

EXHIBIT 1005

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCL Electronics Holdings Ltd. (f/k/a TCL Multimedia Technology Holdings, Ltd.
TCL Industries Holdings Co., Ltd.
TCL Industries Holdings (H.K.) Limited
TTE Technology, Inc. (d/b/a TCL North America)
TTE Corporation
TCL Moka International Limited
TCL Moka Manufacturing S.A. de C.V.
TCL King Electrical Appliances (Huizhou) Co. Ltd.
Manufacturas Avanzadas S.A. de C.V.
TCL Smart Device (Vietnam) Co., Ltd
Shenzhen TCL New Technology Co., Ltd.
TCL Optoelectronics Technology (Huizhou) Co., Ltd.
TCL Overseas Marketing Ltd.
TCL Technology Group Corporation (f/k/a TCL Corp.),

Petitioners

v.

LG ELECTRONICS INC.,
Patent Owner.

Case No. IPR2023-00240

U.S. Patent No. 7,982,803

DECLARATION OF DAVID B. LETT

IN SUPPORT OF

PETITION FOR *INTER PARTES* REVIEW OF

U.S. PATENT NO. 7,982,803

Ex. 1005 – TCL Indus Holdings Co., Ltd.
TCL Indus Holdings Co., Ltd. v. LGE – IPR2023-00240

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

TABLE OF CONTENTS

I.	INTRODUCTION	10
II.	PROFESSIONAL BACKGROUND AND QUALIFICATIONS	11
III.	UNDERSTANDING OF THE LAW	15
IV.	VIDEO/AUDIO PROCESSING OVERVIEW	22
V.	LEVEL OF ORDINARY SKILL	28
VI.	OVERVIEW OF THE '803 PATENT	30
	A. Specification	34
	B. Challenged Claims	39
	C. Prosecution History	39
VII.	CLAIM CONSTRUCTION	41
VIII.	OVERVIEW OF THE PRIOR ART	41
	A. U.S. Pub. No. 2004/0117858 – Boudreau et. al. (Ex. 1003)	41
IX.	GROUND 1: CLAIMS 1-18 OF THE '803 PATENT ARE UNPATENTABLE UNDER 35 U.S.C. §103 IN VIEW OF BOUDREAU ET AL.	56
	A. Independent Claim 1	57
	a) Limitation 1[pre]: “An audio and video synchronizing apparatus comprising”	57
	b) Limitation 1[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”	57
	c) Limitation 1[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal;”	58

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

d)	Limitation 1[c]: “a switching unit selecting paths for the video signal that is input to the video signal processing unit and the audio signal that is input to the audio signal processing unit, and selecting at least an audio signal for output to an external device that is not part of the video processing equipment;”	60
i)	Limitation 1[d]: “an outputting unit outputting the selected at least an audio signal to the external device; and”	60
j)	Limitation 1[e]: “an output selecting unit controlling the switching unit according to a kind of the external device, wherein the switching unit is controlled to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal for output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal for output to the outputting unit.” ..	61
B.	Claim 2: “The apparatus according to claim 1, further comprising a detector detecting the kind of the external device connected to the outputting unit.”	65
C.	Claim 3: " The apparatus according to claim 1, wherein the kind of the external device connected to the outputting unit is either an audio/video device or an audio device."	65
D.	Claim 4: “The apparatus according to claim 3, wherein the switching unit is controlled to select the second audio signal when it is determined that the external device connected to the outputting unit is the audio.”	66
E.	Claim 5: “The apparatus according to claim 1, wherein the kind of the external device connected to the outputting unit is determined according to whether the external device is connected to a video output port or an audio output port.”	66
F.	Independent Claim 6	67

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

a)	Limitation 1[pre]: “An audio and video synchronizing apparatus comprising”	67
b)	Limitation 6[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”	67
c)	Limitation 6[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal; and”	67
d)	Limitation 6[c]: “an output selecting unit selecting an audio signal that is output to an external device that is not part of the video processing equipment,”	67
e)	Limitation Claim 6[d]: “wherein the output selecting unit selects a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the audio signal that is output to the external device or selects a second audio signal output from the audio signal processing unit as the audio signal that is output to the external device.”	67
G.	Independent Claim 7	68
a)	Limitation 7[pre]: “An audio and video synchronizing apparatus comprising:”	68
b)	Limitation 7[a], “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”	68
c)	Limitation 7[b], “an audio signal processing unit outputting an audio signal that is synchronized with the video signal; and”	68
d)	Limitation 7[c], “an audio output selecting unit selecting an audio signal that is output to an external device that is not part of the video processing equipment,”	68

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

e)	Limitation 7[d], “wherein the audio output selecting unit selects an audio signal that bypasses the audio signal that is input to the audio signal processing unit or selects an audio signal output from the audio signal processing unit that is synchronized with the video signal as the audio signal that is output to the external device.”.....	69
H.	Independent Claim 8	69
a)	Limitation 8[pre]: “An audio and video synchronizing apparatus comprising:”	69
b)	Limitation 8[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”	69
c)	Limitation 8[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal;”	69
d)	Limitation 8[c], “an outputting unit outputting at least an audio signal to an external device that is not part of the video processing equipment; and”	70
e)	Limitation 8[d]: “an output selecting unit controlling the outputting unit according to a kind of the external device, wherein the output selecting unit controls the outputting unit to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal output to the external device.”.....	70
I.	Independent Claim 9	70
a)	Limitation 9[pre], “An audio and video synchronizing apparatus comprising:”	70

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

b)	Limitation 9[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”	70
c)	Limitation 9[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal;”	71
d)	Limitation 9[c], “an outputting unit outputting at least an audio signal to an external device that is not part of the video processing equipment;”	71
e)	Limitation 9[d]: “a detecting unit detecting a kind of the external device;”	71
f)	Limitation 9[e]: “an output selecting unit controlling the outputting unit according to the detected kind of the external device, wherein the output selecting unit controls the outputting unit to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal output to the external device.”	71
J.	Independent Claim 10	72
a)	Limitation 10[pre]: “A method of controlling audio and video output comprising:”	72
b)	Limitation 10[a]: “determining a kind of an external device that is not part of the video processing equipment and is connected to an output port of video processing equipment;”	72
c)	Limitation 10[b]: “selecting an audio signal according to a result of the determination and outputting the selected audio signal to the external device,”	72

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- d) Limitation 10[c]: “wherein the selected audio signal is either a first audio signal that bypasses an audio signal that is input to an audio signal processing unit that synchronizes the audio signal with a video signal that is provided to a display device of the video processing equipment or a second audio signal output from the audio signal processing unit.” 72
- K. Claim 11:** “The method according to claim 10, determining the kind of the external device comprises determining whether the external device connected to the output port is an audio device.”.....73
- L. Claim 12:** “The method according to claim 10, wherein the second audio signal is an audio signal that is provided to a speaker of the video processing equipment and synchronized with the video signal.”.....73
- M. Claim 13:** “The method according to claim 10, wherein selecting the audio signal and outputting the selected audio signal to the external device is performed automatically according to a result of the determination.”73
- N. Claim 14:** “The method according to claim 10, wherein selecting the audio signal and outputting the selected audio signal to the external device is performed according to a user's output mode setting.”74
- O. Claim 15:** “The method according to claim 10, wherein the audio signal that is synchronized with the video signal is delayed according to a video signal processing path.”74
- P. Independent Claim 16**.....75
- a) Limitation 16[pre]: “A method of controlling audio and video output comprising:”.....75
- b) Limitation 16[a]: “selecting an output mode of video processing equipment;”.....76

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

c)	Limitation 16[b]: “selecting an audio signal according to the selected output mode for output to an external audio device that is not part of the video processing equipment;”	77
d)	Limitation 16[c], “outputting the selected audio signal to the external audio device, wherein the selected audio signal is either a first audio signal that bypasses an audio signal that is input to an audio device of the video processing equipment that synchronizes the audio signal with a video signal that is provided to a display device of the video processing equipment or a second audio signal output from the audio device.”.....	77
Q.	Claim 17: “The method according to claim 16, further wherein the second audio signal is an audio signal that is provided to a speaker of the video processing equipment and synchronized with the video signal.”	78
R.	Claim 18: “The method according to claim 16, wherein the audio signal that is synchronized with the video signal is delayed according to a video signal processing path.”	78
X.	CONCLUSION	78

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

Exhibit No.	Description
1001	U.S. Patent No. 7,982,803 (“the ’803 Patent”)
1002	Reserved
1003	U.S. Patent Publication No. 2004/0117858 (Boudreau et. al.)
1004	Jack, “Video Demystified, A Handbook for the Digital Engineer,” Elsevier Inc. (2005)
1005	Declaration of David B. Lett in Support of Petition for <i>Inter Partes</i> Review
1006	Curriculum Vitae of David B. Lett
1007	FINTIV Stipulation
1008	Docket Control Order
1009	Average Time to Trial
1010	LGE v. TCL - Complaint for Patent Infringement
1011	Infringement Contentions
1012	Non Final Office Action filed September 3, 2009
1013	Amendment filed October 13, 2009
1014	Non Final Office Action filed January 6, 2010
1015	Amendment filed April 5, 2010
1016	Final Office Action filed July 12, 2010
1017	Amendment filed October 11, 2010
1018	Non Final Office Action filed November 15, 2010

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

Exhibit No.	Description
1019	Amendment filed March 15, 2011

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

I, David B. Lett, declare as follows:

I. INTRODUCTION

1. My name is David B. Lett, and I have been retained on behalf of TCL Industries Holdings Co., Ltd., TCL Industries Holdings (H.K.) Limited, TCL Electronics Holdings Ltd., TTE Corporation, TTE Technology Inc., TCL Overseas Marketing Limited, Manufacturas Avanzadas S.A. de C.V., TTE Technology Inc., TCL Overseas Marketing Limited, Manufacturas Avanzadas, TCL King Electrical Appliances (Huizhou) Co. Ltd., Shenzhen TCL New Technology Co., Ltd., TCL Smart Device (Vietnam) Co., Ltd., and TCL Optoelectronics Technology (Huizhou) Co., Ltd. (collectively, the “TCL companies”) to offer technical opinions relating to U.S. Patent No. 7,982,803 (the “’803 patent”) and prior art references relating to its subject matter. My experience with audio and video technologies provides me with an understanding of the subject matter described and claimed in the ’803 patent.

2. My opinions, as explained below, are based on my education, experience, and expertise in the fields relating to the ’803 patent. Any figures that appear within this document have been prepared with the assistance of Counsel and reflect my understanding of the ’803 patent and the prior art discussed below.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

3. I have no financial interest in the party or in the outcome of this proceeding. I am being compensated for my work as an expert on an hourly basis. My compensation is not dependent on the outcome of these proceedings or the content of my opinions.

II. PROFESSIONAL BACKGROUND AND QUALIFICATIONS

4. I am a technical consultant and product development industry veteran with expertise in electronics, software, hardware, video, audio, and data communications, having led product development organizations in cable, satellite, consumer electronics, asset tracking, remote tank logistics, and alarm industries. My current curriculum vitae is attached as Ex. 1006 and some highlights follow.

5. I earned my B.S. in Electrical Engineering (1982) with high honors from the University of Tennessee in Knoxville, Tennessee. I also attended the Georgia Institute of Technology from 1986 to 1987, completing 40% of the required degree hours for the M.S. Electrical Engineering program,

6. From 1982 to 1985, I worked at Scientific Atlanta as an Electrical Engineer designing video, audio, and data communications equipment for the cable television industry. I designed software and hardware including addressable data transmitters, video sync suppression scramblers, transaction format converters, and

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

data channel monitors for addressable Cable Television systems and Set Top Boxes.

