Filed on behalf of:

Patent Owner Sightsound
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE, INC.,

Petitioner,

v.

Patent of SIGHTSOUND TECHNOLOGIES, LLC,

Patent Owner.

Case CBM2013-00023
Patent 5,966,440

DECLARATION OF JOHN SNELL IN SUPPORT OF PATENT OWNER SIGHTSOUND TECHNOLOGIES, LLC'S RESPONSE TO PETITION

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Patent Trial and Appeal Board
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I, John Snell, hereby declare as follows:

1. I have been retained by the plaintiff Patent Owner SightSound Technologies, LLC ("Patent Owner" or "SightSound"), to provide assistance and expert testimony in the Covered Business Method Review ("CBM Review") taking place before the Patent Trials and Appeals Board ("PTAB" or "Board") regarding U.S. Patent No. 5,191,573 ("the '573 Patent") and U.S. Patent No. 5,966,440 ("the '440 Patent"). I have personal knowledge of the facts and opinions set forth in this declaration, and if called upon to do so, I would testify competently thereto. My *curriculum vitae* describing my background and experience is attached hereto as Appendix A.

2. This Declaration gives the opinions, and their underlying bases and reasons, about which I may testify further. This report further includes information regarding the validity of the patents in light of Petitioner Apple Inc.'s ("Petitioner" or "Apple") assertions in this proceeding that the patents are anticipated under 35 U.S.C. § 102 and obvious under 35 U.S.C. § 103(a). This report also includes information regarding why one skilled in the art would not find the inventions

disclosed in the patents obvious at the relevant time and further information relating to considerations of non-obviousness, as well as information regarding the advantages of the patented invention over the prior art.

I. Background and Qualifications

3. I am an engineer, and reside and work in San Geronimo, California. I specialize in the design and analysis of microelectronics, software, and systems for recording, playing, synthesis, processing and transferring of electronic media over electronic networks. I have over four decades of experience in electronics engineering, computer science, signal processing mathematics, and the engineering of audio, video and music. I have researched, designed, developed and analyzed the microelectronics and software of numerous digital music and video systems.

4. I studied at Carnegie-Mellon University from 1967–74. My interdisciplinary graduate work through the electrical engineering department at Carnegie-Mellon University was performed with a grant from the National Science Foundation. I earned my Bachelor of Science degree in Electrical Engineering and my Bachelor of Arts degree in Cybernetics (an interdisciplinary program, combining coursework in computer science, signal processing mathematics, physics, music analysis and composition, psychology and physiology of perception as well as audio, video and electrical engineering) at Carnegie-Mellon University. I wrote my first computer program in 1968 on a mainframe computer at Carnegie-

Mellon University, where I took courses in programming, including data structures and software design for real-time systems. I have programmed computers and media processing digital systems at all levels, from high-level code down to assembly language and microcode (including binary, octal and hexadecimal for debugging systems).

5. I worked on the development of a large multiprocessing system and a graphics display processor, as well as analog-to-digital and digital-to-analog audio converters in the Engineering Lab of the Artificial Intelligence Lab at Carnegie-Mellon University in the early 1970s. I co-designed the microelectronics and software of a real-time microwave (wireless) signal analyzer in the mid-1970s.

6. I am the founder (1976) and original editor of the COMPUTER MUSIC JOURNAL,[1] an academic publication of international research on the application of computer science, signal processing mathematics, electronics, software, physics, acoustics and psychology of perception to the composition, recording, editing, and processing of music. Publication of several books[2] resulted from the articles I collected and edited.

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[1] Computer Music Journal, MIT Press.

[2] Revised articles from the COMPUTER MUSIC JOURNAL with new articles edited by John Snell, John Strawn and Curtis Roads were published in 3 books:

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7. I also did research in digital audio and music processing at Stanford University from 1977–1980 at the Center for Computer Research in Music and Acoustics (CCRMA). I worked on the development of the third generation of the CCRMA mainframe computer for editing, signal processing, and playing digital music files, and our computer was connected to the ARPANET.

8. I was a design engineer from 1980–86 at Lucasfilm Ltd., where we designed and developed the microelectronics and software of graphics-based multiprocessor supercomputers for recording, processing, synthesis, editing and transferring of digital music, voices, Foley, and sound effects. In addition to design of the programmable digital mixing console and solid state memory system of our Digital Audio Signal Processor (a.k.a. ASP and SoundDroid), I contributed to the architecture[3] and use of higher-speed circuitry (change from noisy, slower

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FOUNDATIONS OF COMPUTER MUSIC (MIT PRESS 1985), DIGITAL AUDIO Engineering (Kaufmann 1985), and DIGITAL AUDIO SIGNAL PROCESSING (Kaufmann 1985).

[3] Contributions to the architecture included replacement of the traditional single-bus with a dual-bus for faster processing (since most calculations involve dual-operands), touch-sensitive, interactive graphics screen technology for ease of

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TTL to faster, less noise-prone, ECL supercomputer integrated circuitry[4]) for real-time operation. Our ASP/SoundDroid system included static and dynamic random access semiconductor memory (RAM) as well as disk drives for storing digital audio. This multiprocessor system was designed so that multiple channels of digital audio could be transmitted over a private Ethernet (ASPnet) between the

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editing, and use of a hinged paging design for easy troubleshooting access to signals.

[4] Emitter-coupled-logic (ECL) was a faster and cleaner method of electronics design than TTL. Electronic circuitry known as transistor-transistor technology (TTL) was commonly used for digital design in the 1970s and 1980s. Schottky TTL sometimes failed due to its electrical noise and reflections over lines connecting TTL chips. From troubleshooting experience with the noise generated by, and line reflections of, Schottky TTL in developing large digital systems in the 1970s, I realized the need for a faster and more reliable supercomputer technology. Speed was an essential ingredient for real-time processing of media during this period. However, I designed portions of our less speed-critical user interface with more energy-efficient CMOS (complimentary metal-oxide-semiconductor) integrated circuitry, which became the dominant technology for microprocessors.

disk drives connected to the memory systems of the processors. Our Trio project was designed for editing digital audio and video with optical video disks.

9. I designed several real-time multiprocessing systems for processing digital media signals over the last few decades[5 and 6] and wrote a book,[7] which detailed my design of numerous architectures for processing audio and video. In 1989, I was invited to give an international presentation on real-time software design issues in programming multiprocessor systems,[8] which was subsequently published by the Audio Engineering Society. In the 1990s, I worked on the design

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[5] John M. Snell, *Expandable Interactive Real-time Multiprocessor DSP*, Proceedings of the IEEE ASSP Workshop on Applications of Signal Processing to Audio and Acoustics (IEEE Press 1989).

[6] John Snell, *Professional Real-time Signal Processor for Synthesis, Sampling, Mixing & Recording,* PROCEEDINGS OF THE 83RD CONVENTION OF THE AUDIO ENGINEERING SOCIETY (Audio Engineering Society 1987).

[7] John M. Snell, Multiprocessor Architectures & Design Techniques for Media Signal Processing & Synthesis 1991–1995 (Timbre Engineering 1995).

[8] John M. Snell, *Multiprocessor DSP Architectures & Implications for Software*, AUDIO IN DIGITAL TIMES (Audio Engineering Society 1990).

of a supercomputer chip and software for personal home computers, which enabled simultaneous processing of multiple streams of media. This integrated circuit with its software was designed to receive, decode and process digital video, digital audio and graphics while implementing modem connection to the Internet. These systems were designed with static and dynamic RAM (Random Access Memory) as well as non-volatile digital storage.

10. Over the last decade, I worked on the design of a multiprocessing supercomputer system which allowed customers to select their own movies and music over the Internet and have them transmitted from solid state memory to their home over the higher-fidelity cable TV and satellite dish (wireless) networks, including thousands of channels of high-fidelity digital audio and high-definition digital video. I also worked on the design/analysis of smartphone applications involving digital media. I have used the Internet and its predecessor, the ARPANET, since 1972[9] for my research and development work in digital media. I

[9] For example, my first transmission of digital files of music instrument designs with scores to play them was from Carnegie-Mellon University to Stanford University in the early 1970s over the ARPAnet. This was years ahead of the less expressive MIDI standard.

have given lectures and engineering presentations at international conferences, research centers and universities.[10]

11. My experience with music is not limited to microelectronics and software engineering. I have been a musician since early childhood, and my compositions have been played in concerts and over the radio, as well as in live theater and film soundtracks.

12. I served from 1992–95 on the Editorial Review Board of MICROPROCESSOR REPORT. I analyzed the internal design of state-of-the-art digital media processing chips and advanced memory technology for this highly-respected

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[10] I have given lectures and engineering presentations at Audio Engineering Society international conferences, International Computer Music Conferences, Institute of Electrical and Electronics Engineers (IEEE) International Conference on Signal Processing Applications and Technology, Stanford University, Institut de Recherche et Coordination Acoustique/Musique (IRCAM, Paris), University of California, Microprocessor Forum, Eastman School of Music, Northwestern University, DSPx (Digital Signal Processing Conference, San Jose, CA), IEEE Mini/Micro West (San Francisco), WCCF, Mills College and Carnegie-Mellon University.

publication on integrated circuit design for electrical engineers and computer scientists.

13. I was honored by the Audio Engineering Society in 2000 with a Fellowship Award for innovative digital audio engineering design and valuable contributions to the advancement of audio engineering.

14. I have analyzed hundreds of patents since the early 1970s and have served as an expert witness in trial and deposition. I am being compensated at $350/hour for my work on this case. I have not testified at trial or deposition in the past four years.

