UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,
AT&T MOBILITY LLC,
Petitioners,

v.

SOLOCRON MEDIA, LLC,
Patent Owner

Patent No. 7,319,866
Issued: January 15, 2008
Filed: August 11, 2004
Inventor: Michael E. Shanahan
Title: METHODS AND APPARATUSES FOR PROGRAMMING USER-DEFINED INFORMATION INTO ELECTRONIC DEVICES

Inter Partes Review No. 2015-_____

Declaration of Henry Houh Regarding

U.S. Patent No. 7,319,866

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

Dated: December 2, 2014

Henry Houh

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I. INTRODUCTION

A. Engagement

1. I have been retained by counsel for Cellco Partnership d/b/a Verizon Wireless ("Verizon Wireless") as an expert witness in the above-captioned proceeding. I have been asked to provide my opinion about the state of the art of the technology described in U.S. Patent No. 7,319,866 ("the '866 patent") and on the patentability of claim 10 of the '866 patent. The following is my written report on these topics.

B. Background and Qualifications

2. My Curriculum Vitae is submitted herewith as Appendix A to my Declaration.

3. I received a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology in 1998. I also received a Master of Science degree in Electrical Engineering and Computer Science in 1991, a Bachelor of Science Degree in Electrical Engineering and Computer Science in 1990, and a Bachelor of Science Degree in Physics in 1989.

4. As further indicated in my C.V., I have worked in the electrical engineering and computer science fields, including web site and web server development, on several occasions. As part of my doctoral research at MIT from 1991-1998, I worked as a research assistant in the Telemedia Network Systems (TNS) group at the Laboratory for Computer Science. The TNS group built a high

speed gigabit network and applications which ran over the network, such as remote video capture, processing and display on computer terminals. In addition to helping design the core network components, designing and building the high speed links, and designing and writing the device drivers for the interface cards, I also set up the group's web server, which at the time was one of the first several hundred web servers in existence.

5. I authored or co-authored twelve papers and conference presentations on our group's research. I also co-edited the final report of the gigabit networking research effort with the Professor (David Tennenhouse) and Senior Research Scientist of the group (David Clark), who is generally considered to be one of the fathers of the Internet Protocol.

6. I started building web servers in 1993, having set up the web server for the research group, to which I belonged. Our group's web server went on to provide what was one of the first live Internet video initiated from a web site. Our web server also archived a number of recorded video clips (including audio) which could be browsed, and updated the library of video/audio clips on an ongoing basis.

7. In 1994, I founded a company called Agora Technology Group which set up advertising-supported web site service for college recruiting called HIRES (Hypermedia Internet Recruitment and Employment Services). Agora also

provided web consulting services to companies; Agora set up web sites for Bay Networks (later purchased by Nortel) and Data Communications Magazine, among others.

8. While at MIT, I also studied communications, wireless networking, video and audio encoding, and streaming media. As part of my expert witness work, I have also studied cell phone applications, including phone applications and back end systems that have the capability for a mobile device such as a cell phone to browse a remote music library for both downloading music and streaming music.

9. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems that streamed packetized audio over data networks instead of using traditional phone lines. NBX was later acquired by 3Com Corporation, and the phone system is still available and being used at tens of thousands of businesses or more. As part of my work at NBX, I designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system. The protocol is used millions of times daily currently.

10. The NBX system had the capability for users to select the ringing tone of their own telephone. This capability was configured through a web server

running on the NBX call processor. The ring tones were stored on the NBX call processor and downloaded as an audio file to the NBX telephone upon bootup or when changed. Two of the company founders and I received U.S. Patent No. 6,697,963 titled "Telecommunication method for ensuring on-time delivery of packets containing time sensitive data," for some of the work I did there.

11. Starting in 2001, I was architect for the next generation of web testing product by Empirix known as e-Test Suite. e-Test Suite is now owned by Oracle Corporation. e-Test provided functional and load testing for web sites. e-Test emulated a user's interaction with a web site and provided web developers with a method of creating various scripts and providing both functional testing (e.g., did the web site provide the correct response) and load testing (e.g., could the web site handle 5000 users on its web site simultaneously). Among Empirix's customers was H&R Block, who used e-Test Suite to test the tax filing functionality of their web site as whether the web site could handle a large expected load prior to the filing deadline.

12. I have also continued to develop web sites for various business projects, as well as setting up web sites on a volunteer basis for various groups that I am associated with.

13. I am the author of several publications devoted to a wide variety of technologies in the fields of electrical engineering and computer science. These

publications are listed on my C.V. (attached hereto as Exhibit A).

C. Compensation and Prior Testimony

14. I am being compensated at a rate of $550 per hour for my study and testimony in this matter. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

15. I have testified in Federal District Court as an expert witness four times. Most recently, I testified in the *Prism Technologies LLC v. AT&T Mobility LLC* in the District of Nebraska. I have also testified in the *Two-Way Media LLC v. AT&T Inc.* matter in the Western District of Texas and *Verizon v. Vonage* and *Verizon v. Cox* matters, both in the Eastern District of Virginia. I also testified at the hearing in *In the Matter of Certain Digital Media Devices, Including Televisions, Blu-Ray Disc Players, Home Theater Systems, Tablets and Mobile Phones, Components Thereof and Associated Software*, Investigation No. 337-TA-882, U.S. International Trade Commission, filed expert reports and was deposed. I have provided deposition testimony for other cases filed in Federal District Court as well. I also have testified in Federal District Court once as a fact witness.

16. In addition, I have filed declarations in *Microsoft v. Telecommunications Systems Inc.* (IPR2014-01568 and IPR2015-00193),

Microsoft v. B.E. Technology, LLC (IPR2014-00039, IPR2014-00040); *Microsoft v. Biscotti Inc., Apple Inc. v. Evolutionary Intelligence, LLC* (IPR2014-00086); *Twitter, Inc. and Yelp Inc. v. Evolutionary Intelligence, LLC*; *Neulion Inc. v. Patent Owner*; *Cisco Systems, Inc. v. AIP Acquisition LLC*; *Cisco Systems, Inc. v. Constellation Technologies LLC*; and *Samsung Electronics Co., LTD et al v. Straight Path IP Group, Inc.*

D. Information Considered

17. My opinions are based on my years of education, research and experience, as well as my investigation and study of relevant materials. In forming my opinions, I have considered the materials I identify in this report and those listed in Exhibit B.

18. I may rely upon these materials and/or additional materials to respond to arguments raised by Solocron. I may also consider additional documents and information in forming any necessary opinions—including documents that may not yet have been provided to me.

19. My analysis of the materials produced in this investigation is ongoing and I will continue to review any new material as it is provided. This report represents only those opinions I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials already provided.

II. LEGAL STANDARDS FOR PATENTABILITY

20. In expressing my opinions and considering the subject matter of claim 10 of the '866 patent, I am relying upon certain basic legal principles that have been explained to me.

21. First, I understand that for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious from what was known before the invention was made.

22. I understand the information that is used to evaluate whether an invention is new and not obvious is generally referred to as "prior art" and generally includes patents and printed publications (e.g., books, journal publications, articles on websites, product manuals, etc.).

23. I understand that, in this proceeding, Verizon Wireless has the burden of proving that claim 10 of the '866 patent is anticipated by or obvious from the prior art by a preponderance of the evidence. I understand that "a preponderance of the evidence" is evidence sufficient to show that a fact is more likely true than it is not.

24. I understand that in this proceeding, the claims must be given their broadest reasonable interpretation consistent with the specification. The claims after being construed in this manner are then to be compared to the information in the prior art.

25. I understand that in this proceeding, the information that may be evaluated is limited to patents and printed publications. My analysis below compares the claims to patents and printed publications that are prior art to the claims.

26. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to "anticipate" the claim. Second, the prior art can be shown to have made the claim "obvious" to a person of ordinary skill in the art. My understanding of the two legal standards is set forth below.

A. Anticipation

27. I understand that the following standards govern the determination of whether a patent claim is "anticipated" by the prior art.

28. I have applied these standards in my evaluation of whether claim 10 of the '866 patent would have been anticipated by the prior art.

29. I understand that the "prior art" includes patents and printed publications that existed before the earliest filing date (the "effective filing date") of the claim in the patent. I also understand that a patent will be prior art if it was filed before the effective filing date of the claimed invention, while a printed publication will be prior art if it was publicly available before that date.

30. I understand that, for a patent claim to be "anticipated" by the prior

art, each and every requirement of the claim must be found, expressly or inherently, in a single prior art reference as recited in the claim. I understand that claim limitations that are not expressly described in a prior art reference may still be there if they are "inherent" to the thing or process being described in the prior art. For example, an indication in a prior art reference that a particular process complies with a published standard would indicate that the process must inherently perform certain steps or use certain data structures that are necessary to comply with the published standard.

31. I understand that, for a piece of prior art to anticipate a claim, it only need to have the same level of disclosure as the asserted patent. I also understand that it is acceptable to consider evidence other than the information in a particular prior art document to determine if a feature is necessarily present in or inherently described by that reference.

B. Obviousness

32. I understand that a claimed invention is not patentable if it would have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made.

33. I understand that the obviousness standard is defined in the patent statute (35 U.S.C. § 103(a)) as follows:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the

> differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

34. I understand that the following standards govern the determination of whether a claim in a patent is obvious. I have applied these standards in my evaluation of whether claim 10 of the '866 patent would have been considered obvious in December of 1999.

35. I understand that to find a claim in a patent obvious, one must make certain findings regarding the claimed invention and the prior art. Specifically, I understand that the obviousness question requires consideration of four factors (although not necessarily in the following order):

- The scope and content of the prior art;
- The differences between the prior art and the claims at issue;
- The knowledge of a person of ordinary skill in the pertinent art; and
- Whatever objective factors indicating obviousness or non-obviousness may be present in any particular case.

36. In addition, I understand that the obviousness inquiry should not be done in hindsight, but must be done using the perspective of a person of ordinary skill in the relevant art as of the effective filing date of the patent claim.

37. I understand the objective factors indicating obviousness or non-

obviousness may include: commercial success of products covered by the patent claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention by those in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and the patentee proceeded contrary to the accepted wisdom of the prior art. I also understand that any of this evidence must be specifically connected to the invention rather than being associated with the prior art or with marketing or other efforts to promote an invention. I am not presently aware of any evidence of "objective factors" suggesting the claimed methods are not obvious, and reserve my right to address any such evidence if it is identified in the future.

38. I understand the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. I also understand that an example of a solution in one field of endeavor may make that solution obvious in another related field. I also understand that market demands or design considerations may prompt variations of a prior art system or process, either in the same field or a different one, and that these variations will ordinarily be considered obvious variations of what has been described in the prior art.

39. I also understand that if a person of ordinary skill can implement a predictable variation, that variation would have been considered obvious. I understand that for similar reasons, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using that technique to improve the other device would have been obvious unless its actual application yields unexpected results or challenges in implementation.

40. I understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take account of the "ordinary innovation" and experimentation that does no more than yield predictable results, which are inferences and creative steps that a person of ordinary skill in the art would employ.

41. I understand that sometimes it will be necessary to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art. I understand that all these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

42. I understand that the obviousness analysis cannot be confined by a formalistic conception of the words "teaching, suggestion, and motivation." I

understand that, in 2007, the Supreme Court issued its decision in *KSR Int'l Co. v. Teleflex, Inc.* where the Court rejected the previous requirement of a "teaching, suggestion, or motivation to combine" known elements of prior art for purposes of an obviousness analysis as a precondition for finding obviousness. It is my understanding that *KSR* confirms that any motivation that would have been known to a person of skill in the art, including common sense, or derived from the nature of the problem to be solved, is sufficient to explain why references would have been combined.

43. I understand that a person of ordinary skill attempting to solve a problem will not be led only to those elements of prior art designed to solve the same problem. I understand that under the *KSR* standard, steps suggested by common sense are important and should be considered. Common sense teaches that familiar items may have obvious uses beyond the particular application being described in a reference, that if something can be done once it is obvious to do it multiple times, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. As such, the prior art considered can be directed to any need or problem known in the field of endeavor in December of 1999 and can provide a reason for combining the elements of the prior art in the manner claimed. In other words, the prior art does not need to be directed towards solving the same problem that is addressed in the patent. Further,

the individual prior art references themselves need not all be directed towards solving the same problem.

44. I understand that an invention that might be considered an obvious variation or modification of the prior art may be considered non-obvious if one or more prior art references discourages or leads away from the line of inquiry disclosed in the reference(s). A reference does not "teach away" from an invention simply because the reference suggests that another embodiment of the invention is better or preferred. My understanding of the doctrine of teaching away requires a clear indication that the combination should not be attempted (*e.g.*, because it would not work or explicit statements saying the combination should not be made).

45. I understand that a person of ordinary skill is also a person of ordinary creativity.

46. I further understand that in many fields, it may be that there is little discussion of obvious techniques or combination, and it often may be the case that market demand, rather than scientific literature or knowledge, will drive design trends. When there is such a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within their technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a

combination was obvious to try might show that it was obvious. The fact that a particular combination of prior art elements was "obvious to try" may indicate that the combination was obvious even if no one attempted the combination. If the combination was obvious to try (regardless of whether it was actually tried) or leads to anticipated success, then it is likely the result of ordinary skill and common sense rather than innovation.

III. THE '866 PATENT

A. Effective Filing Date of the '866 Patent

47. I understand that the '866 patent issued from U.S. Application No. 10/915,866, filed August 11, 2004, and is a continuation of U.S. Application 10/223,200 filed August 16, 2002, which is a continuation of U.S. Application No. 09/518,712, which was filed on March 3, 2000, which claims priority to Provisional Application No. 60/169,158, which was filed on December 6, 1999 ("the December 1999 provisional application").

48. I understand that, in order to claim priority to a provisional application, the specification of the provisional application must contain an adequate written description of the invention as claimed in the nonprovisional, and must enable a person of ordinary skill to practice the invention claimed in the nonprovisional. To satisfy the written description requirement, I understand that each claim limitation must be actually or inherently disclosed.

49. I have reviewed the December 1999 provisional application. It is my opinion that the December 1999 provisional application does not actually or inherently disclose at least two claim limitations in claim 10 of the '866 patent: i) the "browsing application program that allows a user of the telephone to browse the polyphonic audio files"; and ii) the "enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played."

50. For example, the "enhanced speaker" limitation does not appear to be disclosed anywhere. There is no discussion of "enhancement" or the "substantially full range of audio sounds." The provisional application includes a single reference to a "speaker / microphone", and a few references to "transducer", but all of their uses appear to be in the context of capturing audio, not reproducing a ringtone, much less a polyphonic ringtone. Exhibit 1003 at 0006-0007. While there is a statement that the device can "play the audio" (*id.* at 0005), there is no discussion of what plays the audio, whether it is for example, a "conventional speaker" or an "enhanced speaker"—nor is there any discussion of quality, the nature of any "enhancement" or any "full range of audio sounds." Thus, regardless of any other disclosure, claim 10 is limited to the March 2000 filing.

51. Furthermore, neither "browse", "browser" or "browsing application" appears anywhere in the provisional—much less a "browsing application program

that allows a user of the telephone to browse the polyphonic audio files". Exhibit 1003 at 0004-08.

52. Nor are the full scopes of these limitations necessarily disclosed in my view by the provisional application. Based on my review, it is my opinion that the provisional application fails to sufficiently disclose the invention to establish that Mr. Shanahan possessed the full scope of the subject matter of claim 10 at any point prior to March 2000.

53. I have therefore used March 3, 2000, as the earliest effective filing date of the '866 patent claims in my analysis. Nevertheless, even if the December 1999 date is used in my analysis, many of the prior art references described below would still invalidate claim 10.

B. Prosecution History of the '866 Patent

54. The application that matured into the '866 patent was filed on August 11, 2004. Initially, the Patent Office only made an obviousness-type double patenting rejection on the pending claims, based upon claims in another pending application. Exhibit 1007, at 0135 (March 7, 2006 Office Action). The patentee responded by cancelling certain claims and asserting that other claims did not conflict with the claims in other pending application. *Id.* at 0114-0115.

55. The Examiner subsequently withdrew the obviousness-type double patenting rejection and rejected all claims over two references, Isomursu and Lin.

Id. at 0092-0093. In response, the patentee distinguished the purported invention as follows:

> Additional novel features of claims 1, 10 and 31 include the use of polyphonic audio files as ringtones. Both Isomursu and Lin fail disclose this feature at all. In fact, nowhere in either reference, or any reference of record, is the quality or fidelity of a ringtone mentioned or even recognized as a desirable or relevant feature. The use of high quality audio data such as polyphonic audio files for ringtones is an important feature of certain aspects of applicant's claimed invention. For example, the use of high fidelity ringtones such as polyphonic ringtones (sometimes referred to now as "real tones", "true tones", "master tones", etc.) that may be actual MP3 (or other high quality digital representations of) songs or other audio greatly improves the user's experience by allowing the user to hear realistic recreations of selected audio. Nowhere in this feature shown or suggested in the prior art of record . . . .

Id. at 0063-64 (May 4, 2007 Reply at 15, 17-18).

56. The Examiner proceeded to issue a Notice of Allowance on July 23, 2007, and allowed claims 1-10 without further clarification of why those claims were patentable. *Id.* at 0029-0030.

C. The Person of Ordinary Skill In the Art

57. A person of ordinary skill in the December 1999-March 2000 time frame in the art in the field of the '866 patent would have been someone who at a minimum held a bachelor's degree in electrical engineering or computer science from an accredited institution, or equivalent professional experience, and had at least two years of experience with computer design.

D. Overview of Claim 10 of the '866 Patent

58. Claim 10 of the '866 patent generally concerns a telephone that can,

via a browsing application, browse and select polyphonic audio files that can be used as a ringtone.

IV. General Issues Related to My Patentability Analysis

59. As I explain in more detail below, I believe claim 10 of the '866 patent is either anticipated or would have been considered obvious by a person of ordinary skill in the art based on a number of prior art references, particularly when the claims are given their broadest reasonable interpretation consistent with the specification.

A. Claim 10 of the '866 Patent

60. The claim of the '866 patent that I am addressing in this report (*i.e.*, 10) is reproduced below.

Claim 10 of the '866 patent reads:

> 10. A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising:
>
> a communications link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files;
>
> a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and

select at least one polyphonic audio file therefrom;

processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link;

a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication; and

an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played.

B. Interpretation of Certain Claim Terms

61. I understand that in *inter partes* review proceedings, claims are to be given their broadest reasonable interpretation in view of the specification.

62. I also understand that, where a patent applicant explicitly defines a term to mean something in the patent disclosure, that definition should typically be used when evaluating the claims. An explicit definition will be something like "a 'foo' means 'a widget that is 4 inches wide by 6 inches long.'"

63. I understand that if no explicit definition is provided for a term in the patent specification, it must be given its plain meaning unless that would be plainly inconsistent with how the term is being used in the claim or the patent specification. I further understand that the reason the PTAB uses the broadest

reasonable construction standard is that Solocron may ask to amend the claims during the proceeding to make the claim language match what Solocron may argue is the intended meaning of those claims.

64. By contrast, I understand that in a district court litigation, Solocron is not allowed to amend the claim, and in that proceeding, the intended meaning of a term may be considered to be relevant. Because the standards of claim interpretation applied in litigation differ from PTO proceedings, I understand that any interpretation of claim terms in this IPR is not binding upon Verizon Wireless in any litigation related to the subject patent. *See In re Zletz*, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

65. I believe most of the language used in the claims does not need to be specifically discussed other than in the course of comparing it to the prior art. Unless otherwise indicated, my analyses herein are based on the broadest reasonable interpretations for all claim terms, which include the following:

66. I understand that Verizon Wireless has proposed that "polyphonic audio file" be construed to mean "an audio file with content that produces two or more tones at the same time." I understand that Solocron, in the district court litigation, has proposed that "polyphonic audio file" be construed to mean an "audio file having more than one sound." Exhibit 1071 at 0013. I do not believe that Solocron's construction is the proper construction given that it is not

consistent with the distinctions that the patentee made over Isomursu and Lin and would seemingly read on monophonic content. See Exhibit 1007 at 0063-64 (discussed *supra*). In my opinion, one of skill in the art would find that Solocron's litigation construction does not distinguish between polyphonic and monophonic.

67. Nevertheless, for the reasons discussed below, I believe the cited prior art meets this limitation regardless of what construction is adopted. Of course, Solocron's construction is so broad that it would read on the references that the patentee distinguished during prosecution and would read on virtually any monophonic reference given that a monophonic reference with two notes would meet this.

68. I also understand that Solocron relied on format language (*i.e.*, the listing of certain formats such as MP3, WAV, etc.) as providing support for the recitation of polyphonic audio files in the claims during prosecution of U.S. Patent No. 7,257,395. Although I disagree that the listing of such formats explicitly or inherently discloses polyphony, I note that a number of prior art references recite these same formats. Thus, to the extent that Solocron's recitation of these formats is sufficient, I note that the prior art cited below recites these same formats.

69. Similarly, I understand that Solocron has attempted to rely on passages that relate to sampling "popular songs." I note that, if this disclosure is sufficient, then references like Isomursu and Lin have the same level of disclosure,

as do a number of other references discussed below.

70. I understand that Verizon Wireless has proposed that "an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file" is indefinite under the *Markman* analysis that a district court would apply. Solely for purposes of this declaration, I understand that Verizon Wireless has proposed that this term should be construed to mean "a speaker that is capable of playing the audio sounds from the selected polyphonic audio file."

71. I understand that Solocron has proposed that this term mean "a speaker that can provide a substantially full range of audio sounds," where "substantially full range of audio sounds" is further construed to mean "the full range of sounds within human hearing, or a range of sounds not appreciably smaller than that range." Exhibit 1071 at 0028. I do not believe this is an appropriate construction in an IPR. In particular, this construction is substantially narrower than the broadest reasonable construction. Nevertheless, even if this construction is adopted, the references below invalidate claim 10.

C. Prior Art References

72. I understand that a U.S. patent is a formally published document, and that I may rely on the dates in the patent as to when the patent was filed and when it was granted.

73. I understand that the '866 patent issued as a continuation from an application filed in March of 2000, but that it claims priority to a provisional application filed on December 6, 1999. Based on my analysis above, I understand that publications that were published before March 3, 2000, and patents or patent applications filed before March 3, 2000, are prior art to the claims. Many of the references below, however would also be prior art even under the December 6, 1999 date.

1. Exhibit 1070 – Nokia 9110 UM

74. Exhibit 1070 (Nokia 9110 UM or 9110 UM) is the User's Manual for Nokia 9110.

75. The 9110 UM bears on its face a publication date of 1999. Exhibit 1070-0002 (copyright notice at bottom of each page).

76. I understand that 9110 UM was publicly distributed with the Nokia 9110 phone, in both hardcopy form as well as electronically on a CD, that was distributed with the phone no later than about February 1, 1999, and was published via Nokia's website on February 1, 1999. Exhibit 1082 (Declaration of Erin Flaucher ¶¶ 4-13); Exhibit 1065 (Declaration of Jari Valli ("Valli Decl.") ¶¶ 4-6). I understand therefore, that 9110 UM published before December 6, 1999, the earliest asserted priority date of the '866 patent, and it is prior art to claim 10 of the

‘866 patent under 35 U.S.C. § 102(a) and/or § 102(b), depending on the priority date.

2. Exhibit 1083– Nokia 9110 FAQ

77. Exhibit 1083 is a list of “frequently asked questions” regarding the Nokia 9110, which I understand to be a printout of a Nokia.com web page archived May 8, 1999. (“**9110 FAQ**”)

78. I understand that, because the Nokia 9110 FAQ was published via the internet prior to December 6, 1999—the earliest asserted priority date of the ‘866 patent—it is prior art to claim 10 of the ‘866 patent under 35 U.S.C. § 102(a).