7. From 1983 to 1985, while working at Scientific Atlanta, I also worked as an Assistant Professor at Devry Institute of Technology, teaching courses in electronics and microprocessor hardware/software.

8. From 1985 to 1990, I worked at Wegener Communications as a Senior Electrical Engineer, designing satellite communications equipment including forward error correction (FEC) coding systems, PSK modems, and analog control systems for RF modulators and PSK demodulators. I was promoted to the Hardware Engineering Manager, where I managed product development of video, audio, and data satellite receivers, modulators, graphics display systems, DSP-based audio companders, FSK and PSK satellite modems, multiplexers, forward error correction (FEC) codecs, RF upconverters and downconverters, and baseband analog and digital processing components.

9. In 1990, I returned to Scientific Atlanta, which was acquired by Cisco in 2006. I worked as Engineering Manager running the set top box engineering group where I was promoted to Director and Vice President during my tenure until 2011. I led the design of many cable set top boxes and systems through the evolution of analog video, addressability, downloadable software, electronic program guides,

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

digital video, software applications, high-definition TV, DVR, DOCSIS, full spectrum tuners, and multiroom DVR. These systems implemented various technologies including multiple video/audio input/output interfaces and synchronization, DOCSIS 1/2/3 and hybrid gateways, 802.11, IPTV, DVR, cable modems, ADSL, VDSL, DVB-T/C/S, bootloaders, factory diagnostics, application frameworks, Nagra, DRMs, conditional access, secure microprocessors, device management, Android, Adobe Flash, Linux, DVD play/record, MPEG-4, MPEG-2, H.264, NTSC, PAL, DAVIC, MoCA, high-performance CPUs, cablecards, network processors, HDMI, 2D/3D graphics, multiple RF tuners, and full spectrum tuners.

10. From 2011 to 2016, I worked for EchoStar Technologies, which served as the product development organization for sister company DISH Network. I served as Vice President of Engineering and was the Head of the Atlanta research and development center. I led the development of satellite set top boxes, consumer electronic equipment, and a home automation and security system. Technologies used included video/audio interfaces and synchronization, IoT, H.265, HEVC, 3D, Satellite, wireless, MoCA, transcoding, embedded C Linux applications, mobile applications (IOS and Android), SaaS, web applications (Javascript, HTML),

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

BSS/OSS, AWS cloud storage, 2-way video/audio streaming, authentication, and VoIP.

11. In 2016, I started an independent consulting business in technology and intellectual property projects. I have consulted in various technology areas and industries including consumer electronics, cable, satellite, television, and cryptocurrency.

12. From 2019 to 2022, I worked as Chief Technology Officer for Telular, an Ametek company. I was responsible for the development of Industrial IoT (IoT) recurring revenue solutions, combining wireless technologies, purpose-built hardware, and SaaS in the commercial telematics, security and home automation markets and sold under the SkyBitz and Telguard Brands.

13. My record of professional service includes awards on products I designed and developed from several organizations in my field of expertise, including Best of Show, Technology Emmy, and Best of Innovations.

14. I am a named inventor on 36 issued patents and published patent applications corresponding to the areas of my professional work. The patents and published applications involving video and audio technologies include:

- U.S. Patent No. 9,615,139 titled “Determining Device That Performs Processing of Output Pictures”

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- U.S. Patent No. 9,882,736 titled “Remote Sound Generation for a Home Automation System”
- U.S. Patent No. 8,549,567 titled “Media Content Sharing Over a Home Network”
- U.S. Patent No. 8,161,388 titled “Interactive discovery of display device characteristics”
- U.S. Patent No. 7,908,625 titled “Networked Multimedia System”
- U.S. Patent Nos. 7,861,272 and 7,849,486 titled “Networked subscriber television distribution”
- U.S. Patent No. 5,715,515 titled “Method and apparatus for downloading on-screen graphics and captions to a television terminal”
- U.S. Patent No. 5,592,551 titled “Method and apparatus for providing interactive electronic programming guide”
- U.S. Patent No. 5,539,822 titled “System and Method for Subscriber Interactivity in a Television System”
- U.S. Patent No. 5,357,276 titled “Method of Providing Video On Demand with VCR Like Functions”
- U.S. Patent Application Publication Nos. 2004/0068753 and 2008/0072272 titled “Video Transmission Systems and Methods for a Home Network”
- U.S. Patent Application Publication No. 2004/0133911 titled “Subscriber Network in a Satellite System”

III. UNDERSTANDING OF THE LAW

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

15. I am not an attorney. For the purposes of this declaration, Petitioners' counsel has informed me about certain aspects of the law that are relevant to my analysis and conclusions. My understanding of the law is as follows:

16. I understand that in an *Inter Partes* Review proceeding, a patent is not presumed valid and the Patent Trial and Appeal Board will evaluate the validity of the challenged claims under a preponderance of evidence standard. A preponderance standard is met when, considering the evidence presented, it is more likely than not a challenged claim is invalid.

17. A patent claim is invalid if it is "anticipated" by prior art. For a claim to be invalid because it is anticipated, all of its requirements must have existed in a single device or method that predates the claimed invention or must have been described in a single publication or patent, either expressly, inherently, or implicitly, that predates the claimed invention.

18. The description in a written prior art reference does not have to be in the same words as the claim, but all the requirements of the claim must be there, either stated, necessarily implied (i.e., inherent), or implied, so that someone of ordinary skill in the art, looking at that one reference, would have been able to make and use the claimed invention based on the reference.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

19. A patent claim is also anticipated if more than one year before the filing date of the patent, the claimed invention was patented anywhere in the world or described in a printed publication anywhere in the world.

20. A patent claim is invalid if the claimed invention would have been obvious to a person of ordinary skill in the art at the time the application was filed. This means that even if all the requirements of a claim cannot be found in a single prior art reference that would anticipate the claim or constitute a statutory bar to that claim, the claim is invalid if it would have been obvious to a person of ordinary skill at the time of the alleged invention. That is, the claim is obvious if the person of ordinary skill would adapt the reference to meet the claim by applying known concepts to achieve expected results.

21. The determination of whether a claim is obvious should be based upon several factors, including:

- the level of ordinary skill in the art that someone would have had at the time of the claimed invention;
- the scope and content of the prior art; and
- what differences, if any, existed between the claimed invention and the prior art.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

22. In considering the question of obviousness, it is also appropriate to consider any objective indicia (or secondary considerations) of obviousness or non-obviousness that may be shown. These include:

- whether a product that practices the claimed invention has achieved commercial success, to the extent any such success is due to the merits of the claimed invention;
- whether a long-felt need existed in the prior art for the solution provided by the claimed invention;
- whether there were unsuccessful attempts by others to find the solution provided by the claimed invention;
- whether there was copying of the claimed invention by others;
- whether there were unexpected and/or superior results from the claimed invention;
- whether there was acceptance by others of the claimed invention as shown by praise from others in the field or from the licensing of the claimed invention; and
- whether there was independent invention of the claimed invention by others before or at about the same time the named inventor conceived of it.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

23. I further have been informed and understand that a “nexus” must exist between the claimed invention and the alleged commercial success. In other words, proof of commercial success of a product that practices the claimed invention is not enough; there must be evidence that the commercial success resulted, at least in meaningful part, from the claimed invention.

24. I have been informed and understand a patent claim composed of several elements is not obvious merely because each of its elements was independently known in the prior art. In evaluating whether such a claim would have been obvious, it is relevant to consider if there would have been a reason that would have motivated a person of ordinary skill in the art to combine the known elements or concepts from the prior art in the same way as in the claimed invention. For example, market forces or other design incentives may be what produced a change, rather than true inventiveness. It is also appropriate to consider:

- whether the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness;
- whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent;

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- whether the innovation applies a known technique that had been used to improve a similar device or method in a similar way; or
- whether the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those of ordinary skill in the art.

25. In considering obviousness, it is important to be careful not use the benefit of hindsight.

26. A single prior art reference can alone render a patent claim obvious, if any differences between that reference and the claims would have been obvious to a person of ordinary skill in the art at the time of the alleged invention—that is, the patent claim is obvious if a person of ordinary skill would adapt the prior art reference to meet the claim by applying known concepts to achieve expected results.

27. I have been informed that claim construction is a matter of law and that the final claim construction will ultimately be determined by the Board. For the purposes of my analysis in this proceeding and with respect to the prior art, I have been informed that claim terms in an inter partes review (IPR) proceeding are generally given their plain and ordinary meaning as understood by a person of

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

ordinary skill in the art at the time of the invention, with the claim term read not only in the context of the particular claim in which the disputed term appears, but also in the context of the entire patent, including the specification. I understand that this is referred to as the “Phillips standard.”

28. I have been informed that the Patent Owner can serve as his or her own lexicographer. As such, if a claim term is provided with a specific definition in the specification, that claim term should be interpreted in light of the particular definition provided by the Patent Owner.

29. I have been informed that a patent must satisfy the written description requirement separate from any enablement requirement, each of which are found in 35 U.S.C. §112, first paragraph.

30. To satisfy the written description requirement, I understand that the patent’s description must describe the claimed invention in sufficient detail that a person of ordinary skill in the art can reasonably conclude that the inventor had possession of the claimed invention. I understand that the breadth of the claims determines the extent of the required disclosure. I understand that the written description must be commensurate with the scope of the claims. In other words, I understand that the test is whether the disclosure of the application reasonably conveys to those skilled in the art that the inventor had possession of the claimed

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

subject matter as of the filing date. I understand that new matter is matter not supported by the disclosure.

31. I have been informed that a patent must satisfy the enablement requirement separate from any written description requirement. To satisfy the enablement requirement, the patent's description must describe the invention such that one skilled in the art is enabled to make and use it without undue or unreasonable experimentation. I understand that certain factors are relevant, including the breadth of the claims, the nature of the invention, the state of the prior art, the level of one of ordinary skill, the level of predictability in the art, the amount of direction provided by the inventor, the existence of working examples, and the quantity of experimentation needed to make or use the invention based on the content of the disclosure.

IV. VIDEO/AUDIO PROCESSING OVERVIEW

32. Digital televisions typically receive video and audio programming for viewing through a number of input interfaces, for example the tuner input, HDMI, or analog composite (baseband Audio and Video) inputs. The pre-processing requirements for the program audio and video signal input are different depending on the input source supplying the content. Each pre-processing method for

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

different inputs results in separate digital audio, video, and data streams for further processing.

33. The video/audio pre-processing requirements for Digital Set Top Boxes (“STBs”) are very similar to those of a digital TV. Rather than having display screens and speakers like TVs, STBs typically output video and audio signals to interfaces that connect to VCRs and/or displays and speakers in the TV. Also, STBs may provide audio outputs to external sound systems (sound bars, AV receivers, etc.) for a better sound experience (and often multiple speakers and separate sound channels for each speaker) than is heard from typical TV speakers.