II. Materials Reviewed

15. In preparing my opinions, I have considered the following materials:

- '440 Patent, its File History and Reexamination History [Exs. 1301, 1302, 1303]
- '573 Patent, its File History and Reexamination History [Exs. 1304, 1305, 1306]
- The Declaration of Scott Sanders [Ex. 2310]
- The Declaration of John Stautner [Ex. 2321]
- The Deposition of David Michael Schwartz, December 9-10, 2013 [Ex. 2324]

- The Deposition of David M. Schartz, February 1, 2001[Ex. 2325]
- The Deposition of John P.J. Kelly, Ph.D., December 4, 2013 [Ex. 2326]
- Recording Industry Association of America Year-End Shipment Statistics for 2008, 2009, 2010, 2011, and 2012 [Ex. 2327]
- Full Written Transcript from 1987 Stanford Lecture [Ex. 2328]
- Article entitled *A Management/Preservation Scorecard*, written by Bill Bolland, and published in the November, 6, 1999 edition of Billboard Newspaper [Ex. 2329]
- Excerpts of Petitioner's SEC filings [Exs. 2330, 2332, 2344 and 2345]
- Apple Press Releases [Exs. 2331, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340 and 2348]
- Excerpts from Apple's Earning Call Transcripts [Exs. 2341, 2342 and 2346]
- Article entitled *Top Music Seller's Store has no Door*, dated April 04, 2008, and published in the Los Angeles Times (available at http://articles.latimes.com/2008/apr/04/business/fi-itunes4) [Ex. 2343]

- Online article entitled *How iTunes Works*, written by Julie Layton and Jonathan Strickland (available at http://electronics.howstuffworks.com/itunes5.htm) [Ex. 2347]
- Screenshots obtained from Apple's website [Exs. 2350 &2351]
- Steven Dupler, *Joint Telerecording Push: CompuSonics*, AT&T Link, Billboard, vol. 97, no. 40, Oct. 5, 1985 ("Dupler article") [Ex. 4309]
- David Needle, From the News Desk: *Audio/digital interface for the IBM PC?*, InfoWorld, vol. 6, no. 23, p. 9, June 4, 1984 ("Needle article") [Ex. 4310]
- Larry Israelite, *Home Computing: Scenarios for Success*, Billboard, Dec. 15, 1984 ("Israelite article") [Ex. 4311]
- "Digital Audio Telecommunication System" diagram, © 1985 [Ex. 4315]
- David Schwartz, July 16, 1984 Letter to CompuSonics' Shareholders, July 16, 1984 ("Schwartz 1984 Letter") [Ex. 4316]
- Hyun Heinz Sohn, *A High Speed Telecommunications Interface for Digital Audio Transmission and Reception*, 76th AES Convention, Oct. 1984 ("Sohn article") [Ex. 4317]

- David Schwartz, October 10, 1985 Letter to CompuSonics" Shareholders, Oct. 10, 1985 ("Schwartz 1985 Letter") [Ex. 4318]
- CompuSonics Video, *Application Notes: CSX Digital Signal Processing* 1986 ("Application Note") [Ex. 4319]
- "Digital Audio Software Production/Distribution" diagram [Ex. 4320]
- U.S. Patent No. 4,682,248 ("Schwartz patent") [Ex. 4323]
- Brian Dumaine, *The Search for the Digital Recorder*, Fortune, p. 116, Nov. 12, 1984 (Dumaine article") [Ex. 4324]
- Excerpts from 1987 Stanford lecture ("Stanford lecture") [Ex. 4321]
- International Patent Application W085/02310 ("Softnet patent") [Ex. 4312]
- United States Patent No. 3, 718,906 ("Lightner patent") [Ex. 4313]
- United States Patent No. 3,990,710 ("Hughes patent") [Ex. 4314]
- U.S. Patent No. 4,124,773 ("Elkins patent") [Ex. 4330]
- U.S. Patent No. 4,667,008 ("Kramer patent") [Ex. 4331]
- U.S. Patent No. 4,528,643 ("Freeny patent") [Ex. 4332]
- Photograph of CompuSonics equipment [Ex. 4333]

- Declaration of John P. J. Kelly [Ex. 4334]
- Declaration of David Schwartz [Ex. 4335]
- Special Master's Report and Recommendation On Claim Construction dated Nov. 19, 2012 in the matter of SightSound Technologies, LLC v. Apple, Inc. ("Claim Construction Recommendation") [Ex. 4336]
- Order re Claim Construction dated 2/13/13 in the matter of SightSound Techs., LLC v. Apple Inc. [Ex. 4337]
- *New Telerecording Method for Audio,* Broadcast Management/Engineering, (Oct. 10, 1985) [Ex. 4342]

III. The Hair Patents

16. I am very familiar with the background of the technology to which the '573 and '440 patents (collectively the "Patents") relate and the problems they solved. My testimony on this issue is based on my review of the Patents and their prosecution and reexamination histories, as well as my own specialized knowledge of this field of technology, acquired through my education and decades of professional experience.

17. On March 2, 1993, the United States Patent and Trademark Office ("PTO") issued United States Patent No. 5,191,573. The '573 Patent claims priority to an application, Serial No. 206,497, that was filed on June 13, 1988. The

'573 Patent underwent reexamination, and the PTO confirmed the validity of all six claims of the '573 Patent by issuing a reexamination certificate, U.S. Patent No 5,191,573 C1, on November 30, 2010. No claims from the '573 Patent were amended or cancelled during reexamination.

18. The PTO further issued U.S. Patent No. 5,966,440 ("the '440 Patent") on October 12, 1999. The '440 Patent is a continuation of the application that gave rise to the '573 Patent and also claims priority to the same application, No. 07/206,497, that was filed on June 13, 1998. The '440 Patent also underwent reexamination. Among other things, the PTO confirmed the validity of claim 1, as amended, and the '440 Patent was amended to include new claims 64 and 95. The PTO issued a reexamination certificate, U.S. Patent No. 5,966,440 C1, on June 27, 2010.

19. The Patents generally relate to the field of electronic sale and distribution of digital audio or digital video. More specifically, the patented technology pertains to business methods associated with the transmission of digital audio or digital video via telecommunications lines to non-removable memory storage owned by a customer.

A. The '440 Patent and Claims at Issue

20. The '440 Patent discloses a method to sell digital music and digital video files over telecommunication lines, allowing the purchaser/user to pay per

file and download the file to his or her non-removable memory storage such as a hard disk, which allows for playback.

21. The '440 Patent is directed to "a system and associated method for the electronic sales and distribution of digital audio or video signals, and more particularly, to a system and method which a user may purchase and receive digital audio or video signal from any location which the user has access to telecommunications lines." '440 patent at 1:16-21.

22. In describing the sales, distribution and transferability of music at or prior to the filing date, the '440 Patent discusses a number of drawbacks to then-current music media: records, tapes and compact discs (collectively, "the prior art hardware units"). *Id.* at 1:24-2:13. From a capacity standpoint, the '440 patent discloses that the prior art hardware units were limited in the amount of music that can be stored on each unit. *Id.* at 1:27-29. The prior art hardware units also limited a user's ability to play, in a user-selected sequence, songs from different albums. *Id.* at 1:38-43. In contrast, the '440 Patent disclosed the methods that permitted the download of individual songs rather than albums. From a sales and distribution standpoint, the '440 Patent describes the need to physically transfer the prior art hardware units such as compact discs, cassettes or records from the manufacturing facility to the wholesale warehouse to the retail warehouse to the retail outlet prior to final purchase, resulting in lag time between music creation

and marketing as well as the resulting transfer and handling costs. *Id.* at 1:45–51. Before the '440 Patent, customers were required to physically go to retail locations to get selected songs. *See id.*

23. At the time of the invention, there were numerous ways for consumers to purchase audio and video content. The primary method for consumers to purchase music was to make a purchase of records, tapes and CDs at a retail store with cash, check or credit card. Consumers could also order music on hardware units from catalogues and pay with a check or credit card. Consumers could subscribe to cable channels and watch video movies (*e.g.* Showtime, HBO) broadcasted at certain times of the day. Rather than allowing consumers to download and store digital video recordings, pay per view allowed access to content (a code to unscramble content) broadcasted at certain times of the day. Consumers could also rent video cassettes from video rental stores (*e.g.* Blockbuster).

24. The specification of the patent both envisioned and provided for an improved methodology to electronically sell, distribute, store, manipulate, retrieve, play and protect distortion-free digital audio and video files. *Id.* at 2:40-44. The benefits taught by the specification include easy recall of stored music for playback as selected or programmed by the user, changing the playback order of stored music based on different criteria, such as music category, artist, or user's favorite

songs, and the random playback of music based on the user's selection. *Id.* at 2:44–61. The patented method envisioned both a break from and how to break from the distribution of prior art hardware units sold as albums.

25. For protection from piracy, the '440 patent discloses that digital audio and video files can be transferred from a source authorized by the copyright holder to sell and distribute the digital files. *Id.* at Figure 1 & 2:62-3:6. In short, the claimed invention provides a new method of selling and distributing music over telecommunications lines, that reduces the time between music creation, music marketing and music sale that broke with the dependence of hardware units and "album only" sales and play back.. *Id.* at 3:6-13.

26. I understand that claims 1, 64 and 95 of the '440 Patent are at issue in this proceeding. Decision, *Apple Inc. v. SightSound Techs., LLC*, Paper No. 12, CBM2013-00023, at 32 (Oct. 8, 2013). Claim 1 of the '440 Patent is directed to the electronic sale of digital video or digital audio signals. The electronic sale and distribution is accomplished by: (1) forming a connection, through telecommunications lines, between a first party's first memory and a second party's second memory; (2) selling the desired digital video or digital audio signals to the second party by charging a fee through the established connection; (3) transferring the desired digital video or digital audio signals from the first memory to the second memory via the established connection, all while the second memory

is in the possession and control of the second party; (4) storing the transferred digital video or digital audio signals in a non-volatile storage portion of the second memory, wherein the non-volatile storage portion is not a tape or compact disc; and (5) playing the stored digital video or digital audio signal. '440 C1 Patent at 1:33-64. Three amendments were made to claim 1 of the '440 Patent because of the '440 reexamination. *See id.* Two of those amendments focused on the attributes of the second memory: (1) "storing the desired digital video or digital audio signals in a non-volatile storage portion the second memory" (*Id.* at 1:55-57); and (2) "wherein the non-volatile storage portion is not a tape or CD" (*Id.* at 1:63-64). The third and final amendment pertained to the location of the parties and the method for selling the digital video and digital audio signals: "the second party is at a second party location and the step of selling electronically includes the step of charging a fee via telecommunications lines by the first party to the second party at a first party location remote from the second party location, the second party has an account and the step of charging a fee includes the step of charging the account of the second party." *Id.* at 1:42-49.

27. Claims 64 and 95 were both added during the '440 reexamination. Ex. 4303 at 594 (adding claim 64), 924-25 (adding claim 111, which issued as claim 95). Claims 1, 64 and 95 all include "charging a fee via telecommunications lines by the first party" which includes "charging the account of the second party."

Id. at 1:43-49, 8:26-31, 13:28-34. In comparison to claim 1, claims 64 and 95 describe additional attributes of the second memory and the second party's location. *See* '440 C1 Patent at 8:14-44, 13:15-51. Claim 64 adds the requirement that the second memory include a "second party hard disk." *Id.* at 8:19-20, 39, 41-42. Claim 95 adds two additional requirements: (1) that the second memory include a "second party hard disk" (*Id.* at 13:23, 49, 50-51); and (2) that the second party control unit, which houses the second memory, be placed at a "desired second party location determined by the second party" (*Id.* at 13:20-21).