3. Exhibit 1074 –Nikkei Electronics Article (Nikkei)

79. Nikkei Electronics is a Japanese magazine that covers electronics and communications technology. On November 15, 1999, Nikkei Electronics published several articles in a single issue relating to ringtones, including chapters in particular: Chapter 2 (“Music is from Ringing tones, Game is from characters”) and Chapter 3 (“Realized technology: Maintain size and cost, enhance playback functions of images and sound”). Exhibit 1074 (appearing at pages 116-127 of the original magazine). Though the magazine is in Japanese, I have reviewed a translation of this article, which is Exhibit 1074. The magazine indicates that this issue was published November 15, 1999.

80. I understand that because Nikkei published before December 6, 1999, the effective filing date of the '866 patent, Nikkei is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(a).

4. Exhibit 1081 – Perez

81. Exhibit 1081 is a copy of U.S. Patent No. 6,492,761, filed on January 20, 1998, issued on December 10, 2002 ("**Perez**"). Because Perez was filed more almost two years before December 6, 1999—the earliest asserted priority date of the '866 patent—Perez is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(e).

5. Exhibit 1014– International Patent No. 1998025397 to Rizet

82. Exhibit 1014 (Rizet) is a copy of International Patent No. 1998025397 (WO 98/25397) to Rizet et al.

83. I understand that Rizet was filed on November 13, 1997, and claims priority to European Patents filed on December 6, 1996. I understand that because Rizet published on June 11, 1998, which is more than a year prior to December 6, 1999, the earliest asserted filing date of the '866 patent, Rizet is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(b).

6. Exhibit 1063– U.S. Patent No. 6,366,791 to Lin

84. Exhibit 1063 (Lin) is a copy of United States Patent No. 6,366,791 to Lin. Lin was filed June 17, 1999, and issued April 2, 2002.

85. I understand that, because Lin was filed on June 17, 1999, which is before December 6, 1999, the earliest asserted priority date of the '866 patent, it is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(a).

7. Exhibit 1075– U.S. Patent No. 7,088,990 to Isomursu

86. Exhibit 1075 (Isomursu) is a copy of United States Patent No. 7,088,990 to Isomursu.

87. I understand that, because Isomursu was filed on October 30, 1998, as a continuation of parent application No. 08/804,236 filed on February 20, 1997, each of which is over a year before December 6, 1999, the earliest asserted priority date of the '866 patent, Isomursu is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(e).

8. Exhibits 1020, 1053 and 1054 –Yamaha Sound Chip Materials (YMU757)

88. Exhibits 1020, 1053 and 1054 were published in September 1999, October 1999, and February 2000, respectively, and are a press release announcing the YMU757 chip, an article reporting on the new chip, and a technical data sheet for the chip, respectively. Individually and collectively, these two publications describe Yamaha's specialized YMU757 computer chip for producing polyphonic ringtones on a mobile phone.

89. I understand that because YMU757 published before March 3, 2000, the effective filing date of the '866 patent, YMU757 is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(a).

9. Exhibit 1077 – Hosoda

90. Exhibit 1077 (Hosoda) is a certified English translation of Japanese Patent Application Publication No. 11-242490, which published September 7, 1999. Exhibit 1077 at 0007.

91. I understand that because Hosoda is a printed publication that was published before December 6, 1999, the effective filing date of the '866 patent, it is prior art to claim 10 of the '866 patent under 35 U.S.C. § 102(a).

V. Patentability Analysis of Claim 10 of the '866 Patent

92. I am applying the broadest reasonable interpretation of the claim terms, as set forth above, unless otherwise indicated.

A. Nokia 9110 User Manual (Exhibit 1070)

93. As explained in more detail below, the systems and methods described in UM anticipate and would have made obvious to a person of ordinary skill in the art claim 10 of the '866 patent.

1. Overview of 9110 User Manual

94. UM describes a system in which a user can select and download audio files and store them in the sounds folder for use as a "ringing tones" so that a user can customize the user's phone.

2. Comparison of UM to Claim 10 of the '866 Patent

a. Claim 10

Limitation 10 Preamble: "A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising"

95. The 9110 UM describes a telephone that can be customized by searching, selecting and downloading polyphonic audio files (e.g., audio files having a ".WAV extension and support[s] 8, 11, 22 or 44khz, PCM/A-law, Stereo/Mono, 8bit" (Exhibit 1070 at 0143)), which can be played with the "voice recorder" software and the user can then "set them as ringing tones": "Congratulations on purchasing the Nokia 9110 Communicator. The Nokia 9110 Communicator is a complete communications tool: it is a wireless phone, messaging device, access terminal and a palmtop organizer in one pocketable package." Exhibit 1070 at 0011.

Figure 1

96. The 9110 UM discloses polyphonic audio files based on the same arguments that the inventor made to the Patent Office in order to get the patent. If,

as asserted by the inventor, "MP3, WAV, MPEG, and many MIDI files are polyphonic audio files" (Exhibit 1010 at 0442), then the 9110 UM discloses polyphonic audio files (in the same exact sense) because the 9110 UM teaches using WAV files for ringtones. If identification of a WAV file format was sufficient support for the inventor to rely upon during prosecution to add polyphonic to the claims, then it should be sufficient support to establish that the prior art discloses polyphonic audio files. Thus, because 9110 UM teaches the use of WAV files for ringtones, it discloses polyphonic audio files consistent with the prosecution history of the patent.

97. Moreover, the 9110 UM discloses polyphonic under Solocron's Litigation construction, meaning "audio file having more than one sound." For example, the 9110 UM expressly states that "You can also use the *sounds* you have recorded with the Digital voice recorder as ringing tones." Exhibit 1070 at 0123 (emphasis added). In addition, we know that the phone plays "polyphonic ringtones" under this construction because the default ringtone played by the phone is the easily-recognized "Grand Valse" tune which has many different notes. *See* Exhibit 1070 at 0123 ("the default ringing tone Grande valse"). In addition, the 9110 UM teaches how to compose a ringing tone having multiple notes, altered pitches, including for example "D" as well as "D sharp". See, e.g., id. at 0139-

0141 (describing how to use the "Composer" starting on page 129); see also the ringtone depicted in Fig. 4 which illustrates a plurality of notes:

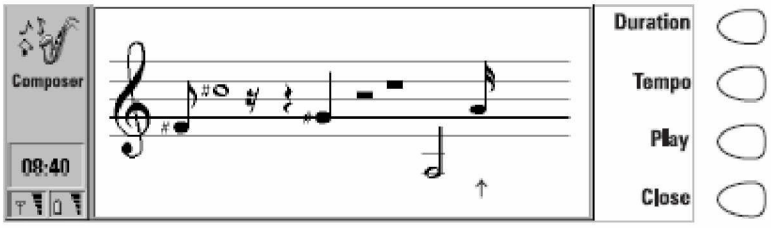


Figure 4

Id. at 0140.

98. Thus, in my opinion, one of skill in the art would understand that the 9110 UM discloses the use polyphonic audio files that meets Solocron's Litigation construction for polyphonic. This is in addition to meeting the definition of polyphonic based upon the prosecution history discussed above.

99. The 9110 can access the Internet, for searching and downloading files: "The World Wide Web: The Nokia 9110 Communicator supports HTML 3.2…." *Id. at 00*95. UM provides detailed instructions on how to use the web browser on the 9110 to navigate the World Wide Web and to subscribe to "Internet services". *See, e.g.*, *id.* at 0099-0102 (the section is entitled "To navigate in WWW"). In addition, any web page may be stored locally and retrieved: "Tip: To fetch WWW pages stored in the …Downloaded files folders of the communicator or the memory card use the prefix 'file:///' (note: three slashes) instead of 'http://'." *Id.* at 0096.

100. The web browsing capabilities on the phone include a search/find feature: "When you have a WWW page open and you press the Menu button, the following options become available: *Add bookmark* – Adds the current address to the Bookmarks list. … *Find* – You can search for various items, such as words in the WWW page. *Open file* – You can open files from the … Downloaded files folder." *Id.* at 0100.

101. The 9110 has software that supports and plays polyphonic audio files: "NOTE: Sound files that the voice recorder can play have a .WAV extension and support the following audio format: 8, 11, 22 or 44khz, PCM/A-law, Stereo/Mono, 8 bit." *Id.* at 0143.

102. Once downloaded, a file can be copied to the sounds folder so it can be selected as a ringing tone: "When you press the Menu button in an opened folder, the following options become available: *Copy* – You can choose a folder into which the selected document will be copied. … *Copy to sounds* – You can add the selected tune to the list of ringing tones." *Id.* at 0110.

103. The 9110 further can assign any downloaded file as a ringing tone: "*Default ringing tone* – You can select one of the tones in the pop-up box or compose a special ringing tone for your telephone with the Composer application. See 'Composer' on page 129. You can also use the sounds you have recorded with

the Digital voice recorder as ringing tones. See 'Voice recorder' on page 132." *Id.* at 0123.

104. In addition, different ringing tones may be assigned to different contacts, as disclosed: "*Ringing tone* – You can set a specific ringing tone for each contact in the Contacts directory. Select a tone from the list, and press **Select**." *Id.* at 0052.

105. UM thus shows "*A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising*" as required by claim 10.

Limitation [10a]: "a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files"

106. The 9110 telephone described in the 9110 UM includes a cellular communications link that is capable of connecting to databases in remote computers (e.g., websites of "service providers" that provide services to "subscribers") that include polyphonic audio files: "The communicator interface includes many organiser and communications applications." *Id.* at 0012. *See also id.* at 0025 ("The coloured application buttons on the communicator keyboard are used to start the corresponding applications [including] Internet and modem-based

applications."), *Id.* at 0083 ("Internet applications … World Wide Web (WWW) – A hypertext-based system for finding and accessing resources on the Internet.").

107. The 9110 uses a radio transmitter to establish a wireless communications link "with remote computers": "As with any other radio transmitting device, do not touch the antenna unnecessarily when the phone is switched on." *Id.* at 0146.

108. The 9110 utilizes the GSM network which make it capable of communicating with other devices reachable from the GSM network: "Facts about cellular data transmission[:] The Nokia 9110 Communicator employs the data transmission capabilities of the GSM network to send faxes, short messages and e-mail, and to establish connections with remote computers. Cellular data connections can be made from most locations where your wireless phone operates." *Id.* at 0014.

109. The 9110 displays the following icon to indicate "An open data connection [to the] 'Internet'":

Id. at 0023. Thus, the 9110 is capable of communicating with Internet servers, which may contain databases of polyphonic audio files.

110. UM thus shows "*a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files,*" as required by claim 10.

Limitation [10b]: "a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom"

111. The 9110 UM describes the 9110's display and a browsing application that allows a user to browse and select audio files from the Internet. Fig. 5 depicts the display:

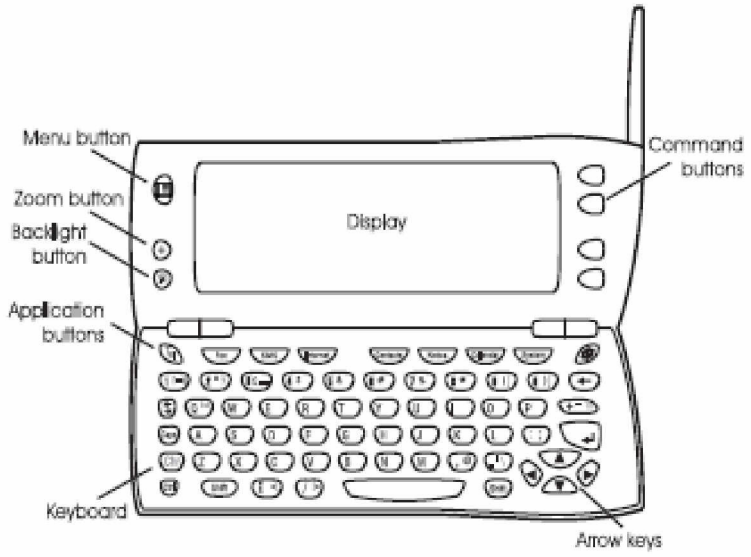


Figure 5

Id. at 0021.

112. UM provides detailed instructions on how to use the web browser on the 9110 to navigate the World Wide Web and to subscribe to "Internet services". *See, e.g.*, *id.* at 0099-0102 (the section is entitled "To navigate in WWW").

113. The UM discloses how to set up an Internet access point if the user has not already done so: "[T]his service provides you a convenient way to set up the internet connection. … You can subscribe to the Internet services of selected providers in your country directly with your Nokia 9110 Communicator, provided that the data service is activated for your SIM card. See the instructions below…. When the connection has been made, follow the instructions on the display to select a service provider and to subscribe to their Internet services." *Id.* at 0084.

114. The browser in the 9110 provides the capability "[t]o fetch a WWW page 1) Select an entry in the Bookmarks list or enter a URL in the address field. 2. Press Go." *Id.* at 0096.

115. When browsing a web page, the 9910 provides the capability to navigate through hyperlinks: "[w]hen the page is on the display, use the arrow keys to scroll the view and to choose hyperlinks and hotspots. Each arrow key press selects the nearest hyperlink or hotspot, or moves the view one line up or down. *See* Figure 8:"

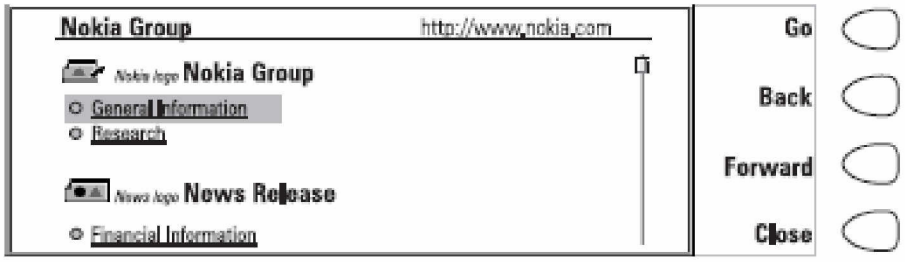


Figure 8

Id. at 0099. *See also* 107 ("To use the browser – Press the arrow keys on the keyboard to move from one hotspot to another. To follow a hyperlink, press Fetch. With Change you can tick off boxes and buttons.")

116. UM also teaches how to use the 9110 in a text mode to access "Operator services" from "network operators": "With Text Web you can fetch information from the Internet, using SMS. Such information can include for example flight schedules, weather reports and stock news. You can also access services provided by your network operator and Nokia." *Id.* at 0107.

117. Network operators may also provide services that may be accessed via the 9110: "Operator services - The Operator services allows the network operator to provide various services to the subscribers. The operator-specific items may vary from subscriber to subscriber, and can be updated by the network operator." *Id.* at 0107.

118. Moreover, the web browser provides the capability for a user to search and select the contents of the website using the "*Find*" function or to browse and select the contents using the "*Save*" function: "When you have a WWW page open and you press the Menu button, the following options become available: … *Find* – You can search for various items, such as words in the WWW page. … *Save* – Saves the page contents or the image to the Downloaded files folder, or adds the address to the page of the Bookmarks list." *Id.* at 0100-0101.

119. UM discloses how to navigate and save content from the web into a local folder: "Folders in the Notes main view are: … Downloaded files – Documents downloaded with the Internet applications." *Id.* at 0109

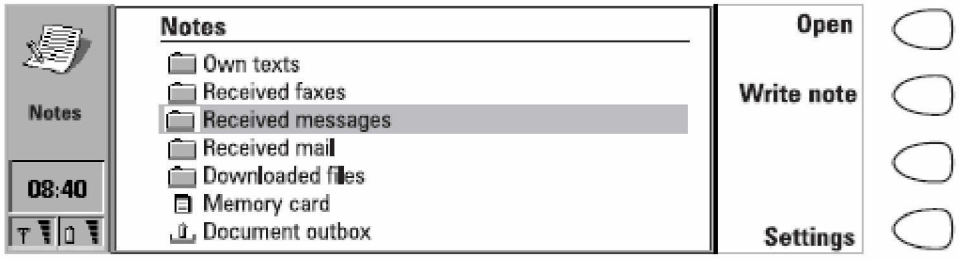


Figure 1

Id. at 0109.

120. Thus, UM teaches a user how to use an Internet browser on a phone to access available remote websites via a wireless communications link and download, as well as save, files into a "downloaded files" directory, which is a programmable memory.

121. UM thus shows "*a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom*" as specified in claim 10.

Limitation [10c]: "processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link"

122. The 9110 telephone is an intelligent communicator that functions like a portable computer in that it can run preinstalled software as well as software that

is downloaded. It has a screen, keyboard and internal processor with software configured to process data transfer protocols utilized by Internet web servers, including HTTP and TCP/IP: "The communicator interface contains many organiser and communications applications. The large keyboard, command buttons and display make using the applications easy." *Id.* at 0012. Furthermore, as a mobile device, the 9110 contains circuitry to selectively distinguish data carried via radio waves addressed to it from data addressed to other mobile devices in the vicinity: "The Nokia 9110 Communicator employs the data transmission capabilities of the GSM network to send faxes, short messages and e-mail, and to establish connections with remote computers…Cellular data connections can be made from most locations where your wireless phone operates. However, it is recommended that you move the communicator to a location where the strongest possible cellular signal can be obtained. When the signal is strong, data transmission is efficient." *Id.* at 0014. Such software for supervising the receipt of data does so for all types of data received, irrespective of what such data contains.

123. Thus, regardless of whether an audio file is downloaded and saved using the Internet browser, received as an SMS message, or received as an application attachment to an email, the 9110 telephone has processing circuitry that monitors receipt.

124. For example, the 9110 monitors for receipt of email and attachments and notifies the user when an attachment is received audibly and visually: "When you receive a short message, the text *Message received* and the [icon] indicator will be displayed and a tone will sound…" *Id.* at 0153.

125. In addition, the receipt of a specific type of data may trigger a specific ringing tone: "*Application tones*: *Calendar alarm*, … *Received SMS, Received mail* – For each of these items you can set a specific ringing tone. You would then be able to tell by the tone whether you have received a fax, or a short message, for example." *Id.* at 0124.

126. When, for example, an email with an attachment is received, the software provides for options on what the user may do with the attachment: "When you open a received mail, the following commands become available: **Attachments** -- Lists all MIME attachments: text, image audio, video or application. … When viewing the list of attachments, you may select an attachment and choose from the following options: **View** – Opens the attachment if there is enough memory and if the message can be opened in the communicator; **Save** –Saves the attachment in the Downloaded files folder…." *Id.* at 0093-94.

127. Further, if a ringtone is downloaded from the Internet, 9110 UM describes two levels of supervising the receipt. First, when surfing the Internet, the 9110 monitors data as it is being received (e.g., "display" shows the "status of the

connection" and "how many bytes of the page have been received) and further confirms receipt by making certain tools available after a page has been downloaded: "When the WWW page is being fetched, the line on top of the display shows the status of the connection, the title of the page, and how many bytes of the page have been received." *Id.* at 0099.

128. Moreover, supervision of receipt is inherent in downloading a file (from the Internet) into a file directory such as the Downloaded files folder: "After the WWW page has been fetched, the following commands become available: *Go* – If there is a link to another WWW page in the currently open page, select the link with the selection frame and press Go to fetch the page....." *Id.* at 0100. "When you have a WWW page open and you press the Menu button, the following options become available: … *Find* – You can search for various items, such as words in the WWW page. … *Save* –Saves the page contents or the image to the Downloaded files folder, or adds the address to the page of the Bookmarks list." *Id.* at 0100. *See also id.* at 0109-0113 (relating to management of documents stored on the phone). Also, the 9110 UM discloses that the phone has electronic circuitry: "Keep it dry. Precipitation, humidity, and liquids contain minerals that will corrode electronic circuits. …Do not store in cold areas. When the communicator warms up … moisture can form inside the communicator, which

may damage electronic circuit boards. …. Rough handling can break internal circuit boards." UM at *Id.* at 0169

129. It is my opinion that based on the discussion above, one of skill in the art would understand that the phone described in UM is a smart phone that has a processor, and further would conclude that UM discloses processing circuitry that supervises receipt of incoming communications.

130. It is also my opinion that processing circuitry that supervises receipt is inherent in the phone described in the UM because it uses folders such as the Downloaded files folder to save downloaded files. The phone necessarily has a processor-based circuit to receive RF signals and convert them to useable information, and necessarily monitors receipt of data to know when a file has been received so that it can update the folders to reflect the newly downloaded file (such as a sound file used for ringtones).

131. UM thus shows "*processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link*" as required by claim 10.

Limitation [10d]: "a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication"

132. The 9110 UM describes that the 9110 telephone as having two memories that can be programmed with ringing tones—an internal memory (which

has a "sounds" folder" which contains a "list of ringing tones") and a removeable "memory card" which can also store sounds. The phone includes an application called "Notes" for managing documents that are downloaded, whether from the Internet or from an attachment (either email or other application). Once downloaded into the "Downloaded files folder," the "Notes" application gives the user the ability to copy a downloaded file into the "sounds" folder for use as a ringtone: "Notes is used for … managing various documents stored in the communicator. Note: When you open a document, the document is opened in the appropriate editor or viewer. The available commands vary according to the editor/viewer. Folders in the Notes main view are: … Downloaded files – Documents downloaded with the Internet applications." *Id.* at 0109

133. The "Downloaded files" folder, as well as the "Memory card" folder, are depicted in Fig. 1:

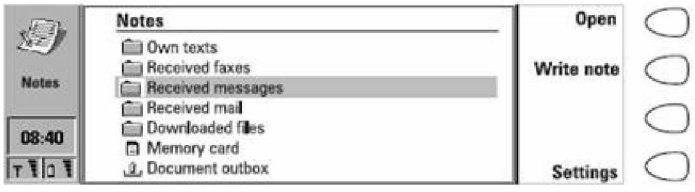


Figure 1

Id. at 0109.

134. Um also teaches how to copy to and from the memory card: "*Copy to memory card* — Copies the selected recording to the memory card. *Copy from*

memory card — Copies the selected recording from the memory card to your communicator." *Id.* at 143.

135. Of course, a file, such as an audio file can be downloaded from the Internet: "When you have a WWW page open and you press the Menu button, the following options become available: … Find – You can search for various items, such as words in the WWW page. … Save –Saves the page contents or the image to the Downloaded files folder, or adds the address to the page of the Bookmarks list." *Id.* at 0100-0101. "To fetch a WWW page 1) Select an entry in the Bookmarks list or enter a URL in the address field…" *Id.* at 0096.

136. If a ringing tone is received as an attachment to an email, the attachment can be saved to the Downloaded files folder and then copied to the sounds folder: "When you open a received mail, the following commands become available: Attachments -- Lists all MIME attachments: text, image, audio, video or application. … When viewing the list of attachments, you may select an attachment and choose from the following options: View – Opens the attachment if there is enough memory and if the message can be opened in the communicator; Save –Saves the attachment in the Downloaded files folder…." *Id.* at 0093-94. MIME may be used to attach audio files: "MIME [is a] standard Internet format which permits including multiple mail objects in a single message [including, for example] audio fragments." *Id.* at 0176.

137. Once an audio file is downloaded, it can become available for use as a ringtone by copying the file to the "sounds" folder which adds "the selected tune to the list of ringing tones": "When you press the Menu button in an opened folder, the following options become available: Copy – You can choose a folder into which the selected document can be copied. … Copy to sounds – You can add the selected tune to the list of ringing tones." *Id.* at 0110.

138. The 9110 contains applications to browse the contents of the memory: "System contains the following applications: ….Memory, … Memory Card tool...." *Id.* at 0123.