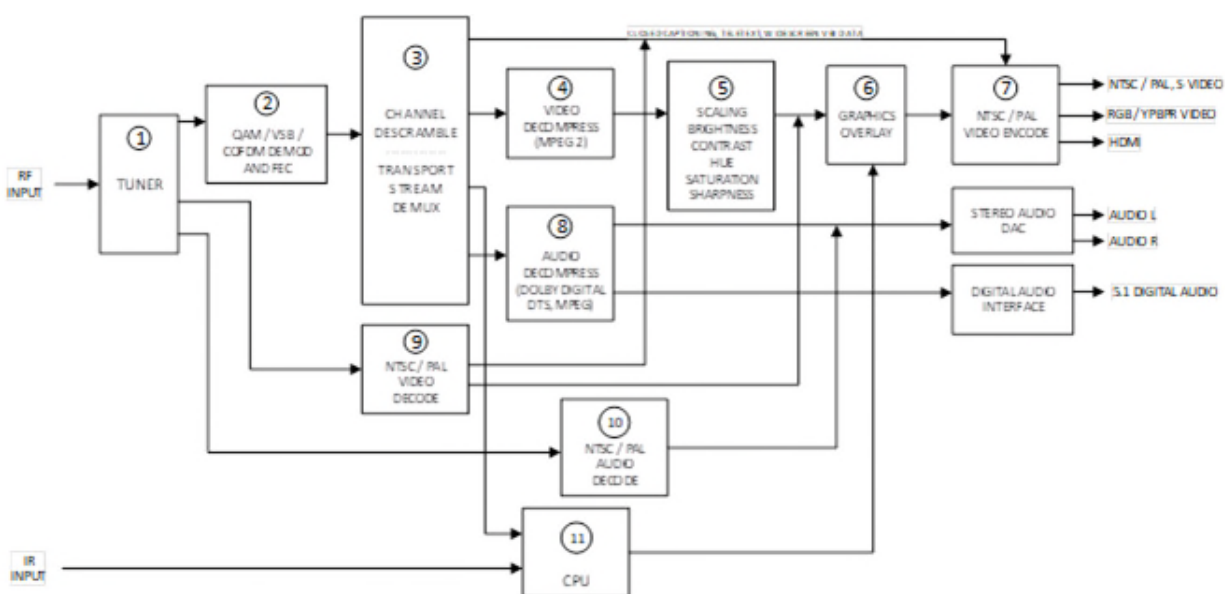
34. The following discussion refers to the simplified block diagram of a Digital Television Set-top Box that was reproduced below with functional block reference numbers to aid in the explanation. Ex. 1004 at page 14.

35. A modulated broadcast or cable TV signal input is provided to the TV or to the Set Top Box through a TUNER 1 (RF input). This is the type of signal used to transmit digital television broadcasts (programs) typically from either terrestrial (over-the-air), satellite, or cable television networks.

36. An RF front end, i.e., the TUNER 1, selects the high frequency signals corresponding to a desired RF channel from the frequency spectrum used for transmission. For example, in one type of cable TV system, RF channel number

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

59 has a 6 MHz channel bandwidth centered at a 429 MHz carrier frequency from the typical 1 GHz RF frequency spectrum used for transmission. In this example, the signals corresponding to RF channel 59 are selected from the transmission broadcast spectrum by filtering, amplification, local oscillators, and mixers.



Ex. 1004 Figure 2.6 at page 14. Simplified block diagram of a Digital Television Set-top Box.

37. The desired program is included in the modulated signal, i.e., a signal that has been modified for transmission in 6 MHz bandwidth (in the example). One typical terrestrial transmission type of modulation used at the time of the invention (used in the ATSC standard) of the '803 patent was VSB, or Vestigial Sideband, where part of the sidebands in a double sideband modulated signal are cut off for optimal transmission. Another modulation type that was typically used

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

in cable televisions at the time of the '803 patent was QAM, or Quadrature Amplitude Modulation, where the amplitude of two carrier waves, which have the same frequency and are 90° out of phase with each other, are varied to convey the digital data.

38. The output of the TUNER 1 is a signal that is the equivalent of one RF channel, e.g. baseband signal representing RF channel 59, which was selected by the TUNER 1.

39. The QAM/VSB/COFDM DEMOD portion of block 2 demodulates the signal, i.e., converts it to a digital bit stream. This demodulated bitstream is then processed by the FEC of block 2, a Forward Error Correction decoder that corrects errors during transmission. The output of block 2 is typically an MPEG-2 transport stream format, normally representing multiple television programs.

40. The error-corrected MPEG-2 transport stream from block 2 is input to CHANNEL DESCRAMBLE portion of block 3, which removes the bit scrambling done for energy dispersal to DC balance the signal during transmission.

41. The descrambled bitstream then proceeds to the TRANSPORT STREAM DEMUX portion of block 3 that separates the desired channel (program) from other programs and outputs separate compressed digital video, audio, and data signals. I want to emphasize that video and audio processing cannot occur if

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

the signal has not been first demodulated, error corrected (if applicable), descrambled (if applicable), and demultiplexed into the separate video and audio signals.

42. Video processing starts with decoding (removing the bit rate compression used for transmission) by VIDEO DECOMPRESS 4.

43. Audio processing starts with decoding (removing the bit rate compression used for transmission) by AUDIO DECOMPRESS 8.

44. The block diagram does not show decryption that is sometimes required to allow viewing/hearing of authorized programs and is beyond the scope of this discussion.

45. NTSC/PAL VIDEO DECODE 9 and NTSC/PAL AUDIO DECODE 10 blocks are provided to support analog video/audio channels that were still partially in use at the time of the '803 patent, where cable systems sometimes broadcasted both analog and digital channels in the RF spectrum. It should be noted that the required NTSC/PAL analog channel demodulation functions are not shown in this simplified block diagram. Video and audio processing of analog signals start after demodulation with decoding of the video and audio signals. The video and audio decoders convert the analog signal into respective non-compressed digital representations of video and audio.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

46. HDMI and baseband analog audio/video inputs (not shown) have different pre-processing as compared with the RF input to produce the separate video and audio signals for further processing.

47. The video signal is then subject to processing 5 that includes scaling to the proper aspect ratio and resolution, interlacing, deinterlacing, color space conversion, frame rate conversion, noise reduction, edge enhancement, motion compensation, etc. Adjustment functionality like brightness, contrast, hue, saturation, and sharpness are usually also accomplished with digital signal processing techniques. Many video processing functions require decoding the signal into the desired color space components, such as Red, Green, Blue (RGB).

48. GRAPHICS OVERLAY processing 6 is required for displaying onscreen menus, graphics overlaid over video, electronic program guides, interactive applications, etc., as generated by the software applications executed by the CPU 11.

49. The video is then processed further by converting the signals to the correct format for output and/or display.

50. In a set top box or TV, the video is processed by NTSC/PAL VIDEO ENCODE 7 into an analog format (NTSC, PAL, S-video, YPBPR) or a digital format (HDMI) for output to a display, VCR, Audio/Video receiver, etc.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

51. In a digital TV, the signal is processed for the type of display to be used, such as, plasma, LCD, etc., that renders the program content on the screen.

52. Processing of the separate audio signal usually involves audio level decompression 8 (as opposed to bit rate compression used for transmission) corresponding to the type of compression used for transmission, equalization, volume control (amplification/attenuation), and time base correction to match the video and to avoid lip sync issues. This audio processing cannot be performed on signals that have not already been demodulated.

53. In a digital TV or a Set Top Box, audio is typically also output via a S/PDIF (optical and/or coaxial) digital interface, a HDMI digital interface, or analog left and right channel RCA jacks. Audio outputs can be used for playing audio on a separate speaker.

V. LEVEL OF ORDINARY SKILL

54. I understand that the level of ordinary skill may be reflected by the prior art of record, and that a POSITA to which the claimed subject matter pertains would have the capability of understanding the scientific and engineering principles applicable to the pertinent art. I understand that one of ordinary skill in the art has ordinary creativity.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

55. I understand there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems. There is likely a wide range of educational backgrounds in the technology fields pertinent to the '803 patent.

56. I am familiar with the knowledge and capabilities that a person of ordinary skill in the art of audio and video synchronization would have possessed in the April 2005 time frame. Specifically, my experience in the industry and with engineers practicing in the industry during the relevant timeframe allowed me to become personally familiar with the knowledge and capabilities of a person of ordinary skill in audio and video synchronization. Unless otherwise stated, my testimony below refers to the knowledge of one of ordinary skill in the art in the field of audio and video synchronization at the time of the priority date of the '803 patent.

57. A person of ordinary skill in the art, at the time the '803 patent was filed, would have had at least an undergraduate degree in electrical or computer engineering or closely related scientific field, or similar advanced post-graduate education, and at least two years of experience with audio and video

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

synchronization. Such a person of ordinary skill in the art would have been capable of understanding the '803 patent and the prior art references discussed herein.

58. Based on my education, training, and professional experience in the field of the claimed invention, I am familiar with the level and abilities of a person of ordinary skill in the art at the time of the claimed invention. Additionally, I met at least these minimum qualifications to be a POSITA at least as of April 2005. Further, although my qualifications may exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the '803 patent have been rendered from the perspective of a person having ordinary skill in the art at the time of the invention.

VI. OVERVIEW OF THE '803 PATENT

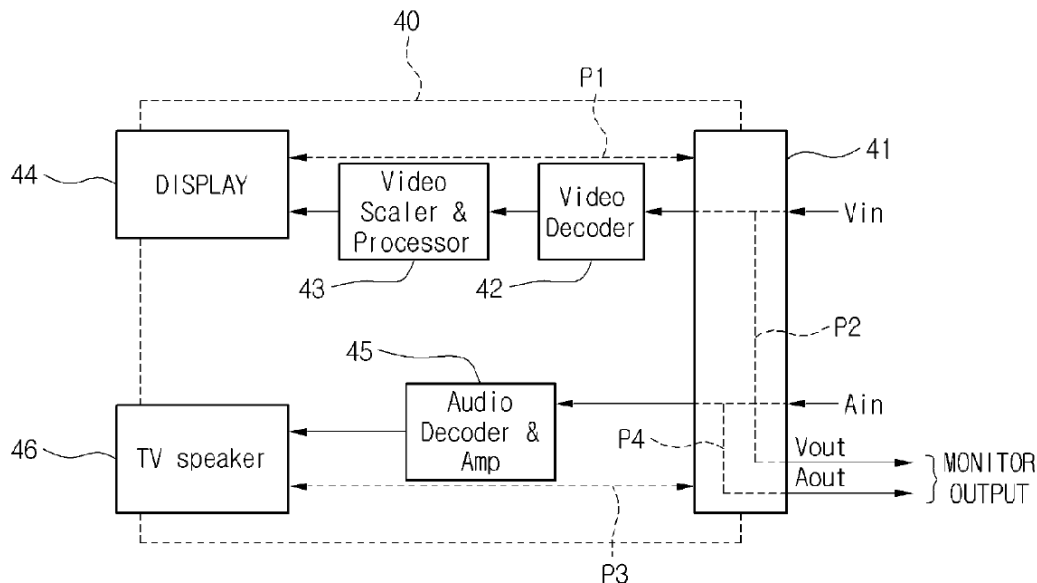
59. The '803 patent, entitled "Audio and Video Synchronizing Apparatus and Method" issued from an application filed on April 10, 2006. Counsel has informed me that this application claims priority to a Korean patent application filed on April 15, 2005. Ex. 1001.

60. At the time of the invention of the '803 patent, a television or a set top (cable) box used with a television, predominantly received encoded video and audio signals from broadcast TV, a cable provider, or a satellite provider.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

61. Referring to FIG. 3 of the '803 patent, it was known that unprocessed video signal V_{in} can be routed to a video decoder 42 through path P1 or to video output port V_{out} through path P2. The unprocessed audio signal A_{in} can be provided to decoder & amplifier 45 or routed to the audio output A_{out} through path P4.

FIG. 3



Ex. 1001 at FIG.3.

62. Assuming the audio and video inputs of a VCR are connected to V_{out} and A_{out} , during VCR recording the video and audio signals as received by the television or STB will bypass the path P1 and the audio decoder & amplifier 45 and are routed directly to the video and audio outputs, V_{out} and A_{out} .

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

63. When the Vin and Ain signals are to be reproduced by the display and speaker(s) of the television, the signals Vin follow path P1 to the video decoder 41 and the signals Ain are provided as inputs to the audio decoder & amplifier 45 to be processed for display on the display 44 of the TV and reproduction through the TV's speaker(s) 46. In this case the signals Vin and Ain do not bypass video and audio processing as evident from Ex. 1001, FIG. 3.