28. The specification makes abundantly clear that the invention precluded removable physical storage media as a second memory. *See* Figure 1 ("hard disk" as second memory). It discussed the host of inefficiencies associated with removable media which was a problem solved by the invention, including that the removable physical media were prone to limited storage capacity, damage and deterioration, low sound quality, and copyright infringement; and the sale and distribution of physical media was time consuming, costly, and wasteful. *See id.* at 1:16-2:13. The '440 Patent's novel method of electronically selling and distributing digital video and digital audio signals directly to a non-removable storage medium rendered these problems moot and rendered unnecessary the time and costs associated with manufacturing, packaging, shipping, and finally shelving the removable physical media at a brick-and-mortar location. *See id.* at 1:45-54,

2:40-48. At the time of the invention, the non-removable second memory storage primarily contemplated was a hard disk as pictured in Figure 1 (indeed claims 64 and 95 specifically require that the second memory include a hard disk). This is in contrast to the primary mobile prior art hardware of tapes used in connection with portable tape recorders like the "Walkman." Additionally claim 1 requires that the "second memory" include a non-volatile storage portion that is not a tape or CD. One of ordinary skill in the art would understand that these '440 Patent "second memories" exclude removable storage mediums, such as records, tapes, CDs, cassettes, cartridges, optical disks and floppy disks and are limited to non-removable memory such as a hard disk.

B. Claim Construction

29. I understand that the Board has adopted the following interpretations of terms in the '440 Patent.

Term	Interpretation
"first party"	A first entity, whether a corporation or a real person.
"second party"	A second entity, whether a corporation or a real person.
"second party control unit"	Control unit of the second party.

"second party hard disk"	A permanent, rigid, magnetic storage device of the second party.
"telecommunications lines"	An electronic medium for communicating between computers
"electronically"	through the flow of electrons
"connecting electronically"	Connecting through devices or systems which depend on the flow of electrons
"transferring electronically"	Transferring through devices or systems which depend on the flow of electrons.
"charging a fee"	Requesting payment electronically.
"selling electronically"	Providing a product or service electronically in exchange for providing payment electronically (i.e., through devices or systems which depend on the flow of electrons).
"digital audio signal"	Digital representations of sound waves.

IV. Level of Ordinary Skill

30. I believe the level of ordinary skill relevant to the '440 Patent would be an individual with an undergraduate degree in electrical engineering or computer science and/or approximately 2–4 years of industry experience in the design of systems and methods for storing and transmitting digital information.

V. Advantages of Patented Methods over prior modes of distributing music.

31. I believe the patented methods had several advantages over the prior modes of distributing and selling music. In my opinion, there were several benefits to selling music electronically as claimed and described in the Patents, over the prior art methods of sale which required the sale of removable physical media—such as records, cassette tapes, cartridges, VHS tapes, optical disks and CDs. Moreover, the cost, warehousing, management of physical inventory, and distribution of such removable physical media made the delivery of single songs impractical. Floppy disks had the same limitations as cassettes, VHS tapes and CDs, and I was unable to determine any indication from the materials I reviewed that a floppy disk with music or audio content was ever sold. Further, based on my experience, I do not believe that a floppy disk was ever a commercial medium for music, audio or video content.

32. The patented methods have several advantages over the prior modes of distributing digital music and digital video, including the combination of deterioration and damage, greatly increased flexibility of retrieval, easier sales and improved distribution, improved audio fidelity and copyright protection, as noted in the first 3 columns of the '440 Patent.

33. The fidelity of audio and video in removable media is typically inferior to audio and video in internal computer storage, where the media is protected. For example, compact discs and DVDs skip or get stuck and have to be restarted, due to oil left from fingers touching the playing surface or to leaving them out of their protective shells, where they may be scratched or collect dust. Even a new disk has errors which the player masks or conceals, resulting in a loss in fidelity.

34. The signal to noise ratio and distortion of even a new audio cassette tape is inferior to that of digital audio recorded with well-designed equipment. An audio signal is recorded in a magnetic coating on a tape. Magnetization is transferred between adjacent windings of the tape on a reel if it is not played for long periods of time. Eventually one can hear the previous or next loud section of music during a quiet moment of music. With each playing, the delicate magnetic tape is pressed against a hard playback head, which slowly wears the coating and degrades the magnetized audio signal over time. When the tape becomes tangled in the playback mechanism, it is often stretched or wrinkled. Tape stretching introduces wow and flutter, and wrinkling of the tape causes distortion in the music.

35. The signal to noise ratio and distortion of even a new record is inferior to that of digital audio recorded with well-designed equipment. An audio signal is

recorded in deformations from the spiral groove in a plastic record. The previous or next loud section of music is sometimes audible in an adjacent groove of quiet music. With each playing, the record player needle degrades the audio signal, as it scrapes, effectively filing or smoothing, the deformations in the shape of the plastic groove in the record. Scratches caused by human handling—or placing and bouncing the needle in the groove—produce objectionable clicks and pops. A record sometimes becomes stuck in a groove, repeating the last few seconds until someone comes to move the needle to the next groove, interrupting the musical experience. Audible distortion may result from oil, food, and other residue on finger tips which touch the surface of the record, or from leaving them out where they collect dust and may be scratched.

36. The quality of digital audio copied into the Patents' internal storage is more reliable and less subject to degradation because the storage media is not handled by humans each time they access the media. This is particularly relevant to flexible playback because with internal storage the song selection can be electronically cued as opposed to physically switching out prior art hardware units (CDs etc).

37. With previous music distribution on CDs, cassettes, cartridges and records, customers had to purchase whole albums in a fixed order, instead of just songs of music one desired, and playback was typically the whole album in the

order fixed by the artist rather than the user. In custom duplicating machines, the order in which the music was stored on a removable medium was fixed after the user selected his pieces and order of playback because removable hardware was used. The "mixed tape" or "party tape" was a popular early version of this but it was still a fixed version on a prior art hardware unit. Even the "mixed tape" or "party tape" required considerable consumer time to set up and then was fixed. A long felt need existed for a methodology that allowed for the flexibility disclosed by the '440 Patent. The '440 patented method allowed the user to change which pieces he or she wanted to hear at any time, and in which order they would be played, without having to change a CD, etc. each time he or she changed which previously purchased pieces would be played, or in which order they would be played. Such customer accommodation led to increased sales.

38. The sale and distribution of digital music over telecommunication lines and digital storage allowed effective copyright and piracy protection so that the creators and the distributor are paid under the '440 patented method.

39. The ability to purchase and receive music and video over a telecommunication line allows customers to shop anytime, not just during store hours, and pieces of music are never out of stock. Shopping by computer also allows customers to search for music by title, composer, musicians, genre and date. Searching through endless rows and bins of CDs and cassettes took hours,

sometimes not finding the music one wanted. The patented method allowed for the ease and flexibility in selecting and purchasing music with the ability to purchase only the pieces of music one wants and being able to hear this music quickly in the comfort and quiet of one's home, all contributing to increased sales.

40. The '440 Patent eliminated the need for transportation through traffic to a physical store, and waiting in a cashier's line for customers to pay for their purchases, saving consumers hours of their valuable time.

41. The '440 Patent described the need to physically transfer prior art media from the manufacturing facility to the wholesale warehouse to the retail warehouse to the retail outlet prior to final purchase, resulting in lag time between music creation and marketing as well as the resulting transfer and handling costs.[11] By teaching the sale and distribution of digital music over a telecommunication line to non-removable memory such as a hard drive, the '440 Patent removed the added cost of manufacturing removable media like CDs and the related tooling costs, as well as the cost of distribution trucks and their fuel. By shifting the paradigm from removable hardware sold in a store the need for warehouses, middle salesmen, stores, distribution trucks and their fuel, a larger percentage of

[11] '440 Patent at 1:45-54.

the royalties could go to the creators of the music, or be realized as profit for the distributor of the music.

42. The '440 Patent provided for advantages of selling, purchasing, and distributing digital music and digital video over telecommunication lines to non-removable memory (*e.g.*, hard drives), resulting in a dramatic shift in the audio market as music stores which sold records, cassette tapes and CDs were replaced by Internet sale of downloadable music and flexible playback by the end user.

VI. The CompuSonics System and Publications

43. I understand that CompuSonics created high end stereo equipment for consumers, specifically, devices referred to as DSPs (digital signal processors) that were intended to replace traditional tape recorders using digital quality. I also understand that CompuSonics focused on developing compression technology. I have reviewed the Declaration of John P. Stautner and the statements in his declaration comport with my understanding of CompuSonics, its business and its technology. CompuSonics sold digital recorder/players referred to as DSPs, which were intended to be a "direct replacement" for traditional stereo components, including replacing CDs with "super floppy" disks. CompuSonics DSPs were intended to be used for (1) archiving a consumer's favorite record or tape on a removable digital copy; (2) home music editing; (3) live recording of music; and (4) miscellaneous professional uses such as playing sound effects and library

archives. I understand CompuSonics' so-called "telerecording" technology was not available on any commercially available DSP.

44. I have also reviewed the exhibits submitted by Apple in this proceeding relating to the so-called "CompuSonics system" or the "CompuSonics publications" and have concluded that when viewed by one of ordinary skill in the art, they do not disclose claims 1, 64 and 95 of the '440 Patent. Further, it is unlikely that many of the "CompuSonics publications" would have been reviewed by those of ordinary skill in the art at the time, who would have been much more likely to read articles published by the Institute of Electrical and Electronics Engineers (*e.g. IEEE Transactions on Acoustics, Speech and Signal Processing*, *IEEE Computer*, *IEEE Micro*), Association for Computing Machinery (e.g. *Journal of the ACM*), AES (e.g. *Journal of the Audio Engineering Society*), MIT Press (e.g. *Computer Music Journal*), ASA (e.g. *Journal of the Acoustical Society of America*), or the Society of Motion Picture and Television Engineers (*SMPTE Journal*). Other related publications read by those of ordinary skill in the art at the time included *Science*, *Scientific American*, *Physics Today* and trade journals like *EE Times*, and *Computer Design*, or popular magazines like *DDJ*, *Byte*, *Macworld*, *PC Magazine*, *The Absolute Sound* and *Stereophile*. However, it is unreasonable to require microelectronics design engineers and computer scientists to have read articles in *Billboard Magazine* (Exs. 4106 & 4108), an article from *Fortune*

Magazine (Ex 1119), and letters to CompuSonics Shareholders which were likely only available to shareholders (Exs. 4113, 4115 & 4116). Although *Billboard* was read by pop musicians and marketing and advertising specialists interested in pop music, microelectronics design engineers and computer scientists did not consider *Billboard* a credible source of mathematics, microelectronics, semiconductor material science, physics, audio engineering, video engineering, or computer science information. Overloaded engineering schedules did not leave time to waste seeking engineering guidance, much less "Futurama" speculation, from magazines like *Billboard* and *Fortune*.