139. The memory applications allow the user to show the contents of the phone's programmable memory circuits: "This [Memory] application shows the amount of available free memory for storing data…. Press Details to open up a list of folders and other data in the communicator. The list shows how much memory each of them takes up…. If your memory card is inserted in the communicator, press Memory card to check the amount of available memory in the card." *Id.* at 0128.

140. In addition to the internal memory circuit, the 9110 includes a removeable "memory card" which is a second programmable memory circuit that can be used to store "ringing tones": "A memory card may contain documents, contact databases, applications…..etc. When a memory card is inserted in the

communicator, the memory card contents are marked with the memory card icon in the corresponding applications. For example, the documents on the memory card are located in a folder shown in the folders list of the Notes application." *Id.* at 0032.

141. The 9110 UM includes programmable "profiles" that can be set to determine which ringing tone is played when a call is received: "Profiles – With this setting you can modify the profiles. The available profiles are: … Ringing tone – Determines the ringing tone. To compose your own ringing tone, see 'Composer' on page 139, and to record a ringing tone with the Digital voice recorder, see 'Voice recorder' on page 132." *Id.* at 0063-64; *see also id.* at 0149 and 0152. In addition, recorded audio may be used as ringing tones: "Tip: With the Voice recorder you can record sounds and speech and set them as ringing tones. See 'Telephone settings' on page 53." *Id.* at 0142.

142. UM teaches how an audio file stored in the sounds folder can be assigned and used as a ringing tone to a contact stored as a contact card: "**Contact card options** – When you press **Options** in an opened contact card, the following options become available: Ringing tone – You can set a specific ringing tone for each contact in the Contracts directory. Select a tone from the list and press Select. The icon appears at the top of the contract card. *See* Figure 2. In order to use

this function, however, the individual ringing tones setting must first be set on. See 'Telephone settings' on page 53." *Id.* at 0052.

143. UM thus shows "*a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication*" as required by claim 10.

Limitation [10e]: "an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played"

144. The UM describes that the 9110 phone has a "handsfree loudspeaker" that permits the user to adjust the volume as well as play WAV-based sound files that may be stereo or mono. The 9110 has software that supports and plays polyphonic audio files, including "stereo": "NOTE: sound files that the voice recorder can play have a .WAV extension and support the following audio format: 8, 11, 22 or 44khz, PCM/A-law, Stereo/Mono, 8 bit." *Id.* at 0143.

145. Based on the inventor's assertion that "MP3, WAV, MPEG, and many MIDI files are polyphonic audio files," (Exhibit 1010 at 0442), the 9110 UM discloses polyphonic audio files in the same exact sense that the inventor argued support for polyphonic, namely that WAV files are polyphonic audio files.

146. The 9110 also includes a loudspeaker that allows for handsfree operation. For example, the following icon indicates that "[y]ou have a voice call,

and the handsfree loudspeaker and microphone are on. See 'Handsfree mode' on page 59."

Exhibit 1070 at 0023.

147. The speaker volume may also be adjusted: "[a]fter the audio has been set on, the command changes to Volume. Press Volume to adjust the speaker volume…" *Id.* at 0059. *See also id* at 0147 (raising the volume on the earpiece).

148. The speaker is located on the rear of the device:

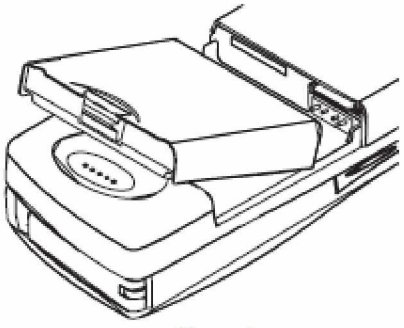


Figure 1

Id. at 0018.

149. The inventor asserted to the Patent Office that WAV files are polyphonic (Exhibit 1010 at 0442), and further that polyphonic ringtones are "high quality." Exhibit 1007 at 0063-0064 ("The use of high quality audio data such as polyphonic ringtones is an important feature…").

150. One of ordinary skill in the art would understand from the note that the 9110 "supports" and "plays" "high quality" WAV files that are formatted for "8, 11, 22 or 44khz, PCM/A-law, Stereo/Mono, 8 bit," (Exhibit 1070 at 0143), the speaker plays the full range of audio file being played, and thus discloses an enhanced speaker.

151. The 9110 UM discloses that the speaker plays the "Grand Valse" default ringtone, Exhibit 1070 at 0123 ("the default ringing tone Grande valse"), various "*sounds* you have recorded with the Digital voice recorder as ringing tones," *id.* at 0123 (emphasis added), and multiple notes that may be composed using the Composer, *id.* at 0139-0141 (describing how to use the "Composer" starting on page 129). This would meet the definition of an enhanced speaker using Solocron's Litigation construction for polyphonic.

152. In my opinion, 9110 UM has as much disclosure of an enhanced speaker as does the '866 patent.

153. The 9110 UM thus shows "*an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played*" as required by claim 10.

154. It is my opinion that UM discloses each and every element of claim 10 and thus the 9110 UM anticipates claim 10.

B. Nokia 9110 User Manual (Exhibit 1070) in combination with 9110 FAQ (Exhibit 1083)

155. As explained in more detail below, claim 10 is obvious in view of the 9110 User Manual and the 9110 FAQ.

156. As discussed above, 9110 FAQ is a publicly available Nokia.com Internet page that was archived on May 8, 1999. Exhibit 1087 at 0008-09 (¶¶ 38-39) and at 0078 – 0081.

157. The 9110 UM and 9110 FAQ relate to the same product (namely, the Nokia 9110). Both documents on their face were intended to publicly distribute information about the 9110 product, and both were produced and distributed by the same company (Nokia) in the same year (1999). For at least these reasons,, one of skill in the art would readily combine these references for their combined teachings. As discussed above in ¶¶ 96-99, 111-114, the Nokia 9110 UM teaches a telephone that includes a web browser that can allow a user to "subscribe to the Internet services of selected providers in your country directly with your Nokia 9110 Communicator" (Exhibit 1070 at 0084), as well as "access[ing] services provided by your network operator and Nokia." *Id.* at 0107.

158. 9110 FAQ teaches the user that she can download WAV files from the internet specifically for use as ringtones: "Can you store PC audio .WAV files on the unit? Yes. WAV files can be downloaded from the Internet …. The WAV files can also be used as ringtones." Exhibit 1083 at 0004. 9110 FAQ also teaches that

the phone plays "Audio files (WAV files as ringtones)" and that the "Voice recorder [can] playback .WAV files." *Id.* at 0002. 9110 FAQ also further describes that the speaker produces "superb audio": "[The Nokia 9110 is an] outstanding mobile phone with … superb audio and voice quality." *Id.* at 0002.

159. I believe that he 9110 FAQ bolsters the teachings of 9110 UM regarding downloading WAV files from the Internet and using those WAV files as ringtones. Moreover, the 9110 FAQ does exactly what the inventor said the prior art was incapable of doing in the prosecution history (Exhibit 1007 at 0064 ("the prior art systems of record is incapable of playing such high quality audio")) because it teaches that the 9110 phone plays WAV-based ringtones and has "superb audio … quality." Exhibit 1083 at 0002.

160. Moreover, to the extent that a WAV file is not considered to be inherently polyphonic as the inventor contended during prosecution, see Exhibit 1010 at 0442 (discussed above), one of skill in the art would have considered it obvious to use a WAV file to store audio that simultaneously produced multiple tones in order to take advantage of the "superb audio …quality" of the 9110 speaker as described in the 9110 FAQ.

161. The inventor chose to differentiate his ringtones on the basis of polyphony. The group of potential ringtones would only include monophonic and polyphonic ringtones. The substitution of a polyphonic ringtone for a monophonic

ringtone is obvious especially when the format here (WAV) has the capacity to be both monophonic or polyphonic. For at least this reason, one of skill in the art would consider it obvious use polyphonic content in a WAV file for use as a ringtone.

162. Since 9110 UM teaches a phone that supports ".WAV extension [file formats with] 8, 11, 22 or 44khz, PCM/A-law, Stereo/Mono, 8bit" audio (Exhibit 1070 at 0143), one of skill in the art would have found further motivation to use an audio file having polyphonic content, because it would take maximum advantage of the supported formats. Thus, it would have been obvious to use a WAV file that produced audio having multiple simultaneous notes and to set the WAV file as a ringing tone as taught by 9110 UM. Exhibit 1070 at 0143.

163. While it is my opinion that the 9110 UM alone anticipates claim 10, it is also my opinion that the combination of 9110 UM and 9110 FAQ would also render claim 10 obvious, using either petitioner's proposed construction or Solocron's Litigation construction of polyphonic.

C. Nokia 9110 User Manual (Exhibit 1070) in combination with 9110 FAQ (Exhibit 1083) and Nikkei (Exhibit 1074)

164. One of skill in the art would have readily combined 9110 UM and 9110 FAQ for the reasons stated above in connection with the analysis of claim 10 based on the same combination.

165. As discussed above, on November 15, 1999, Nikkei Electronics published several articles in a single issue relating to ringtones, including in particular, Chapter 2 ("Music is from Ringing tones, Game is from characters") and Chapter 3 ("Realized technology: Maintain size and cost, enhance playback functions of images and sound"). Exhibit 1074 at 0002-0007 (appearing at pages 116-127 of the original magazine).

166. Figure 4 of Nikkei describes the "Evolution of Services" which recognized how the "success of ringing tones produces demand for high sound quality" and that as of the "End of 99" phones were "function[ing] to simultaneously reproduce 3 to 4 sounds", that by 2000, phones would "function to simultaneously reproduce 16 to 32 sounds" and by 2001, phones would include "audio decoding function [for] MP3." Exhibit 1074 at 0003 (p. 119). Nikkei recognized that a shift from monophonic ringtones to simple polyphonic ringtones had already begun and that the future would bring even higher degrees of polyphony. Exhibit 1074 at 0003 (pp. 118-119). Nikkei's Figure 5 is an illustration of network download speed relative to file size, and reflects that the ability to download MP3 music for use on a phone was simply a matter of waiting for the carrier networks to increase in download speeds sufficient to permit efficient download times:

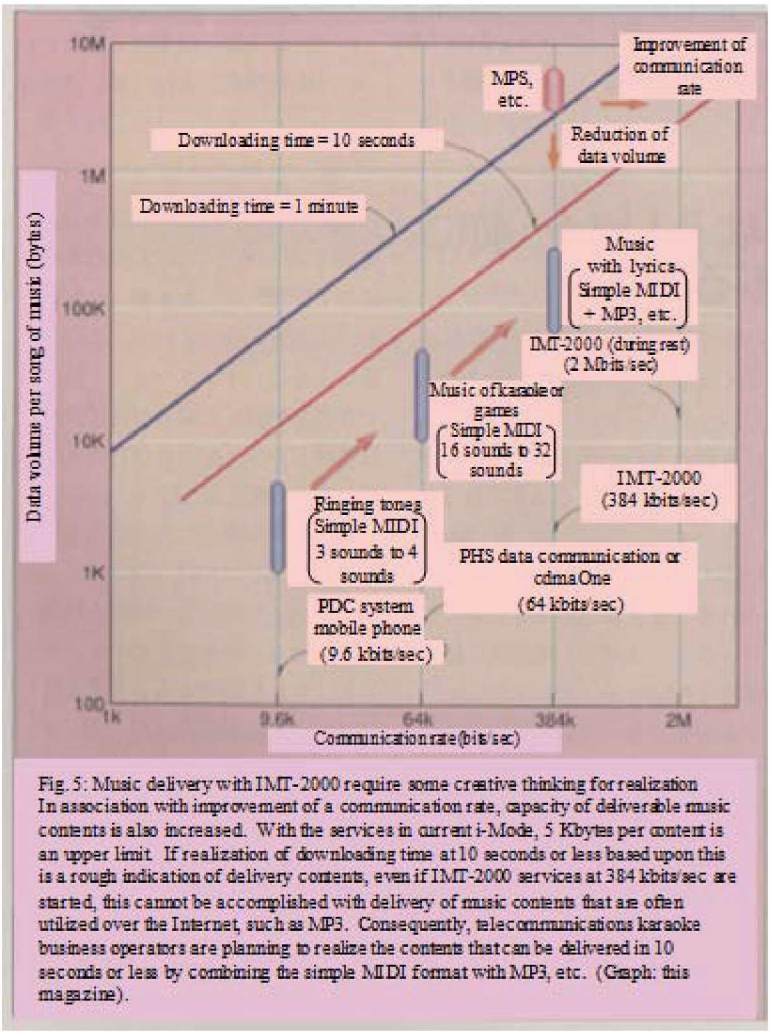


Fig. 5: Music delivery with IMT-2000 require some creative thinking for realization In association with improvement of a communication rate, capacity of deliverable music contents is also increased. With the services in current i-Mode, 5 Kbytes per content is an upper limit. If realization of downloading time at 10 seconds or less based upon this is a rough indication of delivery contents, even if IMT-2000 services at 384 kbits/sec are started, this cannot be accomplished with delivery of music contents that are often utilized over the Internet, such as MP3. Consequently, telecommunications karaoke business operators are planning to realize the contents that can be delivered in 10 seconds or less by combining the simple MIDI format with MP3, etc. (Graph: this magazine).

Exhibit 1074 at 0004 (p. 120).

167. Nikkei even publishes a list of 20 popular ringtones, many of which appear to be polyphonic because they reference not only the song, but also the vocalist, including for example, "Livin' la vida loca [by] Ricky Martin" and "My heart will go on [by] Celine Dion" *Id.* at 0002 (p. 117).

168. Fig. 2 of Chapter 3 is also insightful because it provides further details on "Hardware advances accompanying improvements in audio function":

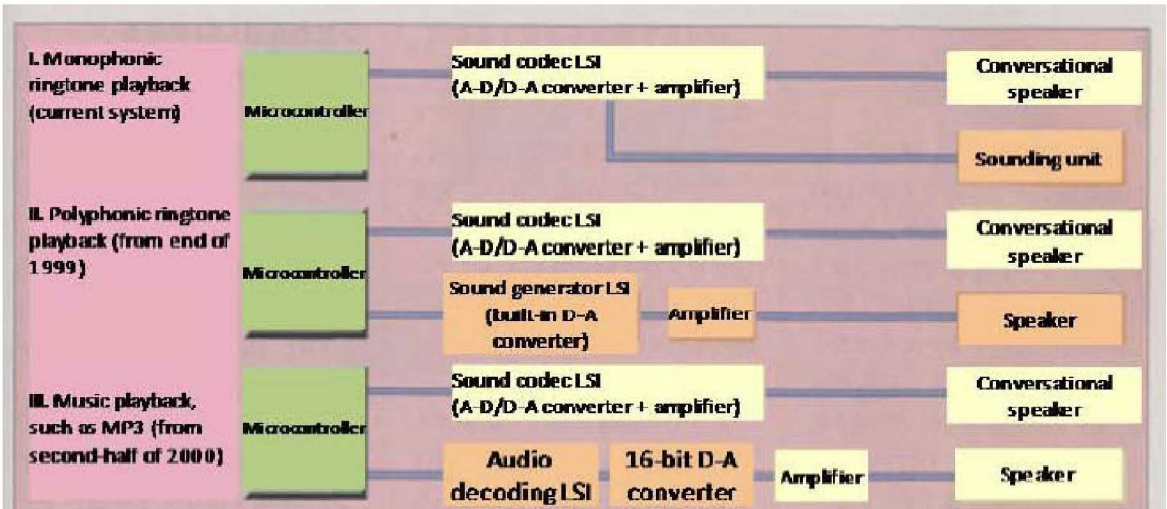


Figure 2: Hardware advances accompanying improvements in audio function
For conventional playback of monophonic ringtone, a codec LSI for playback of sounds is commonly used, and sounds were produced by using an electromagnetic sounding body referred to as a sounding unit. In mobile phones that will be released at the end of 1999, a dedicated sound generator LSI will be added and a sounding unit will be replaced with a speaker. If mobile phones are attempted to be equipped with music playback functions, such as MP3, it is necessary to mount an audio decoding LSI instead of the sound generator LSI, and to include a D-A converter with 16 bits to 18 bits of resolution. Additionally, it will become necessary to add slots for compact memory cards and to increase battery capacity. (Image by this magazine)

Id. at 0006 (p. 125).

169. Figure 2 from page 125 of Nikkei (shown above) and its accompanying description teach everything one skilled in the art needs to know to be a part of the evolution of ringtones in 1999. Exhibit 1074 at 0006 (p. 125). Nikkei teaches evolution from "monophonic ringtone" to "polyphonic ringtone" and then to "MP3 music playback" would happen rapidly and projects that MP3 playback phones will be on the market by mid-2000. Nikkei further describes that the hardware will be "advanced" by replacing the conventional "sounding unit" with an actual "speaker", sound codecs and audio decoding circuitry to accommodate MP3 music. The surrounding pages are devoted to discussing this

"evolution" and the new speaker technologies (e.g., "sound generator LSI") that were to be added to mobile phones by the end of 1999.

170. Nikkei even discloses use of MIDI formats with certain LSI devices, which teaches using synthesized polyphonic ringtones. See Exhibit 1074 at 0003 (p. 119).

171. It is my opinion that the evolution discussed in Nikkei is typical of the portable electronics industry that absorbs known technology as the underlying electronics, and the networks upon which they operate, improve. As discussed above, it is my opinion that the combination of 9110 UM and 9110 FAQ yields the invention of claim 10. To the extent however, that an express teaching of the need for polyphonic ringtones is required, Nikkei establishes indisputably that polyphonic ringtones already existed and were in significant demand. WAV format clearly support polyphonic content, and thus, Nikkei provides a clear teaching that the industry and consumer demand is growing for polyphonic ringtones. It would have been obvious to utilize polyphonic content for a WAV based ringtone which could be played on the 9110 phone and use the speaker of the 9110 to reproduce the polyphonic audio with "superb audio … quality" as taught by 9110 FAQ. The trends discussed in Nikkei are not specific to any one technology, but instead are generally expressed with respect to the cell phone industry as a whole, and one of skill in the art would readily have incorporated the

teachings of Nikkei as a simple matter of technology adoption driven by market forces. Thus, one of skill in the art would have readily combined 9110 UM, 9110 FAQ and Nikkei, for this reason, and the reasons discussed above for combining 9110 UM and 9110 FAQ.

172. As such, it is my opinion that the combination of 9110 UM, 9110 FAQ and Nikkei renders claim 10 obvious, under any of the above-discussed constructions for polyphonic.

D. Nokia 9110 User Manual (Exhibit 1070) in combination with 9110 FAQ (Exhibit 1083) and Perez (Exhibit 1081)

173. One of skill in the art would have readily combined 9110 UM and 9110 FAQ for the reasons stated above in connection with the analysis of claim 10 based on the same combination.

174. Perez (Exhibit 1081) is a patent that issued to the cell phone manufacturer Ericsson, based on an application that was filed January 20, 1998—almost two years before the earliest claim of priority in the '866 patent.

175. I understand that Solocron contends that the "enhanced speaker" limitation should mean "a speaker that can provide a substantially full range of audio sounds," where "substantially full range of audio sounds" is further construed to mean "the full range of sounds within human hearing, or a range of sounds not appreciably smaller than that range." Exhibit 1071 at 0028. As I said above, I do not believe this is an appropriate construction for this term. In

particular, this construction is substantially narrower than the broadest reasonable construction. Nevertheless, even if this construction is adopted, Perez teaches a range that is greater than the total known range of human hearing (which is generally considered to be 20Hz to 20,000 Hz, but of course, the range reduces considerably with the age of the listener).

176. Perez is relevant to the "enhanced performance speaker" limitation. Perez discloses actual details of how to build and make a cell phone speaker that is capable of producing a range of frequencies from 10Hz to 30,000 Hz. Exhibit 1081 at 3:66-4:9.

177. Perez describes a known problem with cell phone speakers which is the electromagnetic energy associated with the cellular transmissions generates "unwanted noise in the speakers": "The EMI which causes unwanted noise in the speakers of modern communication devices, such as cellular phones, is largely generated by the analog and digital circuitry associated with the means for driving said speakers. In cellular communication systems several different mobile units share the same set of frequency channels at the same time." Exhibit 1081 at 2:20-25.

178. Perez "discloses a piezoelectric transducer that is capable of being directly driven by a digital signal." Exhibit 1081 at 3:41-42. "A digitally driven piezeoeletric transducer avoids the problems associated with EMI because it

eliminates the need for additional analog circuitry to create sound audible to humans." *Id.* at 2:59-62. "A further benefit of piezoelectric elements is that they consume a little amount of power compared to the amount of acoustic pressure they can generate." *Id.* at 1:51-54.

179. "The acoustic sound energy is designed to be intensified by the resonant cavity 18 in the range of about 10 HZ to about 30 kHz. This frequency range is chosen because it covers the spectrum of frequencies human beings are capable of hearing." 3:66-4:3. See also Perez at claim 3 ("The digital piezoelectric transducer of claim 2 wherein the acoustic energy is intensified by said resonant cavity in the range of about 10 HZ to about 30 kHZ").

180. Perez intended his speaker to be used in cellular phone: "[A] need exists in the electronic industry to replace analog driven speakers in various products, including cellular phones, with purely digitally driven speakers which are less susceptible to EMI. The present invention discloses a digitally driven piezoelectric transducer which is not dependent on analog circuitry to produce audible sound, thereby eliminating the problems with EMI and the need for additional analog circuitry." *Id.* at 2:40-47. "Unlike conventional speaker systems, a piezoelectric element is capable of creating a sound without a fragile or moving coil." *Id* at 1:40-42.

181. Even before Mr. Shanahan filed his patent application, one skilled in the art would have known the desirability to incorporate an "enhanced performance speaker" such as shown in Perez into cellular telephones.

182. One of skill in the art would be motivated to combine Perez with the 9110 phone described in the 9110UM for at least the reasons noted above, namely, the speaker "avoids the problems associated with EMI", consumes less power, provides superior performance and reduces circuitry for the speaker.

E. Nokia 9110 User Manual (Exhibit 1070) and 9110 FAQ (Exhibit 1083) in combination with Nikkei (Exhibit 1074) and Perez (Exhibit 1081)

183. The addition of Perez to the combination of the other three addresses the situation in which the "enhanced speaker" term is construed to require the full range of human hearing. As shown above at ¶¶174-180, Perez discloses such a speaker in far more detail than is present in the '866 patent.

184. One of skill in the art would have readily combined 9110 UM, 9110 FAQ and Nikkei, and 9110 UM, 9110 FAQ and Perez, for the reasons discussed above in connection with my analysis of claim 10 using the same combinations of references. One of skill in the art would readily have added the improved speaker of Perez to the phone described in the 9110 references because it addresses known problems of cell phones, and further it would provide a better sound quality for the polyphonic audio files taught in Nikkei in order to meet the "demand for high

sound quality" referenced in Nikkei (Exhibit 1074 at 0003 (p. 119 (text for Fig. 4)).

185. The trends discussed in Nikkei are not specific to any one technology, but instead are generally expressed with respect to the cell phone industry as a whole, and one of skill in the art would readily have incorporated the teachings of Nikkei as a simple matter of technology adoption driven by market forces.

186. Similarly, the improvements discussed by Perez are not to any one phone technology, but instead are generally expressed as improvements for use with any cell phone.

187. Thus, one of skill in the art would have been motivated to combine all four references as basic improvements on the underlying mobile phone described in the 9110 UM and 9110 FAQ, which would render claim 10 obvious using either petitioner's proposed claim construction or Solocron's Litigation construction of polyphonic.

F. Rizet (Ex. 1014) in combination with Nikkei (Exhibit 1074)

188. As discussed below, Rizet describes "high quality" ringing tones in the forms of "melody, song, music," and "soundtracks." Rizet does not use the word "polyphonic"--nor does the specification of the '866 patent for that matter—but Rizet does reference a "high quality" ringtone. It is my opinion that claim 10 is obvious in view of Rizet in combination with Nikkei as described below.