64. Referring further to FIG. 3, a digital TV includes “a video decoder 42 decoding the video signal inputted through the AV switch 41, a video scaler/processor 43 scaling the decoded video signal, converting a format of the signal and then outputting the signal, a display 44 displaying the video signal outputted from the video scaler/processor 43, an audio decoder/amplifier 45 decoding and amplifying the audio signal inputted through the AV switch 41, and a TV speaker 46 outputting the decoded and amplified audio signal.” Ex. 1001 at 4:8-21.

65. Instead of a VCR, the signals Aout can be provided to an external audio amplifier or device (sound bar for example) to enhance the sound quality beyond the sound from only the speaker(s) of the television.

66. When a user connects an external audio device to the audio outputs Aout and views a program on the TV screen, synchronization between the displayed

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

images and the sound from the audio device/remote speaker must be achieved otherwise “the user may have to put up with inconvenience of uncoincident lip-sync when viewing an image through a digital TV while listening to a sound through an audio device by connecting the audio device to the TV.” Ex. 1001 at 6:60-64. One reason is because “it takes relatively long time for the digital TV to process the digital video signal as compared to the time it takes to process the audio signal.” *Id.* at 2:8-10.

67. The '803 patent relates to resolving synchronization issues that arise when different devices having different audio processing capabilities can be connected to Vout and Aout. *Id.* at 2:4-34. The processing capabilities or limitations of the connected device dictate whether processed or unprocessed audio signals are appropriate inputs to the external devices. For example, to ensure audio synchronization of an external audio device/speaker with the video being displayed on the screen of the television the processed audio signals provided to the TV speakers 46 must also be provided to an external speaker connected to Aout to avoid “uncoincident lip-sync.” *Id.* at 5:45-64.

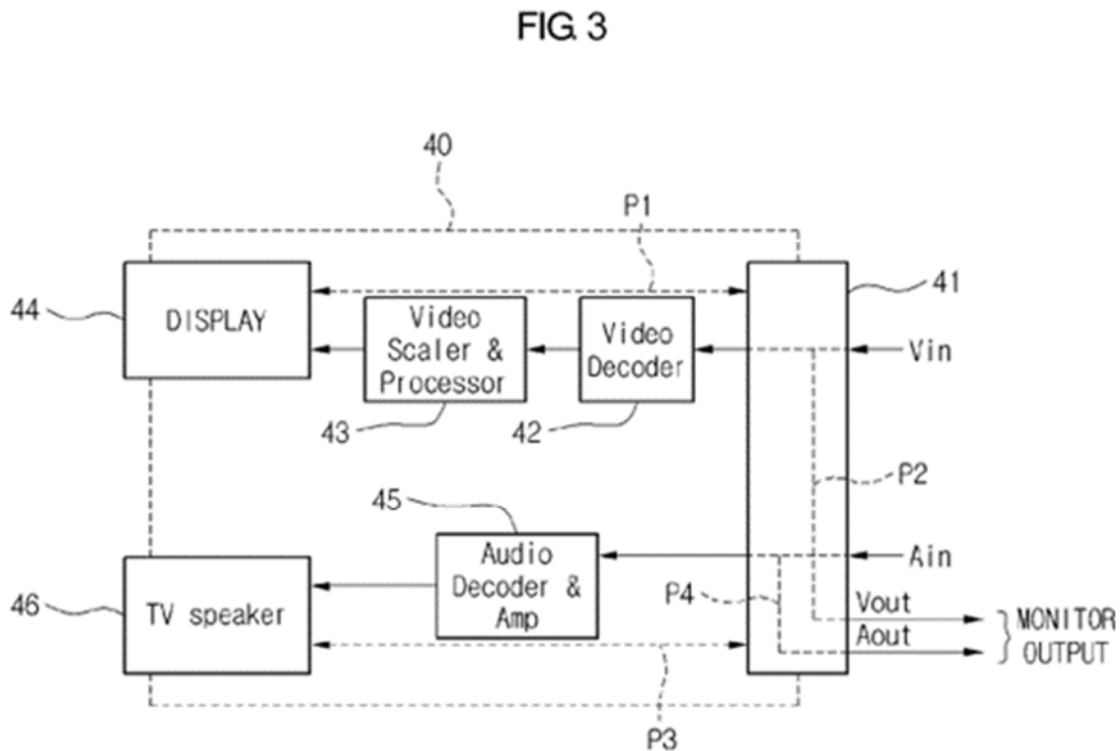
68. As explained below, the solution provided by the '803 patent is to (1) identify the type of external device that is coupled to Vout or Aout and either (2) bypass audio processing if such processing should not be done or is performed

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

internally by the external device, or (3) provide processed audio signals to the external device delayed to match the video displayed on the TV to avoid “uncoincident lip-sync” during reproduction of sound on an external audio device (a speaker). As explained below with reference to Boudreau et al., the prior art had already recognized and solved this issue in a manner that renders obvious the invention of the ’803 patent as claimed.

A. Specification

69. Again, FIG. 3 of the ’803 patent illustrates an audio and video processing unit in a digital TV. *Id.* at 3:55-56.



***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

Ex. 1001, Fig. 3.

70. A digital TV includes an AV switch 41 inputting a video signal (Vin) and an audio signal (Ain), a video decoder 42 and a scaler/processor 43 converting the video signal and outputting it, a TV display 44, an audio decoder/amplifier 45, and a TV speaker 46. Ex. 1001 at 4:3-15.

71. The AV switch 41 controls processing paths of the audio signal and the video signal within the signal processing system. The video signal (Vin) and the audio signal (Ain) are, for example, received broadcasting signals, audio and video signals inputted from an external device, or audio and video signals from, for example, a VCR. Ex. 1001 at 4:16-21. The time required to process the video signal is longer than the time required to process the audio signal. Therefore, the audio signal is delayed synchronizing the video signal and audio signal provided to the display 44 and speaker(s) 46, respectively. Ex. 1001 at 4: 46-58.

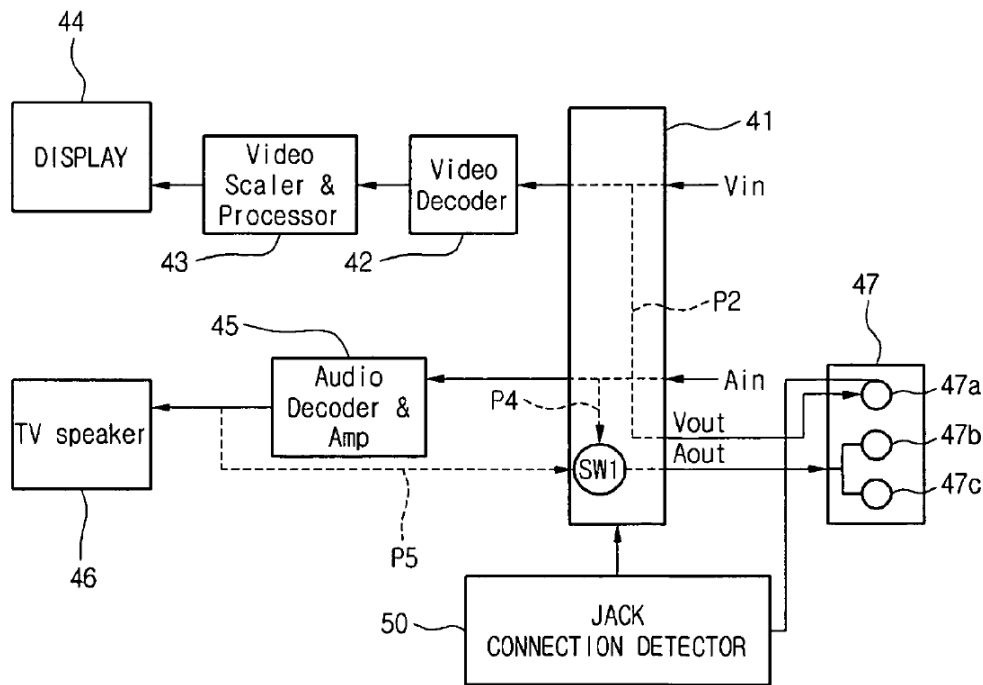
72. Vin and Ain can also be directly routed by the AV switch 41 to monitor outputs Vout and Aout, respectively. This is shown in paths P2 and P4 in Fig. 3. In such an instance the signals provided to the monitor outputs bypass the video and audio processing circuitry and are unaffected by the above-described signal delays. Ex. 1001 at 5:33-39; Fig. 3. Aout and Vout are synchronized at the monitor output ports. *Id.*

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

73. The video signal of the second video path (P2) is synchronized with the audio signal of the second audio path (P4), but the video signal of the first video path (P1) is not synchronized with the audio signal of the second audio path (P4). *Id.* at 5:45-50. Likewise, the audio signal outputted to the TV speaker 46 is not synchronized with the audio signal of the second audio path (P4). *Id.* at 5:51-55. Consequently, an audio system connected to the monitor output port to listen to sound will not be synchronized with images from the TV screen. Ex. 1001 at 5:45-54.

74. Fig. 4 shows a system according to the invention of the '803 patent for also synchronizing an audio signal with a video signal when a user views an image through a TV screen while listening to an external audio system connected to the monitor output port. Ex. 1001 at 5:65-6:17.

FIG. 4



Ex. 1001, Fig. 4.

75. A third audio path (P5) is provided between an output port of the audio decoder/amplifier 45 to Aout. *Id.* at 6:4-17. The third audio path (P5) and the second audio path (P4) are selectively connected to Aout through a selection switch (SW1) to first and second channel audio ports 47b and 47c. *Id.*

76. SW1 is switched by detecting whether or not an external device connected to the monitor connection port is an audio device. Jack connection detector 50 is connected to the video port 47a to detect low (or high) signals according to whether an external device is connected to the video port 47a through

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

a video cable according to a well-known external input automatic detecting circuit for a TV. Ex. 1001 at 6:39-56.

77. If an external device is connected to the video port 47a by a video cable, it is determined that the external device is an audio/video device such as an external AV recording device. Ex. 1001 at 6:57-65. If the external device is not connected to the video port 47a by the video cable, the external device is assumed to be an audio device such as an audio receiver or an external speaker. *Id.*

78. If only an audio device is connected as an external device, the selection switch (SW1) selects the third audio path (P5) through the jack connection detector 50 and transmits an audio signal to the monitor output port 47 so that the video signal outputted to the display 44 and the audio signal outputted to the external audio device connected to the monitor output port 47 are synchronized and then outputted. Ex. 1001 at 7:9-26. Note that the audio signal is also still processed and outputted to the TV speaker 46 and the TV viewer would mute the TV audio for the best audio quality experience. *Id.*

79. If an audio/video device is connected as an external device, the selection switch (SW1) selects the second audio path (P4) according to the jack connection detector 50 and signals are passed from the AV switch 41 to port Aout and port

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

Vout. *Id.* Therefore, the external audio/video device connected to the monitor output port 47 receives synchronized audio and video signals. *Id.*

B. Challenged Claims

80. The Petitioners challenge claims 1-18. Of these, claims 1 and 6-9 are independent apparatus claims directed to an “audio and video synchronizing apparatus.” Claims 10 and 16 are independent method claims directed to “a method of controlling audio and video output.” Claims 2-5 depend from claim 1. Claims 11-15 depend from claim 10. Claims 17 and 18 depend from claim 16.

C. Prosecution History

81. The '803 patent issued on July 19, 2011, from U.S. Application No. 11/401,798 filed April 10, 2006, which claims priority to the Korean Application No. KR 10-2005-0031350, filed April 15, 2005.

82. On September 3, 2009, the Office issued a first Non-Final Rejection under §102 based on KR10-2006-0090099 (IDS provided by Applicant) and objection to drawings that Figures 1-3 should be designated as “Prior Art.” Ex. 1012.