45. Exhibit 4309 discloses a removable floppy disk as a consumer memory. This removable floppy disk would not meet the objectives of the '440 Specification described herein; and it therefore does not anticipate the claims of the '440 Patent. The removable floppy disk would not meet the express "hard disk" requirement of claims 64 and 95 and it therefore does not anticipate those claims. Exhibit 4309 also fails to disclose "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party" and on that basis does not anticipate claims 1, 64 and 95. Moreover, Exhibit 4309 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

46. In Exhibit 4310, InfoWorld incorrectly stated that the "CompuSonic DS-1000" (*sic*) system "will allow the user to route music through the IBM PC" and that "you would be able to download music onto your PC in the same manner as other digital information." InfoWorld was known for reporting on business computing, yet was not a publication engineers would look to for guidance in designing digital music processing equipment. Although PCs were capable of controlling signal processing equipment, routing music through a 1984 IBM PC resulted in clicks, pops and other forms of distortion, due to inadequate processing speed. Further, the idea of "routing music through an IBM PC" was not something that CompuSonics was pursuing according to John Stautner because they understood that the storage capacity and computational capacity was superior on the DSP as compared to a PC. Stautner Decl., ¶ 22. Rather than storing music in a PC, the CompuSonics DSP-1000 enabled music to be stored on a removable floppy diskette which was part of the CompuSonics equipment. The CompuSonic DSP-1000 system described would, at best, replace a CD player for playing digital music, but would read floppy disks with severely limited storage capacity, rather than CDs. CompuSonics did not suggest that the DSP-1000 would use a non-removable hardware unit. Additionally, Exhibit 4310 fails to disclose "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party" and on that basis does not

anticipate claims 1, 64 and 95. Furthermore, Exhibit 4310 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

47. Exhibit 4311 fails to disclose "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party" and on that basis does not anticipate claims 1, 64 and 95. Exhibit 4311 also fails to disclose a non-removable hardware unit for storage and therefore does not anticipate the claims of the '440 Patent. The removable floppy disk would also not meet the express "hard disk" requirement of claims 64 and 95 and it therefore does not anticipate those claims. Exhibit 4311 suggests that with the improvements in shipment of data, customers, "in the not-too-distant future [...] will be able to buy music at home" by using a cable service and paying, long after the step of downloading the music, an "itemized monthly cable service bill." Ex. 4311 at 4. After a cable service bill was mailed, the consumer would pay for their monthly subscription service with a check, cash, or by writing down and mailing a credit card number. The music ends up on a removable floppy disk in the DSP-1000 via the cable station in that scenario. Because a "relatively low number of fully functional cable television installations" were expected for some time ("the availability of high-speed, low-error transmission of digital data will be limited in the immediate future"), another "more realistic" scenario is presented in Exhibit

4311 with the same missing claim elements. This second scenario discloses that: "the customer goes to the record store and requests that a specific 'album' be put on floppy disk." Billboard lacked credibility, as design engineers understood there was no means to sufficiently compress an album of music to fit on a floppy diskette with any reasonable fidelity. Why would a design engineer waste time reading an unreliable newspaper-magazine which didn't understand that even a super-floppy disk provided insufficient storage for an album of music, even when compressed to the levels of distortion Billboard accepted. This second scenario (of transmitting music to the record store where it is stored on a removable floppy disk for the consumer to purchase) fails to disclose "selling electronically" or "charging a fee via telecommunications lines" by a first party having the content to the second party having a second memory (because the record store is the party in possession of the floppy disk memory, rather than the second party transferring the money, at the point of sale). Exhibit 4311 is also contrary to virtually every other element of the patent as well as to the teaching of the patent to obviate removable hardware units. A removable floppy disk as a consumer memory would not allow for the objectives of the '440 Specification described herein to be realized nor the explicit second party hard disk requirement of claims 64 and 95. In light of this, Exhibit 4311 anticipates none of the claims of the '440 patent. Furthermore,

Exhibit 4311 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

48. Exhibit 4315 fails to disclose how a consumer indicates what is a "desired" digital audio signal, fails to teach a first or second party, fails to teach a storing step, and fails to teach "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party." There is no disclosure of a first party and a second party. Exhibit 4315 thus does not anticipate claims 1, 64 and 95. Exhibit 4315 also fails to disclose a second party hard disk, and therefore does not anticipate claims 64 or 95. Moreover, Exhibit 4315 does not provide any business method whatsoever as it merely depicts an alleged experimental transmission of data. Furthermore, other than being mentioned during the Stanford lecture, Exhibit 4315 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure - most of which are incompatible systems with the components of exhibit 4315. Indeed, during the Stanford lecture, Mr. Schwartz suggested that that Exhibit 4315 would involve cable companies who would transmit content to be recorded on floppy disks with charges added to a consumer's monthly bill. Ex. 2328 at 33 ("call up the cable tv company, say I'll buy it, add it to my bill, download it to the disk and then get the bill 30 days later or whatever.").

49. Exhibit 4316 demonstrates CompuSonics' business method. They sold DSPs. More specifically DSP-2000s to keep the company going while waiting for future DSP-1000 sales. The DSP-2000s were designed for professional use, such as the "DSP-2004 Professional Mixer/Recorder [that] was demonstrated with a live duet." Ex. 4316 at 1. Professional use would not have had the first party "selling electronically" or "charging a fee via telecommunications lines" and "charging the account" of the second party" as required by the '440 patent claims. Only when a DSP-1000 and floppy disks were involved was there potentially a sale, and CompuSonics was not interested in the details of such a sale because their business method relied only on sales of the DSPs. There is lack of CompuSonics' evidence disclosing how "consumers will be able to purchase" digital signals. Many methods of purchasing could have existed, including record stores or computer stores selling floppy disks, sales on a monthly cable television bill for a subscription service or pay-by-view content broadcast at certain times of the day, or floppy disk-of-the-month clubs. CompuSonics was focused on the floppy disk being the hardware unit of the future due to its ability to be recorded at home, in comparison with a CD that could not be recorded at home at the time, but did not focus on to whom or how the sales would be made. Therefore, the method of payment recited in the '440 patent claims is not disclosed and for, at least, this reason fails to teach the step of "selling electronically" by the first party or

"charging a fee via telecommunications lines" and "charging the account of the second party," and on that basis does not anticipate claims 1, 64 and 95. Moreover, using a removable floppy disk in the DSP-1000 as a consumer memory would not allow for the objectives of the '440 Specification described herein to be realized, nor the explicit "second party hard disk" required in claims 64 and 95. Finally, Exhibit 4316 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure except possibly Exhibit 4311, from which it seems to borrow a cable service payment suggestion.

50. Exhibit 4317 is directed to "the audio industry [that] is devoted to using, refining and developing new methods of storing, retrieving, transmitting, and receiving sound information." Ex. 4317at 2. Exhibit 4317 mentions a "missing link [that] is an interface to the phone line that will allow the 'pumping' of the sounds data" (*id.* at 3), and states that "[t]hese are exciting times for the electronics industry (*id.* at 11)." Rather than describe a CompuSonics interface to the phone line, Hyun Heinz Sohn described a Multibus host computer buffering interface to an AT&T Accunet Terminal in Exhibit 4317. There is no suggestion that the consumer will have direct access to the imagined database in the "future outlook" portion of Exhibit 4317. The two potential scenarios to obtain audio imagined in Exhibit 4317 are the same as the scenarios described in Exhibit 4316.

First, Exhibit 4317 suggests a scenario in which "video music services, which broadcast over cable networks" can release a new album, presumably with payment to the cable network via an itemized monthly cable television bill as described in Exhibit 4316, thus Exhibit 4317 fails to teach "selling electronically" by the first party or "charging a fee via telecommunications lines." *Second,* Exhibit 4317 suggests connecting *record stores*, again not *consumers*, to databases. Therefore Exhibit 4317 is no better than the prior art describing vending machines, such as U.S. Patent No. 3,718,906 ("Lightner patent"). Further, in Exhibit 4317, the second party, *i.e.,* the consumer, is not the party that has possession of the second memory, instead the record store has possession of the second memory. Exhibit 4317 therefore fails to anticipate claims 1, 64 and 95. In addition, there is no suggestion of use of a non-removable hardware unit for storage of music, thus, exhibit 4317 would not allow for the objectives of the '440 Specification to be realized, nor the explicit "second party hard disk" required in claims 64 and 95. Finally, Exhibit 4317 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure except possibly Exhibit 4311 or 4316, from which it seems to borrow a cable service payment.

51. Even if the single, cryptic reference to "all-electronic purchases" taught "charging a fee via telecommunications lines" and "charging the account of

the second party," Exhibit 4318 fails to anticipate claims 1, 64 and 95. Exhibit 4318 does not teach anything other than a floppy disk as a second memory and fails to allow for the objectives of the '440 Specification described herein to be realized, nor the explicit "second party hard disk" required in claims 64 and 95. Ex. 4318 at the bottom of page 1 ("transfers and digital recording of high fidelity audio from any music dealer's DSP-2000 to the DSP-1000 in your living room"). Exhibit 4318 discusses "the first group of DSP-1000 pilot production units," which only had a floppy disk drive for file storage, as being "used extensively for trade show demonstrations, field testing, and laboratory evaluation." Ex. 4318 at page 2. The mention of professional systems with hard drives in Exhibit 4318 do not have a "selling electronically" by the first party or "charging a fee" step because there is only one party and money would not be transferred between the different audio recording and production services of a single party. Even if these were different parties with transfers between an audio recording and audio production entities, the money transfer would likely be in the reverse order of the claim, *i.e.*, not to the first party with the audio content, but to the second party performing the service. Bob Lifton used the DSP-2002 to do his job of editing audio for video, not to make a purchase from a first party with the desired digital audio or video signals. Exhibit 4318 does not mention any purchases having been made using either DSP version. Finally, Exhibit 4318 lacks any suggestion or link to combine its disclosure, which

is missing elements of the '440 claims, to any other cited exhibit or disclosure. As previously mentioned, it cannot be assumed that one of ordinary skill in the art would have seen CompuSonics shareholder letters, like Exhibit 4318.

