EX1003 (Russ Decl.) at ¶ 94.

(EX2003 (Sprenger Decl.) at ¶ 406)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

REDEFINING CONTROL

Caris + Skerlos fail to disclose the limitations of claim 6 (POR at 54-56)

Petitioner's expert admitted the combination with Skerlos would use IR, not RF (POR at 54-56):

5:25-37; EX1009, 3:20-36; EX1003, ¶¶219-22. While Skerlos describes the transmission of control codes from a remote control, a POSA would have understood that an STB would have implemented the same wireless transmission protocol, and the same IR or RF blaster technology described in Caris transmits control codes in the same manner described in Skerlos. EX1003, ¶¶219-22. Both

(Pet. at 57-58)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose the limitations of claim 6 (POR at 54-56)

Petitioner's expert admitted the combination with Skerlos would use IR, not RF (POR at 54-56):

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose limitations of claim 2

	Ground 3: Caris + Skerlos
"key code generator device"	FAIL
"generating a key code . . . using the keystroke indicator signal"	FAIL
"modulating said key code onto a carrier signal"	FAIL

2. A method comprising:
(a) receiving a keystroke indicator signal from a remote control device, wherein the keystroke indicator signal indicates a keV on said remote control device that a user has selected;
(b) generating a key code within a key code generator device using the keystroke indictor signal;
(c) modulating said key code onto a carrier signal, thereby generating a key code signal; and
(d) transmitting said key code signal from said key code generator device to an electronic consumer device.

(EX1001 (642 Patent) at Cl. 2)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

1

Caris + Skerlos fail to disclose "a key code generator device" (POR at 58-59)

The Board correctly determined that Caris + Skerlos does not disclose a key code generator device (POR at 58-59):

But for the same reasons addressed above, we agree with Patent Owner that, on the current record, the Petition insufficiently explains how "the [set-top box] of Caris discloses the algorithm of the [recited 'key code generator device' under] the proper claim construction." *See* Prelim. Resp. 36. Accordingly, we conclude that Petitioner does not demonstrate a reasonable likelihood of prevailing on its challenge of independent claim 2 as unpatentable under 35 U.S.C. § 103(a) over Caris and Skerlos. Because claims 22–25 depend from claim 2, Petitioner's analysis of those claims suffers from the same deficiency. We accordingly conclude, based on our preliminary claim construction, that Petitioner does not demonstrate a reasonable likelihood of prevailing on its challenge of those claims as unpatentable under 35 U.S.C. § 103(a) over Caris and Skerlos.

(Paper 7 (Decision) at 34)

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**.

(EX1008 (Caris) at 6:53-7:5)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

1

Caris + Skerlos fail to disclose "a key code generator device" (POR at 58-59)

The dedicated hard button in embodiment 2 does not result in the *STB identifying* a codeset (POR at 58-59)

55. Specifically, Caris describes a remote control having a dedicated hard button 118 that, when selected by the user, causes the STB to identify a codeset. *See* EX1008, Caris, 6:58-66. In response to detecting the selection of the dedicated

(EX1032 (Russ Suppl. Decl.) at ¶ 55)

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**.

(EX1008 (Caris) at 6:53-7:5)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

2

Caris + Skerlos fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 58-59)

No "keystroke indicator signal"

(1) "dedicated hard button" (POR at 58-59, 51-53:

Alternatively, Caris teaches the keystroke indicator signal as being an "input received from remote 202." *Id.*, 7:2-5. A POSA would have understood that this input refers to commands corresponding to other buttons on the remote control. EX1003, ¶250. The claimed "keystroke indicator signal" is thus taught by both the dedicated hard button and the input received from the remote. *Id.*

(Pet. at 68)

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**.

(EX1008 (Caris) at 6:53-7:5)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

2

Caris + Skerlos fail to disclose "generating a key code . . . using the keystroke indicator signal" (POR at 58-59)

No "keystroke indicator signal":

(2) "input received from remote" (POR at 58-59):

Alternatively, Caris teaches the keystroke indicator signal as being an "input received from remote 202." *Id.*, 7:2-5. A POSA would have understood that this input refers to commands corresponding to other buttons on the remote control. EX1003, ¶250. The claimed "keystroke indicator signal" is thus taught by both the dedicated hard button and the input received from the remote. *Id.*

(Pet. at 68)

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**.

(EX1008 (Caris) at 6:53-7:5)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 3: Caris + Skerlos (1-4, 6, 8-9, 22-25)

Caris + Skerlos fail to disclose the limitations of dependent claims 22-25 (POR at 59-60)

3. The method of claim **1**, wherein said key code consists of a binary number.

4. The method of claim **1**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

8. The method of claim **1**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

9. The method of claim **8**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

22. The method of claim **2**, wherein said key code consists of a binary number.

23. The method of claim **2**, wherein said key code comprises a binary number and timing information, and wherein said timing information defines how said binary number is modulated in (c) onto said carrier signal.

24. The method of claim **2**, wherein said key code generated in (b) is part of a codeset, and wherein said remote control device does not store said codeset.

25. The method of claim **24**, wherein said codeset comprises timing information and a plurality of key codes, and wherein said timing information describes a digital one and a digital zero.

Patent Owner's Demonstrative Exhibit
Not Evidence

Conclusion

Each of the grounds fails to disclose limitations of claims 1-2 (POR at 22-27, 38-43, 50-53, 58-59)

	Ground 1: Mishra + Dubil	**Ground 2: Rye + Dubil**	**Ground 3: Caris + Skerlos**
"generating a key code . . . using the keystroke indicator signal"	FAIL	FAIL	FAIL
"key code generator device"			FAIL
"key code signal"	FAIL		FAIL
"modulating said key code onto a carrier signal"	FAIL	FAIL	FAIL

Patent Owner's Demonstrative Exhibit
Not Evidence

Patent Owner's Oral Hearing Demonstratives

Case IPR2019-01613
Patent 8,004,389

Roku, Inc. v. Universal Electronics, Inc.

REDEFINING **CONTROL**

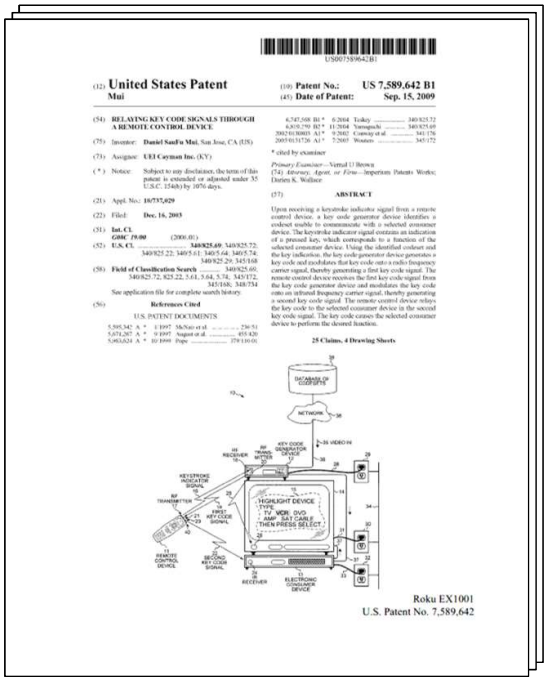
Patent Owner's Demonstrative Exhibit
Not Evidence

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Introduction



(12) **United States Patent**
Mui

(10) **Patent No.: US 7,589,642 B1**
(45) **Date of Patent: Sep. 15, 2009**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(75) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **UEI Cayman Inc.** (KY)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1076 days.