83. The Applicant did not respond on the merits, but rather argued that the applied reference was disqualified as prior art under §102 because the filing date 4/10/2006 of the application is before the published date 8/10/2006 of the applied reference. Ex. 1013.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

84. On January 6, 2010, the Office issued a second Non-Final Rejection under §102 based on AAPA (Applicant Admitted Prior Art -- FIG. 3 of the '803 patent), and a rejection under §103 over the AAPA FIG. 3 combined with Maehara et al. (US 2005/0147129). Ex. 1014. In response, the Applicant argued that FIG. 3 of the application was inadvertently labeled as “Related Art,” and therefore FIG. 3 is not AAPA. Ex. 1015.

85. The Examiner issued a Final Office Action on July 12, 2010. Ex. 1016. He maintained the position that FIG. 3 is AAPA and rejected the claims under §102 based on AAPA FIG. 3 and under §103 over the AAPA FIG. 3 and Maehara et al. (US 2005/0147129). *Id.* In response, the Applicant amended claim 1 to include the limitation “wherein the video signal is output to the display device of the video processing equipment and the audio signal that is synchronized with the video signal is output to the external device simultaneously” and amended independent claims 6-10 and 16 similarly. Ex. 1017.

86. On November 15, 2010, the Examiner again rejected the claims, this time adding new reference Tanaka (US 7,054,544). Ex. 1018. That is, the Office issued a Non-Final Rejection under §102 based on Tanaka and a rejection under §103 over Tanaka in view of Maehara et al. (US 2005/0147129). *Id.* Given the new grounds for rejection the Examiner noted that the prior remarks of Applicant were

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

moot. *Id.* In response, the Applicant amended claim 1 to include “wherein the switching unit selects a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal for output to the external device or selects a second audio signal output from the audio signal processing unit as the at least an audio signal for output to the outputting unit” and amended independent claims 6-10 and 16 similarly. Ex. 1019. On April 1, 2011, the Office allowed the claims in response to the amendment.

VII. CLAIM CONSTRUCTION

87. I have reviewed the '803 patent in its entirety and I do not believe that any terms need to be construed in order for a POSITA, at the time of the purported invention, in light of the claim language, the specification, and the prosecution history, to understand what the terms mean such that the POSITA could determine whether the prior art contains all of the claim elements at issue in the Petition for *Inter Partes* Review.

VIII. OVERVIEW OF THE PRIOR ART

A. U.S. Pub. No. 2004/0117858 – Boudreau et. al. (Ex. 1003)

88. U.S. Pub. No. 2004/0117858 Boudreau et. al (“Boudreau et al.,” Exhibit 1003) indicates on its face that it was filed on December 12, 2002, as patent application Ser. No. 10/318,116 and was published on June 17, 2004. I understand that Boudreau et al. qualifies as prior art under pre-AIA 35 U.S.C. §§ 102(a), (e)

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

and (b) because its publication date (June 17, 2004) is before the earliest priority date of the '803 patent (April 15, 2005) and more than one year before the U.S. filing date (April 10, 2006) of the '803 patent. I also understand that Boudreau et al. was not considered during prosecution of the '803 patent and does not have the same inventors or under a common assignment.

89. For reasons that I will address in more detail below, it is my opinion that, at the time of the alleged invention of the '803 patent, one of ordinary skill in the relevant art would have known to apply the teachings of Boudreau et al. in a manner that renders obvious claims 1-18 of the '803 patent.

90. FIG. 1 of Boudreau et al. is a block diagram of a subscriber television system (STS) 10. Ex. 1003 at [0020]. One example of an STS at the time of the alleged invention is a cable television system.

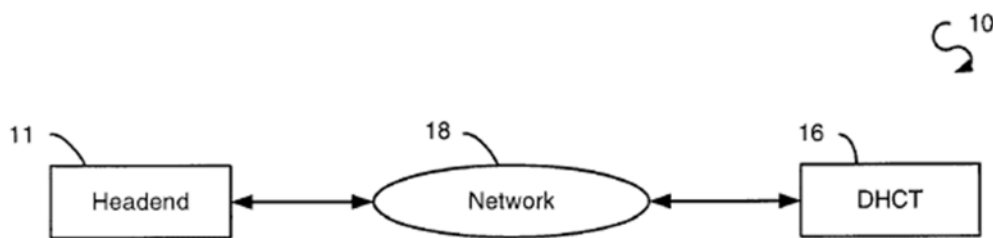


FIG. 1

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

Ex. 1003, FIG. 1.

91. The STS 10 includes a headend 11 and a digital home communication terminal (DHCT) 16 coupled together via a communications network 18 such as cable, satellite and terrestrial-broadcast systems, and local TV stations. *Id.* at [0022]. The headend 11 receives content from one or more content providers and can store and process the content before transmitting it to the DHCT 16 via the network 18. *Id.*

92. The DHCT 16 may be a stand-alone unit, e.g., a set top box, or integrated into a television set. *Id.* at [0021]. The DHCT 16 receives content (video, audio and/or other data) from the headend 11 through the network 18. *Id.*

93. In an embodiment shown in FIG. 2A, Boudreau et al. discloses the combined use of a DHCT 16, television, and a doll 210 embodied as an action figure of a character of a television show viewable on the television. *Id.* at [0023]. The doll 210 includes external circuitry 200 and an audio speaker. *Id.* at [0024].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

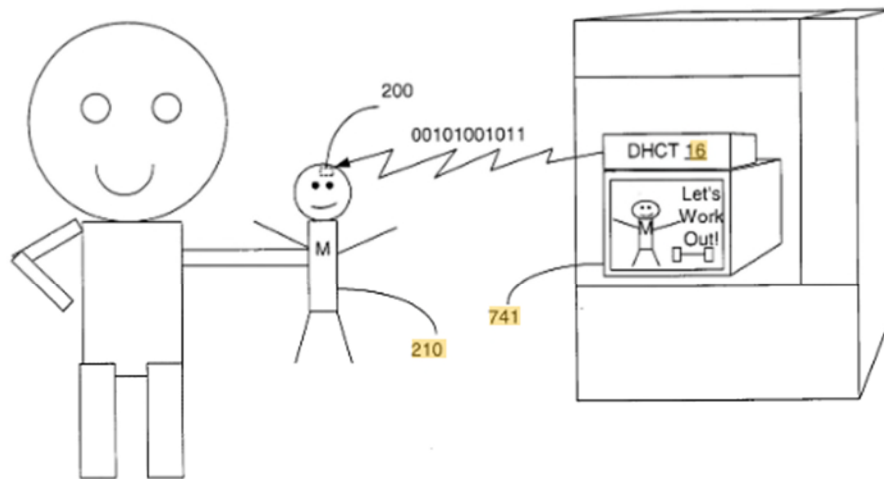


FIG. 2A

Ex. 1003 at FIG. 2A (annotated).

94. In this embodiment, the DHCT 16 and the external device circuitry 200 can be connected physically, such as by cables, or wirelessly. *Id.* at [0007], [0012], and [0093-94]. The doll 210 (which includes the external device circuitry 200) includes the functions of a remote audio device/speaker. *Id.* at [0024].

95. The presentation of content displayed on the television set can be synchronized with the related content presented at the external device. *Id.* at [0016]. For example, the external device can be embodied in the form of an action figure corresponding to a like character on a television show. The action figure can include functionality for providing audio related to the show. *Id.*

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

96. Just as the '803 patent is directed to avoid the “inconvenience of uncoincident lip-sync” when viewing an image through a digital TV while listening to a sound through an external speaker [Ex. 1001 at 5:56-64], Boudreau et al. emphasizes the need for synchronization of the sound from the speaker in the action figure 210 with both the video displayed on the television and the audio from the speaker(s) in the television.

In one implementation, whenever the character on the television show speaks during a particular episode, his or her voice is heard emanating from the action figure associated with the character, alone or in conjunction with the sound (i.e., the character's voice) emanating from the television set. Ex. 1003 at [0016].

97. Boudreau et. al teaches proper “lip synching between the audio content presented in the external device and the corresponding video presented on TV (or between the video and the audio in the presentation on TV).” *Id.* at [0044].

98. FIG. 2A, reproduced below, shows the combination of a TV 741, processing system (DCHT) 16, and an external device 200 (the action figure), which, as will be discussed below, receives processed and/or bypassed audio from the TV processing system to be reproduced by the speaker in the external device 200. Ex. 1003 at [0023].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

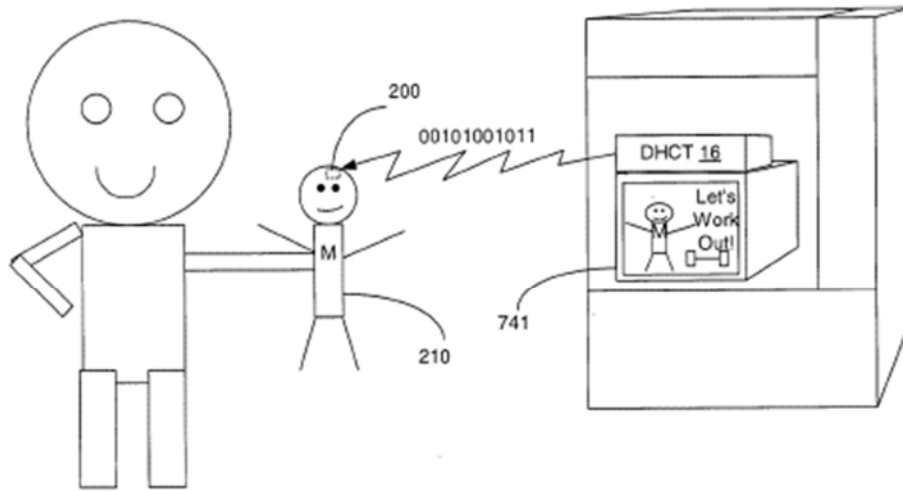


FIG. 2A

Ex. 1003, Fig. 2A.

99. The external device circuitry 700 of the external device (action figure) 200 is shown in FIG. 7B (below) to include a processor 703, memory 704 for storing downloaded content and executable instructions, a speaker 706, an audio decoder 705, and other components known to POSITA. *Id.* at [0097]; FIG. 7B.

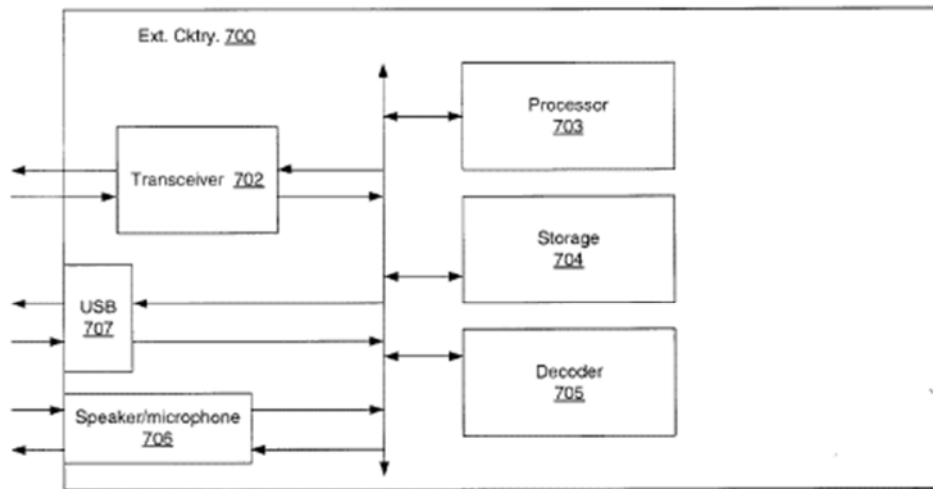


FIG. 7B

Ex. 1003, Fig. 7B.

