Declaration of Tal Lavian, Ph.D. in Support of
Petition for *Inter Partes* Review of
U.S. Patent No. 9,124,717

UNITED STATES PATENT AND TRADEMARK OFFICE

—————————

BEFORE THE PATENT TRIAL AND APPEAL BOARD

—————————

Facebook, Inc., Instagram LLC
Petitioners

v.

Skky, LLC
Patent Owner

U.S. Patent No. 9,124,717

TITLE: MEDIA DELIVERY PLATFORM

<u>DECLARATION OF TAL LAVIAN, PH.D.</u>

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I, Tal Lavian, Ph.D., declare as follows:

I.   INTRODUCTION AND QUALIFICATIONS

A.   Qualifications and Experience

1.   I have more than 25 years of experience in the networking, telecommunications, Internet, and software fields. I received a Ph.D. in Computer Science, specializing in networking and communications, from the University of California at Berkeley in 2006 and obtained a Master's of Science ("M.Sc.") degree in Electrical Engineering from Tel Aviv University, Israel, in 1996. In 1987, I obtained a Bachelor of Science ("B.Sc.") in Mathematics and Computer Science, also from Tel Aviv University.

2.   I am employed by the University of California at Berkeley and was appointed as a lecturer and Industry Fellow in the Center of Entrepreneurship and Technology ("CET") as part of UC Berkeley College of Engineering. I have been with the University of California at Berkeley since 2000 where I served as Berkeley Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, and Nortel's Scientist Liaison. I have taught several classes on wireless devices and smartphones. Some positions and projects were held concurrently, while others were held sequentially.

3.   I have more than 25 years of experience as a scientist, educator and technologist, and much of my experience relates to telecommunication, data

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communications, and computer networking technologies. For eleven years from 1996 to 2007, I worked for Bay Networks and Nortel Networks. Bay Networks was in the business of making and selling computer network hardware and software. Nortel Networks acquired Bay Networks in 1998, and I continued to work at Nortel after the acquisition. Throughout my tenure at Bay and Nortel, I held positions including Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer, and led the development and research involving a number of networking technologies. I led the efforts of Java technologies at Bay Networks and Nortel Networks. In addition, during 1999-2001, I served as the President of the Silicon Valley Java User Group with over 800 active members from many companies in the Silicon Valley.

4.   Prior to that, from 1994 to 1995, I worked as a software engineer and team leader for Aptel Communications, designing and developing wireless technologies, mobile wireless devices and network software products. I worked on development of two-way wireless OFDM technology, in the 915 MHz band, under the FCC part 15. The technology was a continuation of military research for low power, wideband OFDM to reduce wireless transmission detectability.

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5. From 1990 to 1993, I worked as a software engineer and team leader at Scitex Ltd., where I developed system and network communications tools (mostly in C and C++).

6. I have extensive experience in communications technologies including wireless technologies, routing and switching architectures and protocols, including Multi-Protocol Label Switching Networks, Layer 2 and Layer 3 Virtual Private Networks, and Pseudowire technologies. Much of my work for Nortel Networks (mentioned above) involved the research and development of these technologies. For example, I wrote software for Bay Networks and Nortel Networks switches and routers, developed network technologies for the Accelar 8600 family of switches and routers, the OPTera 3500 SONET switches, the OPTera 5000 DWDM family, and the Alteon L4-7 switching product family. I wrote software for Java-based device management, including a software interface for device management and network management in the Accelar routing switch family's network management system. I have also worked on enterprise Wi-Fi solutions, wireless mobility management, and wireless infrastructure.

7. I am named as a co-inventor on more than 100 issued patents and I co-authored more than 25 scientific publications, journal articles, and peer-reviewed papers. Furthermore, I am a member of a number of professional affiliations,

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including the Association of Computing Machinery ("ACM") and the Institute of Electrical and Electronics Engineers ("IEEE") (senior member). I am also certified under the IEEE WCET (Wireless Communications Engineering Technologies) Program, which was specifically designed by the IEEE Communications Society (ComSoc) to address the worldwide wireless industry's growing and ever-evolving need for qualified communications professionals.

8.   From 2007 to the present, I have served as a Principal Scientist at my company TelecommNet Consulting Inc., where I develop network communication technologies and provide research and consulting in advanced technologies, mainly in computer networking and Internet technologies. In addition, I have served as a Co-Founder and Chief Technology Officer (CTO) of VisuMenu, Inc. from 2010 to the present, where I design and develop architecture of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications.

9.   I have worked on wireless and cellular systems using a variety of modulation technologies including time-division multiple-access (TDMA), code-division multiple-access (CDMA), and orthogonal frequency-division multiplexing (OFDM). I have additionally worked on various projects involving the transmission and streaming of digital media content.