52. Exhibit 4319 suggests products that may be made using CompuSonics CSX digital signal processing. Exhibit 4319 does not teach a step of "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party" and on that basis does not anticipate claims 1, 64 and 95. Exhibit 4319 was presumably cited by Petitioner because it suggests a scenario where "a home decoder/recorder receives the digital video/audio data over the cable link and copies it to disk." The disk referred to in this scenario is "a 400 megabyte write-once optical disk," not a non-removable hardware unit. The cost of this write-once optical drive and blank disks limited products to the professional market, as they were too expensive for the consumer home market. Further, the distributor sends a signal to a "cable television subcarrier or other transmission format." The customer would be billed for that transmission, through the cable service or other transmission format, and pay an itemized monthly cable service bill. At the time, cable subscription bills were paid monthly with a check, cash, or by writing down and mailing a credit card number. None of these are "selling electronically" by the first party or "charging a fee via telecommunications lines," and the digital signal is stored on a removable

hardware unit, which would not allow for the objectives of the '440 Specification described herein to be realized, nor the explicit "second party hard disk" required in claims 64 and 95. In addition, I understand that separate disclosures, even in the same reference, cannot be used together without some link or teaching to do so for anticipation purposes. Exhibit 4319 has several other distinct scenarios described that could allegedly substantially improve "the cost/performance ratio of digital video products." Despite what might be references to a "main disk" or "magnetic fixed disk drives" these references are not related to the "Music Video Distribution" section of Exhibit 4319 and are instead discussing databases that would be searched by the *same party* that recorded the information, likely audio/video industry professionals or as part of picture/voice verification or surveillance systems. In particular, there is no business method, let alone "selling electronically" by the first party or "charging a fee via telecommunications lines" that is suggested to be used with the systems that might have non-removable hardware units or hard disks. Even if Exhibit 4319 discloses the use of non-removable hardware units for video or audio storage that can be "played back in any desired order" (*id.* at 1) and for "efficient storage and retrieval," (*id.* at 2), there was no concept to make non-removable hardware units part of a business method and to require selling electronically to store a digital signal on the non-removable hardware unit or hard disk. Finally, Exhibit 4319 lacks any suggestion

or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure except possibly Exhibits 4311, 4316, or 4317, from which it seems to borrow a cable service payment system.

53. Exhibit 4320 has no disclosure of a non-removable hardware unit or hard disk. It therefore does not anticipate any claims of the '440 patent, including claims 64 and 95 which explicitly require a "second party hard disk." Exhibit 4320 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure. Even if one of skill in the art did combine exhibit 4320 with any of the other cited exhibits, there is no disclosure or even a suggestion to use a non-removable hardware unit or hard disk at the location of the second party consumer with exhibit 4320. In addition, there is no disclosure or suggestion of transmitting a desired digital audio or video signal in exchange for "charging a fee via telecommunications lines" and "charging the account of the second party." A person skilled in the art would be unable to discern any method of payment.

54. Exhibit 4323 (Schwartz '248 patent) is directed to "using high density recording on a low cost magnetic media . . . [to provide] a digital audio, video recording and playback system." Exhibit 4323 at 3:44-50. Exhibit 4323 describes the problems of "cost and slow access speed" for digital image storage and playback (*id.* at 3:7-9) and preferably uses "a 5.25" magnetic disk commonly in

use for digital magnetic storage" (*id.* at 8:44-46). Ex. 4323 teaches away from storage in non-removable memory, as it teaches toward floppy and optical disks, which allow a recorder to be more economically competitive than recorders based on solid state silicon memory and bubble memory. "The preferred embodiment of the present invention utilizes a 5 1/4" flexible diskette commonly known as a mini-floppy." (*id.* at 14:31-15:5). Exhibit 4323 does not disclose a business method at all, and in particular does not disclose a first party selling a desired digital audio signal electronically by charging a fee via telecommunications lines. Regardless of hard drive digital storage disclosure in Exhibit 4323, it lacks the suggestion to transfer money electronically (with the first party charging a fee) between two financially distinct parties for any reason, let alone a transmission of a digital audio signal. The uses described for the invention of Exhibit 4323 may or may not require "a computer communications link." *Id.* at 12:44-49, 62-68. It therefore does not anticipate the '440 claims. Finally, Exhibit 4323 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

55. Exhibit 4324 is a story about plans to replace a digital compact disk players with a digital floppy disk player that can also record. Ex. 4324 at 1. Exhibit 4324 states that "[t]o make its floppy disks the standard" before the Japanese decide to go with digital cassette tapes, CompuSonics "plans to license

the technology cheaply to other manufacturers." Ex. 4324, pg. 2. There is no disclosure that CompuSonics was even planning to replace the prior art removable hardware units with a non-removable hardware unit or a hard disk. To the contrary, CompuSonics was prepared to lose money by giving cheap licenses to make floppy disks the standard hardware unit in Japan. Accordingly, Exhibit 4324 does not anticipate claims 1, 64 and 95. In addition, Exhibit 4324 speaks of selling "over the telephone," but a person of skill in the art would understand that this could mean placing an order by telephone to be invoiced on a monthly bill. The reference to "symphonies *ordered* by credit card" also suggests that a credit card payment would be made in writing in advance of purchase, for instance by writing down a code for a recording and a credit card number and mailing it to the seller. Exhibit 4324 therefore fails to teach "selling electronically" by the first party or "charging a fee via telecommunications lines" and "charging the account of the second party," and fails to anticipate claims 1, 64 and 95 for this reason as well. Finally, Exhibit 4324 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

56. Exhibit 4321 focuses on the DSP-1000 and replacing the prior art hardware units with the removable optical disks that were handed out during the lecture. Ex. 4321 at 3, lines 18-23. The comparison point was compact disks and CD ROM. *Id.* at 4, line 21. There was no teaching of a second party having a non-

removable hardware unit, and certainly no second memory that would read on claim 1. There was similarly no teaching of a "second party hard disk" as required for claims 64 and 95. Exhibit 4321 states that the DSP-2002 "was while we were in the process of developing the system. So we couldn't do the research itself on the system." *Id.* at 23, lines 12-14. The DSP-2000s were *never* intended to transmit to each other under the possession of financially distinct parties and be part of a business method that would have a step of "selling electronically" by the first party or "charging a fee via telecommunications lines." *Id.* at 32, lines 7-12. At best, the DSP-2002 had a database for transmission to another user having only a DSP-1000 floppy disk drive. Exhibit 4321 states that the floppy disk provides the flexible playback long desired *(id.* at 29, line 21 through 30, line 13) and states that removable hardware units are preferable (*id.* at 35, lines 4-16; 38, lines 8-16; 44, lines 5-21). Finally, other than Exhibits 4315 and 4320 discussed above, exhibit 4321 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure.

57. Exhibit 4333 discloses none of the steps of the patent, but is a photograph of a box with a removable floppy disk leaning against it, from which a person skilled in the art would be unable to discern any method, much less a business method of selling electronically by the first party or charging a fee for a desired digital audio or video signal. Exhibit 4333 fails to disclose a non-

removable second memory and certainly fails to disclose the second party hard disk required for claims 64 and 95. In addition, Exhibit 4333 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure. Exhibit 4333 therefore does not anticipate any claims of the '440 patent.

58. Exhibit 4342 fails to disclose a non-removable hardware unit or a hard disk. Although AM radio is not CD quality music as specified in the patent, Exhibit 4342 discloses the recording onto floppy disk of a transmission of audio from WLS radio over AT&T's Accunet. Ex. 4342 at 2. Exhibit 4342 also disclosed that Schwartz "visualizes a time when new music will be sent out from recording companies directly to radio stations or consumers at home, from the phone onto floppy disk." *Id.* at 3. And exhibit 4342 disclosed "a floppy disk-based digital recorder for broadcast use;" (*id.*) and "the consumer marketplace [] floppy disk-based DSP-1000" (*id.*). All potential second memory disclosed in Exhibit 4342 is removable. Moreover, there is no disclosure of a step of "selling electronically" by the first party or "charging a fee via telecommunications lines" and for at least these reasons, Exhibit 4342 fails to anticipate claims 1, 64 and 95. Finally, Exhibit 4342 lacks any suggestion or link to combine its disclosure, which is missing elements of the '440 claims, to any other cited exhibit or disclosure. Exhibit 4342 therefore does not anticipate any claims of the '440 Patent.

VII. At the time of the invention, the business method of electronically selling digital audio signals and digital video signals over telecommunications lines for storage on consumer memory free of removable physical media such as CDs, cassettes, cartridges, tapes, optical disks and floppy disks was neither obvious nor predictable in light of the CompuSonics Publications

59. At the time of the invention (June 13, 1988), content producers were unwilling and/or unable to make their content available for sale (or otherwise make their content available for distribution) in digital format over computer networks.

60. Even as late as 1999, only one of the five major music studios (Sony) had a central digital music archive in place that would allow it to participate in electronic distribution of its digital audio signals:

> U.S. record labels are at varying stages in their efforts to achieve a central digital database with asset management and archival preservation functions. Following is a rundown of the status to date.
>
> * Sony Music is the only one of the five major-label groups to have a central digital music archive in place.
>
> Its customized system—which is handled by a staff of 10— is based on the twin concepts of asset preservation and asset management. "It allows us to save our recordings and to quickly find, transfer, and re-purpose them for electronic media distribution and other ventures," says director of technology Malcolm Davidson.
>
> The system was installed in early 1996 and has been online since. Approximately 40% of Sony Music's

> CD-era recordings are now stored in its digital silo, with an estimated 2% of remaining catalog being added every year: Also, all new releases are automatically added to the silo. The material in the digital silo is "backed up" at the close of every day.
>
> The database consists of a Silicon Graphics computer and an EMASS data archive system developed by Raytheon (now Advanced Digital Information Corp.'s AMASS), which includes an Automatic Media Library (AML) component.
>
> The AML is a robotic retrieval system that offers infinitely expandable storage. It can store a variety of media, including Digital Tape Format (DTF), Advanced Intelligent Tape, and Digital Linear Tape.
>
> The company has installed Sony-manufactured DTF subsystems that store data on large (42 gigabyte) or small (12 gigabyte) tape cartridges.[12]

61. As discussed in the quote above, Sony was the only music label that had a central digital music archive system in place by 1999 to find, transfer, and re-purpose recordings for electronic media distribution, and Sony used removable tapes as its storage medium.

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[12] BILL BOLLAND, A management/preservation scorecard, BILLBOARD 92 (Nov. 6, 1999) (emphasis added), available online at http://books.google.com/books?id=eggEAAAAMBAJ&pg=PA92 [Ex. 2329].

62. Content producers believed the digital formats of their master recording content, such as digital audio signals and digital video signals, were so valuable that they were unwilling to make systems that stored them accessible to users on devices that were in the control and possession of the users. Although CDs contain digital recordings, due to flaws, they are not exact copies of the master recordings owned by content producers. CDs use error concealment to reduce audibility of imperfections. To avoid piracy of master recordings, content producers were focused on utilizing techniques to avoid storage to consumer-controlled memory. The audio and video recording labels attempted to block electronic distribution of the digital, non-physical signals of recordings during the 1990s and into the next decade due to concern over loss of their control of the audio and video markets.