(21) Appl. No.: **10/737,029**

(22) Filed: **Dec. 16, 2003**

(51) **Int. Cl.**
G08C 19.00 (2006.01)

(52) **U.S. Cl.** **340/825.69**; 340/825.72; 340/825.22; 340/5.61; 340/5.64; 340/5.74; 340/825.29; 345/168; 345/156; 348/734

(58) **Field of Classification Search** 340/825.65, 340/825.72, 825.22, 5.61, 5.64, 5.74; 345/172, 345/168; 348/734
See application file for complete search history.

(56) **References Cited**
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Primary Examiner—Vernal U Brown
(74) *Attorney, Agent, or Firm*—Imperium Patent Works; Darien K. Wallace

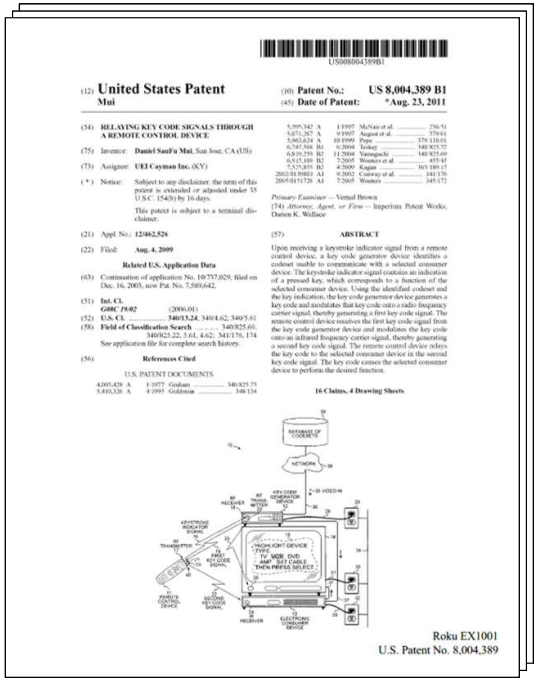
(57) **ABSTRACT**

Upon receiving a keystroke indicator signal from a remote control device, a key code generator device identifies a codeset unable to communicate with a selected consumer device. The keystroke indicator signal contains an indication of a pressed key, which corresponds to a function of the selected consumer device. Using the identified codeset and the key indication, the key code generator device generates a key code and modulates that key code onto a radio frequency carrier signal, thereby generating a first key code signal. The remote control device receives the first key code signal from the key code generator device and modulates the key code onto an infrared frequency carrier signal, thereby generating a second key code signal. The key code causes the selected consumer device to perform the desired function.

25 Claims, 4 Drawing Sheets

Roku EX1001
U.S. Patent No. 7,589,642

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



(12) **United States Patent**
Mui

(10) **Patent No.: US 8,004,389 B1**
(45) **Date of Patent: *Aug. 23, 2011**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(75) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **UEI Cayman Inc.** (KY)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 16 days.
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/462,526**

(22) Filed: **Aug. 4, 2009**

Related U.S. Application Data

(63) Continuation of application No. 10/737,029, filed on Dec. 16, 2003, now Pat. No. 7,589,642.

(51) **Int. Cl.**
G08C 19.02 (2006.01)

(52) **U.S. Cl.** **340/13.24**; 340/4.62; 340/5.61

(58) **Field of Classification Search** 340/825.65, 340/825.22, 5.61, 4.62; 341/176, 174
See application file for complete search history.

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2005/0151726 A1 7/2005 Wooters 345/172

Primary Examiner—Vernal Brown
(74) *Attorney, Agent, or Firm*—Imperium Patent Works; Darien K. Wallace

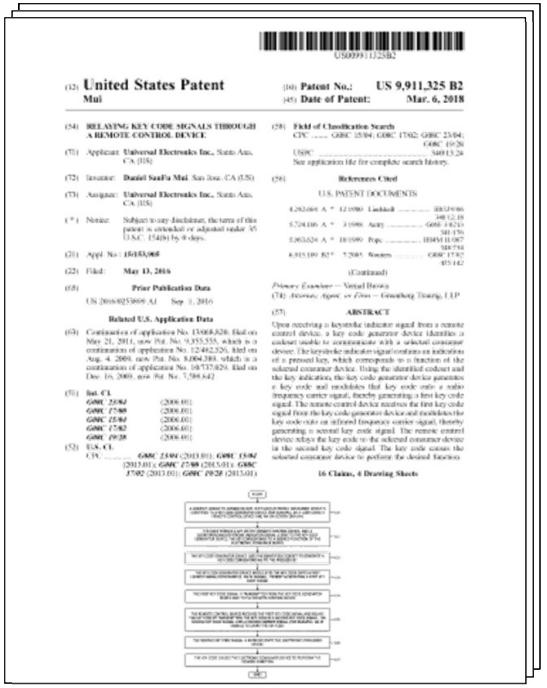
(57) **ABSTRACT**

Upon receiving a keystroke indicator signal from a remote control device, a key code generator device identifies a codeset unable to communicate with a selected consumer device. The keystroke indicator signal contains an indication of a pressed key, which corresponds to a function of the selected consumer device. Using the identified codeset and the key indication, the key code generator device generates a key code and modulates that key code onto a radio frequency carrier signal, thereby generating a first key code signal. The remote control device receives the first key code signal from the key code generator device and modulates the key code onto an infrared frequency carrier signal, thereby generating a second key code signal. The remote control device relays the key code to the selected consumer device in the second key code signal. The key code causes the selected consumer device to perform the desired function.

16 Claims, 4 Drawing Sheets

Roku EX1001
U.S. Patent No. 8,004,389

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



(12) **United States Patent**
Mui

(10) **Patent No.: US 9,911,325 B2**
(45) **Date of Patent: Mar. 6, 2018**

(54) **RELAYING KEY CODE SIGNALS THROUGH A REMOTE CONTROL DEVICE**

(71) Applicant: **Universal Electronics Inc.**, Santa Ana, CA (US)

(72) Inventor: **Daniel SauFu Mui**, San Jose, CA (US)

(73) Assignee: **Universal Electronics Inc.**, Santa Ana, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/153,065**

(22) Filed: **May 13, 2016**

(65) **Prior Publication Data**
US 2016/0253899 A1 Sep. 1, 2016

Related U.S. Application Data

(63) Continuation of application No. 13/468,820, filed on May 21, 2012, now Pat. No. 9,355,555, which is a continuation of application No. 12/462,526, filed on Aug. 4, 2009, now Pat. No. 8,004,388, which is a continuation of application No. 10/737,029, filed on Dec. 16, 2003, now Pat. No. 7,589,642.