1. Overview of Rizet

189. Rizet is a published PCT application which Philips Electronics N.V. ("Philips") filed November 13, 1997—more than two years before the earliest priority application for the '866 patent was filed. Rizet was not cited during prosecution of the '866 patent. Notably, Rizet uses strikingly similar language to the 866 patent, including for example, "user-defined" ringing tones (as referenced in the title and specification of the 866), "communication link", "remotely situation database" (compared to "database in remote computer").

2. Comparison of Rizet to Claim 10 of the '866 Patent

a. Claim 10

Limitation 10 Preamble: "A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising"

190. Rizet discloses a telephone (e.g., a "cellular telephone") that can be programmed with "user-defined forms of ringing information" (Exhibit 1014 at 0004) (e.g., "melody, song, music," and "soundtracks") : "A telecommunication device is disclosed comprising a ringing information memory means, and a ringing information memory updating means for updating the ringing information content [in] the form of … melodies." Exhibit 1014 at 0001 (Abstract).

191. Rizet's claims are even directed to a cellular telephone: "the telecommunication device is ... a cellular telephone." *Id.* at 0007 (claim 9).

192. Rizet disclose that ringing information of high quality, including songs and music: "It is an object to provide a multi selection, high quality ringing information extend/change feature to a telecommunication device such as a telephone [by providing] a public database containing a variety of alternative forms of ringing information …such as a melody, song, music…." *Id.* at 0003-0004 (1:27-2:6).

193. Rizet discloses that such ringing information is stored in a database: "The database is filled with alternative forms of ringing information such as melodies, songs, sound, soundtracks, speech etcetera." *Id.* at 0005 (3:23-24). See also Rizet claim 4 (wherein "the ringing information memory updating means is connected to selection means coupled to the database for selecting user defined forms of ringing information"). *Id.* at 0007.

194. One of skill in the art would consider the ringing information stored in the database constitutes audio files because the ringing information comprises audio information or data (see, e.g., claim 6 ("ringing information comprises audio … information) that is used by the phone's "audio producing means" (see, e.g., claim 8 ("device comprises audio producing means") to produce an audible "high quality" (*id.* at 0003 (1:26)) ringing tone.

195. As discussed in greater detail below, Rizet also describes in connection Figure 2 how to search and select ringing information from a database

for download into the ringing information memory. *See id.* at 0005-0006 (3:31-4:17).

196. To the extent that the preamble is limiting, Rizet thus shows "*A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising*" as required by claim 10.

Limitation [10a]: "a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files"

197. Rizet teaches that the telephone can be used to form a "communication link" to a remote "database" that "filled with alternative forms of ringing information such as melodies, songs": "In an embodiment the telecommunication device according to the invention is characterised in that the ringing information memory updating means is connected to the data base via a long distance communication link. Such a database can comprise one or more remotely situated databases, which are connectable directly to the telecommunication device and to the ringing information memory, but preferably there is a database which can be consulted …by means of a generally long distance communication link to each subscriber of the telecommunication device, in order to select and at wish download his favourite ringing item." *Id.* at 0004 (2:19-26).

198. The "telecommunication link 2" is also discussed in connection with Fig. 2: "Figure 2 shows a flowchart for elucidating one possible way of implementing the updating of the ringing information present in the ringing information memory 4. …. Block 9 represents the establishing of a telephone call through a number to make a connection via the telecommunication link 2 to the database 6, usually through a modem (not shown). A suitably programmed and connected microprocessor 10 in telecommunication device 3 provides a guided menu (block 11), wherein choices can be made by pushing appropriate keys on a keyboard 12, to choose (block 13) for example for ringing information in the form of music, tones, speech etcetera to be downloaded by the downloading means 7. ……." *Id.* at 0005-0006 (3: 31-4: 17).

199. The communication link is also depicted in Fig. 1 (see reference numeral 2):

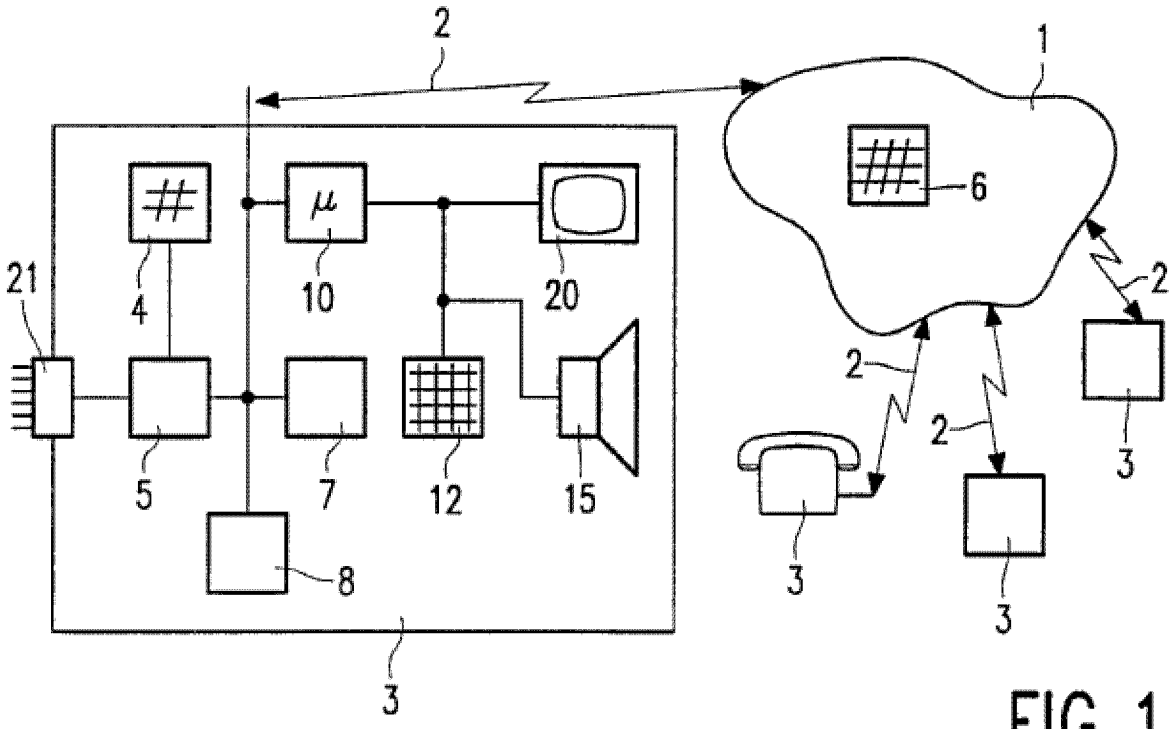


FIG. 1

200. Rizet further discloses that the databases contain ringing information: "[t]he database is filled with alternative forms of ringing information such as melodies, songs, sound, soundtracks, speech etcetera." *Id.* at 0005(3:23-24).

201. One of skill in the art would understand that "songs" and "soundtracks" meet Solocron's Litigation construction proposed for polyphonic. In addition, one of skill in the art would find it obvious to use audio files with true polyphonic content in order to accurately reproduce "songs" and "soundtracks" that have more than one note at the same time.

202. Thus, Rizet discloses "polyphonic audio files" consistent with the Solocron's Litigation construction, and in any event it would be obvious to use true polyphonic content with the database of Rizet.

203. Rizet thus shows "*a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files,*" as required by claim 10.

> **Limitation [10b]: "a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom;"**

204. Rizet discloses a display (e.g., "video display means" and a browsing application program (e.g., "selection means" and/or a programmed processor that provides a "guided menu") that allows the user to browse audio files (e.g., browsing "melodies" and "songs" using menu buttons such as "stop, next and selection") in the remote database that includes audio files, including allowing the user to "prelisten" to ringtones.

205. For example, Rizet discloses: "Figure 2 shows a flowchart for elucidating one possible way of implementing the updating of the ringing information present in the ringing information memory 4. .... A suitably programmed and connected microprocessor 10 in telecommunication device 3 provides a guided menu (block 11), wherein choices can be made by pushing appropriate keys on a keyboard 12, to choose (block 13) for example for ringing

information in the form of music, tones, speech etcetera to be downloaded by the downloading means 7. In block 14 the chosen ringing information can at wish be prelistened by audio producing means 15 to hear the melody, speech etcetera, before being downloaded. The selection means 8 provide for a stop, next and selection in blocks 16 of a preferred and in block 17 confirmed choice of ringing information. In block 18 the means 7 download the confirmed choice and block 19 ends the cession. In an alternative embodiment the telecommunication device 3 contains a video display means 20 for selecting ringing information items in the database 6 on the basis of the name displayed on the video display means 20 or a reference to a particular ringing item, generally by displaying characters on the means 20." *Id.* at 0005-0006 (3: 31-4: 17).

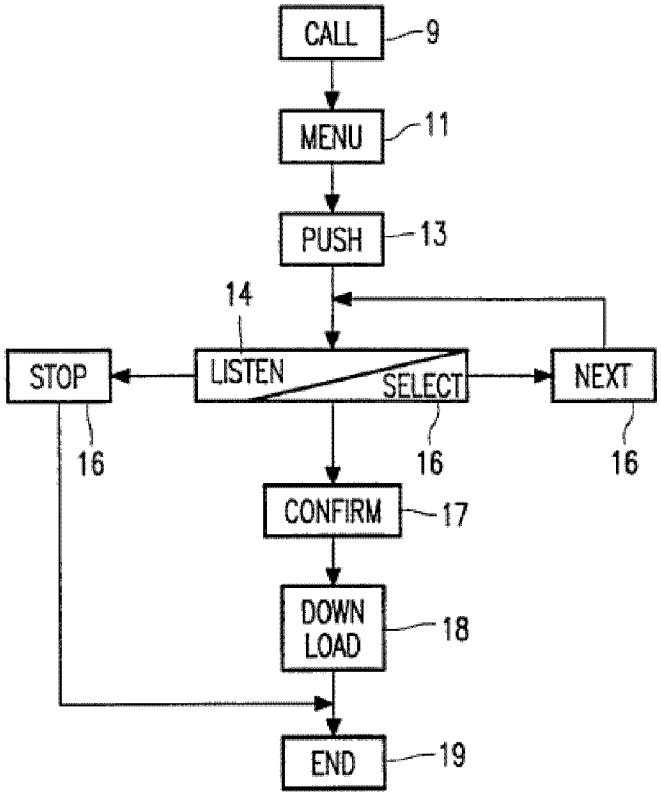


FIG. 2

206. See also Figure 1 (depicted above) which illustrates components of the menu system as discussed in the preceding paragraph.

207. Rizet further discusses a display: "[i]n a further elaboration the telecommunication device according to the invention is characterised in that it comprises video display means. The advantage thereof is that the user can select his preferred ringing information items, such as melodies, songs etcetera by name. This reduces the trespassing on communication time over the communication link." *Id.* at 0004-0005 (2:31-3:1).

208. Rizet discloses that a menu-driven application is used to select ringing information: "[i]n a further embodiment the telecommunication device according to the invention is characterised in that there is provided in selection means, in particular user friendly menu driven, preferably easily software implemented, selection means coupled to the database for selecting user defined forms of ringing information." *Id.* at 0004 (2:27-30).

209. Rizet thus shows "*a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom*" as specified in claim 10.

Limitation [10c]: "processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link"

210. Rizet discloses a telephone having a processor (e.g., "microprocessor 10" and associated hardware that supervises receipt of a selected audio file received from the communications link, including for example a "cellular" link. In a cellphone that receive wireless transmission, the processor necessarily supervises, receives and processes the received signals in order to retrieve data from the wireless transmissions. Moreover, Rizet teaches that as soon as the ringing tone is downloaded the cession is terminated, which also confirms that the processor is supervising receipt of the audio file: "Each telephone 3 is provided with a ringing information memory 4, wherein information or data is stored about

the sound a telephone makes when it rings. Each telephone 3 is also provided with ringing information memory updating means 5, which means 5 are connected to the memory 4, in order to be able to update the content of the memory 4. The memory updating means 5 is connected via the communication link 2 to a database 6, which is present somewhere in the network 1. The database is filled with alternative forms of ringing information such as melodies, songs, sound, soundtracks, speech etcetera. The communication link 2 is connected to means 7 for downloading at least one or the alternative forms of ringing information to the ringing information memory 4. There is provided in selection means 8 connected to the memory updating means 5 and via the communication link 2 to the database 6 in order to be capable of selectively providing ringing information items from the database 6 to the memory 4 in a way to be described with reference to the flowchart of figure 2." *Id.* at 0005 (3:18-30).

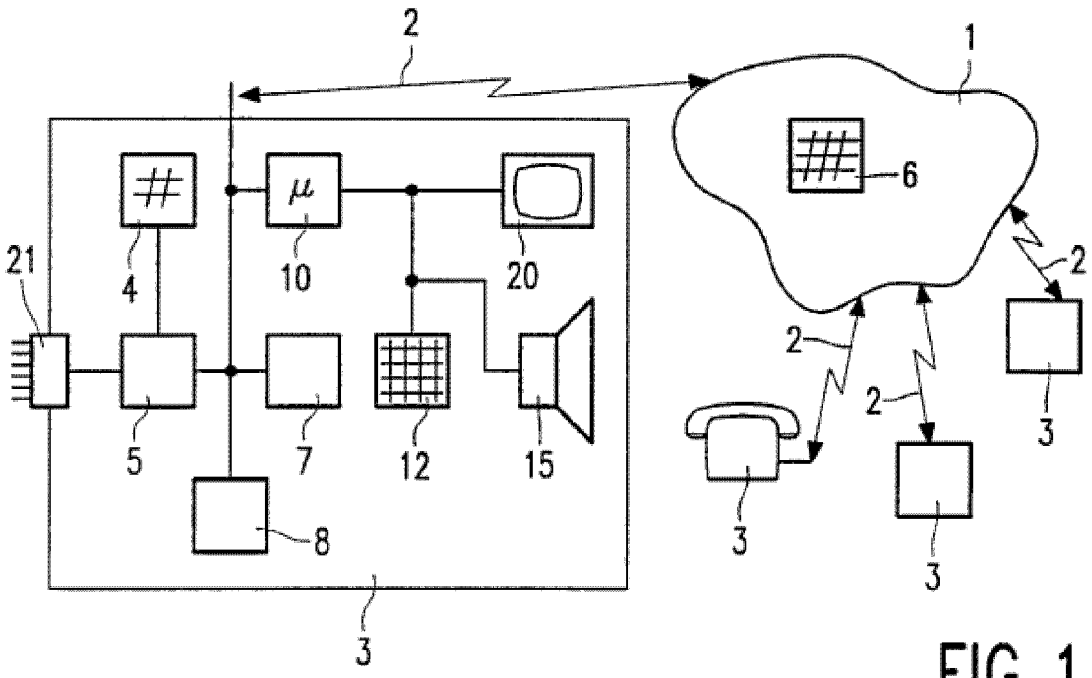


FIG. 1

211. The process for receiving and processing ringing information is disclosed by Rizet: "Figure 2 shows a flowchart for elucidating one possible way of implementing the updating of the ringing information present in the ringing information memory 4. … Block 9 represents the establishing of a telephone call through a number to make a connection via the telecommunication link 2 to the database 6, usually through a modem (not shown). A suitably programmed and connected microprocessor 10 in telecommunication device 3 provides a guided menu (block 11), wherein choices can be made by pushing appropriate keys on a keyboard 12, to choose (block 13) for example for ringing information in the form of music, tones, speech etcetera to be downloaded by the downloading means 7. In

block 14 the chosen ringing information can at wish be prelistened by audio producing means 15 to hear the melody, speech etcetera, before being downloaded. The selection means 8 provide for a stop, next and selection in blocks 16 of a preferred and in block 17 confirmed choice of ringing information. In block 18 the means 7 download the confirmed choice and block 19 ends the cession." *Id.* at 0005-0006 (3:31- 4:17).

212. Rizet also discusses receiving high-quality ringing information: "It is an object to provide a multi selection, high quality ringing information extend/change feature to a telecommunication device such as a telephone…. [T]he ringing information updating means comprises a public database containing a variety of alternative forms of ringing information. …So the personal touch and the diversity of adjustments on this point to the wishes of each individual owning a telecommunication device can be honoured in a recognisable, individualised way, without expanding hardware or hardware requirements beyond the technical means normally available to an average user. This high quality, multi diverse extension can be implemented very simple on for example a personal, mobile, cellular, or cordless telephone…." *Id.* at 0003-0004 (1:27-2:18). *See also* Fig. 2 (depicted above in connection with limitation [1b]).

213. One of skill in the art would consider the "means 7 for downloading … ringing information" as discussed above – which is coupled to the

microprocessor ("suitably programmed and connected microprocessor 10"), constitutes processing circuitry configured to supervise receipt of the audio file being downloaded and ends the "cession" after download (see discussion of Block 19). Figure 1 shows the components being connected to each other and the microprocessor, which constitutes the processing circuitry.

214. It is also my opinion that this the supervising receipt function is performed inherently by the processing circuitry in the cellular phone described in Rizet because it necessarily has to use a processor to receive RF signals and convert them to useable information, and necessarily monitors receipt of data to know when a transmission has been fully received so that it can update the ringing tone memory with the newly downloaded ringtone.

215. Rizet thus shows "*processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link*" as required by claim 10.

Limitation [10d]: "a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication"

216. Rizet discloses a telephone having a programmable memory that can store ringtones: "Figure 2 shows a flowchart for elucidating one possible way of implementing the updating of the ringing information present in the ringing information memory 4. …. A suitably programmed and connected microprocessor

10 in telecommunication device 3 provides a guided menu (block 11), wherein choices can be made by pushing appropriate keys on a keyboard 12, to choose (block 13) for example for ringing information in the form of music, tones, speech etcetera to be downloaded by the downloading means 7. In block 14 the chosen ringing information can at wish be prelistened by audio producing means 15 to hear the melody, speech etcetera, before being downloaded. The selection means 8 provide for a stop, next and selection in blocks 16 of a preferred and in block 17 confirmed choice of ringing information. In block 18 the means 7 download the confirmed choice and block 19 ends the cession. In an alternative embodiment the telecommunication device 3 contains a video display means 20 for selecting ringing information items in the database 6 on the basis of the name displayed on the video display means 20 or a reference to a particular ringing item, generally by displaying characters on the means 20." *Id.* at 0005-0006 (3:18-30).

217. The high quality ringing information is stored in the memory: "Each telephone 3 is provided with a ringing information memory 4, wherein information or data is stored about the sound a telephone makes when it rings. Each telephone 3 is also provided with ringing information memory updating means 5, which means 5 are connected to the memory 4, in order to be able to update the content of the memory 4. The memory updating means 5 is connected via the communication link 2 to a database 6, which is present somewhere in the network 1. …There is

provided in selection means 8 connected to the memory updating means 5 and via the communication link 2 to the database 6 in order to be capable of selectively providing ringing information items from the database 6 to the memory 4 in a way to be described with reference to the flowchart of figure 2." *Id.* at 0005 (3:18-30).

218. Rizet discloses that ringing information may be stored in a database: "It is an object to provide a multi selection, high quality ringing information extend/change feature to a telecommunication device such as a telephone…[T]he content of the ringing memory means in the form of ringing information is updatable from the publicly available database, at wish on a regular basis. So the personal touch and the diversity of adjustments on this point to the wishes of each individual owning a telecommunication device can be honoured in a recognisable, individualised way…." *Id.* at 0003-0004 (1:27-2:18).

219. Rizet thus shows "*a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication*" as required by claim 10.

Limitation [10e]: "an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played"

220. Rizet discloses a speaker ("audio producing means 15" depicted in Fig. 1) that works in conjunction with the processor to replay the "high quality" "songs" and "melodies": "It is an object to provide a multi selection, high quality

ringing information extend/change feature to a telecommunication device such as a telephone [by providing] a public database containing a variety of alternative forms of ringing information …such as a melody, song, music…. *Id.* at 0003-0004 (1:27-2:18). The audio producing means is also recited in the claims. *See, e.g.*, *id.* at 0007 (5:21-23) (claim 8) ("telecommunications device comprises audio producing means").

221. Songs and soundtracks would contain a full range of audio sounds: "The database is filled with alternative forms of ringing information such as melodies, songs, sound, soundtracks, speech etcetera." *Id.* at 0005 (3:23-24).

222. "A suitably programmed and connected microprocessor 10 in telecommunication device 3 provides a guided menu (block 11), wherein choices can be made by pushing appropriate keys on a keyboard 12, to choose (block 13) for example for ringing information in the form of music, tones, speech etcetera to be downloaded by the downloading means 7. In block 14 the chosen ringing information can at wish be prelistened by audio producing means 15 to hear the melody, speech etcetera, before being downloaded." *Id.* at 0006 (4:2-8).

223. As discussed above, the audio producing means produces a high quality audible ringtone. Rizet would appear to have at least as much disclosure for an enhanced speaker as does the '866 patent.

224. One of skill in the art would consider the audio producing means that produces a high quality ringtone in Rizet be an enhanced speaker within the meaning of claim 10.

225. Rizet thus shows "*an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played*" as required by claim 10.

226. Thus, it is my opinion that Rizet discloses each and every element of claim 10 as described above.

3. Combining Rizet with Nikkei

227. As discussed above, on November 15, 1999, Nikkei Electronics published several articles in a single issue relating to ringtones, including in particular, Chapter 2 ("Music is from Ringing tones, Game is from characters") and Chapter 3 ("Realized technology: Maintain size and cost, enhance playback functions of images and sound"). Exhibit 1074 (appearing at pages 116-127)

228. Figure 4 of Nikkei describes the "Evolution of Services" which recognized how the "success of ringing tones produces demand for high sound quality" and that as of the "End of 99" phones were "function[ing] to simultaneously reproduce 3 to 4 sounds", that by 2000, phones would "function to simultaneously reproduce 16 to 32 sounds" and by 2001, phones would include

"audio decoding function [for] MP3." Exhibit 1074 at 0003 (p. 119). Nikkei recognized that a shift from monotonic ringtones to simple polyphonic ringtones had already begun and that the future would bring even higher degrees of polyphony. Exhibit 1074 at 0003 (pp. 118-119).

229. As discussed above, Figure 5 reflects that the ability to download MP3 music for use on a phone was a matter of waiting for the carrier networks to increase in download speeds sufficient to permit efficient download times:

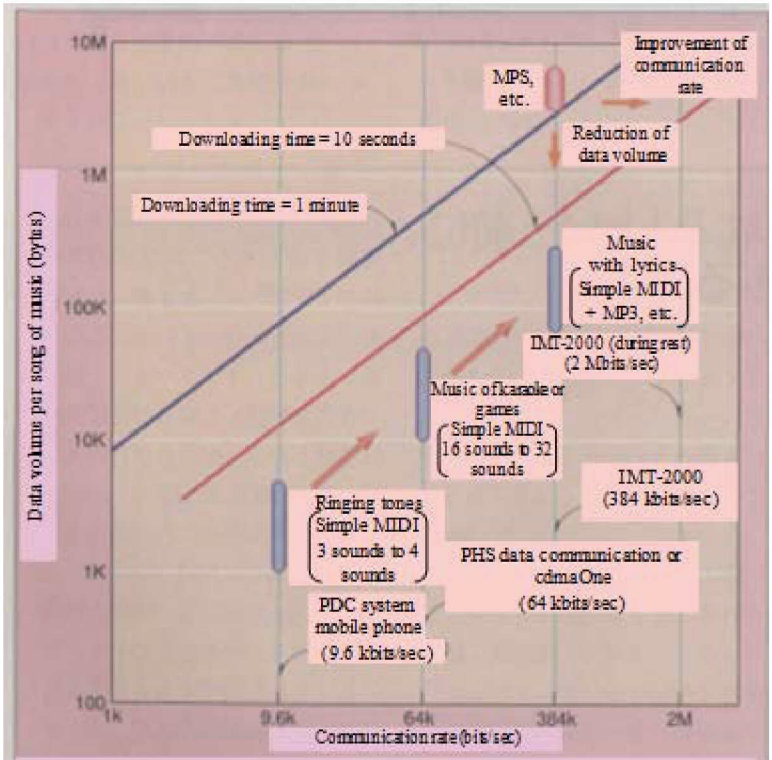


Fig. 5: Music delivery with IMT-2000 require some creative thinking for realization
In association with improvement of a communication rate, capacity of deliverable music contents is also increased. With the services in current i-Mode, 5 Kbytes per content is an upper limit. If realization of downloading time at 10 seconds or less based upon this is a rough indication of delivery contents, even if IMT-2000 services at 384 kbits/sec are started, this cannot be accomplished with delivery of music contents that are often utilized over the Internet, such as MP3. Consequently, telecommunications karaoke business operators are planning to realize the contents that can be delivered in 10 seconds or less by combining the simple MIDI format with MP3, etc. (Graph: this magazine).