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10.   The above outline of my experience with communications systems is not comprehensive of all of my experience over my years of technical experience. Additional details of my background are set forth in my curriculum vitae, attached as **Exhibit A** to this Declaration, which provides a more complete description of my educational background and work experience.

11.   I am being compensated for the time I have spent on this matter at the rate of $400 per hour. My compensation does not depend in any way upon the outcome of this proceeding. I hold no interest in the Petitioners (Facebook, Inc. and Instagram LLC) or the Patent Owner (Skky, LLC).

B.   Materials Considered

12.   The analysis that I provide in this Declaration is based on my education and experience in the telecommunications and information technology industries, as well as the documents I have considered, including U.S. Patent No. 9,124,717 ("'717" or "'717 patent") **[Ex. 1001]**, which states on its face that it issued from an application filed on March 31, 2014, in turn claiming priority back to an earliest application filed on June 27, 2001. For purposes of this Declaration, I have assumed June 27, 2001 as the effective filing date for the '717 patent. I have cited to the following documents in my analysis below:

Exhibit No.	Title of Document
1001	U.S. Patent No. 9,124,717 to John Mikkelsen et al.

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Exhibit No.	Title of Document
1003	U.S. Patent No. 7,065,342 to Devon A. Rolf
1004	Ben Forta et al., *WAP Development with WML and WMLScript*, Sams Publishing (September 2000)
1005	Alan Gatherer et al., *DSP-Based Architectures for Mobile Communications: Past, Present and Future*, IEEE Communications Magazine (January 2000)
1060	U.S. Patent No. 8,996,698 to James P. Tagg
1061	Bob O'Hara et al., *802.11 Handbook: A Designer's Companion*, IEEE Press (1999)`
1069	Scott Hacker, *MP3 The Definitive Guide* (March 2000)
1070	U.S. Patent No. 5,815,811 to Patrick Pinard et al.
1073	U.S. Patent No. 6,693,236 to Eric J. Gould et al.

13.   I previously submitted a declaration in support of the Petition for Inter

Partes Review of the '717 Patent, dated October 14, 2016. I maintain the opinions

set forth in that Declaration, and provide additional opinions in this Declaration. I

have also read the "Declaration of William H. Beckmann, Ph.D.," dated June 14,

2016, in support of the Petition for Covered Business Method (CBM) Review of

U.S. Patent No. 9,037,502 ("'502 patent") ("Beckmann Declaration"). I am

informed that the Beckmann Declaration was submitted by counsel for Facebook

and Instagram in connection with a separate petition on the '502 patent, which I

understand shares an identical specification with the '717 patent, as well as the

same earliest claimed priority date. Although I agree with the opinions provided

by Dr. Beckmann, I will provide my own discussion to emphasize points that I find

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pertinent to my analysis of the claims and the prior art addressed in this Declaration. To the extent the analysis in the Beckmann Declaration is informative or applicable to my opinions, I will refer to or incorporate it in my analysis below.

II.   PERSON OF ORDINARY SKILL IN THE ART

14.   Part III of the Beckmann Declaration includes a discussion of a person of ordinary skill in the art. I agree with the points made by Dr. Beckmann, but I will provide my own discussion to emphasize points that I find pertinent to my analysis of the claims and the prior art addressed in this Declaration.

15.   I understand that an assessment of claims of the '717 patent should be undertaken from the perspective of a person of ordinary skill in the art as of the earliest claimed priority date, which I understand is June 27, 2001. In my opinion, a person of ordinary skill in the art as of June 2001 would have possessed at least a bachelor's degree in computer science, computer engineering, or electrical engineering (or equivalent degree or experience) with at least four years of experience with wireless communications systems and at least two years of experience with the communication of digital media.

16.   My opinions regarding the level of ordinary skill in the art are based on, among other things, my over 25 years of experience in computer science and network communications, my understanding of the basic qualifications that would

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be relevant to an engineer or scientist tasked with investigating methods and systems in the relevant area, and my familiarity with the backgrounds of colleagues, co-workers, and employees, both past and present.

17.   Although my qualifications and experience exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the '717 patent have been based on the perspective of a person of ordinary skill in the art as of June 2001.

III.   RELEVANT TECHNOLOGY BACKGROUND

18.   Part IV of the Beckmann Declaration includes an overview of the underlying technology of the '502 patent, which I understand shares the same specification with the '717 patent.   Although I agree with Dr. Beckmann's summary, I will provide my own overview to emphasize points that I find pertinent to my analysis of the claims and the prior art addressed in this Declaration.