63. Content producers were more comfortable with consumers holding their content on removable physical media, as had been done on tapes, CDs and records. As one example, the Freeny patent cited by Dr. Kelly to support his assertion that "the advantages . . . of electronic distribution and sales . . . of digital music, were known" (*see* e.g., Ex. 4132 at ¶¶ 27), described a system in which even though the information was transmitted over a telecommunications line, the information would only be transmitted to a retail location so that a physical object, such as a CD or cassette could be made and sold on-the-spot to a customer:

> The present invention provides a means for reproducing or manufacturing material objects at point of sale locations only with the permission of the owner of the information, thereby assuring that the owner of the information will be compensated in connection with such reproduction. The system of the present invention solves the problems associated with manufacturing, inventory, configuration distribution and collection previously discussed and permits sale of material objects embodying information in a more efficient, economical and profitable manner.[13]

64. Thus, the Freeny patent accommodated concerns of content providers and did not describe or suggest the business method for electronically selling digital signals described in the '440 Patent. The Freeny system maintained control over the digital audio signals and digital video signals by both transmitting them to a retail location, not to a user, and by only selling them in material objects, such as cassette tapes.[14]

65. The CompuSonics publications similarly teach toward utilizing removable physical media (specifically floppy disks) as the consumer storage medium and teach away from the patented invention. The focus of all of the exhibits is the CompuSonics compression technology ("CSX") and the use of removable disks as a consumer storage medium. The inefficiency that

[13] Freeny at 4:8–18.

[14] Freeny at 4:36–55:

CompuSonics focused on was due to the size of the audio and digital files themselves. *See* Ex. 4116 at 2 ("Any time video and audio are stored, retrieved, or transmitted by computer, CSX makes it less costly and more efficient."); Stautner Decl., ¶11 ("Developing sophisticated compression algorithms, supported in hardware and software, was critical to CompuSonics' and CompuSonics Video's mission to sell digital recording devices.").

66. Conversely, Hair understood that music and video sales were being hampered by their removable media: "The three basic mediums (hardware units) of music: records, tapes, and compact discs, greatly restricts the transferability of music and results in a variety of inefficiencies." '440 Spec 1: 24-26. The '440 patent specification was directed to changing the distribution of music and audio so that it only lists records, tapes, and compact disks as the basic mediums of music. It is not surprising that "floppy disk" is not included in this list of basic mediums of music. Music was not typically, if at all, sold commercially on floppy disks The Petitioner has not provided any evidence that music on a floppy disk was ever commercially sold by CompuSonics.

67. CompuSonics focus was to replace CDs with floppy disks, however, floppy disks shared almost all of the same inefficiencies and limitations of the other media described in the patent. While CompuSonics compression technology was designed to fit a song on a floppy disk or more content on an optical disk, the

amount of digital music or video material that CompuSonics was projecting could be on a single optical disk was, at best, no more than the existing mediums at that time. With regard to capacity, there was no advantage beyond existing audio and video mediums if a floppy disk was used as the medium.

68. The '440 patent specification also states that the materials used to manufacture the hardware units are subject to damage and deterioration during normal operations, handling, and exposure to the elements. '440 Spec 1:30-33. CompuSonics compression technology made no change to the basic materials used for the floppy disks, which were also subject to damage and deterioration during normal operations, handling, and exposure to the elements (including setting a floppy on top of a stereo amplifier with its power transformer, which could alter the magnetically recorded data).

69. The '440 patent specification also states that the physical size of the hardware units imposes constraints on the quantity of hardware units which can be housed for playback in confined areas ('440 Spec 1:34-37), and that the hardware units limit the ability to play a sequence of units selected by the user, songs from different albums (*id.*). There was no change in the method of distribution or sales described by CompuSonics so that the floppy disks of CompuSonics would have these limitations as well.

70. The "electronic record store" disclosed in Exhibit 4309 suggested music transmission over AT&T's Accunet from a record company to a retailer, and then from the retailer to a consumer for storage on a floppy disk. AT&T Accunet was priced for the business market, beyond the residential consumer market. Evidence of the availability of AT&T Accunet to residential consumers is not disclosed in exhibit 4309, nor in the other exhibits. Without AT&T Accunet, a second party would not be able to receive transmission of digital audio signals at a location determined by the second party. Exhibit 4309 discloses the potential for a consumer to record received music on a floppy disk in a "CompuSonics digital audio recorder/player (which has yet to see production)." Ex. 4309 at 3. One can see the labels of cassette tapes, CDs and records in a consumer's library of music on bookshelves. The floppy diskette is too thin for a label on its side. A user would spend an inordinate amount of time searching, sorting, handling and cueing of different songs if floppy disks or other removable media were used to play numerous songs. Similarly, organization of the media would depend on the user to organize them in a physical space as opposed to the electronic organization of all the media on a hard disk. Only the use of non-removable memory such as a hard disk accomplishes an objective of the '440 patent to easily and electronically sort stored music based on many different criteria. '440 Spec. 2:49-52.

71. Further, the concern about copyright protection disclosed in the '440 patent specification would be no better with floppy disks than with existing media at the time. CompuSonics was designing compression techniques to enable "high density recording" at home. Ex. 4323 at 3:44-50. The audio files stored on the floppy disks recorded by a CompuSonics system would have probably been copied many 1000's of times by the same machine that recorded the first copy. "If music exists on hardware units, it can be copied." '440 spec 2:12-13. Unlike the '440 patent, the CompuSonics exhibits provide no disclosure of illegal copy protection. Further, the editing function present in the DSPs further teaches away from the utilization of these devices to purchase digital signals. Content holders would be unwilling to allow their digital signals to be downloaded to the CompuSonics devices because they could be changed (*e.g.* removal of copy protection) with the editor, hence, the CompuSonics devices are in conflict with the invention.

72. None of the CompuSonics exhibits alone or combined, even with the skill of one in the art, disclose the claimed method. The CompuSonics exhibits are evidence that those of skill in the art did not recognize the inefficiencies or the solution for the problem. CompuSonics was focused on compressing the size of the files on the floppy disks. While smaller digital files may have improved the transmission or storage of digital audio and video files, they do not suggest the methods claimed in the '440 Patent. Rather, CompuSonics emphasized using

floppy disks and DSP-1000s with only removable media for consumer file storage despite having designed DSP-2000s with hard drives for professional systems. CompuSonics taught the use of a hard disk for an "electronic record store," but specifically disclosed a floppy disk for the consumer. CompuSonics, notwithstanding being knowledgeable about hard drives, taught away from consumer storage on non-removable media such as hard drives.

73. One of ordinary skill in the art would understand that CompuSonics was teaching away from the use of non-removable media such as hard drives for a consumer memory device. At the time, one of ordinary skill in the art would have believed that non-removable storage, such as a hard drives, were an extremely impractical storage medium for a consumer to utilize for a music library (just as CompuSonics believed). Hard drives were extremely expensive with limited storage capacity. Although it was conceivable to connect a few drives to a home computer, noise, driver current, power and cooling would be obstacles to connecting the large number of hard drives required to store a library of music on a consumer computer at the time. While the technology existed and could be implemented as described in the '440 Specification, a person of ordinary skill in the art would not have been attracted to this overly complex and impractically expensive solution for consumer products.

74. In sum, despite the prior art elements working according to their established functions and predictability, CompuSonics did not see or teach a solution to removable hardware units. CompuSonics always intended to use removable media and floppy disks because they believed hard drives were inferior (noisy and impractical for consumer equipment), which is why the DSP-1000s that were subsequently produced only had a floppy drive. Stautner Decl., 7.

75. In addition, there is no evidence that CompuSonics was concerned about copyright protection or how the money would be transferred in connection with a sale. I have seen no evidence that CompuSonics had a defined approach to how the money would transfer for payment. Several different methods were existing at the time of the '440 patent filing date, including a monthly bill via a cable company and a subscription service. Any of the CompuSonics systems are not sufficient disclosure of the claimed elements even when combined with other exhibits or the knowledge of one of skill in the art in the absence of a defined billing method.

76. For all of these reasons, selling digital audio signals and digital video signals over telecommunications lines and storing them in user-controlled non-removable memory, including hard drives and hard disks, were not an obvious or predictable variations over the CompuSonics publications.

VIII. Apple, iTunes and the iTunes Music Store

77. Apple is a technology company based in Cupertino, California. Apple designs, manufactures and markets mobile communication and media devices, personal computers, and portable digital music players as well as providing software and services.[15]

78. Apple introduced version 1.0 of the iTunes software in 2001. The iTunes software did not provide for the sale of any music or video, but was instead a music player that allowed users to create and manage digital music in a virtual library.[16] The iTunes software allowed users to copy (often referred to as "rip") the content of physical CDs to their music libraries, where the content would reside in digital form on the user's hard drive, allowing a user to organize, search, browse and play music or video, as well as burn their own audio CDs. Apple promoted the iTunes software as offering "a real-time search engine and single-click browsing

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[15] Exhibit 2330, Excerpts from Apple's SEC Form 10-K for the Fiscal Year Ended September 29, 2012, at 1, obtained from http://www.sec.gov/edgar.shtml.

[16] Exhibit 2331, printout of http://www.apple.com/pr/library/2001/01/09Apple-Introduces-iTunes-Worlds-Best-and-Easiest-To-Use-Jukebox-Software.html; Exhibit 2332, Excerpts from Apple's SEC Form 10-K405 for the Period Ending September 29, 2001, at 5, obtained from http://www.sec.gov/edgar.shtml.

by artist, album or genre"[17] and also as having an "elegant user interface," which took "the complexity out of managing digital music, making it fast and easy to encode MP3s, create playlists, burn custom CDs and store an entire digital music collection on a Mac."[18]

79. In October 2001, Apple introduced the iPod digital music player.[19] When synched to the user's computer, the iPod automatically downloaded the user's iTunes songs and playlists to the iPod for playback.[20] Apple promoted the iPod and iTunes as a duo in 2001-2002,[21] claiming that "iTunes seamlessly

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[17] Exhibit 2331, printout of http://www.apple.com/pr/library/2001/01/09Apple-Introduces-iTunes-Worlds-Best-and-Easiest-To-Use-Jukebox-Software.html.

[18] Exhibit 2333, printout of http://www.apple.com/pr/library/2002/07/17Apple-Announces-iTunes-3.html.

[19] Exhibit 2334, printout of http://www.apple.com/pr/library/2001/10/23Apple-Presents-iPod.html.