Exhibit 1074 at 0004 (p. 120).

230. Nikkei even published a list of 20 popular ringtones, many of which appear to be polyphonic because they reference not only the song, but also the vocalist, including for example, "Livin' la vida loca [by] Ricky Martin" and "My heart will go on [by] Celine Dion" *Id.* at 0002 (p. 117).

231. Fig. 2 of Chapter 3 is also insightful because it provides further details on "Hardware advances accompanying improvements in audio function":

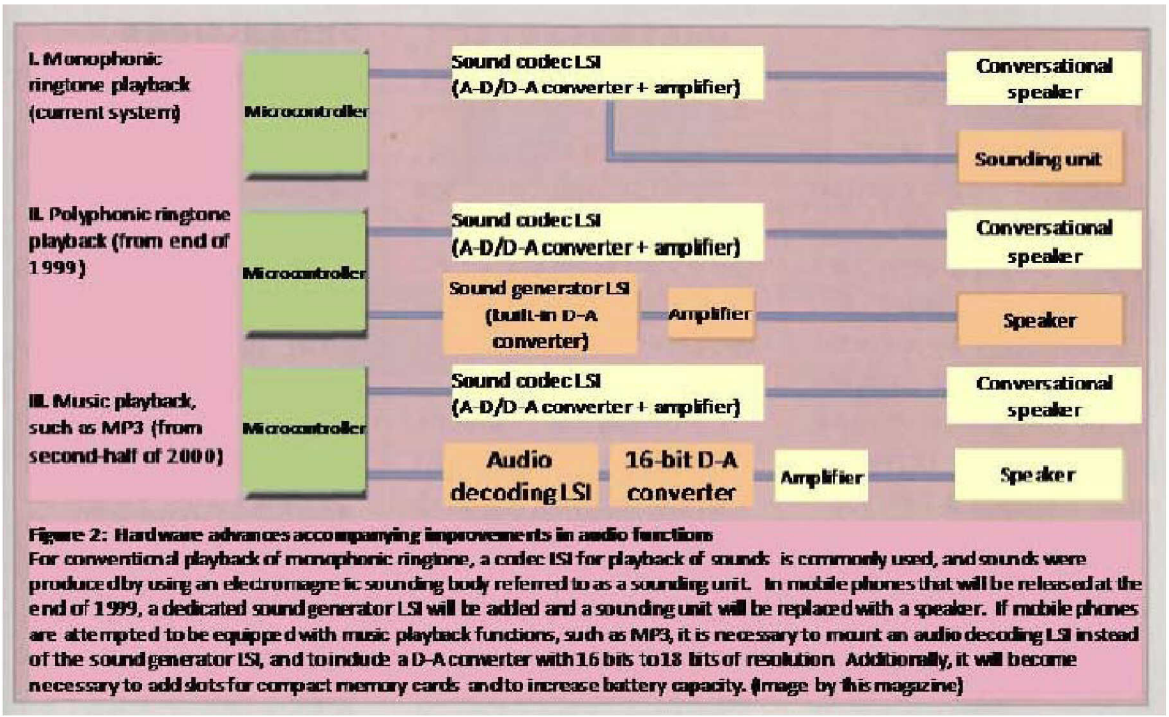


Figure 2: Hardware advances accompanying improvements in audio function
For conventional playback of monophonic ringtone, a codec LSI for playback of sounds is commonly used, and sounds were produced by using an electromagnetic sounding body referred to as a sounding unit. In mobile phones that will be released at the end of 1999, a dedicated sound generator LSI will be added and a sounding unit will be replaced with a speaker. If mobile phones are attempted to be equipped with music playback functions, such as MP3, it is necessary to mount an audio decoding LSI instead of the sound generator LSI, and to include a D-A converter with 16 bits to 18 bits of resolution. Additionally, it will become necessary to add slots for compact memory cards and to increase battery capacity. (Image by this magazine)

Id. at 0006 (p. 125).

232. Figure 2 from page 125 of Nikkei (shown above) and its accompanying description provide sufficient information to permit one skilled in the art to participate in the evolution of ringtones in 1999. Exhibit 1074 at 0006 (p. 125). Nikkei teaches evolution from "monophonic ringtone" to "polyphonic

ringtone" and then to "MP3 music playback" would happen rapidly and projects that MP3 playback phones will be on the market by mid-2000. Nikkei further describes that the hardware will be "advanced" by replacing the conventional "sounding unit" with an actual "speaker" sound codecs and audio decoding circuitry to accommodate MP3 music. The surrounding pages are devoted to discussing this "evolution" and the new speaker technologies (e.g., "sound generator LSI") that were to be added to mobile phones by the end of 1999. *Id.* at 0003 (p. 119); 0006 (pp. 124-125) and 007 (pp. 126-127).

233. As discussed above, while Rizet generally discloses all of the elements of claim 10, it does not expressly discuss a polyphonic audio file or say that a polyphonic audio file is played using the audio producing means.

234. Nikkei establishes indisputably that polyphonic ringtones already existed and were the future of ringtones. Nikkei provides a clear teaching that the industry and consumer demand is growing for polyphonic ringtones. It is commonsensical to give the consumer what they want. One of skill in the art would have considered it obvious to utilize polyphonic content (as suggested by Nikkei) for audio information used as ringtones in Rizet, which could then be reproduced on a speaker to yield "high quality" audio as described by Rizet. Moreover, Nikkei describes upgrades in hardware (including the use of codecs, speakers and amplifiers) which can be used to reproduce polyphonic ringtones on a

speaker to yield high quality sound. The trends discussed in Nikkei are not specific to any one phone technology, but instead are generally expressed with respect to the cell phone industry as a whole, and one of skill in the art would readily have incorporated the teachings of Nikkei as a simple matter of technology adoption driven by market forces.

235. In addition to the reasons above, one of skill in the art would have readily combined Rizet and Nikkei because they are both directed to delivering improved sounding ringtones to mobile phones.

236. As such, it is my opinion that the combination of Rizet and Nikkei renders claim 10 obvious.

237. This combination would render claim 10 obvious regardless of which construction is adopted.

G. Rizet (Ex. 1014) in combination with Nikkei (Exhibit 1074) and either Perez (Exhibit 1081) or YMU757 (Exhibits 1020, 1053 and 1054)

238. As discussed above, the nature of the enhancements and the details of the enhanced speaker were not disclosed in the specification for the'866 patent. In anticipation that Solocron argues that Rizet and/or Nikkei does not disclose the "enhanced performance speaker" element, an enhanced performance speaker that meets Solocron's litigation construction can be found in Perez or the YMU757 references. If a speaker is needed that produces the full range of frequencies that

human beings can hear (despite the lack of any such disclosure in the '866 patent), Perez and the YMU757 both disclose such a speaker.

1. Combining Perez with Rizet and Nikkei

239. The addition of Perez to the combination of Rizet and Nikkei addresses the situation in which the "enhanced speaker" term is construed to require the full range of human hearing. As shown above at ¶¶174-180, Perez discloses such a speaker in far more detail than is present in the '866 patent.

240. One of skill in the art would have readily combined Rizet and Nikkei for the reasons discussed above in connection with my analysis of claim 10 using the same combination. One of skill in the art would readily have added the improved speaker of Perez to the phone described in Rizet because it addresses known problems of cell phones, and further it would provide a better sound quality for the polyphonic audio files taught in Nikkei in order to meet the "demand for high sound quality" referenced in Nikkei (Exhibit 1074 at 0003 (p. 119 (text for Fig. 4)). Nikkei even identified the need for hardware improvements such as speakers. *Id.* at 0006-0007 (pp. 124-126).

241. Perez recognizes a need "in the electronic industry to replace analog driven speakers and various products, *including cellular phones*, with purely digitally driven speakers which are less susceptible to EMI." Exhibit 1081 at 2:40-43 (emphasis added). It follows that a person of ordinary skill in the art would

have been motivated to combine the 9110 UM cellular phone with the Perez piezoelectric transducer for use as a speaker. Indeed, Perez expressly discloses that "cellular phones are an ideal application" for its disclosed transducers in order to "eliminate the noise associated with analog speaker systems of the prior art." *Id.* at 6:8-11. Such a disclosure is consistent with Rizet's goal of providing "high quality" ringing tones. Additionally, Nikkei repeated discusses the need and desire to produce better quality speakers to support its musical ringtones delivered to the mobile phones. Perez addresses that need.

242. The trends discussed in Nikkei are not specific to any one phone technology, but instead are generally expressed with respect to the cell phone industry as a whole, and so, one of skill in the art would readily have incorporated the teachings of Nikkei as a simple matter of technology adoption driven by market forces.

243. Similarly, the improvements discussed by Perez are not to any one phone technology, but instead are generally expressed as improvements for use with any cell phone.

244. Thus, one of skill in the art would have been motivated to combine all three references as basic improvements on the underlying mobile phone described in Rizet to further enhance that phone's ability to replay high quality ringtones.

2. Combining YMU757 with Rizet and Nikkei

245. The addition of YMU757 is also directed to the combination of Rizet and Nikkei addresses the situation in which the "enhanced speaker" term is construed to require substantially the full range of human hearing.

246. One of skill in the art would have readily combined Rizet and Nikkei for the reasons discussed above in connection with my analysis of claim 10 using the same combination. One of skill in the art would readily have added the improved speaker of YMU757 to the phone described in Rizet because would provide a better sound quality for the polyphonic audio files taught in Nikkei in order to meet the "demand for high sound quality" referenced in Nikkei (Exhibit 1074 at 0003 (p. 119 (text for Fig. 4)).

247. One of skill in the art would combine Rizet and Nikkei with the YMU757 because Nikkei expressly references the YMU757 as one of the speaker technologies ("Yamaha has released a sound generator LSI: YMU757") recently developed to support polyphonic ringtones. See Exhibit 1074 at 0007 (p. 127). Such an express reference to YMU757 would motivate one of skill in the art to consider and combine the references which describe the YMU757 with Rizet and Nikkei.

248. The YMU757 shipped on September 30 and was described in at least two different printed publications, issued in September, 1999 and October 12, 1999 (collectively, the "YMU757").

249. In September, 1999, Yamaha introduced, and began shipping on September 30, a new chip-based sound generator, which was designed to produce "melody ringtones [with] high-quality sound" Exhibit 1020 at 0001. As discussed below in detail, YMU757 teaches how to produce polyphonic sound having up to four simultaneous notes, and in addition teaches the use of a 300mW amplifier "capable of driving dynamic spears" and an "equalizer circuit" for customizing frequency ranges as described in the following section.

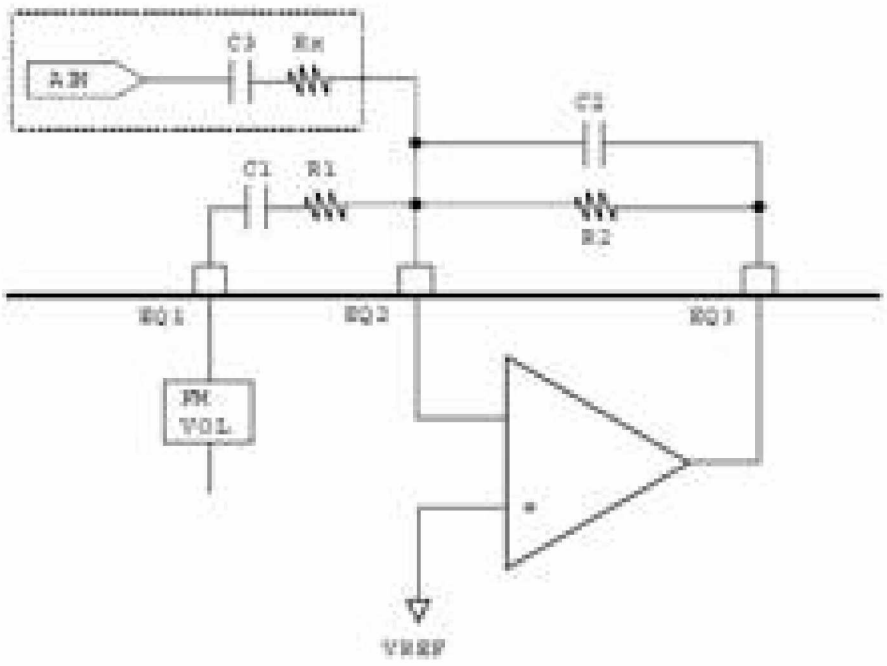
250. The YMU757 documentation discloses that "[i]n addition to being able to play melodies [having] high-quality sound [, the YMU757 is] of a compact size, … can also play a complex melody without putting a burden on the CPU of the mobile phone…" Exhibit 1020 at 0002.

251. The YMU757 is capable of playing four sounds simultaneously, as disclosed: "[S]ince polyphony of up to 4 sound[s] is possible with different tones each, expressive power of music … will be greatly improved." Exhibit 1020 at 0001-0002. *See also* Exhibit 1053 at 0001 ("With 128 instruments, each with four tones, high quality melody reproduction is greatly enhanced."), Exhibit 1053 at 0001 ("[f]our simultaneous sounds [can be] generated."), Exhibit 1054 at 0001

("The YMU757 … [has a] built-in Yamaha's original FM synthesizer [that can] produce up to 4 different sounds with 4 different timbres simultaneously without placing a load on the controller."), Exhibit 1054 at 0004 ("The timbres are synthesized and generated according to settings. Four sounds can be generated at the same time.").

252. Furthermore, the chip includes a "300 mW [amplifier] capable of driving dynamic speakers," and a "built-in equalizer circuit for correcting the frequency characteristics that are different for each model." Exhibit 1020 at 0002. Designed to be used with an external speaker, "[T]he YMU757, designed for mobile phones and PDAs, now allows the download and playback of user-selected sounds and melodies." Exhibit 1053 at 0001.

253. The YMU datasheet also provides two different "sound quality correction circuits" (Exhibit 1054 at 0031-0032), and provides formulas that will allow a user to design the gain circuit to meet the needs of the application, and in one instances, suggests component values that yield a frequency range of greater than 330Hz – 16KHz (broader than that required for telephony): "Sound quality correction circuit[:] It is possible to correct the sound quality and gain by using an external circuit connected to EQ1 to 3 terminals. A circuit structure of EQ1 to 3 terminal inside and example of external circuit are as follows":



Gain and filter characteristic are adjusted by value of C1, C2, R1 and R2.

Gain = R2 /R1. Recommendation of R1 is 22kΩ and R2 is 82kΩ (gain = 3.7 times).

Cutoff frequency f1 and f2 of filter is as follows.

$f1=1/(2\pi \times R1 \times C1)$.

$f2=1/(2\pi \times R2 \times C2)$.

Recommendation of each value are as follows.

If C1=0.022μF and C2=120pF, cutoff frequency f1=330Hz and f2=16kHz.

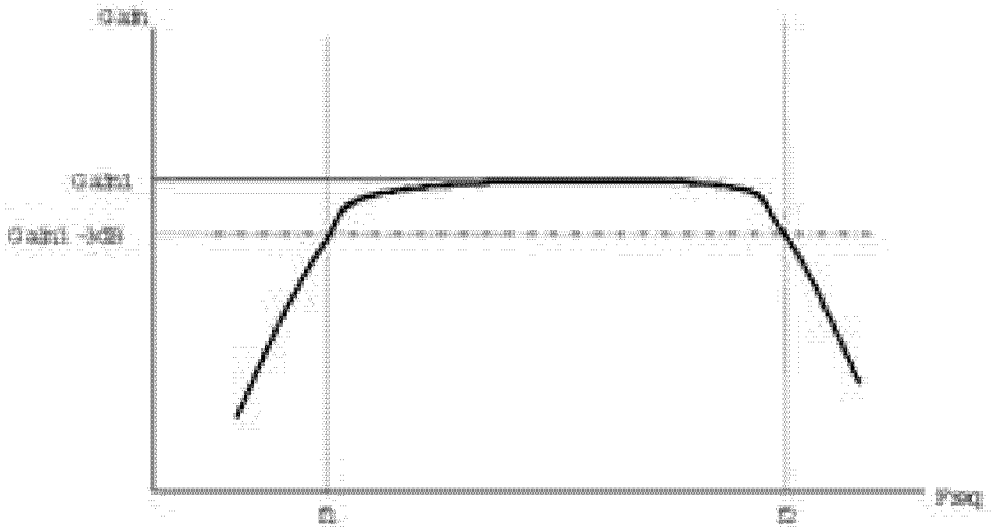


Exhibit 1054 at 0031. *See also* id. at 0032 for a second correction circuit / gain pattern.

254. The output of the sound quality correction circuit is designed to be connected to a speaker capable of delivering the sound quality designed: "[a]s this design presupposes the use of this LSI [sound chip] for the "hands-free", it is possible to process the FM sound and call sound by analog mixing in the equalizer circuit and output the resulting sound through the speaker." Exhibit 1054 at 0007 and at 0031.

255. In addition, the YMU757 can be used with "delivery service of melody ringtone by e-mail function." Exhibit 1020 at 0001.

256. Such ringtones were in high demand at the time of the release of the chip: "[C]ustom melody sounds….is a feature in high demand. In Japan alone, the 40 million units currently in use are increasingly customized with … personalized

ringing tones. Download services are growing at a very high rate to support this trend." Exhibit 1053 at 0002.

257. One of skill in the art would understand from Exhibits 1020 and 1053 that that YMU757 teaches an enhanced speaker as well as hardware to incorporate into a phone for using polyphonic audio files. One of skill in the art would understand from Exhibits 1020, 1053 and 1054 that how to design an enhanced speaker that delivers polyphonic audio sound for the full range of human hearing (by adjusting the component values in the formulas), as well as for substantially the full range as illustrated with the component values and frequency response diagram shown in Exhibit 1054 at 0031.

258. Thus, even under a narrower construction of "enhanced speaker," it is my opinion that claim 10 is invalid as obvious in view of Rizet and Nikkei, in combination with either Perez or YMU 757.

H. Rizet (Exhibit 1014) in combination with Hosoda (Exhibit 1077)

259. As discussed above, while Rizet generally discloses the limitations of claim 10 but does not expressly discuss ringtones that are polyphonic. Hosoda expressly teaches the use MIDI files downloaded from databases to mobile phones, which files are truly polyphonic under the narrowest construction of polyphonic audio files. Thus, combining Hosoda with Rizet adds: express disclosure of polyphony content in its downloaded files in a specific file format (MIDI)

identified by the inventor as support for "polyphonic audio files." Thus, this combination meets the "polyphonic audio file" (and speaker) terms under any construction.

260. Hosoda describes a database that provides karaoke music as well as ringtones. Hosoda teaches that a song has multiple passages ("performance tracks") that can serve as "candidates" for use as ringtones. Just as people may prefer different portions of a song, e.g., where the singing begins or where the chorus begins, so may be their preferences for ringtones from that song.

261. Each of these passages may have different levels of musical complexity. For example, each passage may have a number of parts or channels that are played simultaneously to produce the music for the passage, including for example, multiple "music parts" that are "simultaneously produced" to form a "harmony." Hosoda teaches that a user can search the database of songs for a particular song and receive several ringtone options to choose from, even from the same song. The user can then select one or more ringtone to preview, and then select one to download to her phone, thereby enabling the user to enjoy polyphonic ring tones from their favorite song.

262. Hosoda describes how a "karaoke performing device [containing a database of songs] can be used as a data source for ring tones of a mobile device with communication functions and … provide[] a multiplicity of ring tones that

match the specification of various mobile devices." Exhibit 1077 at 0007 (Abstract).

263. Hosoda describes the "problem to be solved" by explaining that mobile devices currently have a very limited selection of ringtones that is available for download, while at the same time, there is an enormous supply of karaoke music: "An enormous amount of music data groups provided for karaoke performance devices have been prepared for playing melodies of a multiplicity of music genre as accompaniment music." Exhibit 1077 at 0008 (¶[0002]) . "On the other hand, there are various types of … mobile phones … that play ring tones …, and many types of tone sounds for ring have been prepared and can be freely selected. However, the number of types is finite, and eventually listening interest will be lost after using for a while." *Id.* at 0009 (¶[0003])

264. Having identified a demand for ringtones, and having identified a large potential supply of music, Hosoda suggests that the demand for musical diversity can be made by tapping into the enormous supply of karaoke music.

265. Hosoda's solution is to convert each karaoke song into multiple ringtones for a user to select. "The present invention resolves the aforementioned problems, [by] provid[ing] a multiplicity of ring tones in combination with the specifications of various mobile devices, without establishing

a separate and special music playback database for providing the ring tone." *Id.* at 0009 (¶[0004])

266. Hosoda teaches that the ringtones are "retrieved from the [karaoke music] database." *Id.* at 0009 (¶¶ [0005]-[0008]. Hosoda's claims are even directed in part to "a database where karaoke data in digital formation that includes karaoke accompaniment music playback data for a plurality of songs…are recorded … [and wherein] specific sections in the karaoke accompaniment music playback data are specified for a ring tone… when requests for trial listening of sections for ring tones of a song [are] received through a user interface… and the part for the appropriate ring tone that was retrieved from the database is [played]…" *Id.* at 0008 (claim 1). One of skill in the art would understand that making the karaoke database available for queries for ringtones constitutes providing a database of digital audio files.

267. The database disclosed in Hosoda contains a plurality of polyphonic audio files, as I will now explain. In connection with Figure 2, Hosoda teaches that any song can be divided into multiple "ring tone candidates" that are much smaller in size and that have varying numbers of "tracks" (such as a "main performance track" and a "plurality of music parts"). The song information is stored in the database using a MIDI data format, which can provide detailed information on multiple "channels" –which can correspond to the various

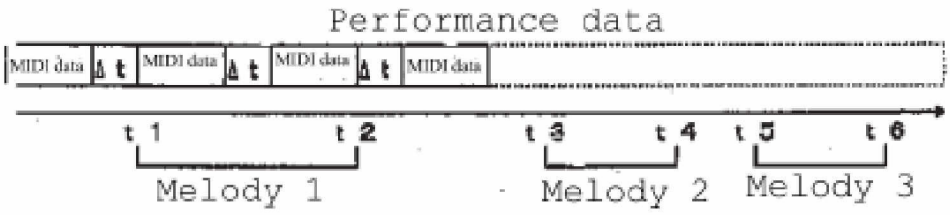
"tracks"—that comprise the song. These tracks can be played simultaneously, for example, to create a "harmony": "The karaoke data … is diverted and the music playback data for the ring tone is provided to the mobile device 100…. This data includes a specific portion of the MIDI data (performance data) of the songs as shown in FIG. 2. In other words, one or a plurality of performance tracks (Melody 1 through 3) are specified as ring tone candidates on the playback time axis (direction of arrow in the figure). This performance track can be the beginning of singing, a high point of the song, or a characteristic melodic section of the song, and is an appropriate track as a ring tone. Furthermore, a plurality of music parts that form the harmony are specified in addition to the main tone section of each performance track. The data that specifies the performance track and song parts is attached as auxiliary data to the MIDI data of each song. The partial MIDI data (section for ring tone) corresponding to the ring tone is retrieved in accordance with the specified auxiliary data, and is provided to the mobile device 100. The recording capacity for the candidate data is extremely small compared to all of the MIDI data of each song." *Id.* at 0010 (¶[0010]).