(51) **Int. Cl.**
G08C 23/02 (2006.01)
G08C 17/00 (2006.01)
G08C 15/06 (2006.01)
G08C 17/02 (2006.01)
G08C 19/28 (2006.01)

(52) **U.S. Cl.**
CPC ***G08C 23/04*** (2013.01); ***G08C 15/06*** (2013.01); ***G08C 17/00*** (2013.01); ***G08C 17/02*** (2013.01); ***G08C 19/28*** (2013.01)

(58) **Field of Classification Search**
CPC G08C 23/04; G08C 17/02; G08C 23/04; G08C 19/28
USPC 340/13.26
See application file for complete search history.

(56) **References Cited**
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5,963,624 A * 10/1999 Pope 379/110.01
6,915,109 B2 * 7/2005 Wooters G08C 17/02 455/41.2

(Continued)

Primary Examiner—Vernal Brown
(74) *Attorney, Agent, or Firm*—Greenberg Traurig, LLP

(57) **ABSTRACT**

Upon receiving a keystroke indicator signal from a remote control device, a key code generator device identifies a codeset unable to communicate with a selected consumer device. The keystroke indicator signal contains an indication of a pressed key, which corresponds to a function of the selected consumer device. Using the identified codeset and the key indication, the key code generator device generates a key code and modulates that key code onto a radio frequency carrier signal, thereby generating a first key code signal. The remote control device receives the first key code signal from the key code generator device and modulates the key code onto an infrared frequency carrier signal, thereby generating a second key code signal. The remote control device relays the key code to the selected consumer device in the second key code signal. The key code causes the selected consumer device to perform the desired function.

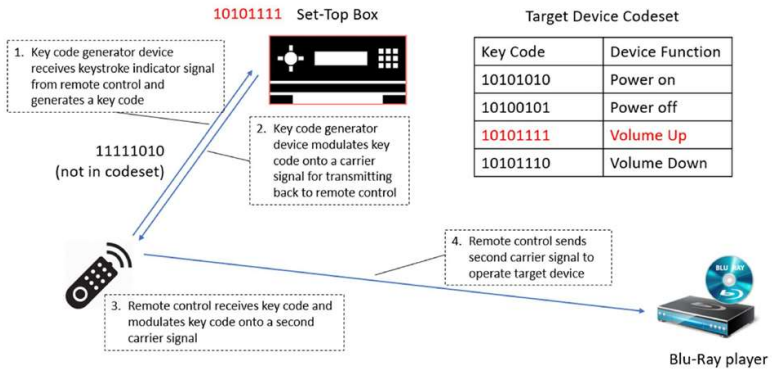
16 Claims, 4 Drawing Sheets

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

Patent Owner's Demonstrative Exhibit
Not Evidence

389 Patent

Remote → Key Code Generator Device → Remote → Consumer Device



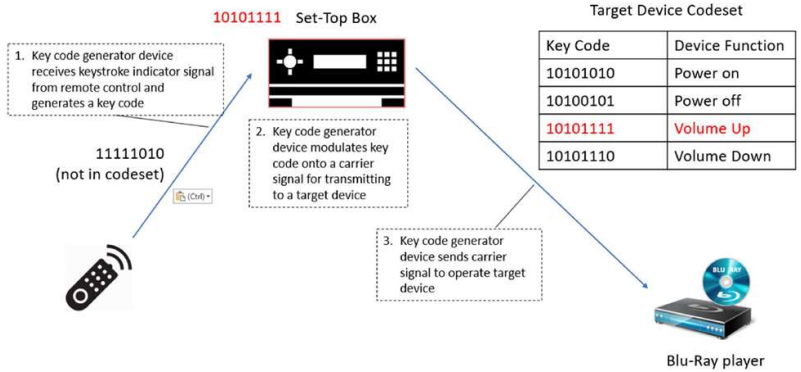
Target Device Codeset

Key Code	Device Function
10101010	Power on
10100101	Power off
10101111	Volume Up
10101110	Volume Down

(EX2003 (Sprenger Decl.) at ¶ 68)

389 Patent, Claim 4, 12 + dependents

Remote → Key Code Generator Device → Consumer Device



Target Device Codeset

Key Code	Device Function
10101010	Power on
10100101	Power off
10101111	Volume Up
10101110	Volume Down

(EX2003 (Sprenger Decl.) at ¶ 70)

389 Patent, Claim 2 + dependents

Patent Owner's Demonstrative Exhibit
Not Evidence

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Petition

Petitioner asserts 8 obviousness grounds against claims 2-5 and 7-15 (Pet. at 3)

Ground	Prior Art	Basis	Claims Challenged
1	Mishra (EX1005) Dubil (EX1006) Van Ee (EX1013)	35 U.S.C. § 103	2 and 3
2	Mishra (EX1005) Dubil (EX1006)	35 U.S.C. § 103	4 and 7-15
3	Mishra (EX1005) Dubil (EX1006) Lambrechts (EX1011)	35 U.S.C. § 103	5
4	Caris (EX1008) Skerlos (EX1009) Van Ee (EX1013)	35 U.S.C. § 103	2 and 3
5	Caris (EX1008) Skerlos (EX1009)	35 U.S.C. § 103	4 and 11
6	Caris (EX1008) Skerlos (EX1009) Lambrechts (EX1011)	35 U.S.C. § 103	5 and 8
7	Caris (EX1008) Skerlos (EX1009) Yazolino (EX1012)	35 U.S.C. § 103	10, 12, and 15
8	Caris (EX1008) Skerlos (EX1009) Yazolino (EX1012) Lambrechts (EX1011)	35 U.S.C. § 103	13 and 14

(Pet. at 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

Petition

Petitioner has not alleged motivation to combine each reference in Grounds 1, 3-4, 6-8 (PO Sur-reply at 1)

Ground	Prior Art	Basis	Claims Challenged
1	Mishra (EX1005) Dubil (EX1006) Van Ee (EX1013)	35 U.S.C. § 103	2 and 3
2	Mishra (EX1005) Dubil (EX1006)	35 U.S.C. § 103	4 and 7-15
3	Mishra (EX1005) Dubil (EX1006) Lambrechts (EX1011)	35 U.S.C. § 103	5
4	Caris (EX1008) Skerlos (EX1009) Van Ee (EX1013)	35 U.S.C. § 103	2 and 3
5	Caris (EX1008) Skerlos (EX1009)	35 U.S.C. § 103	4 and 11
6	Caris (EX1008) Skerlos (EX1009) Lambrechts (EX1011)	35 U.S.C. § 103	5 and 8
7	Caris (EX1008) Skerlos (EX1009) Yazolino (EX1012)	35 U.S.C. § 103	10, 12, and 15
8	Caris (EX1008) Skerlos (EX1009) Yazolino (EX1012) Lambrechts (EX1011)	35 U.S.C. § 103	13 and 14

(Pet. at 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

Petition

Petitioner has not alleged motivation to combine each reference in Grounds 1, 3-4, 6-8 (PO Sur-reply at 1)

"**When an obviousness determination relies on the combination of two or more references, there must be some suggestion or motivation to combine the references**." *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1355 (Fed. Cir. 1999); *see also Dome Patent L.P. v. Lee*, 799 F.3d 1372, 1380 (Fed. Cir. 2015) ("If all elements of a claim are found in the prior art, as is the case here, the factfinder must further consider the factual questions of whether a person of ordinary skill in the art would be motivated to combine those references, and whether in making that combination, a person of ordinary skill would have had a reasonable expectation of success."). *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1368 (Fed. Cir. 2016).