19.   The '717 patent, entitled "Media Delivery Platform," purports to disclose and claim a system and method for delivering digital media files to an electronic device.   ('717, Abstract.)   In this section, I provide a brief background discussion on technologies pertinent to the '717 patent prior to June 2001.

A.   Cellular Telephones and Networks

20.   Cellular phones (also known as "cell phones") were well known prior to June 2001.   The '717 patent itself recognizes the existence of "commercially

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available cellular phone[s]." ('717, 14:34-35.) Cell phones included transmitters

and receivers for transmitting and receiving over-the-air signals (e.g., radio

frequency waves), which allowed cell phones to communicate wirelessly.

21.   The first commercial cellular service was launched in 1979 in Japan,

over 20 years before the earliest filing date to which the '717 patent could claim

priority. By the 1980s, cell phones were in widespread commercial use. For

example, the Motorola "DynaTAC" cell phone was launched in the United States

as early as 1983. Typical of early cell phones, the Motorola DynaTAC was

designed to communicate over "1G" or "first generation" cellular networks known
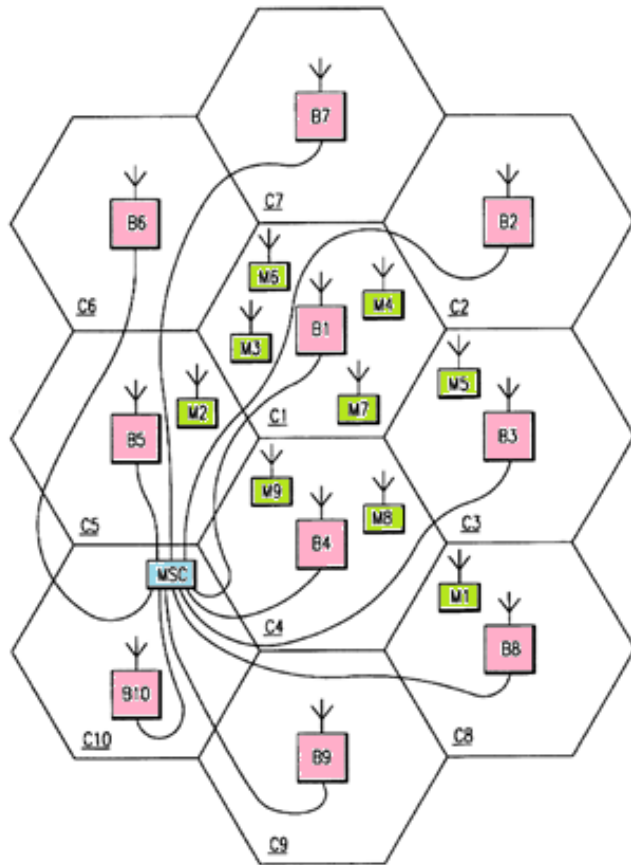
as the Advanced Mobile Phone System (AMPS). Similar cellular phones and networks were also deployed in other countries throughout the 1980s.

22.   Networks designed for cell phones, such as AMPS mentioned above, are referred to as "cellular" networks because they utilize the concept of "cells." A "cell" is a geographical region within which

FIG. 1

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wireless coverage is provided by a corresponding base station or access point. Accordingly, the base station or access point enables wireless communication between a cell phone (within the corresponding cell) and the rest of the world. This is shown in Figure 1 of U.S. Patent No. 5,726,978 to Carl Magnus Frodigh et al. ("Frodigh") **[Ex. 1006]**, reproduced above. (Frodigh, Fig. 1 (highlighting added).) As shown, "[a]ssociated with and located within each of the cells **C1**-**C10** is a base station designated as a corresponding one of a plurality of base stations **B1**-**B10**," highlighted in pink above. (*Id.*, 5:64-66.) The base stations include equipment enabling wireless communication with mobile stations (shown in green) within their respective cells. (*Id.*, 5:66-6:1, 6:15-16.) Because a single base station may communicate with more than one mobile station at any given time, as shown in cells **C1** and **C4** above, "multiple access" techniques are employed that allow a base station's communication bandwidth to be shared among multiple mobile stations. (*See id.*, 7:51-63; Fig. 2.)