[20] *Id.*

[21] See e.g., Exhibit 2335, printout of http://www.apple.com/pr/library/2002/03/20Apple-Introduces-10GB-iPod-2-000-Songs-in-Your-Pocket.html;

Footnote continued on next page

integrates with iPod, allowing Mac users to easily transfer their entire digital music collection onto their iPod in less than 10 seconds per CD."[22]

80. On April 28, 2003, Apple introduced the iTunes Music Store (herein referred to "ITMS"), an "online music store that lets customers quickly find, purchase and download the music they want for just 99 cents per song, without subscription fees."[23] The ITMS store was "fully integrated into iTunes 4," "allowing users to purchase, download, organize and listen to their music using

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Exhibit 2336, prinout of http://www.apple.com/pr/library/2002/07/17Apple-Unveils-New-iPods.html.

[22] Ex. 2333, printout of http://www.apple.com/pr/library/2002/07/17Apple-Announces-iTunes-3.html.

[23] Exhibit 2337, printout of http://www.apple.com/pr/library/2003/04/28Apple-Launches-the-iTunes-Music-Store.html. Initially iTunes and the ITMS were only available to Macintosh users. In October 2003, Apple made iTunes and the ITMS available to Windows users. Exhibit 2338, printout of http://www.apple.com/pr/library/2003/10/16Apple-Launches-iTunes-for-Windows.html.

just one application."[24] Like the iTunes software, the ITMS permitted users to "browse the entire collection of songs by genre, artist and album."[25]

81. With the ITMS, users now had the choice of: (1) purchasing their music on a CD and copying ("ripping") the content of the CD to the iTunes software, where they could organize, search, play and transfer their music to other devices; or (2) purchasing their music directly in the form of digital signals from the ITMS, where once on their iTunes library they could organize, search, play and transfer their music to other devices (Figure 1, '440 Patent). Once the music was purchased, either in CD form or directly from ITMS as a digital signal, the options for consumers to use the iTunes "elegant user interface" to organize, search and browse their music—as well as to transfer it to their iPod—were essentially the same. Users purchasing CDs (and then ripping them to iTunes) had the benefit of an additional portable copy of their music in another medium. Users purchasing directly from the ITMS had expressed a clear preference to purchase their music directly in the form of digital signals for download——*i.e.*, the patented invention. If a user was primarily attracted to the content itself, the iTunes user interface or the ability to use Apple products such as the iPod, there is no reason why the user

[24] *Id.*

[25] *Id.*

would purchase through the ITMS as opposed to purchase a CD and upload the content to their iTunes library. The decision to purchase directly from the ITMS instead of to purchase a CD for upload to the iTunes library reflects a demand for the ability to purchase the signals electronically for download.

IX. The Patented Invention Has Been Commercially Successful

82. The patented invention is commercially successful. The success of the invention is reflected in the prevalence of both digital downloads generally and specifically, sales of audio/video content from the ITMS.[26]

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[26] In forming the opinions herein regarding the commercial success of the patented invention, I reviewed the June 5, 2013 Expert Report of Mark. M. Gleason from the underlying litigation in the District Court and the data summarized and presented therein regarding digital downloads. The report I reviewed was redacted of any Apple confidential information. While Mr. Gleason was preparing the expert reports submitted in the District Court, I spoke to him regarding the patents and provided information regarding the music industry throughout the relevant time period and other modes of content distribution in relation to the patented invention. I have reviewed the data formatted by Mr. Gleason in the following table and chart regarding the digital downloads vs.

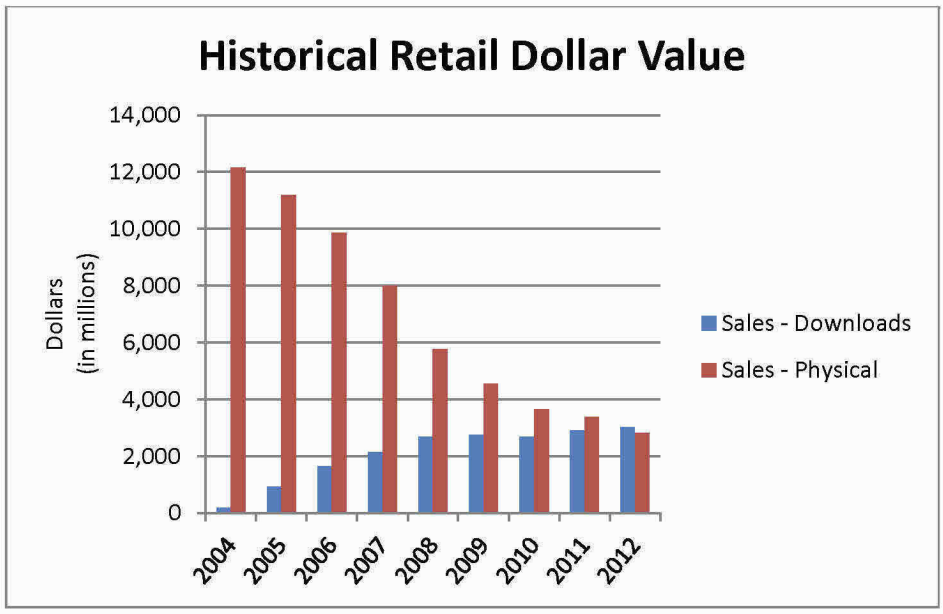
Footnote continued on next page

A. Commercial Success of Digital Downloads

83. Sales of digital downloads have largely displaced sales of physical media for content, such as records and compact disks ("CDs"). The graph below shows, in terms of retail dollar value, the increase in digital download purchases and the corresponding decrease in physical media purchases from 2004 through 2012 in the United States.[27]

Footnote continued from previous page
physical media and streaming, confirmed that it is correct, and incorporated it herein.

[27] Attached here to as Ex. 2327 are true and correct copies of Recording Industry Association of America Year-End Shipment Statistics for 2008, 2009, 2010, 2011, and 2012.



84. Subscription streaming services are an alternative method of providing consumers digital music or digital video content over the Internet. With a streaming subscription service, the consumer never owns the content and such lack of ownership limits its portability. Some people now view this as a disadvantage to streaming subscriptions services; however, these services have achieved some success (although they have not been as successful as digital downloads). The table below shows that substantially more retail dollars have

been generated from digital downloads compared to streaming subscription services from 2004 through 2012 in the United States.[28]

Manufacturers' Retail Dollar Value (in millions, net after returns)									
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Downloads	183	925	1,652	2,138	2,689	2,760	2,681	2,905	3,020
Subscription	-	149	206	201	221	213	212	359	571

85. Digital downloads have the largest market share of the music market compared to other product. Digital downloads have been significantly more commercially successful than other available methods of obtaining digital audio and digital video signals, in particular, (a) using physical media and (b) obtaining digital content through streaming subscription services.

B. Commercial Success of Apple's ITMS

86. The ITMS is the most successful download music store of all time and is currently the largest music retailer in the world.[29] On February 6, 2013, Apple announced that it had sold more than 25 billion songs from the ITMS, selling in

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[28] See Exhibit 2327 (Recording Industry Association of America Year-End Shipment Statistics for 2008, 2009, 2010, 2011, and 2012).

[29] Exhibit 2339, printout of http://www.apple.com/pr/library/2010/02/25iTunes-Store-Tops-10-Billion-Songs-Sold.html.

more than 119 countries.[30] At times since its launch, the ITMS's market share was over 80 percent of the U.S. digital download music market.[31] By 2008, the ITMS had become the largest music retailer in the U.S., surpassing Wal-Mart (which primarily sold physical media).[32] TIME magazine listed the iTunes Store as the Coolest Invention of 2003.[33]

87. The ITMS has also generated a substantial amount of revenue, for example, over $4.1 billion in net sales in FY 2010, $5.4 billion in new sales in 2011, $7.5 billion in net sales in FY 2012 and $9.3 billion in net sales in FY

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[30] Exhibit 2340, printout of http://www.apple.com/pr/library/2013/02/06iTunes-Store-Sets-New-Record-with-25-Billion-Songs-Sold.html.

[31] Exhibit 2341, Excerpts from Apple's Fourth Quarter of Fiscal Year 2005 Earnings Call Transcript, dated October 13, 2005, and Exhibit 2342, Excertps from Apple's Second Quarter of Fiscal Year 2008 Earnings Call Transcript, dated April 23, 2008.

[32] Exhibit 2343, http://articles.latimes.com/2008/apr/04/business/fi-itunes4.

[33] Exhibit 2320, "Coolest Inventions: Invention of the Year: The 99 Cent Solution," *Time* (Nov. 17, 2003).

2013.[34] ITMS has also been commercially successful in facilitating sales of other products in Apple's "ecosystem," such as the iPod, iPad and iPhone. It is well known that Apple's business strategy was to drive sales of the iPod and other devices using the ITMS.[35]

C. The ITMS Practices the Patents and is Co-Extensive with the Claims of the Patents

88. I have used the ITMS numerous times and am familiar with the process by which sales of digital audio and video are made through the ITMS, as

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[34] *See* Exhibit 2344 (excerpts from Apple 10-K for the Fiscal Year Ended September 28, 2013, at 29), Exhibit 2330 (excerpts from Apple 10-K for the Fiscal Year Ended September 29, 2012, at 31) , Exhibit 2345 (excerpts from Apple 10-K for the Fiscal Year Ended September 24, 2011, at 32).

[35] *See e.g.*, Exhibit 2341, Excerpts from Apple's Fourth Quarter of Fiscal Year 2005 Earnings Call Transcript, dated October 13, 2005) ("we believe selling music helps us to sell iPods and we are very focused on that"); Ex. 2346, (Apple's First Quarter of Fiscal Year 2008 Earnings Call Transcript, dated January 22, 2008) ("Our objective with the iTunes store is to run it just a little above break-even and we think that it helps us to sell iPods and Macs and that is really our strategy.")

well as reviewed information regarding the operations of the ITMS available at www.Apple.com as well as other publicly available sources.

89. I believe the ITMS practices the claimed invention and in fact embodies and is co-extensive with the claims of the patents. Claim 1 of the '440 Patent describes "A method for transferring desired digital video or digital audio signals" from a first party to a second party and charging a fee via telecommunications lines. Claim 1, Preamble. In sum, the ITMS is a system which uses a method for transmitting a digital audio signal (e.g. iTunes digital music recording), desired by a consumer, from the memory part of Apple servers, to the non-removable memory (*e.g.* disk drive for claims 64 and 95) in a consumer's device (e.g. computer or digital device) for a fee charged by Apple or its agents. Apple is the first party. The consumer or user is the second party. The first memory of Apple is server memory, including disk drives, tape drives and semiconductor memory in and connected to the servers, including those provided by Akamai, in the Apple data centers. The second memory is the non-removable memory in a computer or device owned by consumers/users.