"Although Petitioner has discussed motivation for combining the pairs of references disclosed above, **Petitioner did not provide an explicit basis for combing the references in the other combinations on which Petitioner challenged patentability**. Although we instituted in the combination of Park '672, Park '486, Oshio and Urasaki, in view of Petitioner's failure to discuss explicitly its challenges based on Park '697, Park '486 and Oshio, Park '697, Urasaki and Oshio; and Park '697, Park '486, Urasaki and Oshio, initially **we did not institute on those grounds individually**." *Vizio, Inc. v. Nichia Corp.*, 2019 Pat. App. LEXIS 1479, *54-55 (P.T.A.B. January 9, 2019).

(POR at 24)

Patent Owner's Demonstrative Exhibit
Not Evidence

Petition

Petitioner has not alleged motivation to combine each reference in Grounds 1, 3-4, 6-8 (PO Sur-reply at 1)

"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).

Patent Owner's Demonstrative Exhibit
Not Evidence

Petition

Petitioner has not alleged motivation to combine each reference in Grounds 1, 3-4, 6-8 (PO Sur-reply at 1)

"There is no per se rule that requires each subset of prior art references to be independently combined, and Patent Owner does not point us to any authority that Petitioner's "pair-wise" combination is improper. **Absent a teaching away from the asserted combination or failure of the asserted combination to result in the claimed features**, we find no flaw in Petitioner's manner of combining prior art teachings." *Ericsson Inc. et al. v. Intellectual Ventures II LLC*, 2016 Pat. App. LEXIS 844, at *26-27 (P.T.A.B. January 29, 2016)

Patent Owner's Demonstrative Exhibit
Not Evidence

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Decision to Institute

Parties do not dispute some of the preliminary claim constructions (Paper 12 (Decision) at 11-16)

"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"
"key code generator device"	Function: "to generate a key code" Structure: "a set-top box, television, stereo radio, digital video disk player, video cassette recorder, personal computer, set-top cable television box or satellite box . . . performing the steps of (1) identifying a codeset usable to communicate with an electronic consumer device . . . and (2) identifying the key code corresponding to a pressed key for that codeset . . . and equivalents thereof."

Patent Owner's Demonstrative Exhibit
Not Evidence

Claim constructions

- **“key code generator device”**
- “generating a key code within a key code generator device using the keystroke indicator”
- “key code signal”
- “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”

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Board requested the Parties address "autoscan functionality" (Paper 12 (Decision) at 15-16)

UEI does not believe that there is any inconsistency and respectfully submits that the district court did not describe the autoscan embodiment as an alternative *to* the algorithm but as an alternative way *of* implementing the algorithm, such that the structure of the key code generator device is still satisfied. The excerpt of the specification cited by the district court that describes the autoscan embodiment is instructive:

> "Each time the power-on key is pressed, the keystroke indicator signal 16 communicates this to key code generator device 12. Key code generator device 12 in turn generates and transmits a key code signal containing a power-on key code using a different codeset . . . until the electronic consumer device performs a desired function."

(EX1001 at 8:7-18).

Thus, each time the user presses a key, the key code generator device performs (1) identifying a codeset . . . and (2) identifying the key code . . . , thereb satisfying the structure. Eventually, the key code generator device identifies *the* codeset that corresponds to *the desired* electronic consumer device and generates the key code for that codeset, and the electronic consumer device responds. After that, the specification describes a final identifying step:

> "When the user stops pressing the power-on key, then the key code generator device 12 identifies the codeset of the last transmitted key code to be the codeset used by the electronic consumer device."

(EX1001 at 8:23-26).

Thus, claim 2 requires not only a key code generator device but also a separate final limitation of "identifying said codeset . . . when said user stops pressing a key . . . ." (EX1001 at 10:49-52). While "identifying" is used both within the claims and in the construction of terms, the specification makes clear that because there are multiple "identifying" steps there is no inconsistency between the district court's construction and the autoscan functionality.[2]

(POR at 12-13)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Parties agree that there is no inconsistency

B. "key code generator device"

UEI argues that there is no inconsistency between the District Court's construction and the autoscan functionality claimed in the '389 patent. POR, 13-14. Roku agrees. Under the District Court's construction, the "key code generator

(Pet. Reply at 3)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Parties dispute the scope of "autoscan functionality" (POR at 30-31)

carrying out all the lookup information and things like that…"). In this case, the autoscan functionality may occur prior to the two "identifications" recited in the District Court's construction. EX1040, ¶¶13-15.

After performing the autoscan, the key code generator device performs both identifications "[e]ach time the user presses a key." POR, 12. For example, the key code generator device initially uses autoscan to identify codesets for future use when controlling different consumer electronic devices (e.g., a VCR and a TV). EX1040, ¶¶14-15. Subsequently, after the autoscan configuration, a user actually presses a button on the remote, which causes the key code generator device to identify a specific codeset and key code associated with the pressed button (e.g. the codeset for "Sony 8000 VCR" and the key code for "VCR power-on"). EX1001, 3:18-21, 3:40-50. When the key code generator device. When the key code

(Pet. Reply at 4)

Patent Owner's Demonstrative Exhibit
Not Evidence

"key code generator device"

The Parties dispute the scope of "autoscan functionality" (POR at 30-31)

generation of the key code as well. For example, I understand that Dr. Sprenger also explained in his deposition that the claimed "key code generator device" as recited in claim 2 of the '389 patent may first identify a codeset using autoscan functionality. EX1042, 32:22-33:6. Subsequently, the key code generator device may and then identify that codeset and identify a corresponding key code in response to a pressed key:

> Q: So Step (e) could be performed after Step (d), right? …
>
> [A:] Not necessarily. It does not specify when exactly this occurs. However, some of this information is needed in order for the system to be able to function properly. ***So Step (e) would have to occur at some point prior to carrying out all the lookup information and things like that***, because without having a clear correlation or information of the consumer electronics device that is to be addressed, in my opinion, the Elements (a) through (d) would not make much sense.

EX1042, 32:16-33:6 (emphasis added).

(EX1040 (Russ Suppl. Decl.) at 12.)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Claim constructions

- “key code generator device”
- “generating a key code within a key code generator device using the keystroke indicator”
- “key code signal”
- **“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”**

Patent Owner's Demonstrative Exhibit
Not Evidence

Decision to Institute

REDEFINING CONTROL

Parties did not dispute "means for receiving . . ." for the POPR only (Paper 12 (Decision) at 16-17)

5. "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 . . ."

Challenged independent claim 12 recites "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 . . . ." Ex. 1001, 12:11–16. The parties agree that this limitation should be construed under the provisions of 35 U.S.C. § 112 ¶ 6. Pet. 13; Prelim. Resp. 10. The parties also agree that, under such a construction, the function of the recited "means" is "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." Pet. 13; Prelim. Resp. 10–11. Patent Owner explicitly proposes that the corresponding structure is "a microcontroller that facilitates the receiving and sending of the key code," and Petitioner appears to accept such a proposal. Prelim. Resp. 10–11; Pet. 13 ("For the purposes of this Petition and as shown below, the prior art teachings the function and alleged structure of this claim element.").