100. Two types of external devices 200 are disclosed. In a first type (referred to herein as “type 1”), the external device 200 includes decoding functionality. In this embodiment, audio data transmitted to the external device 200 from the DHCT 16 bypasses the decoding processing functionality within the DHCT 16 and is provided to the external device 200 without decoding processing by the DHCT 16. *Id.* at [0065]. This is the type of operation disclosed in the preferred embodiment of the ’803 patent in which signals from Vin and Ain bypass video and audio processing and are directly routed to outputs Vout and Aout because a video device like a VCR is detected as being coupled to Vout.

101. A second type of external device 200 (referred to herein as “type 2”) does not include video and audio decoding functionality and in order to

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

synchronize the audio from the speaker of the action figure 210 with the video and audio provided by the television 741 the audio is decoded and processed within the DHCT 16 and the processed audio is provided to the speaker(s) of the television 741 and to the external device 200. Ex. 1003 at [0063].

102. The DHCT 16 determines if the external device is a type 1 device or type 2 device from data provided by the external device to inform the DHCT 16 of the capabilities of the external device with respect to audio decoding as explained by Boudreau et al.:

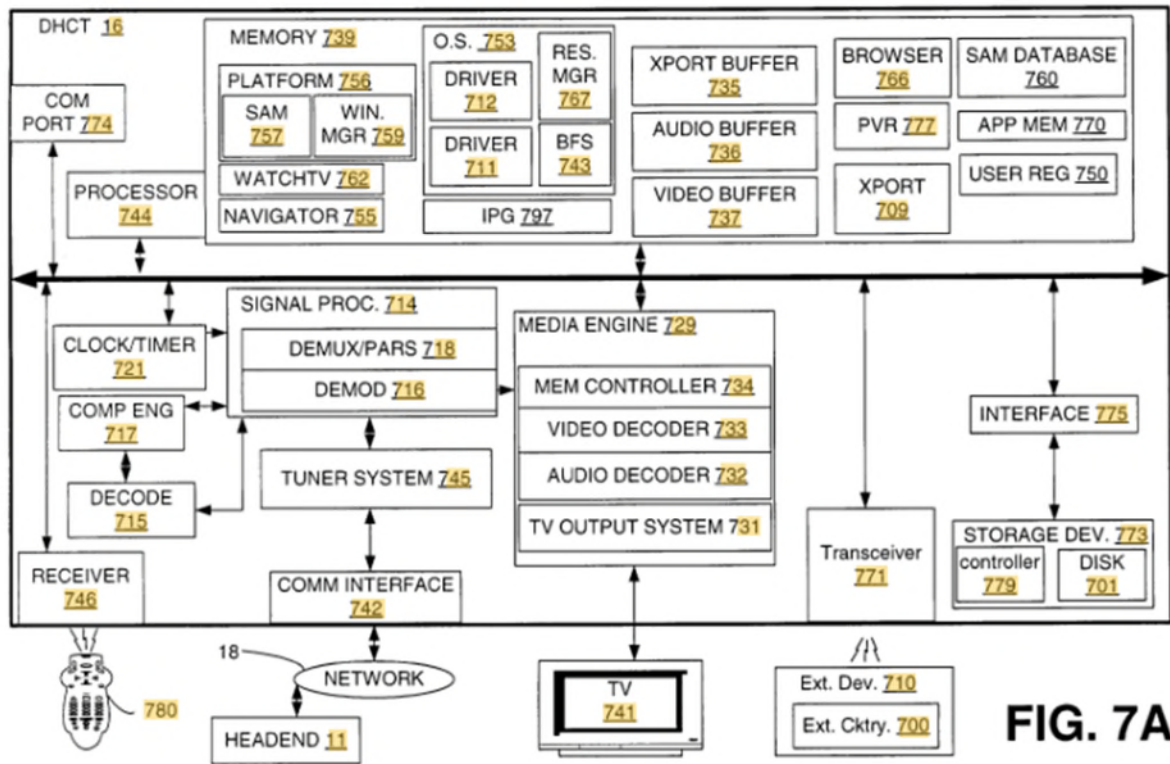
For example, determinations as to when an external device includes decoding functionality can be made based on the received information (i.e., received from the external device 710). *Id.* at [0065].

103. FIG. 7A reproduced below shows an embodiment of the DHCT 16 in which audio signals can bypass the audio processing of the processing system 16 and are outputted to the external device 710 through an output system 731, i.e., “bypass one or more elements of the signal processing system 714 and are forwarded directly to the output system 731 (or transceiver 771).” *Id.* at [0061]. The audio and video can be output for “display on TV 741 or output to the external device 710.” *Id.* at [0056]. Furthermore, “instead of routing the audio to the

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

television set 741, the audio is routed to the external device 710, in some implementations. *Id.*

Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803



Ex. 1003 at FIG. 7A (annotated).

104. Referring to Fig. 7A, synchronized video and audio signals are received from the headend 11 through the network by communication interface 742, passed to tuner system 745, and sent to the signal processing system 714 that separates the audio signal in preparation for audio processing. The audio is not processed until after it is demodulated and demultiplexed into an audio-only signal.

105. Alternatively, audio signals ready for processing can be received from an external source through transceiver 771, *id.* at [0052], as was explained in the FIG 7A discussion above.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

106. After the audio signal is ready for audio processing after DEMUX/PARS 716 (input via the network) or after driver 711 (external input), the audio signals can take two paths within the DCHT 16.

107. The first path (for a type 1 external device) is highlighted in green in annotated Fig. 7A below. The first path bypasses audio processing and is “buffered in the XPORT buffer 735 [without being decoded], routed using the transceiver driver 711 to the local cache for the transceiver 771, and then transmitted to the external device 710, thus bypassing the DHCT decoding functionality due to decoding functionality resident in the external device 710.” *Id.* at [0058]. This enables proper lip-sync with the video displayed on the TV and the audio heard from the external device. *Id.* at [0044].

Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803

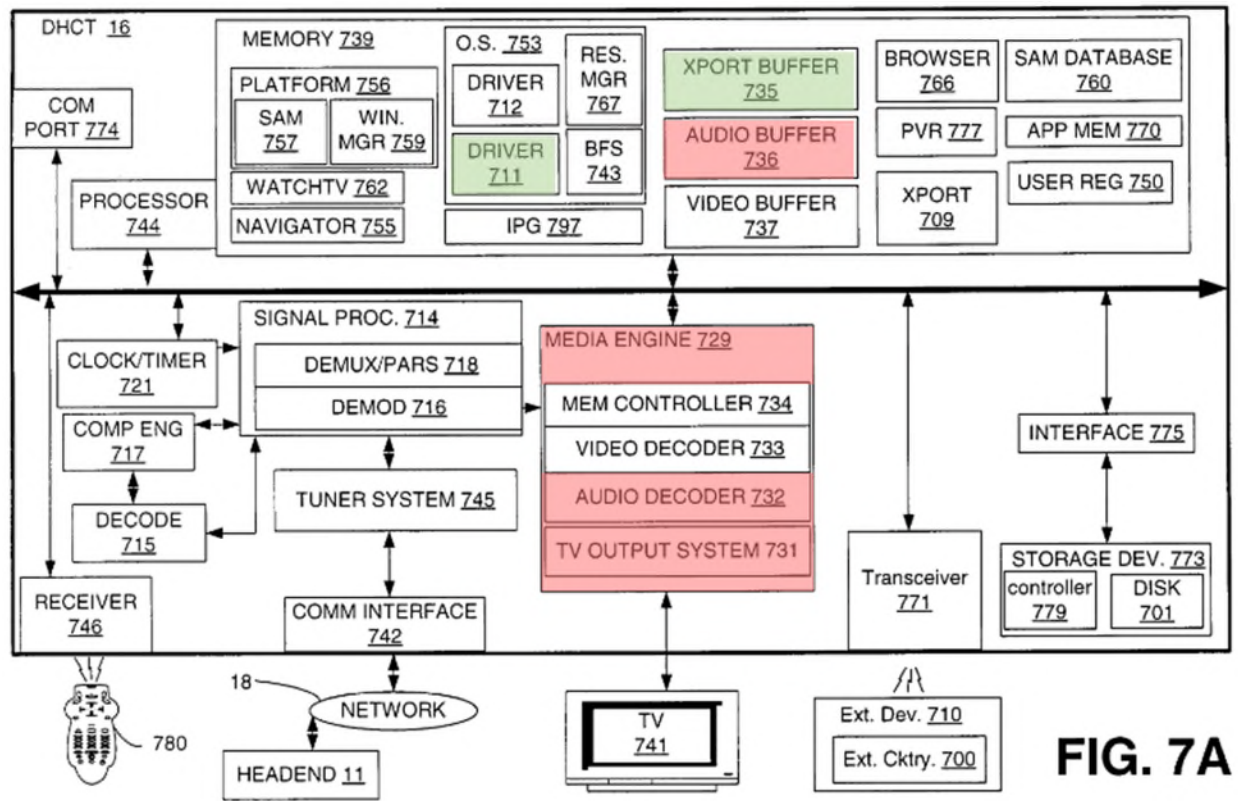


FIG. 7A

Ex. 1003 at FIG. 7A (annotated).

108. A second path (for a type 2 device) is highlighted in red. After the audio signal is ready for audio processing (from signal processing system 714 or transceiver 771), audio processing occurs in the audio buffer 736, and is presented as an input to the media engine 729 for decompression by the audio decoder and decompression engine 732 and routed to the audio output through transceiver 771 (or the TV Output System 731). The processed audio that is provided to the external device 710 is reproduced in a manner synchronized (proper lip-sync) with the audio and video of the television 741. *Id. at* [0060]. Audio signals to be sent

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

to a type 1 external device with audio decoding and processing capability, e.g., the remote speaker of the action figure 200, are not processed by the components highlighted in red in path 2.

109. The DCHT 16 makes the determinations of the type or kind of the external device and performs or bypasses audio processing operations in the DHCT 16 accordingly. *Id.* at [0058], [0065]. Such “determinations as to when an external device includes decoding functionality can be made based on the received information (i.e., received from the external device 710) that is loaded into the transceiver registers. *Id.* The registers can include a device identification that the transceiver driver 711 or operating system 753 can use to determine the characteristics from an internal look up table (not shown), or one or more flag bits received into the registers are recognized by the transceiver driver 711 as indicative of decoding functionality or not.” *Id.*

110. In this manner audio signals can “bypass one or more elements of the signal processing system 714 [and] are forwarded directly to the output system 731 (or transceiver 771).” *Id.* at [0061]. This routing is based upon the type or kind of the external device. i.e., whether it has the capability to decode (process) audio signals.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

111. An XPORT application 709 controls the multimedia system functionality of the DHCT 16. *Id.* at [0072] including providing AV switching functionality. In the preferred embodiment(s), the XPORT application 709 is implemented in software or firmware that is stored in a memory 739 and that is executed by a suitable instruction execution system. *Id.* at [0102]. As Boudreau et al. further explains: “the XPORT application 709 cooperates with” the transceiver driver 711 “to decide whether to **route** [switch] the content from the XPORT buffer 735 to decoding functionality in the DHCT 16 and/or to process (in cooperation with the transceiver driver 711) for transmittal to the external device 710.” *Id.* at [0073], emphasis added.

112. However, the XPORT application 709 can be implemented in hardware, software, firmware, or a combination thereof.

The XPORT application 709 can be implemented in hardware, software, firmware, or a combination thereof. In the preferred embodiment(s), the XPORT application 709 is implemented in software or firmware that is stored in a memory and that is executed by a suitable instruction execution system. If implemented in hardware, as in an alternative embodiment, the XPORT application 709 may be implemented with any or a combination of the following

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

technologies, which are all well known in the art: a discrete logic circuit(s) having logic gates for implementing logic functions upon data signals, an application specific integrated circuit (ASIC) having appropriate combinational logic gates, a programmable gate array(s) (PGA), a field programmable gate array (FPGA), etc.