268. Because Hosoda teaches "simultaneously" playing different sounds to create ringtones that have harmonies, Hosoda teaches ringtones that reproduce a plurality of simultaneous parts or notes. Thus, one of skill in the art would find that Hosoda teaches polyphonic ringtones under all of the potential constructions

of polyphonic, including what I understand to be the broadest reasonable interpretation.

269. For example, Hosoda teaches that music files encoded as MIDI files have data that expresses music for each of a plurality of channels, and that when portions of a song are selected for ringtones, these portions too will include music content for one or more channels: "The MIDI data that reproduces the ring tone is described in detail. For example, as shown by the [table] under FIG. 2, three types of melodies 1 through 3 are specified for a certain song, and the start times (times t1, t3, t5) and the stop times (times t2, t4, t6) for each tone are specified on the playback time axis. " *Id.* at 0010 (¶[0011]).

270. Figure 2 of Hosoda discloses three different potential ringtones (Melody 1, 2 and 3)—which are shown on a time line that represents the performance data for an entire song. The table that is included with Figure 2 provides start and stop times for each "Melody" and also identifies the "limited number of several MIDI channels" that is used to make up each of the Melodies:



Candidate	Start time	End time	MIDI channel
Melody 1	t1	t2	1, 2, 5
Melody 2	t3	t4	3
Melody 3	t5	t6	4

271. One of skill in the art would understand that "Melody 1" represents three channels of music that would be simultaneously played to reproduce Melody 1. One of skill in the art would understand Hosoda to be teaching polyphonic ringtones (with multiple, simultaneous notes).

272. Hosoda teaches that "a limited number of several MIDI channels are specified" for each ringtone candidate: "The synthesizer of the mobile device 100 that has retrieved the specified MIDI data often contains an integrated circuit of a relatively simple chip, and the ring tone that corresponds to all of a multiplicity of MIDI channels cannot be reproduced as with a high level synthesizer 18 of the karaoke performance device. Therefore, all of the MIDI channel specified as original accompaniment music playback data, which is tone 1 through 3 of the performance track, cannot be specified for play back of the ring tone. As shown by the figure title under FIG. 2, the number of a limited number of several MIDI channels are specified for tone 1 through 3." *Id.* at 0010-11 (¶[0011])

273. One of skill in the art would also understand the passage above as indicating that not every phone will have a synthesizer that is capable of playing "all of the MIDI channel[s] [that were] specified in the original [song]." *Id.* at 0010-11 (at [0011]). Thus, the ringtone is specified using "a limited number of several MIDI channels"—such as was discussed with Melodies 1, 2 and 3, in connection with Figure 2.

274. One of skill in the art would know that a standard MIDI file uses up to 16 channels, each of which is capable of producing a variable number of voices. *See, e.g.*, Exhibit 1047 at 0004 (General MIDI Specification states "All 16 MIDI channels" are "supported" and "Each channel an play a variable number of voices (polyphony)." One of skill in the art, would thus understand that when Hosoda uses the phrase "a limited number of several MIDI channels," Hosoda is generally referring to a small subset of the 16 channels, such as 3-5 channels.

275. In the examples provided for Melodies 1 – 3, the number of channels for which playback data is variable. For example, Melody 1 has data for three channels (namely, MIDI channels 1, 2 and 5), while Melody 3 has data for only 1 channel (namely, MIDI channel 4). *Id.* at 0010-11 (¶[0011)] and Figure 2. The "limited number of several MIDI channels" for Melody 1 is 3, whereas the "limited number of several MIDI channels" for the collective 3 Melodies is 5.

276. One of skill in the art would understand that Hosoda is teaching that some of the synthesizers being used in the mobile devices described in Hosoda are not capable of playing all 16 MIDI channels, but instead use more "simple" forms of synthesizers that play a small number of channels, for example up to 3 or 5 channels, based on the examples provided.

277. Hosoda teaches that in some of those "cases where all of the specified portions of the MIDI channel cannot be accommodated," the mobile device can be designed to play a MIDI channel based on a "priority order": "Even if a MIDI channel is specified on a limited basis in this manner, there are cases where all of the specified portions of the MIDI channel cannot be accommodated by the supplying side mobile device 100. In these cases, a priority order is assigned to the MIDI channel, and the MIDI channel number with the highest priority order is extracted and supplied in accordance with the music source specification of the mobile device 100." *Id.* at 0011 (¶0012). One of skill in the art would thus understand that Hosoda is teaching providing a ringtone to a mobile device using the prioritized channel.

278. "Even if a MIDI channel is specified on a limited basis in this manner [that is, by limiting the number of channels to "a limited number of several MIDI channels"], there are cases where all of the specified portions of the MIDI channel cannot be accommodated by the supplying side mobile device 100. In these cases,

a priority order is assigned to the MIDI channel, and the MIDI channel number with the highest priority order is extracted and supplied in accordance with the music source specification of the mobile device 100." *Id.* at 0011 (¶[0012]).

279. Hosoda teaches that when the priority channel approach is used, the ringing tone is still made polyphonic for those song clips that have musical harmonies because "the MIDI data … that forms [the] musical harmony [is provided] on a single MIDI channel" that is played on the phone to reproduce the harmony. *Id.* at 0011 (¶[0012]). ("Note that the MIDI data of the tone portion that forms musical harmony by simultaneously producing sound on a single MIDI channel is provided while deleting the simultaneously producible data in accordance with the music source specification of the connected mobile device.") One of skill in the art, would understand Hosoda is teaching providing a plurality of ringing tones that are capable of simultaneously producing multiple sounds (for example to reproduce musical harmonies). Hosoda is expressly teaching that his ringtones simultaneously produce multiple sounds, and thus, teaches polyphonic ringtones.

280. One of skill in the art would be motivated to combine polyphonic MIDI ringtones as taught by Hosoda with the telephone as described in Rizet for at least the reason identified in Hosoda. Hosoda recognized that people frequently tire of using the same ringtone. *Id.* at 0009 (¶ [0003]). Hosoda

proposed to take advantage of preexisting karaoke databases which were widely available and offered a great diversity in music. *Id.* at 0008 (¶ [0002]). Rizet's "database filled with alternative forms of ringing information such as melodies, songs, sounds, soundtracks…" does not depend on any particular format. One of skill in the art would appreciate that the known MIDI format of Hosoda would readily work in Rizet's "databases." One of skill in the art would combine Hosoda with Rizet in order to take advantage of a large number of preexisting music databases having polyphonic MIDI formats which can be used as ringtones on the phone as taught by Rizet. Rizet, as modified, would then render claim 10 obvious even under a narrower construction of "polyphonic."

281. Moreover, one of skill in the art would understand that the examples presented in connection with Figure 2 are exemplary, and that Hosoda teaches that the same identification process is performed on multiple songs in a karaoke database in order to provide "a multiplicity of ringtones." *See id.* at 0007 (Abstract), and at 0008 (claim 1 ("a database where karaoke data in digital format that includes karaoke accompaniment music playback data for a plurality of songs … are recorded [and where] specific sections in the karaoke accompaniment music playback data are specified for a ring tone"). Hence one of skill in the art would understand that Hosoda teaches a database having a plurality of polyphonic audio ringtones for each of the plurality of songs in the database.

282. Thus, regardless of which construction of "polyphonic" is applied, one of skill in the art would find claim 10 is invalid as obvious in view of Rizet and Hosoda.

I. Lin (Exhibit 1063) and Isomursu (Exhibit 1075) in combination with Nikkei (Exhibit 1074)

283. As referenced above, during prosecution, the Examiner rejected claim 10 on the basis of Lin and Isomursu, (Exhibit 1007 at 0092-0093 (discussed above)), and the inventor responded, in part, that neither reference taught polyphonic audio files. Exhibit 1007 at 0063-0064. This argument resulted in the examiner issuing the claims.

284. I understand that in the related Litigation, Solocron has taken a claim construction position on polyphonic that I believe is directly contrary to the arguments made in connection with the rejection based on Lin and Isomursu. In particular, Solocron's proposed construction in the litigation is "polyphonic" means "having more than one sound." Exhibit 1071 at 0013. If the broadest reasonable construction of "polyphonic"[1] is "having more than one sound," then in light of the position taken by Solocron in the litigation, the assertions below which shows how the combination of Lin and Isomursu renders claim 10 obvious, relying

[1] I do not concede that this is the broadest reasonable construction, but simply address the invalidity under Solocron's own interpretation.

upon the same prior art combination that the Examiner used to reject similar claims during prosecution.

1. Overview of Lin

a. Claim 10

Limitation 10 Preamble: "A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising"

285. Lin discloses a mobile telephone ("mobile station" depicted as a cellular phone in Figs. 1 and 2) that can be programmed with "musical ringing tones" that are "downloaded" from a "web page" in the "internet": "A telecommunications system and method is disclosed for allowing network operators to download ringing tone pattern(s) associated with one or more musical scores to mobile stations (MSs) according to the music selection of mobile subscribers associated with the MSs. Once executed, the ringing tone pattern provides a musical ringing tone on the MS, instead of the normal ringing tone." Exhibit 1063 at Abstract. *See also id.* at 1:9-12 ("The present invention relates generally to telecommunications systems and methods for ringing mobile stations within a cellular network, and specifically to providing network ringing options to mobile subscribers").

286. Lin discloses that ringing tones may be downloaded by accessing a web page: "[i]n order to download the desired ringing tone patterns 65, the mobile subscriber can … access the network operator through an Internet 35… [by] accessing a web page 45 of the network operator … from the MS 20 that has either a laptop computer 21 attached to it … or a computer 21 integrated with it." *Id.* at 3:22-29. *See also* Fig 2, elements 20, 45, 55 and Lin's description at 3:8-4:38 (as cited by the Examiner) teaching a "mobile station" depicted as a cellular phone in Figs. 1 and 2 that can be programmed with "musical ringing tones" that are "downloaded" from a "web page" in the "internet".

287. Lin thus shows "*A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising*" as required by claim 10.

Limitation [10a]: "a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files"

288. The cellular phone in Lin (e.g., the "Mobile Station" or "MS") has a built-in transmitter that establishes a communications link ("connection") "to access a webpage" having "different popular musical score [] selections": "The MS 20 is the physical equipment, e.g., a … portable phone, used by mobile

subscribers to communicate with the cellular network 10, each other, and users outside the subscribed network…." *Id.* at 1:35-39.

289. Lin discloses that the mobile telephone accesses ringing tones stored on Internet web sites provided by network operators: "As shown in FIG. 2, if the MS 20 with the attached computer 21 wants to access the web page 45 of the network operator that provides different popular musical score 55 selections for ringing tones, the MS 20 can dial a number associated with an Internet Service Provider (ISP) 30, or other entity providing access to the Internet 35 …. Thereafter, the mobile subscriber can enter on the computer 21 a Universal Resource Locator (URL) (not shown) identifying the web page 45 of the network operator. This URL is transmitted to the ISP 30 via the MS 20 and the MSC 14. The ISP 30, using the entered URL, routes the call through the Internet 35 to a web server 40 storing the requested web page 45 and establishes a connection with that web server 40." *Id.* at 3:31-46.

290. Lin also discloses that a database in the HLR stores ringing tones: "FIG. 4 illustrates a database for storing the ringing tone pattern[s]" *Id.* at 2:58-59, Figure 4.

291. Lin thus shows "*a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files,*" as required by claim 10.

Limitation [10b]: "a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom;"

292. The telephone in Lin can have a "laptop computer 21 attached" and alternative, it can have "integrated computer." Thus, regardless of how configured, the telephone has a "display" and is using software that allows the user to browse ringing tones by "access[ing] the web page" for "selections of ringing tones": "As shown in FIG. 2, if the MS 20 with the attached computer 21 wants to access the web page 45 of the network operator that provides different popular musical score 55 selections for ringing tones, the MS 20 can dial a number associated with an Internet Service Provider (ISP) 30, or other entity providing access to the Internet 35 to establish a call connection with the ISP 30 .... Thereafter, the mobile subscriber can enter on the computer 21 a Universal Resource Locator (URL) (not shown) identifying the web page 45 of the network operator. This URL is transmitted to the ISP 30 via the MS 20 and the MSC 14. The ISP 30, using the entered URL, routes the call through the Internet 35 to a web server 40 storing the requested web page 45 and establishes a connection with that web server 40. Once the web page 45 is located, the web page 45 is downloaded through the Internet 35 onto the computer 21. At this point, the mobile subscriber can access a subscriber record 28 associated with the MS 20 that is stored on the web page 45 ...or within in a Home Location Register (HLR) 26, the latter being illustrated, and select the

desired musical score(s) 55 based upon the model number of the MS 20 to receive the selected musical score(s) 55." *Id.* at 3:31-53.

293. The display disclosed by Lin is also used to display fees for ringing tone purchases: "Fees for each musical score 55 can be displayed to the mobile subscriber on the computer 21…" *Id.* at 3:60-61.

294. In addition, Figure 2 depicts the telephone coupled to a computer with a display, but also shows that the phone itself has a display:

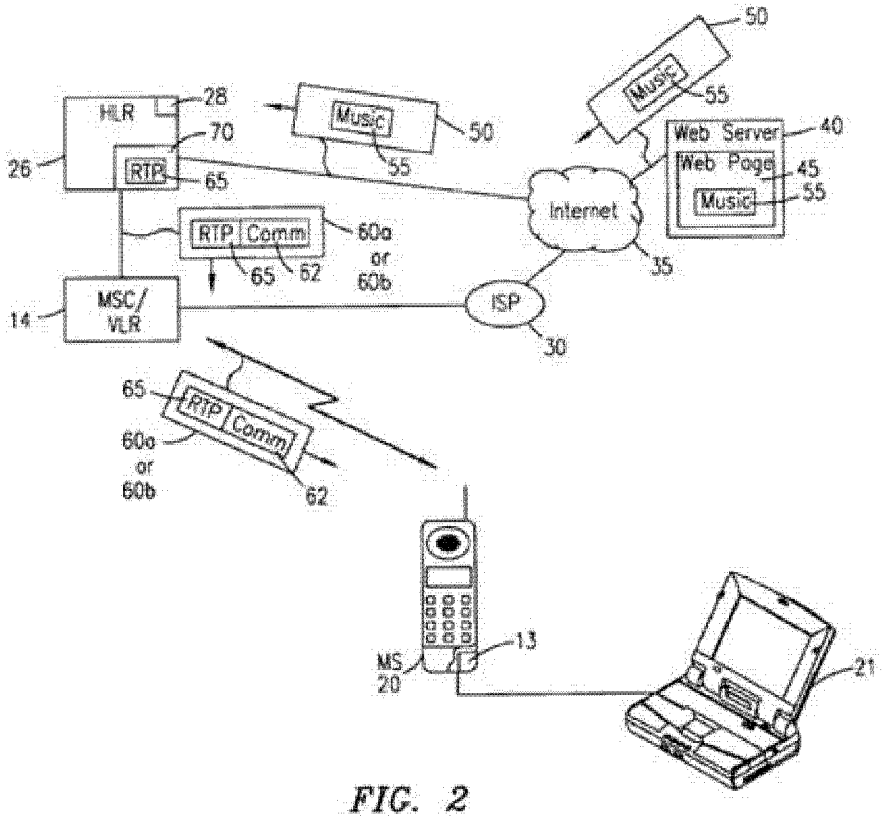


FIG. 2

295. Lin discloses that the mobile telephone may be used to access a web page of ringing tones: "[i]n order to download the desired ringing tone patterns 65,

the mobile subscriber can … access the network operator through an Internet 35… [by] access[ing] a web page 45 of the network operator … from the MS 20 that has either a laptop computer 21 attached to it … or a computer 21 integrated with it." *Id.* at 3:22-29.

296. Lin also discloses that the ringing tones may be selected from "a database for storing a plurality of ringing tone patterns…; and ringing tone logic for … accessing said database to retrieve a select one of said plurality of ringing tone patterns." *See id.* at claim 28.

297. Lin thus shows "*a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom*" as specified in claim 10.

Limitation [10c]: "processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link"

298. Lin describes that the phone (the MS or Mobile station) receives the "musical score" from the HLR (or Home Location Register) which downloads the musical score to the handset, or alternatively, the handset can download the musical score directly from the web page. See 3:47-4:10 See also Lin at claim 1 ("downloading said select ringing tone pattern to said mobile station")

299. Lin also describes that messages can be sent to the handset to trigger the SIM card in the handset to program a downloaded ringtone into the handset:

"If the MS **20** is within the Global System for Mobile Communications (GSM) system, the MS **20** has a memory **13** therein, such as a Subscriber Identity Module (SIM) card, for storing subscriber related information. Therefore, as an example, in the GSM system, this ringing tone pattern **65** can be downloaded to the MS **20** using a SIM Application Toolkit (SAT) download procedure. A new SIM AN;**4** command and/or parameter **62** along with the ringing tone pattern **65**can be sent from the HLR **26** or the web page **45** to the MS **20** using a Short Message Service (SMS) message **60** *a* or Unstructured Supplementary Service Data (USSD) message **60** *b* via the MSC/VLR **14** serving the MS **20**. It should be understood that if an SMS message **60** *a* is sent, the SMS message **60** *a* is sent to the MSC/VLR **14** from a Short Message Service Center (SMSC) (not shown). Once received, the new SIM command or parameter **62** triggers the SIM card **13** within the MS **20** to program the ringing of the MS **20** according to the received ringing tone pattern **65**." *Id.* at 4:12-29 (describing receipt of 'ringing tone patterns' by MS 20 and ability of SIM card to program phone)."

300. In each of these cases, the handset must be aware of the incoming communication because it must be able to receive the radio frequency communication and convert the RF signals into useable data. Moreover, in the case of triggering the SIM card to program the phone, the SIM card (which one of skill in the art would understand to be circuitry that works with the phone's

microprocessor) to program the phone. One of skill in the art would consider this passage as teaching that the phone in Lin thus includes processing circuitry that supervises receipt of the incoming ringtone.

301. One of skill in the art would also understand that the mobile phone in Lin inherently has processor circuitry that detects data received on the antenna and to process it into a useable format. *Id.* at 3:47-56 (describing receipt of "musical score" by MS 20)

302. Lin thus shows "*processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link*" as required by claim 10.

Limitation [10d]: "a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication"

303. Lin discloses a programmable memory circuit (e.g., the "memory" in the MS, and alternatively, the "memory" in the MS in combination with the SIM card) for allowing the user to store the selected ringing tone for use an indicia of an incoming call. For example, a parameter can be included during download that causes the MS to program itself (Claim 17) or that causes the SIM card to program the MS to use the ringtone stored in memory as a "ringing tone": "In order to automatically program the MS 20 to ring with the music score 55 selection(s) of a mobile subscriber, ringing tone patterns 65 associated with the selected musical

score(s) 55 can be downloaded to the MS 20. When implemented on the MS 20, the ringing tone patterns 65 provide a musical ringing tone corresponding to the selected musical score 55, instead of the normal ringing tone." *Id.* at 3:13-21. See also Claim 2 ("The telecommunications system of claim 1, wherein said mobile station further comprises: a memory for storing said select ringing tone pattern."), Claim 4 ("wherein said node transmits a parameter to said Subscriber Identity Module card within said mobile station instructing said Subscriber Identity Module card to program the ringing of said mobile station with said select ringing tone pattern."); Claim 17 ("The method of claim 16, wherein said step of downloading further comprises … storing said select ringing tone pattern within-a memory in said mobile station."), Claim 18 ("The method of claim 17, wherein said step of downloading further comprises … transmitting a parameter to said memory within said mobile station instructing said memory to program the ringing of said mobile station with said select ringing tone pattern.").

304. "[I]nstead of using a SIM Application Toolkit download procedure, the ringing tone pattern 65 can be downloaded from the HLR 26 to the memory 13 within the MS 20 using, for example, an SMS message"). See *id.* at 4:35-38.

305. Such ringing tones may be selected as an incoming ring tone: "The telecommunications system of claim 1, wherein said mobile station provides said

musical ringing tone on said mobile station using said select ringing tone pattern in response to receiving an incoming call to said mobile station." *Id.* at claim 11.

306. One of skill in the art would understand that a SIM card referenced in LIN is a device that includes hardware and related circuitry, as well as memory for storing data and software. Based on the passages quoted above, one of skill in the art would understand that the telephone has circuitry associated with the SIM card that works with the MS's internal memory to program it, and thus, the combination serves as a programmable memory circuit as claimed. In addition and as described above, Lin describes that the MS can be "automatically programmed" by downloading the ringing tone into the internal memory of the cellular phone.

307. One of skill in the art would also understand that the phone in Lin has an internal programmable memory circuit (separate from the SIM card) that allows the user to store a downloaded ringtone.

308. Lin thus shows "*a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication*" as required by claim 10.

Limitation [10e]: "an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played"

309. Lin discloses an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file

when the selected polyphonic audio file is played. For example, Lin discloses "A telecommunications system and method is disclosed for allowing network operators to download ringing tone pattern associated with one or more musical scores to mobile stations (MSs) according to the music selection of mobile subscribers associated with the MSs. Once executed, the ringing tone pattern provides a musical ringing tone on the MS, instead of the normal ringing tone." *Id.* at Abstract.

310. Lin also discloses that popular music may be used as ringing tones: "A current popular trend is to program the MS 20 to ring with popular music, instead of the normal ringing tone." *Id.* at 2:6-7.

311. Lin thus shows "*an enhanced performance speaker capable of providing a substantially full range of audio sounds from the selected polyphonic audio file when the selected polyphonic audio file is played*" as required by claim 10.

2. Overview of Isomursu

312. Isomursu, filed October 30, 1998, issued as a continuation patent of an application that Nokia filed February 20, 1997—three years before the 'earliest priority application for the '866 patent was filed. The patent has a comprehensive specification that provides details as to how to create menus that operate with different websites in order to download ringing tones to cellular phones. See, e.g.,

Exhibit 1075 at 14:47-15:6 (describing a step-by-step process in connection with Figure 10 as to how to search, browse, select and download a ringtone); and 23:50-24:46 (describing in connection with Appendix 1 how to transform an Internet web page into HTML language to present the page on the display of a cellular phone).

313. Isomursu discloses generally all of the elements of claim 10, though it does not use the term "polyphonic" or otherwise discuss the content of audio files that would meet the narrowest definitions of polyphonic..

3. Comparison of Isomursu to Claim 10 of the '866 Patent

a. Claim 10

Limitation 10 Preamble: "A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising"

314. Isomursu discloses a telephone and a method for searching, selecting and programming an audio file (e.g., "ring tone melodies" selected by the user) into a telephone (e.g., "mobile telephone"; "phone") using "Operator Services" which are provided using "menus": "[T]he menu or menus can include main-menus and sub-menus as shown above, where the main menus [such as] Operator Services….include sub-menus. These sub-menus may further be divided into sub-menus, e.g. sub-menu Download Ringing Tones can be divided into sub-menus according to ring tone melodies (Rock around the clock, Those were the days,

Smoke on the water) which can then be chosen as ring tones by selecting the specific sub-menu and activating it as a command. The command is sent to the service provider as a user message according to the invention and as a response to the user message the operator may send the ring tone coded into a user message which can then be stored into a ring tone memory of the terminal." Exhibit 1075 at 11:15-31.