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties agree that the term is governed § 112, ¶ 6 and that the function is "receiving a key code . . . and for sending a key code . . . modulated onto an IR carrier signal" (POR at 14-16)

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)

Patent Owner has indicated that the corresponding structure is a microcontroller that facilitates the receiving and sending of the key code, which is consistent with claims 4 and 10. *See* EX1036, 15-19, *see also* EX1001, 4:7-11, 6:68-60. For the purposes of this Petition and as shown below, the prior art teaches the function and alleged structure of this claim element.

(Pet. at 13)

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties dispute the appropriate structure" (POR at 14-16)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties dispute the appropriate structure" (POR at 14-16)

"In cases involving a computer-implemented invention in which the inventor has invoked means-plus-function claiming, this court has consistently required that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor . . . . **But that language simply describes the function to be performed, not the algorithm by which it is performed**." *Aristocrat Techs. Austl. PTY Ltd. v. Int'l Game Tech.*, 521 F.3d 1326, 1333-34 (Fed. Cir. 2008).

"This type of purely functional language, which ***simply restates the function associated with the means-plus-function limitation, is insufficient*** to provide the required corresponding structure." *Noah Sys. Inc. v. Intuit Inc.*, 675 F.3d 1302, 1317 (Fed. Cir. 2012).

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties dispute the appropriate structure" (POR at 14-16)

Petitioner's proposed structure simply restates the function without providing an algorithm for how the function is performed. The '389 Patent discloses the corresponding algorithms in Step 105 of Fig. 2, as further explained in detail at 5:49-6:4 (EX2003 at ¶ 142). Therefore, UEI proposes that the proper corresponding structure is "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)

Next (step **105**), remote control device **11** receives first key code signal **19** and relays the key code communicated by first key code signal **19** to VCR **13** in the form of a second key code signal **22**. Remote control device **11** is a slave to key code generator device **12**. Remote control device **11** relays the key code by receiving first key code signal **19** in RF form and translating the communicated key code so that the key code is modulated onto a second carrier signal resulting in second key code signal **22**. In this example, the second carrier signal is an infrared signal with a frequency in the range between three hundred gigahertz and three hundred terahertz. Second key code signal **22** is transmitted by an IR transmitter **23** on remote control device **11** to VCR **13**. In the embodiment of FIG. **5**, key code signal **19** is converted into key code signal **22** by forming the bursts of the intermediary signal using the second carrier signal with an infrared frequency in the place of the first carrier signal with a radio frequency. For both key code signal **19** and key Code signal **22**, digital ones and digital zeros are modulated using the same timing for "mark/space" pairs. The waveform diagram of key code signal **22** appears the same as the waveform diagram shown in FIG. **5** for key code signal **19**; only the frequency of the carrier signal that forms the bursts is different.

(EX1001 (389 Patent) at 5:49-6:4)

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties dispute the appropriate structure" (POR at 14-16)

Petitioner's proposed structure simply restates the function without providing an algorithm for how the function is performed. The '389 Patent discloses the corresponding algorithms in Step 105 of Fig. 2, as further explained in detail at 5:49-6:4 (EX2003 at ¶ 142). Therefore, UEI proposes that the proper corresponding structure is "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)

Although remote control device **11** in the first example stores either a proprietary codeset or a standardized codeset and uses that codeset to generate keystroke indicator signal **16**, remote control device **11** stores only that single codeset. This codeset is the codeset used by key code generator device **12** to receive communications from remote control device **11**. Remote control device **11** can therefore be made inexpensively and may contain a relatively small amount of memory. The memory may, for example, be read only memory (ROM) on a microcontroller integrated circuit (for example, a Z8 microcontroller available from Zilog, Inc. of San Jose, Calif.)

(EX1001 (389 Patent) at 6:50-60)

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

(EX1001 (389 Patent) at Cl. 15)

Patent Owner's Demonstrative Exhibit
Not Evidence

"means for receiving . . . and for sending . . ."

The Parties dispute the appropriate structure" (POR at 14-16)

Petitioner's proposal simply restates the function without an algorithm (POR Sur-reply at 4-5):

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)

Rather, the construction for the structure should be "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 a infrared carrier signal resulting in a second key code signal." *See* EX1001, 5:45-59; EX1040, ¶¶21-24.

(Pet. Reply at 8)

Patent Owner's Demonstrative Exhibit
Not Evidence

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

REDEFINING CONTROL

Van Ee:

However, the IR or RF code receiver in the STB is typically a narrow-band receiver (i.e., it is receptive to signals in a specific frequency band). Accordingly, it cannot properly work with all possible control codes for all equipment from all manufacturers when eavesdropping due to different frequency ranges being used, e.g., by different manufacturers. The frequency bands used by different manufacturers of remote control devices for, e.g., IR codes, differ widely (KHz–MHz range). The inventors therefore further suggest to interleave the device-specific control codes (e.g., the VCR power codes in the example above) with identifiers codes (referred to herein as "id codes" or "tags") to which the STB's IR or RF receiver is receptive. That is, each test control code is tagged for being identified by the STB. The tag or id code is sent in a frequency range that allows the STB to intercept it. These id codes preferably have an enumerator embedded, so that the STB is always in sync with the remote.

(EX1013 (Van Ee) at 2:26-43)

106 according to the present invention. In step **202**, a user selects an apparatus type/brand combination from combinations stored in the database of memory **112** of programming means **110**. The user-selected apparatus type/brand combination is transmitted to remote server **118** in step **204**. Remote server **118** identifies all the sets of control codes corresponding to the user-selected apparatus type/brand combination in step **206**. A particular control code corresponding to a particular function of the apparatus to be controlled is then selected from all the identified sets in step **208**. The control codes are then transmitted via Internet **116** to programming means **110** in step **210**.

The control codes are interleaved with associated identifier codes stored in memory **112** to form the interleaved control signal in step **212**. The interleaved control signal is transmitted to control device **106** in step **214** to program the control device **106**. The button on user-interface **108** is then pressed on control device **106** to transmit a control code and its associated identifier code for each press in step **216**. In step **218**, the user determines whether the apparatus to be controlled responded to the transmitted control code. If no, the process returns to step **216**.

(EX1013 (Van Ee) at 7:38-59)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Van Ee:

range that allows the STB to intercept it." EX1013 (Van Ee) at 2:34-41. Thus, when "it is determined that the apparatus responded to the transmitted code," the STB uses the received identifier code to retrieve the "respective control code" that successfully operated the appliance from a database in the STB's memory. EX1013 (Van Ee) at 7:60-64. Unlike the '389 Patent, the "respective control code is then transmitted to remote server 118," which "identifies the set of control codes in which the respective control code belongs" and transmits the identified codeset back to the STB, which in turn transmits the codeset to the remote control. EX1013 (Van Ee) at 7:65-8:8.