Id. at [0102].

113. At the time of the '803 patent's priority, digital video/audio transmission was prevalent and, as described by Boudreau et al.'s preferred embodiment, AV processing functionality was implemented with digital circuits and processors running software applications. *Id.* at [0003]. This was preferred over using hardware switches because the audio and video signals already were available in digital form because that was required for other digital video/audio processing functions, i.e. decoding, decompressing, etc. If a "hardware" switch (supporting analog and digital input and output ports) was to be used in a digital TV or Set Top Box at the time of the '803 patent's priority date, it would have required significantly more circuitry and cost. Thus, the XPORT application acts as the AV switch of the '803 patent because the XPORT application is for controlling the "processing paths of the audio signal and the video signal." Ex. 1001 at 4:16-17.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

114. The XPORT application 709 provides functionality for effecting the retrieval of related content from a data stream, routing related content to an appropriate buffer or buffers, and interpreting time stamps for the related content designated for transmittal or download to the external device 710 in association with the presentation of content on the television set 741. The XPORT application 709 provides this functionality in cooperation with other components of the DHCT 16, the headend 11, and the external device 710. *Id.* at [0072].

115. The characteristics of the external device 710 (e.g., decoding functionality, etc.) may be acquired by the transceiver driver 711 with which the XPORT application 709 cooperates to decide whether to route the content from the XPORT buffer 735 to decoding functionality in the DHCT 16 or to the transceiver driver 711 for transmittal to the external device 710. *Id.* at [0073].

116. The XPORT application 709, upon being alerted to the presence of the external device 710, awaits information from the transceiver driver 711 such as the identity of the external device 710 and corresponding performance characteristics, such as the fact that the external device 710 has decoding functionality for audio signals (e.g., as determined by flag bit or bits, unique code, etc.). *Id.* at [0095].

IX. GROUND 1: CLAIMS 1-18 OF THE '803 PATENT ARE UNPATENTABLE UNDER 35 U.S.C. §103 IN VIEW OF BOUDREAU ET AL.

A. Independent Claim 1

- a) Limitation 1[pre]: “An audio and video synchronizing apparatus comprising”

117. Boudreau et al. describes an audio and video synchronizing apparatus, such as DCHT 16, which connects to a TV 741 to display video and provide associated audio such that the video on the TV 741 is synchronized with audio played from the TV’s speaker or from the external audio device/speaker. Ex. 1003 at [0023]-[0024]; Fig. 2A.

118. Video on the TV 741 is synchronized with audio played from a speaker in the external device e.g., doll 210, so that the sound from the speaker in the external doll 210 is heard in synchronization with the video displayed on the TV 741. *Id.* at [0023]-[0024], Fig. 2A. As described by Boudreau et al., “audio is heard emanating from the television set 741 (or from remote speakers for the television set 741) and from the doll 210 (or from only the doll 210)... the audio content... [is] presented in synchronization with the corresponding video.” *Id.*

119. Boudreau et al. discloses element 1[pre].

- b) Limitation 1[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”

120. The Boudreau et al. system includes a video signal processing unit processing a video signal that is provided to a television for display. The

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

combination of the (television) display device 741 and the DHCT 16 comprises the system that is a display device of video processing equipment. “While many conventional DHCTs are stand-alone devices that are externally connected to a television, a DHCT and/or its functionality may be integrated into a television ... as will be appreciated by those of ordinary skill in the art.” Ex. 1003 at [0003]. See FIG. 7A. “The DHCT 16 includes a signal processing system 714, which comprises a demodulating system 716 and a transport demultiplexing and parsing system 718 (herein demux/parse system 718) to process broadcast content.... processing of the input digitized pictures and their respective digitized audio.... presented as input to the media engine 729 for decompression by video decompression engine 733 and audio decompression engine 732 and then output for display on the TV 741.” *Id.* at [0053]-[0058].

121. The demodulating system 716, transport demultiplexing and parsing system 718, media engine 729, and media engine 729 process video signals to provide signals that can be displayed on the TV 741.

122. Boudreau et al. discloses element 1[a].

c) Limitation 1[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

video processing equipment, the audio signal synchronized with the video signal;”

123. Boudreau et al. teaches processing of audio signals that are synchronized with the video signals being displayed on the television. *See* FIG. 7A. “The DHCT 16 includes a “signal processing system 714, which comprises a demodulating system 716 and a transport demultiplexing and parsing system 718 (herein demux/parse system 718) to process broadcast content.... processing of the input digitized pictures and their respective digitized audio.... presented as input to the media engine 729 for decompression by video decompression engine 733 and audio decompression engine 732 and then output for display on the TV 741.” *Id.* at [0053]-[0058].

124. Furthermore, Boudreau et al. teaches that the audio signal is synchronized with the video signal, as a POSITA would recognize was standard practice, “MPEG picture 604 corresponds to a picture on a television screen in which each pixel of the television screen has been illuminated, and an audio elementary stream (not shown) is made up of multiple audio frames, some of which are synchronized with the MPEG pictures for presentation.” *Id.* at [0043]. Additionally, Boudreau et al. teaches “content is to be presented at the external device 710 to provide synchronized audio with the related content presented on the television set 741”. *Id.* at [0069].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

125. Boudreau et al teaches limitation 1[b].

- d) Limitation 1[c]: “a switching unit selecting paths for the video signal that is input to the video signal processing unit and the audio signal that is input to the audio signal processing unit, and selecting at least an audio signal for output to an external device that is not part of the video processing equipment;”

126. Boudreau et al. teaches this limitation, in an embodiment where the switching unit is implemented in software (the XPORT application) routing signals input to the XPORT buffer 735, Audio buffer 736, and Video buffer 737, audio and video processing units, and selecting video and audio outputs to external device 710. “The characteristics of the external device 710 (e.g., decoding functionality, etc.) may be acquired by the transceiver driver 711, which the XPORT application 709 cooperates with to decide whether to route the content from the XPORT buffer 735 to decoding functionality in the DHCT 16 and/or to process (in cooperation with the transceiver driver 711) for transmittal to the external device 710.” *Id.* at [0073].

127. Boudreau et al. teaches limitation 1[c].

- i) Limitation 1[d]: “an outputting unit outputting the selected at least an audio signal to the external device; and”

128. Boudreau et al. teaches an outputting unit that outputs the selected at least an audio signal to the external device. “The DHCT 16 also includes a transceiver 771 that is driven by a transceiver driver 711 in the operating system

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

753 that preferably formats the signal to enable communication to (and from) an external device 710.” *Id.* at [0052]. The audio signal is “output by the signal processing system 714, buffered in video, audio, and/or XPORT buffers 735-737, and presented as input to the media engine 729 for decompression by video decompression engine 733 and audio decompression engine 732 and then output for display on the TV 741.” *Id.* at [0058]. A POSITA would understand that “output for display on the TV” includes audio because of the description of the signal flow including the audio decompression engine 732. Also, Boudreau et al. teaches that the audio is output to the external device: “The show host barks out, “Let's work out”, and this audio is heard emanating from the television set 741 (or from remote speakers for the television set 741) and from the doll 210 (or from only the doll 210).” *Id.* at [0024].

129. Boudreau et al. teaches limitation 1[d].

- j) Limitation 1[e]: “an output selecting unit controlling the switching unit according to a kind of the external device, wherein the switching unit is controlled to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal for output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal for output to the outputting unit.”

130. The underlined portion of this limitation was added to each independent claim by the Amendment filed on March 15, 2001 (Ex. 2019). The addition of this

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

or similar language to each independent claim resulted in their allowance.

Boudreau et al. teaches this limitation. With regard to the “output selecting unit controlling the switching unit according to a kind of the external device” reference is made to the following excerpts 1-4 from Boudreau et al.

(1) “one example implementation for detecting (according to a kind of the external device) an external device and downloading related content to the external device is described, in accordance with one embodiment of the invention.” *Id.* at [0018],

(2) “detection of the external device 710 may be performed by polling mechanisms or interrupt mechanisms associated with the processor 744, which the XPORT application 709, as an application that has registered to receive and/or transmit information from a receiving port, uses to prepare for receiving content from a data stream. The characteristics of the external device 710 (e.g., decoding functionality, etc.) may be acquired by the transceiver driver 711, which the XPORT application 709 cooperates with to decide whether to route the content from the XPORT buffer 735 to decoding functionality in the DHCT 16 and/or to process (in cooperation with

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

the transceiver driver 711) for transmittal to the external device 710.”

Id. at [0073],

(3) “In an alternate embodiment, the DHCT 16 is notified of the external device 710 via a user interface displayed on the television 741, and by the user entering information via his or her remote control device 780, as described previously.” *Id.* at [0073], and

(4) “In other embodiments, the XPORT application 709, upon receiving certain triggers in the data stream (e.g., indicating associated data streams carrying related content available for downloading to the external device 710), can cause the polling mechanisms and information acquiring mechanisms to be activated as opposed to taking a more passive role in the process.” *Id.* at [0073].

131. Boudreau et al. also teaches underlined “wherein” clause that the switching unit is controlled to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal for output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal for output to the outputting unit. This is explained as follows: “XPORT application 709 cooperates with to decide whether to route the content from the XPORT buffer 735 to

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

decoding functionality in the DHCT 16 and/or to process (in cooperation with the transceiver driver 711) for transmittal to the external device 710.” *Id.* at [0073].

Further he explains that “the content designated for the external device 710 can be buffered in the XPORT buffer 735 and processed and routed using the transceiver driver 711 to the local cache for the transceiver 771, and then transmitted to the external device 710, thus bypassing the DHCT decoding functionality due to decoding functionality resident in the external device 710.” *Id.* at [0058]. A POSITA would understand this to mean that the switching unit output can be either a first audio signal that bypasses audio processing functionality or a second audio signal that is processed by audio processing functionality.

132. There are other examples of either processing or bypassing the processing before output to the external device. For example: “The packetized compressed streams can be also output by the signal processing system 714, buffered to the video, audio, and/or XPORT buffers 735-737, and presented as input to the media engine 729 for decompression by the video decompression engine 733 and the audio decompression engine 732 (or bypassing the decoding functionality and processed for transport to the transceiver 771 for transmission to the external device 710).” *Id.* at [0060]. Another example is: “analog signals (e.g., NTSC),” which a POSITA would have understood includes an audio signal, “that

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

bypass one or more elements of the signal processing system 714 and are forwarded directly to the output system 731 (or transceiver 771).” *Id.* at [0061]. Another teaching is: “In embodiments wherein an external device, such as the external device 710, includes decoding functionality, the video, audio, and/or other data comprising the content in the XPORT buffer 735 can bypass the decoding functionality of the media engine 729.” *Id.* at [0065].” A POSITA can easily see that bypassing processing according to a kind of the external device is repeatedly taught by Boudreau et al.

133. Boudreau et al. teaches limitation 1[e].

B. Claim 2: “The apparatus according to claim 1, further comprising a detector detecting the kind of the external device connected to the outputting unit.”

134. Boudreau et al. discloses this claim for the reasons discussed for Claim 1, Limitation 1[e]. *See supra* ¶130(1)-(3).

C. Claim 3: “The apparatus according to claim 1, wherein the kind of the external device connected to the outputting unit is either an audio/video device or an audio device.”