315. Isomursu further discloses that the telephone may be a mobile phone: "[t]he terminal is preferably a mobile phone or communicator, which has circuits and a user interface that enable the processing of different applications." *Id.* at 20:56-59.

316. To the extent that the preamble is limiting, Isomursu thus shows "*A telephone that may be customized by searching for and selecting an audio file from a remote computer and programming the selected audio file into the telephone for use as an indicia of an incoming communication, the telephone comprising*" as required by claim 10.

Limitation [10a]: "a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files"

317. Isomursu discloses a communications link that allows the telephone to connect to a remote database that includes polyphonic audio files: "The present invention relates to a terminal (**1**) for a communication network, the terminal being

capable of supporting a plurality of applications (**17, 18**) and having means of communicating user messages. The terminal comprises means for receiving user messages having data and a header relating to one of the applications (**17, 18**) and means (**8**) for addressing the data to a respective application according to the header. In an embodiment the user messages are short messages and the data comprises characters in the short message." *Id.* at Abstract 1:12-16. See also 16:44-17:5 ("Correspondingly, by means of the terminal, a communications link can be established to the Internet through a mobile communications network. This communications link can be established by connecting a computer to a mobile station, by means of a data card, in which case a user interface of the computer can be utilised for reading pages and services on the Internet. Alternatively, a communications link to the Internet can be established by means of a communicator, which comprises in itself a user interface for reading pages and services on the Internet….Computer programs by means of which a communications link to different pages on the Internet can be established, and which enable the so-called surfing on the Internet, are called WWW (World Wide Web) browsers. Currently, a number of different companies have their own service pages on the Internet, through which a user may order information on a service or make orders and reservations. This is accomplished by establishing communication to such a service page and by inputting information on what is required from the

provider of services. This information can be either text or selection boxes/keys, by means of which selections are made according to the 'tick the appropriate box' principle. ")

318. Isomursu also teaches that the "sub-menus" can be associated with different "Uniform Resource Locators" (aka Internet links) that can "fetch information from the internet"; an express example of this includes using a "sub-menu" that sends a "command" "request" for the "top 10 ringing tones" as described in connection with Fig. 10: "Selections made in sub-menus cause wide variety of actions. Entries in the sub-menus can be associated with URL (Uniform Resource Locater) information, which can be used to fetch information from Internet…In addition, supplementary services can be initiated directly from these entries; …Actions may cause information to be sent to the terminal by a network entity, e.g. enables selection and then downloading of ringing tones as explained above. Thereby the Operator Services menu can cause information to be fetched from Internet based on URL information, … The users can browse through these services, and pick those that interest them." Isomursu at 11:32-51.

319. Isomursu discloses that remote computers may be accessed over a data network such as the Internet: "[A]communications link can be established to the Internet through a mobile communications network. … Computer programs by means of which a communications link to different pages on the Internet can be

established, and which enable the so-called surfing on the Internet, are called WWW (World Wide Web) browsers. Currently, a number of different companies have their own service pages on the Internet, through which a user may order information on a service…." Isomursu at 16:44-66.

320. Isomursu thus shows "*a communication link capable of connecting to a database in the remote computer that includes a plurality of polyphonic audio files,*" as required by claim 10.

Limitation [10b]: "a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom;"

321. Isomursu discloses that using a display and a menu system, the user can browse ("scroll down") the list of potential ringtones one at a time and has the option to "select" a ringtone for downloading and for "playback" before deciding to "save" or reject the ringtone.

322. Isomursu provides two examples of browsing ringtones. First, in connection with Figure 10, Isomursu describes in detail how the user can "scroll down" through each of the "Top 10 Ringing Tones" sent by the server (though only four ringing tones can be shown on the screen in Fig. 10): "An example of creating a menu for ringing tones is disclosed in FIG. 10 as a sequence of displays to illustrate what the user sees on the display. The command "NEW RINGING TONES" is sent in a user message to a server of a ringing tone service provider in

order to request for latest ringing tones. As a response the server sends a user message containing information relating to the Menu applications for creating a menu, from which the user can select a new ringing tone. The user selects the desirable ringing tone from the menu (selects ring tone 'Popcorn'). The selection activates a user message to be sent to the server indicating the desired ring tone. After a while the terminal receives the ring tone from the server. … The user can accept or reject the ring tone. …If the user selects the Playback-option the received ringing tone is played to the user and after that the original selection list displays again. If the user gives a rejection of the new ring tone, the received ringing tone is discarded…." Isomursu at 14:47-15:6.

323. Figure 10 and corresponding description disclose scrolling through menus and playing back ringtones:

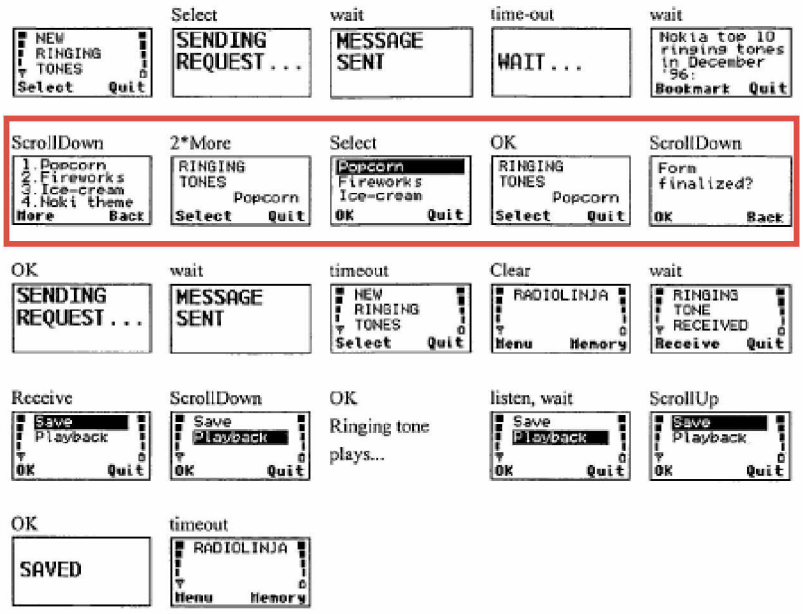


Figure 10

(highlights added).

324. Second, in connection with the Operator Services Menu example, Isomursu describes providing "Operator Services," namely, "Download Ringing Tones" via a menu system that is linked to the Internet:

> MENU:
> Phone Settings
> Operator Services
> Call Customer Service
> Download Ringing Tones
> Rock around the clock
> Those were the days
> Smoke on the water

Id. at 10:60-67.

325. Isomursu explains that the menus for Operator Services can be divided using sub-menus, and that these sub-menus may also be divided into

various sub-menus, which would allow the user an ability to search a plurality of sub-menu categorizations of ring tones: "sub-menu Download Ringing Tones can be divided into sub-menus according to ring tone melodies (Rock around the clock, Those were the days, Smoke on the water) which can then be chosen as ring tones by selecting the specific sub-menu and activating it as a command. The command is sent to the service provider as a user message according to the invention and as a response to the user message the operator may send the ring tone coded into a user message which can then be stored into a ring tone memory of the terminal." *Id. at* 11:22-31.

326. Isomursu thus shows "*a display screen and a browsing application program that allows a user of the telephone to browse the polyphonic audio files and select at least one polyphonic audio file therefrom*" as specified in claim 10.

Limitation [10c]: "processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link"

327. Isomursu discloses a "processor" and "circuits" that enable the processing of "different applications." More particular, Isomursu teaches a telephone or communicator as depicted in Fig. 9, wherein a "data processing unit DU of the terminal" which "will report short messages [when] received" and if the message has an identifier (such as a ringing tone), the DU processor will "launch the application … [and] the reception of the user message (e.g. short message) will

be displayed to a user as received application related information." Isomursu at 23:12-22.

328. Isomursu further discloses that a processor runs the software: "the Menu application which is stored in a memory and run by the processor. In following a protocol is explained according to which the Menu application may be implemented as software run by a processor." 12:8-11.

329. Isomursu also discloses processing circuitry: "In FIG. 9, there is a block diagram of the implementation of a terminal according to the present invention…. The terminal is preferably a mobile phone or communicator, which has circuits and a user interface that enable the processing of different applications. The terminal 1 in FIG. 9 comprises, for communication using radio communication, a radio unit RU (the reference has not been marked in the figure), which comprises a transmitter branch 2, known from an ordinary mobile station, (comprising blocks implementing coding, interleaving, ciphering, modulating, and transmitting), a receiving branch 3 (comprising receiving, de-modulating, de-ciphering, de-interleaving, and implementing blocks) and, for transmission using radio communication, … an antenna 5. The terminal has a main control circuit 6 that controls its operation. Furthermore, the main control circuit 6 comprises still a RU controller 7 that carries out control functions of an ordinary mobile station. …

Thus, the blocks 8-12 can be said to form a data processing unit DU of the terminal." Id. at 20:48-21:20.

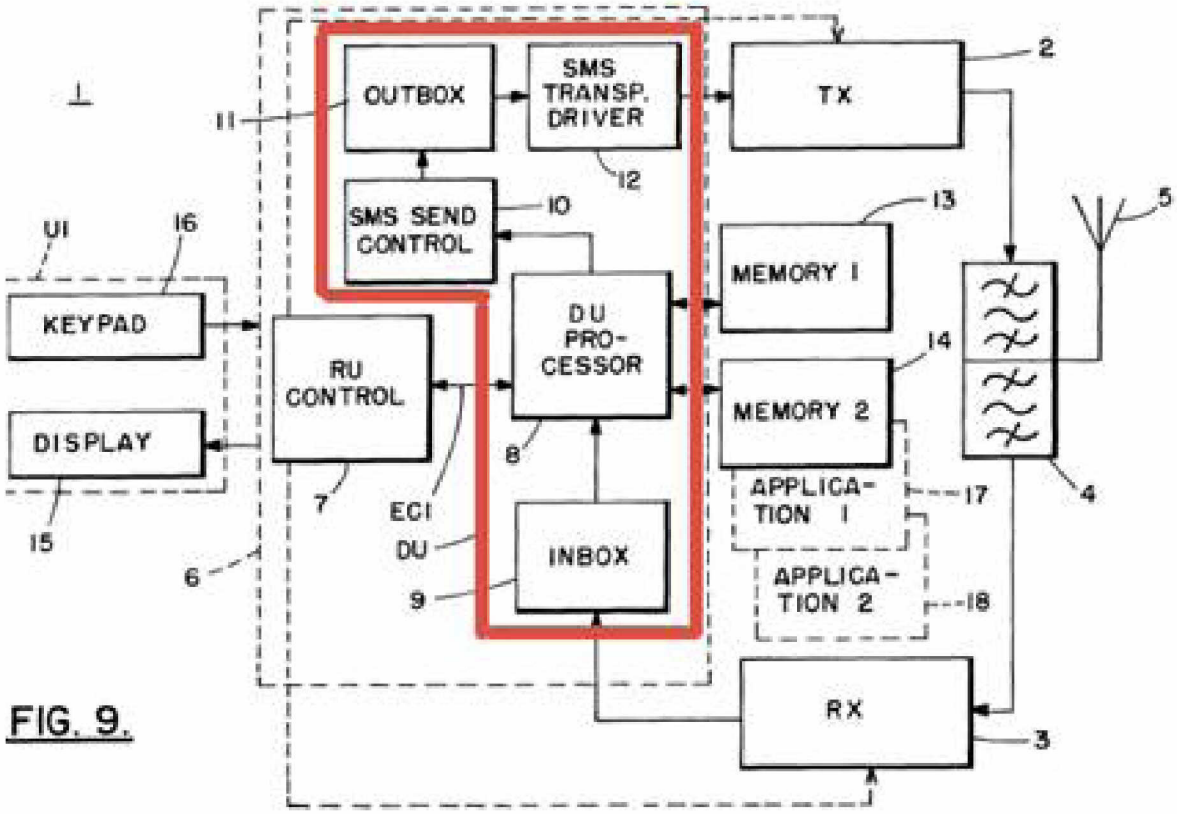


FIG. 9.

330. Isomursu also discloses the process or receiving and processing a message that may contain additional data such as ringing tones: "In the following, we will discuss the implementation and operation of the terminal in receiving application related information. When the terminal receives a short message containing information for an application, the message first arrives at the radio unit RU. There, at a receiving branch 3, the processing of the message takes place according to the mobile communications system…. If the received frame identifier

(SAPI) indicates that the message is a short message, it will be transferred into a destination box 9 of the data processing unit, which can be a memory for storing the message. If the received message is an ordinary short message, the DU processor 8 will report the short message received. If the message has an identifier, which indicates that it is an application related message, the DU processor 8 will launch the application 17, 18 in question, and place the information, from the received message, in the application in accordance with the markings on the received message. Hence, the reception of the user message (e.g. short message) will be displayed to a user as received application related information." 23:1-22.

331. An example of this is illustrated in connection with the ringing tone application discussed in Fig 10, in which the DU processor causes "Ringtone Received" to be displayed:

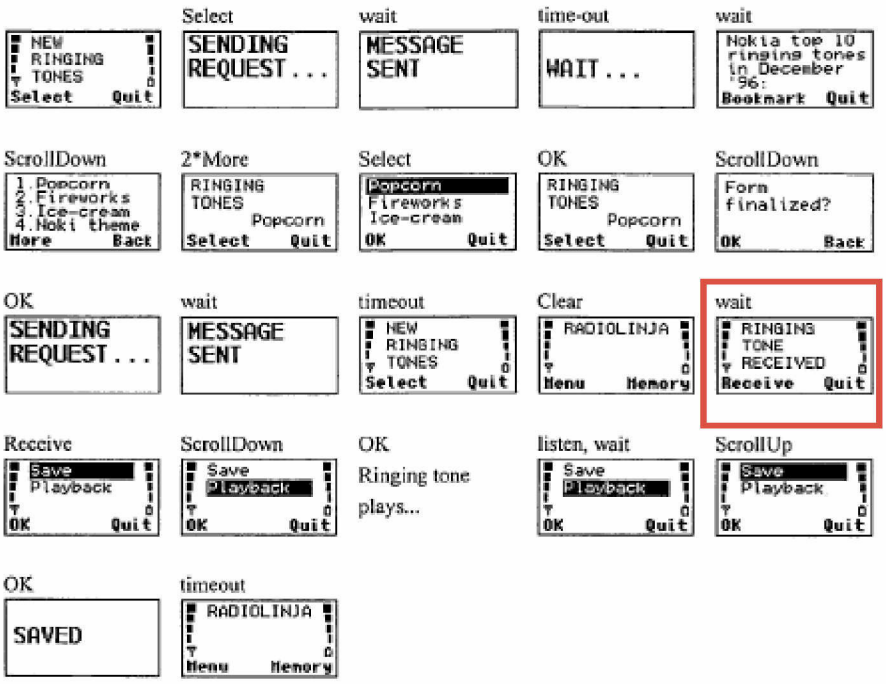


Figure 10

(highlights added).

332. Isomursu thus shows "*processing circuitry configured to supervise receipt of a selected polyphonic audio file from the communications link*" as required by claim 10.

Limitation [10d]: "a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication"

333. Isomursu discloses allowing the user to choose ("select") a "ring tone melody" (e.g., the song "Popcorn") from among the browsed audio files. For example, Isomursu discloses allowing the user of the wireless telephone to select a desired audio file (e.g., "ring tone melodies") from the list of ringtones received

from the server of the "service provider". Using the menu functions, the user can "select" the preferred ringing tone and request that the same be sent to the mobile phone: "[T]he menu or menus can include main-menus and sub-menus as shown above, where the main menus [such as] Operator Services….include sub-menus." Id. at 11:18-21.

334. These sub-menus may further be divided into sub-menus, e.g. sub-menu Download Ringing Tones can be divided into sub-menus according to ring tone melodies (Rock around the clock, Those were the days, Smoke on the water) which can then be chosen as ring tones by selecting the specific sub-menu and activating it as a command. The command is sent to the service provider as a user message according to the invention and as a response to the user message the operator may send the ring tone coded into a user message which can then be stored into a ring tone memory of the terminal." Isomursu at 11:22-31.

335. In addition, "[a]s a response the server sends a user message containing information relating to the Menu applications for creating a menu, from which the user can select a new ringing tone. The user selects the desirable ringing tone from the menu (selects ring tone 'Popcorn'). The selection activates a user message to be sent to the server indicating the desired ring tone. After a while the terminal receives the ring tone from the server. A received ringing tone is indicated to the user using the "RINGING TONE RECEIVED" notification. The user can

accept or reject the ring tone." Isomursu at 14:52-61. See also Fig. 10 shown above in connection with claim limitation 10c] (relating to selection and receipt of the ringing tone "Popcorn" selected from the list of 'Top 10' ringtones).

336. *See also* Fig. 10 and discussion relating to saving the received ringtone:

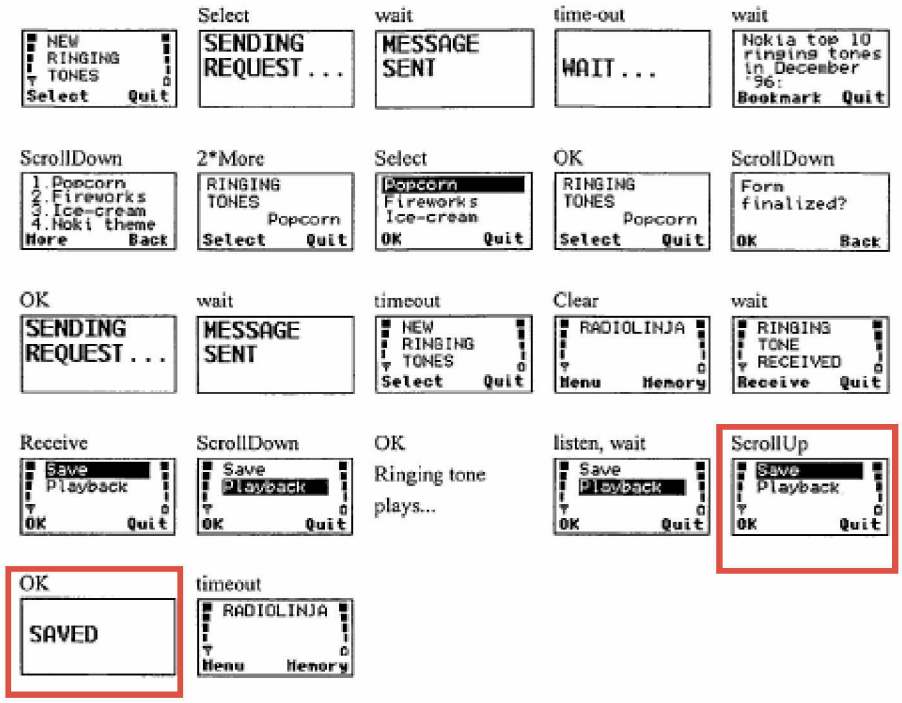


Figure 10

(highlights added).

337. Isomursu thus shows "*a programmable memory circuit for allowing the user to optionally store the selected polyphonic audio file for use as an indicia of an incoming communication*" as required by claim 10.

Limitation [10e]: "an enhanced performance speaker capable of providing a substantially full range of audio sounds from the

selected polyphonic audio file when the selected polyphonic audio file is played"

338. One of skill in the art would also understand that the mobile phone in Isomursu inherently has a speaker, and further would understand that the speaker would play the range of sounds from the downloaded files such as "ring tone melodies" that include popular songs: "(Rock around the clock, Those were the days, Smoke on the water) which can then be chosen as ring tones" 11:24-25. *See also* 10:63-66 and Figure 10 listing popular songs.

4. Combining Lin, Isomursu and Nikkei

339. Isomursu, Lin and Nikkei all relate to the same general art, namely the delivery of ringtones to, and the playback of ringtones on, mobile phones. As discussed below, Lin and Isomursu describe advances in ringtone delivery systems, and Nikkei discusses evolution of that art to include polyphonic ringtones. Thus one of skill would have been motivated to combine these references for at least the reason that they all relate to the same art.

340. In my opinion, the Examiner was correct to combine Lin and Isomursu. Lin notes that with its system "that the downloading of ringing tone patterns 65 to MSs 20 can be implemented within any type of cellular system." Exhibit 1063 4:30-34. Both references relate to updating ringtones with the same approach of searching for and downloading audio files off the Internet using the "URL" (referenced in both) to provide links to the audio files and the databases

with the audio files on the Internet. Exhibit 1063 at 3:30-46; Exhibit 1075 at 11:32-66.

341. I understand that during prosecution, the inventor challenged the motivation to combine Isomursu and Lin. See Exhibit 1007 at 0068. According to the inventor, Lin used SMS and USSD for messages while Isomursu used "a multiple format system." *Id.* Isomursu's "multiple format system," however, included SMS and USSD (the same as Lin) which could be used as well as other formats. *See* Exhibit 1075 at 13:14-16. Rather than point out the overlap, the inventor argued that they taught away from each other: "Attempting to combine the multiple format system of Isomursu in to the single format system of Lin would require substantial modification of each of the devices further discouraging the proposed combination….Isomursu and Lin teach away from each other…" Exhibit 1007 at 0068. It is my opinion that one of skill in the art would find that Lin and Isomursu do not teach away from each other.

342. Indeed, one of skill in the art would have been motivated to combine Isomursu with Lin for at least the reason that a user, who has placed an order for a downloadable ringing tone, would want to know when that ringtone has arrived on her phone. Indeed, it is common sense that a consumer who has ordered something wants to know when their order has been delivered. Isomursu teaches that the handset provides an alert to the user such as "Ringing tone received."

343. One of skill in the art would have readily combined Lin and Isomursu for the reasons discussed above, and to combine them with Nikkei to incorporate polyphonic ringtones in order to meet the "demand for high sound quality" referenced in Nikkei (Exhibit 1074 at 0003 (p. 119 (text for Fig. 4)).

344. The trends discussed in Nikkei are not specific to any one technology, but instead are generally expressed with respect to the cell phone industry as a whole, and one of skill in the art would readily have incorporated the teachings of Nikkei as a simple matter of technology adoption driven by market forces.

345. It is my opinion that one of skill in the art would find that this combination (Isomursu, Lin, and Nikkei) meets "polyphonic audio file" under any of the constructions above. First, Nikkei shows actual polyphonic files which were to be delivered to wireless phones from databases (such as those also described in Isomursu and Lin). It shows the specific file formats alleged (wrongly) by the inventor to disclose polyphonic audio files in the form of MP3, MPEG and MIDI files discussed in Nikkei. Under Solocron's Litigation construction, the combination clearly shows "more than one sound" in Nikkei's description as well as the descriptions in Isomursu and Lin of "melodies" and "popular songs."

346. The handset of Lin, as modified by Isomursu (to give affirmative notice of receipt of a downloaded ringtone), and as further modified by Nikkei to incorporate polyphonic audio content, and hardware to process and play back the

polyphonic content, renders claim 10 obvious. Even under a narrower construction of "polyphonic," it is my opinion that claim 10 is invalid as obvious in view of Lin, Isomursu and Nikkei. This conclusion is also consistent with the Examiner's position taken during prosecution.

VI. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

347. I understand that Solocron may attempt to rely on evidence of objective evidence of nonobviousness, known as "secondary considerations." I understand that, in order to establish such secondary considerations, Solocron must show a "nexus" between the alleged claimed invention and the evidence. I do not believe Solocron will be able to show such a nexus for several reasons. First, I understand that, if the secondary considerations result from something other than what is novel in the claim, there is no nexus. Here, as shown above, there is nothing novel about this claim set when compared to prior art references such as Isomursu and Rizet. Thus, it is my opinion that Solocron will not be able to establish such a nexus.