(EX2003 (Sprenger Decl.) at ¶ 114)

If it is determined that the apparatus responded to the transmitted control code in step **218**, the identifier code associated with the control code which caused the apparatus to respond is then associated with its respective control code in step **220** using the database stored within memory **112**. The respective control code is then transmitted to remote server **118** via Internet **116** in step **222**. Remote server **118** identifies the set of control codes in which the respective control code belongs to in step **224**. The identified set is then transmitted to programming means **110** in step **226**. Programming means **110** receives the identified set in step **228** and programs control device **106** to associate the control codes of the identified set, i.e., the set containing the control code which caused the at least one apparatus to respond, with the multiple user inputs of programmable control device **106**.

(EX1013 (Van Ee) at 7:65-8:8)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

A POSITA would not have combined Mishra with Dubil and Van Ee (POR at 19-24)

- A POSITA would not have combined Mishra with Dubil
- A POSITA would not have combined Mishra with Van Ee
- A POSITA would not have combined Dubil with Van Ee

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

A POSITA would not have combined Mishra with Van Ee (POR at 22-24)

(1) Petitioner's expert admitted that Van Ee has the same problem that a POSITA reading Mishra would supposedly be trying to avoid (EX2003 (Sprenger Decl.) at ¶160; POR at 22):

Q So is it correct that you're saying a person of ordinary skill is looking for a back-up plan in case the user failed at using Mishra's GUI correctly, is that right?

A Yes.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 60:15-19, 62:12-63:2)

Q Would you agree with me that what this is describing here in Van Ee is pretty much the same thing that we just talked about with Mishra states the graphical user interface may ask a user to select from among the models available for the unit type of device and the selected manufacturer?

A Yes. That seems to be similar, you know, the user interface, select the make and model.

Q So if the user is going have the same problem with this step in Van Ee that they had in this step in Mishra; is that correct?

A Yes. There is a user interface involvement there, yes.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

A POSITA would not have combined Mishra with Van Ee (POR at 22-24)

(2) Mishra and Van Ee teach away from each other in multiple ways (POR at 22-24):

163. Third, a POSITA would also recognize that Mishra and Van Ee teach away from one another in a fundamental and incompatible way. In particular, Mishra and Van Ee have conflicting teachings as to what functions should occur at a server as opposed to the set-top box. Mishra teaches that "system 12 [set-top box] can translate that signal and send information back to the RCU 18 to enable the RCU 18 to control the particular device." EX1005 (Mishra) at [0020]. But Van Ee teaches that a "[r]emote server 118 uses the associated control code to determine to which set of control codes it belongs to." EX1013 (Van Ee) at 6:67-7:2, 7:66-8:1; EX2009 (Russ Depo. Tr. June 18, 2020) at 63:3-65:2.

(EX2003 (Sprenger Decl.) at ¶¶ 163, 165)

165. Fourth, another fundamental difference between Mishra and Van Ee is that Van Ee teaches a set-top box that cannot receive control codes from the remote control. EX1013 (Van Ee) at 2:27-34. Van Ee explains that its set-top box cannot receive the range of frequencies of control codes and therefore the control code signal must be interleaved with an identification code at a frequency that the set-top box can receive. EX1013 (Van Ee) at 2:34-41. Mishra, in contrast, teaches a set-top box that directly receives the control codes. EX1005 (Mishra) at [0020]. Accordingly, Mishra teaches that the set-top box converts every received control code; whereas, Van Ee teaches that only "the last identified code received" is then associated with its control code. EX1005 (Mishra) at [0020]; EX1013 (Van Ee) at 6:63-67. Therefore, a POSITA would recognize that the entire point of Van Ee is lost with the set-top box of Mishra because there would be no need for the interleaving or eavesdropping that Van Ee requires.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

REDEFINING CONTROL

A POSITA would not have combined Dubil with Van Ee (POR at 24)

It is unrebutted that a POSITA would not have combined Dubil and Van Ee (PO Sur-reply at 5):

168. First, Dubil teaches that the remote control does not transmit information to the set-top box to request a codeset. EX1006 (Dubil) at 5:6-13 ("user requests via appliance 106 a code set from server 102 . . . by having the user fill out an electronic template at the service's website")). But Van Ee teaches the exact opposite. EX1013 (Van Ee) at 5:66-6:8; 7:38-42. A POSITA would thus recognize that while Van Ee teaches a remote control that transmits to a STB, Dubil teaches a remote control that does not transmit to the STB. A POSITA would not have been motivated to combine references with these opposing disclosures.

169. Second, Van Ee teaches to interleave the control codes with identifier codes because the STB cannot receive the frequency ranges of the control codes. EX1013 (Van Ee) at 2:27-41. However, Dubil teaches away from the STB receiving any such transmissions from the remote control because the STB has already transmitted the entire codeset to the remote. EX1006 (Dubil) at 5:6-26. Thus, the STB in Dubil has no need to receive transmissions from the remote control.

170. Third, Van Ee teaches that the STB eavesdrops on the remote control transmissions in order to receive the identifier codes. EX1013 (Van Ee) at 2:14-15; 2:27-41. However, Dubil teaches away from any such eavesdropping on the remote control because the STB has already transmitted the entire codeset to the remote control and therefore has no need to eavesdrop on any transmissions from the remote control. EX1006 (Dubil) at 5:6-26.

(EX2003 (Sprenger Decl.) at ¶¶ 168-170)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

REDEFINING CONTROL

Mishra, Dubil, + Van Ee fail to disclose claim 2 (POR at 24-31)

Petition admits that the STB must identify the codeset, but Van Ee does not disclose this (Pet. at 24-31):

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)

231. Additionally, Van Ee fails to teach "an STB identifying a codeset when a user stops pressing a key," contrary to what the Petition asserts. Petition at 22; EX1003 (Russ Decl.) at ¶ 130. That is because in Van Ee, the "[r]emote server 118 uses the associated control code to determine to which set of control codes it belong to and transmits the set." EX1013 (Van Ee) at 6:67-7:2, 7:66-8:2, 3:39-3:48). Accordingly, it is the remote server, and not the set-top box, in Van Ee that identifies the codeset.

(EX2003 (Sprenger Decl.) at ¶ 231)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Mishra, Dubil, + Van Ee fail to disclose claim 2 (POR at 24-31)

Once the user stops intermittently pressing the button on user-interface **108**, interleaver/identifier circuit **120** samples the last identifier code picked up by IR receiver **122**, i.e., the identifier code associated with the control code which caused the apparatus to respond, and converts the sampled signal into a digital word of, e.g., a compressed data format. The compressed data format is then matched with a compressed data format of an identifier code stored within memory **112** to identify the identifier code that caused the apparatus to respond.

Programming means **110** then correlates the matched compressed data format of the last identifier code received with its associated control code stored in the database. The associated control code is then transmitted to remote server **118** via Internet **116**. Remote server **118** uses the associated control code to determine to which set of control codes it belongs to and transmits the set to programming means **110**.