135. Boudreau et al. describes detecting the kind of external device connected and cites an example of an audio device: “the XPORT application 709, upon being alerted to the presence of the external device 710, awaits information from the transceiver driver 711 such as the identity of the external device 710 and corresponding performance characteristics, such as the fact that the external device

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

710 has decoding functionality for audio.” *Id.* at [0095]. “The show host barks out. ‘Let’s work out’, and this audio is heard emanating from the television set 741 (or from remote speakers for the television set 741) and from the doll 210 (of from only the doll 210).” *Id.* at [0024]. A POSITA would understand that the detection and identification capabilities taught by Boudreau et al. is more general including not only an audio device as mentioned, but also an audio/video device, as well as more types of external devices connected to the outputting unit. Boudreau et al. discloses this claim.

D. Claim 4: “The apparatus according to claim 3, wherein the switching unit is controlled to select the second audio signal when it is determined that the external device connected to the outputting unit is the audio.”

136. Boudreau et al. discloses this claim for the reasons discussed for Claim 1, Limitation 1[c] and Claim 3.

E. Claim 5: “The apparatus according to claim 1, wherein the kind of the external device connected to the outputting unit is determined according to whether the external device is connected to a video output port or an audio output port.”

137. Boudreau et al. discloses this claim for the reasons discussed for Claim 3. A POSITA would understand that the detection and identification capabilities taught by Boudreau et al. are more general and include determining whether the external device is connected to a video device port or an audio device. ¶109, *supra*.

F. Independent Claim 6

- a) Limitation 1[pre]: “An audio and video synchronizing apparatus comprising”

138. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[pre].

- b) Limitation 6[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”

139. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[a].

- c) Limitation 6[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal; and”

140. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[b].

- d) Limitation 6[c]: “an output selecting unit selecting an audio signal that is output to an external device that is not part of the video processing equipment,”

141. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[c].

- e) Limitation Claim 6[d]: “wherein the output selecting unit selects a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the audio signal that is output to the external device or selects a second

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

audio signal output from the audio signal processing unit as the audio signal that is output to the external device.”

142. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

G. Independent Claim 7

a) Limitation 7[pre]: “An audio and video synchronizing apparatus comprising:”

143. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[pre].

b) Limitation 7[a], “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”

144. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[a].

c) Limitation 7[b], “an audio signal processing unit outputting an audio signal that is synchronized with the video signal; and”

145. Boudreau et al. teaches this limitation for the reasons discussed in Claim 1, Limitation 1[b].

d) Limitation 7[c], “an audio output selecting unit selecting an audio signal that is output to an external device that is not part of the video processing equipment,”

146. Boudreau et al. teaches this limitation for the reasons discussed in Claim 1, Limitation 1[c].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- e) Limitation 7[d], “wherein the audio output selecting unit selects an audio signal that bypasses the audio signal that is input to the audio signal processing unit or selects an audio signal output from the audio signal processing unit that is synchronized with the video signal as the audio signal that is output to the external device.”

147. Boudreau et al. teaches this limitation for the reasons discussed in Claim 1, Limitation 1[e].

H. Independent Claim 8

- a) Limitation 8[pre]: “An audio and video synchronizing apparatus comprising:”

148. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[pre].

- b) Limitation 8[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”

149. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[a].

- c) Limitation 8[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal;”

150. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[b].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- d) Limitation 8[c], “an outputting unit outputting at least an audio signal to an external device that is not part of the video processing equipment; and”

151. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[c].

- e) Limitation 8[d]: “an output selecting unit controlling the outputting unit according to a kind of the external device, wherein the output selecting unit controls the outputting unit to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal output to the external device.”

152. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

I. Independent Claim 9

- a) Limitation 9[pre], “An audio and video synchronizing apparatus comprising:”

153. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[pre].

- b) Limitation 9[a]: “a video signal processing unit processing a video signal that is provided to a display device of video processing equipment;”

154. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[a].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

- c) Limitation 9[b]: “an audio signal processing unit processing an audio signal that is provided to an audio device of the video processing equipment, the audio signal synchronized with the video signal;”

155. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[b].

- d) Limitation 9[c], “an outputting unit outputting at least an audio signal to an external device that is not part of the video processing equipment;”

156. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[c].

- e) Limitation 9[d]: “a detecting unit detecting a kind of the external device;”

157. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

- f) Limitation 9[e]: “an output selecting unit controlling the outputting unit according to the detected kind of the external device, wherein the output selecting unit controls the outputting unit to select a first audio signal that bypasses the audio signal that is input to the audio signal processing unit as the at least an audio signal output to the external device or to select a second audio signal output from the audio signal processing unit as the at least an audio signal output to the external device.”

158. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

J. Independent Claim 10

- a) Limitation 10[pre]: “A method of controlling audio and video output comprising:”

159. Independent claim 10 is a method version of independent apparatus claim 1. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[c].

- b) Limitation 10[a]: “determining a kind of an external device that is not part of the video processing equipment and is connected to an output port of video processing equipment;”

160. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

- c) Limitation 10[b]: “selecting an audio signal according to a result of the determination and outputting the selected audio signal to the external device,”

161. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

- d) Limitation 10[c]: “wherein the selected audio signal is either a first audio signal that bypasses an audio signal that is input to an audio signal processing unit that synchronizes the audio signal with a video signal that is provided to a display device of the video processing equipment or a second audio signal output from the audio signal processing unit.”

162. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[e].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

K. Claim 11: “The method according to claim 10, determining the kind of the external device comprises determining whether the external device connected to the output port is an audio device.”

163. Boudreau et al. discloses this claim for the reasons discussed for Claims 3 and 5.

L. Claim 12: “The method according to claim 10, wherein the second audio signal is an audio signal that is provided to a speaker of the video processing equipment and synchronized with the video signal.”

164. Boudreau et al. discloses this claim for the reasons discussed for Claim 1, Limitation 1[e].

M. Claim 13: “The method according to claim 10, wherein selecting the audio signal and outputting the selected audio signal to the external device is performed automatically according to a result of the determination.”

165. Boudreau et al. discloses this claim for the reasons discussed for Claim 1, Limitation 1[e]. The selection of the audio signal and outputting the audio signal to the external device is performed automatically according to a result of the determination of the characteristics of the external device 710. “The characteristics of the external device 710 (e.g., decoding functionality, etc.) may be acquired by the transceiver driver 711, which the EXPORT application 709 cooperates with to device whether to route the content from the XPORT buffer 735 to decode functionality in the DHCT 16 and/or to process (in cooperation with the transceiver driver 711) for transmittal to the external device 710.” Ex. 1003 at [0073]. Therefore, this claim element is met.

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

N. Claim 14: “The method according to claim 10, wherein selecting the audio signal and outputting the selected audio signal to the external device is performed according to a user's output mode setting.”

166. Boudreau et al. discloses this claim for the reasons discussed for Claim 1, Limitation 1[e]. and discloses according to a user’s output mode setting as follows:

“a receiver 746 receives externally generated information, such as user inputs or commands from an input device, such as a remote control device 780”, *Id.* at [0052], and “DHCT 16 is notified of the external device 710 via a user interface displayed on the television 741, and by the user entering information via his or her remote control device 780, as described previously.” *Id.* at [0073].

When the user sets the type of device in the user interface, a POSTA would understand that the selection of the external device includes the characteristics to know whether to output processed audio or the bypassed audio to the external device.

O. Claim 15: “The method according to claim 10, wherein the audio signal that is synchronized with the video signal is delayed according to a video signal processing path.”

167. Boudreau et al. discloses this claim. It teaches how the audio signal is delayed or not in all cases (external audio device or the TV speakers) to avoid “uncoincident lip-sync” when viewing an image through a digital TV while

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

listening to the sound through the TV speakers and/or an external audio device.

This is explained as follows: “and this audio is heard emanating from the television set 741 (or from remote speakers for the television set 741) and from the doll 210 (or from only the doll 210). The doll 210 preferably receives this audio content in real-time with the show presentation, but in other embodiments, the audio content can be downloaded to the doll 210 ahead of time and presented in synchronization with the corresponding video for the show when “awakened” by trigger signals sent by the DHCT 16 or according to time stamps interpreted by the DHCT 16 and downloaded to the external device circuitry 200 (or interpreted at the doll 210).”

Id. at [0024]. Further Boudreau et al. teaches: “Related content designated for delivery to the external device 710 can be buffered in the XPORT buffer 735 and then downloaded to a local cache of the transceiver 771 for subsequent delivery that occurs in synchronization with the signals decoded and presented to the television set 741”. *Id.* at [0056].

P. Independent Claim 16

- a) Limitation 16[pre]: “A method of controlling audio and video output comprising:”

168. Boudreau et al. teaches this limitation for the reasons discussed for Claim 1, Limitation 1[c].

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

b) Limitation 16[a]: “selecting an output mode of video processing equipment;”

169. The DCHT 16 makes the determinations of the type or kind of the external device and determines an output mode that either performs or bypasses audio processing operations in the DHCT 16. Such “determinations as to when an external device includes decoding functionality can be made based on the received information (i.e., received from the external device 710) that is loaded into the transceiver registers. The registers can include a device identification that the transceiver driver 711 or operating system 753 can use to determine the characteristics from an internal look up table (not shown), or one or more flag bits received into the registers are recognized by the transceiver driver 711 as indicative of decoding functionality or not.” *Id.* at [0058], [0065].

170. In this manner, one of two output modes is selected. In the first mode, audio signals can “bypass one or more elements of the signal processing system 714 [and] are forwarded directly to the output system 731 (or transceiver 771).” *Id.* at [0061]. In the second mode, the audio output of the external device is processed by the DCHT 16, i.e., audio processing by the DCHT 16 is not bypassed, such that the audio output of the external device is synchronized with the video on the display screen and the audio from the televisions speakers such that when the video shows the host saying “Let's work

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

out ... this audio is heard emanating from the television set 741 (or from remote speakers for the television set 741) and from the doll 210 (or from only the doll 210).” *Id.* at [0024]. This routing, i.e., output mode selection, is based upon the type or kind of the external device. i.e., whether or not it has the capability to decode (process) audio signals.

171. This limitation of claim 16 is rendered obvious by Boudreau et al.

- c) Limitation 16[b]: “selecting an audio signal according to the selected output mode for output to an external audio device that is not part of the video processing equipment;”

172. As discussed with regard to limitation 16[a], the output mode, i.e., a first mode of outputting audio signals that bypass processing in the DCHT 16 or second mode of outputting audio signals processed by the DCHT 16 is selected according to the characteristics of the external device as provided to the DCHT 16. *See*, ¶¶ 109, 110, 169, and 170, *supra*. Consequently, Boudreau et al. renders obvious the subject matter of limitation 16[b].

- d) Limitation 16[c], “outputting the selected audio signal to the external audio device, wherein the selected audio signal is either a first audio signal that bypasses an audio signal that is input to an audio device of the video processing equipment that synchronizes the audio signal with a video signal that is provided to a display device of the video

***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

processing equipment or a second audio signal output from
the audio device.”

173. Boudreau et al. teaches this limitation for the reasons discussed for
Claim 1, Limitation 1[e].

Q. Claim 17: “The method according to claim 16, further wherein the second audio signal is an audio signal that is provided to a speaker of the video processing equipment and synchronized with the video signal.”

174. Boudreau et al. discloses this claim. For example, it teaches that when “[t]he show host barks out, “Let's work out”, ... this audio is heard emanating from the television set 741. *Id.* at [0024].

R. Claim 18: “The method according to claim 16, wherein the audio signal that is synchronized with the video signal is delayed according to a video signal processing path.”

175. Boudreau et al. discloses this claim for the reasons discussed in Claim 15.

X. CONCLUSION

176. For at least the reasons addressed above, it is my opinion that every claim of the '803 patent is invalid as obvious.

177. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place

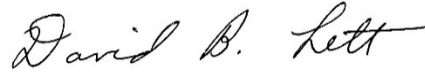
***Declaration of David B. Lett
In Support of Petition for Inter Partes Review of
U.S. Patent No. 7,982,803***

within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

178. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

179. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: November 21, 2022



David B. Lett