90. Through the ITMS, Apple, the "first party," operates a download system by which digital audio and video files are electronically sold to buyers for download over the Internet. Servers with memory for storage of digital audio and video content, are required to operate a digital audio and video download system.

For Apple to sell digital audio and video signals over the Internet, these servers must be controlled directly or indirectly by Apple.

91. A user of the ITMS, the "second party," controls some type of personal computer or consumer digital media player at some location remote from Apple. The user controls where it utilizes the personal computer or consumer digital media player and what information and software resides on it.

92. Using a software application downloaded from Apple.com or a website associated with Apple.com, an online buyer forms a connection to the ITMS over the Internet (a telecommunications line). The user's computer is at a location remote from the ITMS servers where the content is stored.

93. In making a purchase through the ITMS, the user is required to provide a credit card number, PayPal or other bank or financial account information so that payment may be made electronically for purchases made from the ITMS (the "charging a fee via telecommunications lines" and "charging an account" step). *See How iTunes Works* by Julia Layton and Jonathan Strickland, http://electronics.howstuffworks.com/itunes5.htm ("To make a purchase in the iTunes store, all you have to do is click the 'Buy' button next to the song, video or app. Apple will charge your account and the download will begin."), Exhibit 2347.

94. In making a purchase, the user selects digital files for purchase and then receives the music file via a download process where the file is transferred

from Apple's, or its agent's (*e.g.* Akamai), servers to the user's computer (the step of transferring the desired digital video or audio signal step).

95. Finally, the transmitted digital audio or video signals are stored on the user's non-removable memory (storing step: the digital signal in the second memory). The buyer can then play the file using his or her computer or consumer digital media playing device.

96. The steps described herein are duplicated when video is sold through the ITMS instead of music.

97. The operation of the ITMS is a reflection of the patented method of electronically selling digital audio and video signals and is commensurate with the scope of the claimed invention. Indeed, the operation and essential purpose of the ITMS is to accomplish every step of the claim. While the ITMS is able to access content to sell through the claimed method and also contains a user interface, these elements are no more than necessary to effectuate the purpose of the invention.

D. There is a Nexus Between the Commercial Success of the ITMS and the Patented Invention

98. I further believe that a nexus exists between this commercial success and the unique features claimed in the patents. The '440 Patent covers a method and system that allows a customer to purchase and download digital audio and/or digital video signals over telecommunications lines for future playback. This is

coextensive with sales of audio and video content from the ITMS, which—as described above—is essentially an embodiment of the patented invention. Accordingly, the decision by consumers to purchase digital downloads generally, and to purchase infringing sales of content from the ITMS more specifically, establishes a nexus between the commercial success of the product and the unique features claimed in the patents.

99. The nexus between the commercial success of the ITMS and the '440 Patent is also specifically demonstrated comparing the use of iTunes software to manage content copied from CDs to the use of iTunes software to manage music purchased and downloaded from ITMS. As explained above (*see supra*, Section VIII.C), prior to the introduction of the ITMS, the iTunes software did not provide for the sale of any music or video, but was instead a music player that allowed users to manage digital music in a virtual library.[36] The iTunes software allowed users to copy ("rip") the content of physical CDs to their music libraries, where the content would then reside in digital form so that the user could "store them on their

[36] http://www.apple.com/pr/library/2001/01/09Apple-Introduces-iTunes-Worlds-Best-and-Easiest-To-Use-Jukebox-Software.html, attached hereto as Exhibit 2331; Apple's SEC Form 10-K405 for the Period Ending September 29, 2001, attached hereto as Exhibit 2332.

computer's hard drive; organize their music using powerful searching, browsing and play list features; watch stunning visualizations on their computer screen; and burn their own audio CDs."[37] The iTunes software offered "a real-time search engine and single-click browsing by artist, album or genre" and an "elegant user interface."[38]

100. As explained above, with the introduction of the ITMS, which was "fully integrated into iTunes 4," consumers now had the choice of: (1) purchasing their music on a CD and "ripping" the content of the CD to the iTunes software, where they could organize, search, play and transfer their music to other devices; or (2) purchasing their music directly in the form of digital signals from the ITMS, where once on their iTunes library they could then organize, search, play and transfer their music to other devices (Figure 1, '440 Patent). Once the music was purchased (either in CD form or directly from ITMS as a digital signal), the options for consumers to use iTunes to organize, search and browse their music was the same. Customers purchasing CDs (and then ripping them to iTunes) had

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[37] Exhibit 2331, printout of http://www.apple.com/pr/library/2001/01/09Apple-Introduces-iTunes-Worlds-Best-and-Easiest-To-Use-Jukebox-Software.html;

[38] *Id*; Exhibit 2333, printout of http://www.apple.com/pr/library/2002/07/17Apple-Announces-iTunes-3.html

the benefit of an additional portable copy of their music in another medium. Customers purchasing directly from the ITMS had expressed a clear preference to purchase their music directly in the form of digital signals for download——i.e., the patented invention. A customer's preference to purchase through the patented method is not surprising, and is due to the convenience of the electronic purchase and payment, the flexibility, and the elimination of inefficiencies disclosed in the patented invention.

101. Apple may suggest that customers are attracted to the ITMS because of non-patented features such as its elegant user interface or the desire for content. The user interface of the ITMS does not appear to be significantly different than the user interface of SightSound.com, which organized content in the same fashion, offered the same purchasing and preview options, and also utilized cover art. *Compare* Exs. 2312, 2313 and 2319 *with* Exs. 2350 and 2351. Further, in my opinion these "features" would not drive a consumer to purchase from the ITMS and could not be responsible for its commercial success. The content available through the ITMS was similarly available to consumers in the form of physical media such as a CD. A consumer always had the option of purchasing the content on a CD and uploading it to the iTunes Software, where the consumer could experience Apple's iTunes user interface, as well as sort and view their music, cover art and transfer it to an iPod. All of these features are available in the iTunes

Software (*see supra* sec. VIII). The data outlined above, however, suggests there has been a significant move away from physical media to digital downloads. Thus, the decision to purchase audio and video from the ITMS necessarily reflects the consumer's deliberate choice to purchase the content directly in its digital form over telecommunications lines—*i.e.*, to utilize the patented technology.

102. The nexus between the commercial success of the ITMS and the patented invention is further demonstrated by evidence provided with the declaration of Scott Sander that Apple copied the patented invention. Representatives from SightSound specifically alerted Apple to the patents in 1993 and subsequently, in 1999, disclosed details of their business model of selling digital audio and video signals via the Internet in a written diagram detailing their system for implementing the method disclosed in the patents. Sander Decl., ¶ 8, Ex. 2317. This written disclosure was followed up by an in person meeting, where SightSound again described in detail their implementation of the method disclosed in the patents, and asked Apple to implement certain functionality in its operating system that would allow Mac computers to support the electronic sale of digital audio and video. Sander Decl., ¶ 10. SightSound also suggested that Apple create a handheld audio player (prior to Apple's creation of the iPod). *Id.*, Ex. 2317. Apple declined; however, within two years of the meeting it launched the iTunes software and iPod, followed by the ITMS. In creating the ITMS, Apple chose to

utilize the method disclosed in the patents not a method or system described in the prior art.

I declare under penalty of perjury that the foregoing is true and correct. Sworn this 3rd day of January, 2014 at San Geronimo, CA.

John Snell

Appendix A

John Snell Curriculum Vitae

Experience

1988-present Engineering Consultant: Design, analysis, testing and reverse-engineering of circuit microelectronics, software & systems for consumer and professional systems. Work has focused on digital video and audio processors, special-purpose chips and FPGAs for real-time systems, networks and multi-processor systems. Projects have included: multi-channel cable network digital video/audio server, digital audio and video compression, high-bandwidth switching and routing systems, video/audio set-top boxes, digital signal processors, MP3 players and smart phone applications, media processor system on a chip for personal computer video and audio, music synthesizers and samplers, satellite digital broadcast network, digital signal processing mathematics, multichannel high-bandwidth recorders and a media editor. Expert witness: analyzed hundreds of patents, tested and reverse engineered potential prior art, prepared reports and exhibits, and testified in deposition and court.

1986-1988 University of California: Research Engineer: real-time multiprocessor research & design for digital media signal processing; design seminars covering this research.

1980-1986 Lucasfilm Ltd.: Computer Research & Development Engineer: engineering design of microelectronics, software & systems for recording, processing & editing digital media.

1977-1980 Engineering Consultant (design & analysis of circuit micro-electronics, computer design and development, software & systems for recording & processing digital media).

1976-78 *Computer Music Journal*, MIT Press: Founder and Editor-in-chief of this peer-reviewed academic journal focused on research and design of digital audio systems and software (in publication for over 35 years).

1975-76 ARGOSystems: Electronics Engineer: design, development, programming & debugging of microelectronics & software for real-time, microwave signal analysis system.

1973 Carnegie-Mellon University, Electrical Engineering Dept.: Instructor (electronics circuit design)

1972-74 Carnegie-Mellon University, Computer Science Dept.: Electronics Technician: development and troubleshooting of micro-electronics, including multiprocessor (crossbar switch connecting 16 computers and 16 shared memory banks), digital audio A/D/A converters, and computer graphics display system.

1971 PBS (WQED) Television: Internship in video/audio television broadcasting network.

Education

1992 Stanford University: digital signal processing (advanced mathematics for media processing).

1978-1980 Stanford University: guest researcher.

1967-74 Carnegie-Mellon University: interdisciplinary graduate work in electrical engineering (focused on digital media processing & synthesis) with grant from National Science Foundation; BS in Electrical Engineering; BA in Cybernetics (interdisciplinary program, combining coursework in computer science, calculus and signal processing mathematics, physics, music analysis and composition, psychology and physiology of perception as well as audio, video and electrical engineering).

Honors and Service

John Snell served from 1992-95 on the Editorial Review Board of *Microprocessor Report*, a prestigious publication on integrated circuit design analysis (focusing on design of media processors and advanced memory).

In Sept., 2000 the Audio Engineering Society honored John Snell with a Fellowship Award for innovative digital audio engineering design and valuable contributions to the advancement of audio engineering.

John Snell has been an invited lecturer and given workshops at numerous international conferences, research centers and universities, including Audio Engineering Society international conferences, International Computer Music Conferences, IEEE International Conference on Signal Processing Applications and Technology,

Stanford University, IRCAM, University of California, Microprocessor Forum, Eastman School of Music, Northwestern University, DSPx, IEEE Mini/Micro West, WCCF, Mills College and Carnegie-Mellon University.

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