(EX1013 (Van Ee) at 6:53-7:2)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Mishra, Dubil, + Van Ee fail to disclose claim 3 (POR at 31-32)

> 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)

Claim 3 requires (1) prompted and (2) by autoscan functionality (POR at 31-32):

> An alternative embodiment uses an "autoscan functionality" in which the user is "prompted by successive screens on display 15 to push the power-on key of remote control device 11 multiple times." *Id.* at 8:1–7. As the user repeatedly presses the power-on key, "key code generator device 12 in turn generates key codes using different codesets until the electronic consumer device performs a desired function," such as turning on. *Id.* at

(Paper 12 (Decision) at 4)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Mishra, Dubil, + Van Ee fail to disclose claim 3 (POR at 31-32)

(1) Both experts testified Van Ee does not disclose any instructions to the user (POR at 31):

242. Rather, in Van Ee, the user simply keeps pressing the button until he/she recognizes the appliance responding. EX1013 (Van Ee) at 6:50-52; Petition at 24 ("the user presses a button, determines that the apparatus does not respond properly, and then presses the button again"); EX1003 at ¶ 138. In Van Ee, "the user determines whether the apparatus to be controlled responded to the transmitted control code" and "[i]f no, the process" repeats. EX1013 (Van Ee) at 7:56-59. Thus, in Van Ee, it is the *absence* of any response that causes the user to keep pressing the button. The absence of a response is not a prompt. In fact, that is the opposite of a prompt.

(EX2003 (Sprenger Decl.) at ¶ 242)

(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.

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Mishra, Dubil, + Van Ee fail to disclose claim 3 (POR at 31-32)

139. Additionally, Van Ee describes a "touch screen" graphical user interface that displays "soft keys" corresponding to control codes that a user may press. *Id.*, 5:39-40, 6:41-52, 7:25-35. A POSA would have understood that the display of soft key buttons as displayed on the touch screen UI would also prompt the user to press a button during the autoscan process. As the UI displays the keys during the autoscan process, a user would have been prompted to select the key and select the key repeatedly until completing the process as described in claim element [2.5].

(EX1040 (Russ Suppl. Decl.) at ¶ 49)

An alternative embodiment uses an "autoscan functionality" in which the user is "prompted by successive screens on display 15 to push the power-on key of remote control device 11 multiple times." *Id.* at 8:1–7. As the user repeatedly presses the power-on key, "key code generator device 12 in turn generates key codes using different codesets until the electronic consumer device performs a desired function," such as turning on. *Id.* at

(Paper 12 (Decision) at 4)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 1: Mishra, Dubil, and Van Ee (2-3)

Mishra, Dubil, + Van Ee fail to disclose claim 3 (POR at 31-32)

(2) Both experts testified Van Ee does not disclose generating a key code for each button press (POR at 32):

244. But Van Ee does not teach generating a key code for each key press Van Ee teaches that "the STB downloads in this test phase a specific code . . . from every code set, to the programmable remote" and then merely "eavesdrop[s] on the remote control communication during the testing phase." EX1013 (Van Ee) at 2:3-15. Thus, Van Ee does not communicate a keystroke indicator signal to the key code generator device and generate a key code for each button press. Instead, Van Ee sends all of the key codes at one time and then only passively observes until the process is complete. I understand that Dr. Russ agreed with this distinction. EX2009 (Russ Depo. Tr. June 18, 2020) at 18:2-19:7, 20:22-21:22, 22:4-23:12, 68:2-16, 71:6-72:17, 139:3-9). Therefore, Van Ee does not teach the claimed autoscan functionality.

(EX2003 (Sprenger Decl.) at ¶ 242)

In the implementation of Van Ee, they decided do it slightly differently. They send all the possible codes ahead of time and have the remote control send them one at a time, and that's just a decision that was made. So because of this, your bulk sending all the codes down and then trying one at a time on the remote, they had to interleave the codeset identifier so that the set top could keep track of what the remote control is doing.

(EX2009 (Russ Depo. Tr. June 18, 2020) at 86:8-16)

Patent Owner's Demonstrative Exhibit
Not Evidence

Agenda

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

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

REDEFINING CONTROL

Mishra + Dubil fail to disclose claim 4 (POR at 32-34)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claims 7-11 (POR at 34-38)

7. The remote control device of claim **4**, wherein said key code is part of a codeset, and wherein said codeset is not stored on said remote control device.

8. The remote control device of claim **4**, wherein said modulating to generate said first key code signal is performed according to a first codeset, and wherein said remote control device stores no codeset other than said first codeset.

9. The remote control device of claim **4**, wherein said key code is part of a codeset that includes a plurality of key codes, wherein each one of said plurality of key codes corresponds to a different function of the electronic consumer device, and wherein no more than a single one of said plurality of key codes is present on said remote control device at any given time.

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.

11. The remote control device of claim **4**, wherein said modulating said key code onto said first carrier signal is performed by an electronic consumer device taken from the group consisting of: a television, a stereo radio, a digital video disk player, a video cassette recorder, a personal computer, a set-top cable television box and a set-top satellite box.

(EX1001 (389 Patent) at Cl. 7-11)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claim 10 (POR at 37-38)

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.

shows that microcontroller 26 is connected to "IR transmitter 35." *Id.*, ¶22. A POSA would have understood that Mishra's controller 26 controls the properties of the signal generated by the IR transmitter by using a modulation scheme as disclosed by Dubil. EX1003, ¶¶157-58. Accordingly, Mishra (in view of Dubil) teaches this claim element. *Id.*

(Pet. at 36)

Patent Owner's Demonstrative Exhibit
Not Evidence

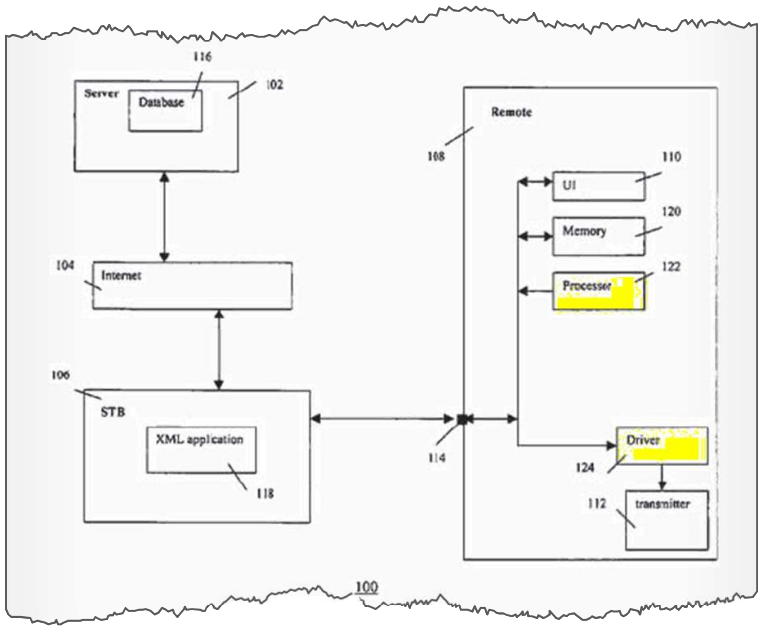
Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claim 10 (POR at 37-38)

Dubil teaches modulating with a "driver" not the microcontroller (POR at 38):

294. Additionally, as discussed previously in Section IX.B.2.c, Mishra does not teach that its microcontroller performs modulating onto a carrier signal, so the Petition must combine Mishra with Dubil. Petition at 35-36; EX1003 (Russ Decl.) at ¶ 158. However, the Petition yet again ignores critical contrary teachings in Dubil. Dubil teaches a processor that is separate from a driver, and that the driver (not the processor) "control[s] transmitter 112 for sending the IR or RF code." EX1006 (Dubil) at 5:20-26.