348. Second, I understand that evidence of near-simultaneous invention by others can, under certain circumstances, demonstrate obviousness. As shown above, numerous entities developed the claimed invention before or near Mr. Shanahan's alleged priority date. I believe that this near-simultaneous invention confirms my opinion that these claims are invalid. Third, I have not seen any

evidence of such secondary considerations. To the extent that Solocron provides such evidence, I reserve the right to supplement my opinion to respond to that evidence.

VII. SUPPLEMENTATION

349. I expressly reserve the right to supplement this declaration based on information provided by the patentee and/or based on additional evidence or testimony.

VIII. CONCLUSION

350. For the reasons set forth above, it is my opinion that the subject matter recited in claim 10 of the '866 patent was not novel as of the filing date of the '866 patent.

Exhibit A to Declaration

Henry H. Houh

Education

Massachusetts Institute of Technology, Cambridge, MA

- PhD in Electrical Engineering and Computer Science, January 1998. "Designing Networks for Tomorrow's Traffic," thesis supervised by Professor David Tennenhouse and Professor John Guttag. GPA 4.7/5.0
- Master of Science in Electrical Engineering and Computer Science, February 1991. "Demonstration of a laser repetition rate multiplier," thesis. GPA 4.5/5.0
- Bachelor of Science in Electrical Engineering and Computer Science, June 1989. "Boundary element analysis of arbitrarily shaped dielectric structures," thesis. GPA 4.7/5.0
- Bachelor of Science in Physics, February 1990. GPA 4.7/5.0

Experience

H3XL Inc. d/b/a Einstein's Workshop (formerly Lexington Robotics)

- 2009 - present: Founder and President. Started local league providing science and engineering education programs based on LEGO Mindstorms, LEGO WeDo, and FIRST LEGO League. In 2012, grew program into a full science, technology, engineering and math enrichment program and creative/maker space, in 7,000 square feet of space. Serve 2,000+ kids and families annually.

Houh Consulting Inc. / Independent Consultant

- 2009 - present: Technical consultant specializing in Social Networking, Web 2.0, Web Site Development, Data Networking, Optical Networking, Telecommunications, Media Streaming and Voice Over IP. Representative clients include: BBN, Covington & Burling LLP, Winston & Strawn LLP, Wilmer Cutler Pickering Hale and Dorr LLP, Kellogg Huber Hanson Todd Evans & Figel PLLC, McGuireWoods LLP, Sidley Austin LLP and startup companies.

Eons

- 2008 - 2009: Chief Technology Officer. Created product that Eons acquired from BBN Technologies. Integrated BBN product with Eons social networking platform and significantly increased the Eons group creation rate. Eons raised $32 million from General Catalyst Partners, Charles River Ventures, Sequoia Capital, and Intel Capital.

BBN Technologies

- 2007 - 2008: Delta Division, Vice President of Technology. Grew "Boomerang" counter-sniper project engineering team and significantly de-risked $10 million worth of product deliveries.

Boomerang was a significant asset leading to the acquisition of BBN by Raytheon in 2009. Created new business plan and grew team; launched new fully-featured social networking web site in 5 months.

- 2004 - 2007: Delta Division, Director of Technology, responsible for commercializing IP and creating new businesses. Hired and grew division's initial engineering team. Wrote three business plans, two of which are funded and active. For call center business plan, acted as general manager, hiring and managing engineering team, inside sales team, and identifying and recruiting a new general manager. Identified and recruited other key employees to Delta Division, including senior members of team leading to successful internal sales growth and spin-outs of projects. Contracted by BBN to BBN spin-out PodZinger as VP of Operations and Technology. Identified sales team for counter-sniper system, leading to $10 million dollars of new sales within 6 months and $100+ million in additional orders in the following two years.

PodZinger Inc. (BBN spin-out, also known as EveryZing and now RAMP)

- 2006: Vice President of Operations and Technology. Significantly upgraded capability of consumer-facing search site and redeployed web site from company to co-location facility. Identified key portions of infrastructure for upgrading and cost reduction. Hired in operations replacement and phased back to BBN.

Commonwealth Capital

- 2004: Entrepreneur-in-residence (informally), performed technical due diligence on business plans, brainstormed ideas for new businesses with venture partner. With venture partner, left for portfolio company BBN to form core of commercialization team.

Empirix, Inc./Teradyne, Inc.

- 2001 - 2004: Chief Technologist, Engineering Manager, Web Application Test Group. Researched potential new product areas; developed product plan and prototype. Responsible for three new and existing products. Managed off-shore development team. Chief architect for all web testing products. Re-architected core testing product. Provided technical vision for core product.
- 2000 - 2001: Chief Technologist, Communication Infrastructure Test Group. Responsible for incorporating new technology internally, tracking new technologies, technical evaluation of partnerships and potential acquisitions. Helped develop division strategy. Developed plans which formed core capabilities for successful new products introduced in 2004-5.
- 2000 - 2001: Engineering Manager, Communications Infrastructure Test Group. Execution of new product plan developed in prior role. Grew team from four existing engineers to team of over 30 on immediate team and over 40 on project. Delivered new platform in one year. Platform and derivatives accounted for large portion of booked products for the division within 2 years and is currently (2008) a key portion of new product offerings.
- 2000: Empirix was formed as a spin-out of Teradyne in January 2000. Reported to CEO in carve-out of Empirix from Teradyne.
- 1999: (Teradyne) Director of Business Development, Software Test Units. Reported directly to Chairman of the Board/Founder and then to general manager of software test unit (6 divisions of Teradyne). Evaluated and researched acquisition and partnership candidates. Internally assessed

technology position in market and gaps in product lines. Worked with senior division staff to develop new product strategies. Attended internal Teradyne divisional board meetings. Chairman served as my mentor.

3Com Corporation/NBX Corporation

- 1999: Software Engineer 5. Continued work after 3Com acquisition of NBX. Built cross-division relationships for new products and research directions. NBX was acquired by 3Com in March 1999.
- 1997 - 1999: (NBX) Senior Scientist and Engineer. Work in IP Telephony. Architected next-generation product. Protocol design and validation for core protocol now used tens of millions of times daily. Led team in integration of IP protocols into current product. Designed audio reconstruction algorithms. Developed applications for bug analysis and diagnosis of system problems. Implementation of network simulator. Work on collaborative projects with external partners. Worked to identify gaps in product. Representative at numerous trade shows. Innovated novel methods of using product.

MIT Department of Electrical Engineering and Computer Science, Cambridge, MA

- 1991 - 1998: Research assistant, Telemedia Network Systems Group. Design, development, and implementation of Gigabit ATM network for distributed multimedia system. Studied host interface design issues. ATM network simulation.
- Spring 1989, Fall 1990, Spring 1995: Teaching assistant, Computation Structures digital systems course. (Spring 1995 Head TA)
- 1988 - 1989: Head laboratory teaching assistant for Computation Structures. Responsibilities included writing and revising lab assignments, and maintaining the lab.
- 1987: Laboratory teaching assistant for Computation Structures.
- 1987: Design, construction, and programming of 16-bit computer.

Agora Technology Group, Incorporated

- 1994 - 1996: Founder and CEO. Conceived and oversaw development of targeted advertising-supported Web sites. Responsible for company's vision and direction. Sold company intact; is currently an operating stand-alone company.

AT&T Bell Laboratories, Holmdel, NJ

- 1989 - 1990: Implementation of cascadable all-optical fiber logic gate. Modelocking of all-fiber erbium laser. Construction of modelocked laser repetition rate booster. Strong optics laboratory and fiber optic experience.
- Summer 1988, 1987: Research in integrated optics. Analysis of rectangular waveguides using microwave modeling. Fabrication of integrated optical components.

Honors

- MIT Alumni Association Great Dome Award, 2010, Baker 60th Anniversary Reunion Co-Chair (highest group award given by MIT Alumni Association)

- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 2008, Member of MIT Chairman's Salon committee
- MIT Alumni Association Bronze Beaver Award, 2007 (highest individual award given by MIT Alumni Association)
- MIT Alumni Association Volunteer Honor Roll, February 2004
- MIT Alumni Association Lobdell Award, 1999
- Boston Museum of Science Gold Pin for 1000 hours of Volunteer Service, April 1999
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 1997, Member of Alumni Online Communications Committee

Patents and Patent Publications

- US Patent #7,975,296, L. Apfelbaum, H. Houh, T. Mayberry and G. Friedman, "Automated security threat testing of web pages," July 5, 2011
- US Patent #7,877,736, H. Houh and J. N. Stern, "Computer language interpretation and optimization for server testing," January 25, 2011
- US Patent #7,801,910, H. Houh and J. N. Stern, "Method and apparatus for timed tagging of media content," September 21, 2010
- US Patent #7,590,542, D. C. Williams, W. C. Hand, H. Houh, A. R. Seeley, "Method of Generating Test Scripts Using a Voice-Capable Markup Language," September 15, 2009
- US Patent #6,967,963, H. H. Houh, P. Anderson, C. Gadda, "Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data," November 22, 2005.
- US Patent #5,144,375, M. C. Gabriel, H. H. Houh, N. A. Whitaker, "Sagnac Optical Logic Gate," September 1, 1992. Also European Patent # EP0456422, July 23, 1997, German Patent #DE69126913, August 28, 1997
- US Patent Application Publication No. 20020015387, "Voice Traffic Packet Capture and Analysis Tool for a Data Network"
- US Patent Application Publication No. 20020016708, "Method and Apparatus for Utilizing a Network Processor as Part of a Test System"
- US Patent Application Publication No. 20020016937, "Method and Apparatus for Utilizing a Network Processor as Part of a Test System"
- US Patent Application Publication No. 20070106646, "User-directed navigation of multimedia search results"
- US Patent Application Publication No. 20070106660, "Method and apparatus for using confidence scores of enhanced metadata in search-driven media applications"
- US Patent Application Publication No. 20070106685, "Method and apparatus for updating speech recognition databases and reindexing audio and video content using the same"
- US Patent Application Publication No. 20070106693, "Methods and apparatus for providing virtual media channels based on media search"
- US Patent Application Publication No. 20070106760, "Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications"
- US Patent Application Publication No. 20070118873, "Methods and apparatus for merging media content"
- US Patent Application Publication No. 20090222442, "User-directed navigation of multimedia search results"
- US Patent Application 11/395,732, "Search snippet creation for audio and video data"

- US Patent Application 11/774,931, "Methods and apparatus for managing a social networking web site"
- US Patent Application 11/774,947, "Methods and apparatus for organizing media files"
- US Patent Application 11/774,956, "Methods and apparatus for managing an online event"
- US Provisional Patent Application 61/086,909, "Measuring and ranking relationship activity"
- US Provisional Patent Application 61/086,914, "Detecting media object commonality"
- US Provisional Patent Application 61/086,904, "Message categorization based on message characteristics"
- US Provisional Patent Application 61/086,905, "Photo tagging to request action"

Trials and Depositions

- Case No. 1:06CV682 (CMH/BRP), Verizon vs. Vonage, US District Court for the Eastern District of Virginia, was deposed as an expert witness and testified at trial.
- Case No. 1:08CV157 (CMH/TRJ), Verizon vs. Cox, US District Court for the Eastern District of Virginia, was deposed as an expert witness and testified at trial.
- Case No. 5:09-cv-476, Two-Way Media vs. AT&T, US District Court for the Western District of Texas, filed expert report, testified at trial
- Case No. 2:10-cv-248 (RAJ/FBS), ActiveVideo Networks vs. Verizon, US District Court for the Eastern District of Virginia, filed expert report and was deposed as an expert witness
- Case No. 1:11-cv-00880-TSE-JFA, Bear Creek Technologies, Inc. vs. Verizon Services Corp., et al, US District Court for the Easter District of Virginia, was deposed as an expert witness
- Case No. 3:10-CV-298-BBC, AlmondNet, Inc. vs. Microsoft Corp., US District Court for the Western District of Wisconsin, filed expert report
- Case No. 6:10-cv-00597, Guardian Media Technologies, Ltd. Vs. AT&T Operations, Inc. et al., US District Court for the Eastern District of Texas, Tyler Division, filed expert report
- Case No. ESCV2010-02282C, The Octopus Solution LLC v. Gary Brown et al., Essex, MA Superior Court, testified at trial
- Investigation No. 337-TA-882, In the matter of Certain digital media devices, including televisions, Blu-ray disc players, home theater systems, tablets and mobile phones, components thereof and associated software, U.S. International Trade Commission, filed expert reports, was deposed and testified at hearing
- Case No. 8:12-cv-122-LES-TDT, Prism Technologies LLC v. AT&T Mobility LLC, US District Court for the District of Nebraska, filed expert report, was deposed and testified at trial

Publications

- "IP switching: server driven flow classification," H. H. Houh, Proceedings of the Washington University Workshop on Integration of IP and ATM , November 1996.
- "Aurora at MIT," D. D. Clark, H. H. Houh, and D. L. Tennenhouse, Editors, MIT Laboratory for Computer Science Technical Report 673, December 1995.
- "ViewStation Applications: Implications for Network Traffic," C. J. Lindblad, D. Wetherall, W. Stasior, J. F. Adam, H. H. Houh, M. Ismert, D. Bacher, B. Phillips, and D. L. Tennenhouse, IEEE Journal of Selected Areas in Communications, 1995.

- "The VuNet Desk Area Network: Architecture, Implementation, and Experience", H. H. Houh, J. F. Adam, M. Ismert, C. J. Lindblad, and D. L. Tennenhouse, IEEE Journal of Selected Areas in Communications, 13 (4), May, 1995.
- "Reducing the Complexity of ATM Host Interfaces", H. H. Houh and D. L. Tennenhouse, Hot Interconnects II Symposium Proceedings, Stanford, August 11-12, 1994.
- "Media-intensive data communications in a `desk-area' network," J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, IEEE Communications, August 1994.
- "ViewStation Applications: Intelligent Video Processing Over A Broadband Local Area Network," C. J. Lindblad, D. J. Wetherall, W. Stasior, B. Phillips, D. Bacher, J. Adam, H. Houh, M. Ismert, and D. L. Tennenhouse, Proceedings of the 1994 USENIX Symposium on High-Speed Networking, Oakland, CA, August 1994.
- "The Media Gateway: Live Video on the World Wide Web," H. H. Houh, C. J. Lindblad, J. Soo, D. L. Tennenhouse, and D. J. Wetherall, Workshop at the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- "Active Pages: Intelligent Nodes on the World Wide Web ," H. H. Houh, C. J. Lindblad, and D. J. Wetherall, Proceedings of the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- "Wavelength Division vs. Code Division Access Methods for Optical Networks," H. H. Houh, Area Exam Paper, May 1993.
- "Experience with the VuNet: A Network Architecture for a Distributed Multimedia System," J. F. Adam, H. H. Houh, D. L. Tennenhouse, Proceedings of the 18th Conference on Local Computer Networks, pp. 70-76, September 1993
- "The VudBoard: A Simple DMA Interface," H. H. Houh, Proceedings of the 4th Gigabit Minijam, January 1994.
- "A Software-Oriented Approach to the Design of Media Processing Environments," D. L. Tennenhouse, J. Adam, D. Carver, H. Houh, M. Ismert, C. Lindblad, W. Stasior, D. Weatherall, D. Bacher, and T. Chang., submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- "A Network Architecture for Distributed Multimedia Systems," J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- "The Viewstation Collected Papers," D. L. Tennenhouse, J. Adam, C. Compton, A. Duda, D. Gifford, H. Houh, M. Ismert, C. Lindblad, W. Stasior, R. Weiss, D. Wetherall, D. Bacher, D. Carver, and T. Chang, MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-590, November 1993.
- "A System's Perspective of the Sagnac Fiber Logic Gates and Their Possible Applications," A. Huang, N. Whitaker, C. Gabriel, H. Avramopoulos, P. M. W. French, H. H. Houh, and I. Chuang, Applied Optics, September 10, 1994
- "Complete Switching in a Three-Terminal Sagnac Switch," H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, T. Morse, IEEE Phot. Tech. Lett. **3** (3), 235
- "Complete Switching in a Three-Terminal Sagnac Switch," H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, IEEE/LEOS Annual Meeting, Paper PDP-13, November 1990
- "All-optical phase-locked oscillator," N. A.Whitaker, Jr., H. H. Houh, H. Avramopoulos, T. F. Morse, IEEE/LEOS Annual Meeting, Paper ELT2.4/MOO3, November 1990

- "Passive modelocking of an all-fiber erbium laser," H. Avramopoulos, H. H. Houh, N. A. Whitaker, M. C. Gabriel, T. F. Morse, IEEE/LEOS Conference on Optical Amplifiers and their Applications, Paper PDP-8, August 1990
- "Transverse modes, waveguide dispersion, and 30ps recovery in submicron GaAs/AlAs microresonators," J. L. Jewell, S. L. McCall, A. Scherer, H. H. Houh, N. A. Whitaker, A. C. Gossard, and J. H. English, Appl. Phys. Lett. **55** (1), July 3, 1989

Leadership, Activities and Interests

- Leadership
  - Discovery Museums (Acton, MA)
    - Science and Technology Advisory Council, 2012 - present
  - MIT Alumni Association Board of Directors
    - K-12 STEM Initiatives Co-chair, 2013 - present
    - Awards Committee Chair, 2012 - present
    - Awards Committee, 3 year term, 2011 - 2014
    - Vice President, 2 year term, 2004 - 2006
    - Board Member, 2 year term, 1997 - 1999
  - MIT Club of Boston
    - Board of Directors, 2006 - present
    - K-12 Initiatives Chair, 2009 - 2012
    - VP of Communications, MIT Club of Boston, 2003 - 2006
    - Past-President, MIT Club of Boston, 2002 - 2003
    - President, MIT Club of Boston, 2001 - 2002
    - President-Elect, MIT Club of Boston, 2000 - 2001
    - VP of Programs, MIT Club of Boston, 1999 - 2000
    - Activities Super-Chair, MIT Club of Boston, 1998 - 1999
  - MIT Enterprise Forum of Cambridge, Inc.
    - Past Chair, 2009 – 2011
    - In-NOW-vation Co-chair, 2010
    - Chair, 2007 - 2009
    - Vice Chair, 2005 - 2007
    - Executive Board Member, 2002 - present
    - Winter Workshop Co-Chair, February 2007 - conceived idea for conference, which sold-out and produced largest attendance numbers in recent memory
    - Spring Workshop Co-Chair, Spring 2004
    - Membership Committee Chair, Fall 2003 - 2006
    - 25th Anniversary Dinner Chair, Fall 2003
    - As Membership Chair and Board Member, started Special Interest Groups in 2004; a SIG won the MIT Presidential Citation award, the MIT Alumni Association's highest award for organizations, in 2006
  - Estabrook Elementary School PTA
    - Advisory committee to the superintendent on PCB issue, 2010-2011
    - 4th Grade after-school science program co-organizer, 2010-2012
    - 4th and 5thGrade before-school Math Olympiad co-organizer, 2009-2013
    - 5th Grade BBQ and Yearbook Committee, 2011, 2013
    - Family Math Night volunteer, 2008-2012

- Tau Beta Pi National Engineering Honor Society
  - Advisor, MA B Chapter at MIT, 2003 - present
  - District Director (National Officer), Tau Beta Pi, New England Area, 1991 - 2003
  - President, MA B Chapter at MIT, Fall 1988 - Spring 1989
  - Laureate award, 1989
- MIT Class of 1989
  - Secretary, consecutive 5 year terms, 1989 - present
  - 20-year Reunion Committee and Gift Committee, 2009
  - 15-year Reunion Committee and Gift Committee, 2004
  - 10-year Reunion Committee and Gift Committee, 1999
  - 5-year Reunion Committee, 1994
  - Interim Treasurer, 1993 - 1994
  - Instituted annual senior class career fair, now entering eleventh year, now raising over $100,000 annually for senior class activities, Fall 1988
- Strong, consistent record of leadership dating to high school

- Acting
  - '21' (Sony Pictures), credited as "Chinatown Dealer," 2007, Kevin Spacey's movie about the MIT Blackjack Team inspired by "Bringing Down the House" by Ben Mezrich, opened nationwide on March 28, 2008. 21 was the number one movie in US for two weeks and number one globally for one week. 21 also topped the DVD sales, Blu-ray sales and DVD rental charts.
  - Spring Lake Theater Company, first New York-area off-broadway production of "A Chorus Line," played role of Mark, Summer 1990
- Former member of the MIT Blackjack team
- Producer for 10,000 Maniacs' 2013 album "Music from the Motion Picture"
- Executive Producer for 10,000 Maniacs' 2014 album "Twice Told Tales"
- Violist, violist, harpist, guitarist, singer, actor: played in many amateur/semi-professional groups including Merrimack Valley Philharmonic, Longwood Symphony, MIT Symphony, MIT Summer Philharmonic Orchestra and Somerville Community Chorus

EXHIBIT B TO DECLARATION

List of Materials Considered by Henry Houh

1. All documents cited within my reports
2. U.S. Patent No. 6,496,692
3. U.S. Patent No. 7,257,395
4. U.S. Patent No. 7,295,864
5. U.S. Patent No. 7,319,866
6. Prosecution History of U.S. Patent No. 6,496,692
7. Prosecution History of U.S. Patent No. 7,257,395
8. Prosecution History of U.S. Patent No. 7,295,864
9. Prosecution History of U.S. Patent No. 7,319,866
10. Prosecution History for U.S. Patent Application 09,518,846
11. U.S. Provisional Application No. 60/169,158
12. Solocron's Infringement Contentions
13. Defendants' Invalidity Contentions
14. October 27, 2014 Declaration of Chris Butler and Exhibits Thereto
15. Jukeboksi Certified Translations
16. Nokia 9110 User Manual
17. Nokia 9110 Browser Style Guide
18. U.S. Patent No. 6,292,668 (Alanara)
19. WO 1998/025397 (Rizet)
20. MIDI Specification
21. Standard MIDI File Specification
22. General MIDI Specification
23. "Yamaha Sound Generator LSI 'YMU757,'" Yamaha News Release

24. Japanese Unexamined Application No. H11-242490 and Certification Thereof

25. U.S. Patent No. 5,481,599 (McCallister)

26. U.S. Patent No. 6,247,130 (Fritsch)

27. U.S. Patent No. 6,366,791 (Lin)

28. U.S. Patent No. 6,492,761 (Perez)

29. U.S. Patent No. 7,065,342 (Rolf)

30. U.S. Patent No. 7,088,990 (Isomursu)

31. U.S. Patent No. 7,149,208 (Mattaway)

32. Yamaha YMU757 Technical Manual, February 2000

33. Certified translation of Chapters 2-3 of "Nikkei Electronics" 1999.11.15

34. Yamaha YMU757 Press Release, October 12, 1999

35. Declaration of Erin Flaucher re Nokia 9110 with Exhibits

36. 9110 Nokia.com web page archived May 8, 1999 for "Frequently Asked Questions"

37. Nokia 9110 CD Listing Printout

38. 9110 PC Suite PC Suite for Nokia 9110 Communicator User's Guide

39. Quick Guide for the WAV Converter for the Nokia 9110 Communicator, 10/22/1999

40. Declaration of Internet Archive re Nokia Websites

41. Declaration of Jari Valli

42. Solocron's Opening Claim Construction Brief from *Solocron v. Cellco Partnership et al.* (Case No. 2-13-cv-1059) (E.D. Tex.)

43. Local Patent Rule 4-3 Statement filed in *Solocron v. Cellco Partnership et al.* (Case No. 2-13-cv-1059) (E.D. Tex.)

44. Any other materials referenced in my declaration, but not cited above

45. All exhibits cited in IPR petitions for the '692, '395, '866, and '864 patents, for which I submitted a declaration.