(EX2003 (Sprenger Decl.) at ¶ 294)



(EX1006 (Dubil) at Fig. 1)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claim 10 (POR at 37-38)

Dubil teaches modulating with a "driver" not the microcontroller (POR at 38):

10 Q Would you agree that in Dubil does the
11 driver 124 at least is necessary to translate the
12 modulated IR and RF signals?
13 MR. KENTON: Objection. Form.
14 BY THE WITNESS:
15 A It seems like it's the preferred embodiment
16 of Dubil. I was not relying on that aspect of Dubil
17 for my obviousness combination.

(EX2008 (Russ Depo. Tr. June 17, 2020) at 145:10-17)

62. Similar to the other arguments presented by UEI, UEI again appears to argue that Mishra would not incorporate physical components from Dubil. POR, 37-38. UEI, however, mischaracterizes the combination presented in the petition and in my previous declaration. In particular, the combination relies on Mishra's microcontroller 26 in combination with Dubil's modulation techniques and parameters to teach claim 10. Pet., 35-36; EX1003, ¶¶157-58; *see also* Sections III.A.1, III.A.3. UEI does not address this specific combination.

(EX1040 (Russ Suppl. Decl.) at ¶ 62)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose claim 12 (POR at 39-40)

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)

in detail at 5:49-6:4 (EX2003 at ¶ 142). Therefore, UEI proposes that the proper corresponding structure is "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)

Next (step **105**), remote control device **11** receives first key code signal **19** and relays the key code communicated by first key code signal **19** to VCR **13** in the form of a second key code signal **22**. Remote control device **11** is a slave to key code generator device **12**. Remote control device **11** relays the key code by receiving first key code signal **19** in RF form and translating the communicated key code so that the key code is modulated onto a second carrier signal resulting in second key code signal **22**. In this example, the second carrier signal is an infrared signal with a frequency in the range between three hundred gigahertz and three hundred terahertz. Second key code signal **22** is transmitted by an IR transmitter **23** on remote control device **11** to VCR **13**. In the embodiment of FIG. **5**, key code signal **19** is converted into key code signal **22** by forming the bursts of the intermediary signal using the second carrier signal with an infrared frequency in the place of the first carrier signal with a radio frequency. For both key code signal **19** and key Code signal **22**, digital ones and digital zeros are modulated using the same timing for "mark/space" pairs. The waveform diagram of key code signal **22** appears the same as the waveform diagram shown in FIG. **5** for key code signal **19**; only the frequency of the carrier signal that forms the bursts is different.

(EX1001 (389 Patent) at 5:49-6:4)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose claim 12 (POR at 39-40)

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)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claims 13-15 (POR at 40-41)

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.

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

(EX1001 (389 Patent) at Cl. 13-15)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claim 13 (POR at 40)

Petitioner has consistently failed to address the actual limitations of claim 13 (POR at 40, PO Sur-reply at 18-19):

H. Claim 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."

Mishra describes key codes that are stored in its STB and not sent to its remote until a button is pressed on the remote and the corresponding key code is transmitted from the STB to the remote. EX1005, ¶20, 21, 37. In view of this description, a POSA would have understood that Mishra discloses the key code not being stored on the RCU immediately prior to the RCU receiving the key code. EX1003, ¶165.

(Pet. at 40)

304. The "said means" of the claim is a microcontroller (whether or not an additional algorithm is also required). The "said means" is not the entire remote control device. Therefore, this claim refers to not storing the key code on the remote control device before the *microcontroller* receives the key code.

(EX2003 (Sprenger Decl.) at ¶ 304)

Patent Owner's Demonstrative Exhibit
Not Evidence

Ground 2: Mishra and Dubil (4, 7-15)

Mishra + Dubil fail to disclose dependent claim 13 (POR at 40)

Petitioner has consistently failed to address the actual limitations of claim 13 (POR at 40, PO Sur-reply at 18-19):

> **H. Claim 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."**
>
> Mishra describes key codes that are stored in its STB and not sent to its remote until a button is pressed on the remote and the corresponding key code is transmitted from the STB to the remote. EX1005, ¶20, 21, 37. In view of this description, a POSA would have understood that Mishra discloses the key code not being stored on the RCU immediately prior to the RCU receiving the key code. EX1003, ¶165.

(Pet. at 40)

> UEI also argues that Mishra does not teach claim 13, but again fails to note that Mishra describes key codes that are stored in its STB and not sent to its remote until a button is pressed on the remote and the corresponding key code is transmitted from the STB to the remote. EX1005, ¶¶20, 21, 37. Thus, Mishra's RCU and its corresponding microcontroller do not store the key code prior to receiving it. Pet., 40.

(Pet. Reply at 21)

Patent Owner's Demonstrative Exhibit
Not Evidence

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

Patent Owner's Demonstrative Exhibit
Not Evidence

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

Lambrechts:

sal remote control. IR codes for a specific appliance are entered into a universal remote control by placing the universal remote control and the remote control of the appliance face to face. Generally, the universal remote control must be set to a learning mode and repetitively a key of the universal remote control is selected and a corresponding key of the other remote control is pressed, causing a command code to be transmitted to the universal remote control and associated with the selected key. A disadvantage of this method is that the remote control of the appliance has to be present and operational. This is often not the case, e.g. if a user lost its old universal remote control and now wants to put a new one into use, the remote controls of the various appliances may not be present anymore or their batteries may be empty.

(EX1011 (Lambrechts) at 1:44-58)

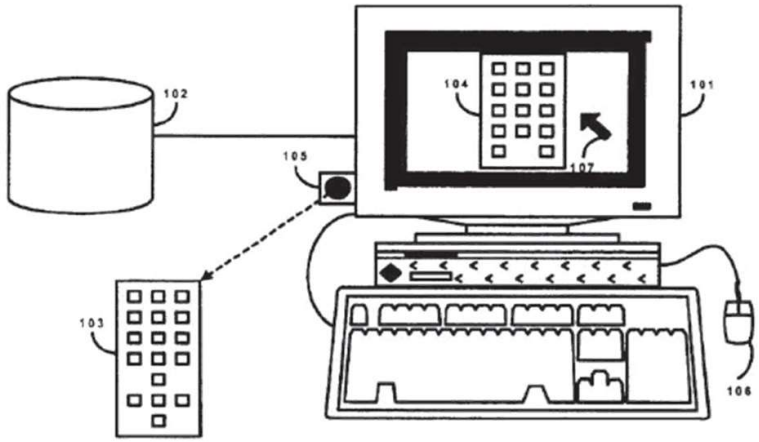


FIG. 1

(EX1011 (Lambrechts) at Fig. 1)

Patent Owner's Demonstrative Exhibit
Not Evidence

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

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

- A POSITA would not have combined Mishra with Dubil
- A POSITA would not have combined Mishra with Lambrechts
- A POSITA would not have combined Dubil with Lambrechts

Patent Owner's Demonstrative Exhibit
Not Evidence