23. Moreover, as shown in Figure 1 above, each base station is connected to a mobile station switching center (MSC) (shown in blue), which couples the cellular network to other networks (e.g., PSTN) via communication links such as cables or radio communication. These communication links can be based on PSTN services, ISDN, and other radio links. (*Id.*, 6:33-47.) As Frodigh makes clear, the

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cellular phone and networking technique discussed above were "well known" prior to June 2001. (*Id.*, 6:1, 6:42.) Various methods for providing "multiple access," such as TDMA, CDMA, and OFDM, were also well known. (EP 1039683 A2 **[Ex. 1007]**, at ¶¶ 0002-09; U.S. Patent No. 5,815,488 **[Ex. 1008]**, 1:12-16, 3:38-42; *see also* Cheong Yui Won et al., *A Real-time Sub-carrier Allocation Scheme for Multiple Access Downlink OFDM Transmission*, IEEE (1999) **[Ex. 1009]**; Wonjong Rhee et al., *Increase in Capacity of Multiuser OFDM System Using Dynamic Subchannel Allocation*, IEEE (2000) **[Ex. 1010]**.)

24. Although cell phones were originally designed for voice communications, techniques were developed to allow them to transmit and receive non-voice data. For example, a technology known as Wireless Application Protocol (WAP), an industry standard for delivery of Web content to cell phones. Cell phones that supported WAP technology typically included a special browser that issued requests for Web content and displayed the received content on the phone's display. These techniques are described in Ben Forta, *WAP Development with WML and WMLScript*, Sam Publishing (Sep. 2000) ("Forta") **[Ex. 1004]**, and is generally shown in Figure 1.1, reproduced below.

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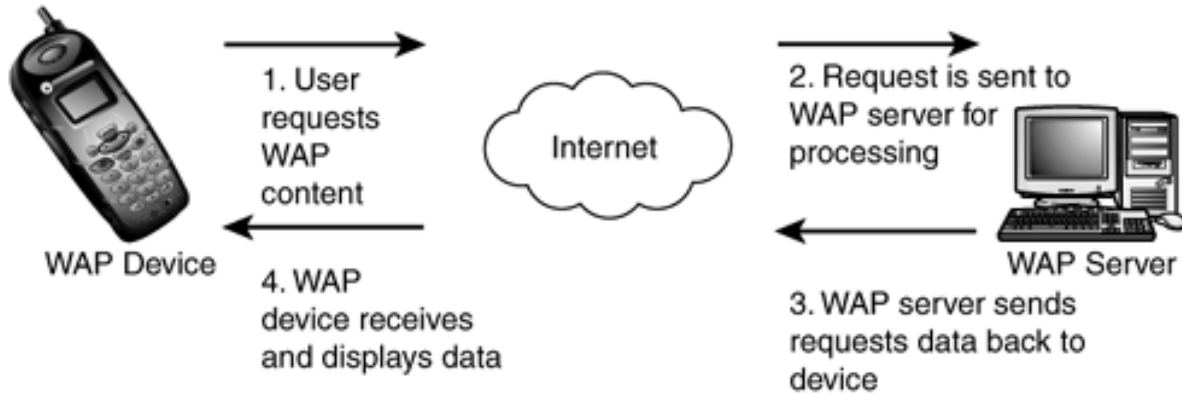
(Forta, p. 12, Fig. 1.1.) Indeed, by June 2001 well-known Web companies such as Amazon and Yahoo! were using WAP to make their websites accessible to cell phones. (*Id.*, at p. 316 ("This is the Amazon.com site that is written explicitly for phones with a WAP browser in them."), p. 317 ("Clearly, Yahoo! has done some considerable work here to build a powerful wireless site that works as a companion to its HTML site."); *see also id.*, at pp. 316, 317, Figs. 13.3 & 13.5.)

25.   It was also well-known that cell phones could be used to download and playback digital media. For example, the Background Art section of the '717 patent acknowledges the existence of cell phones that can play music in a compressed format such as MP3. ('717, 1:34-40.) Cell phones with media download and playback features are also discussed in prior art publications including EP 1033894 A2 **[Ex. 1011]**, U.S. Patent No. 6,423,892 **[Ex. 1012]**, U.S. Patent No. 7,065,342 to Devon A. Rolf ("Rolf) **[Ex. 1003]**, and Alan Gatherer, *DSP-Based Architectures for Mobile Communications: Past, Present and Future*,

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IEEE Communications (Jan. 2000) ("Gatherer") **[Ex. 1005]**. I discuss Rolf and

Gatherer in detail in **Part V** below.

B. Compression of Digital Media

26. It was well known before June 2001 that digital media (e.g., audio and

video) could be stored and transmitted in compressed form. Compression

techniques enabled media files to be stored at a fraction of their original size,

which provided advantages by allowing for more efficient use of storage mediums

(e.g., computer hard drives) and network bandwidth.

27. Indeed, the '717 patent acknowledges the existence of "MP3" ('717,

1:38, 24:7-8, 29:67), which is a standardized technique for compressing digital

audio. (John Hedtke, *MP3 and the Digital Music Revolution* (1999) **[Ex. 1013]**, at

p. 1.) By 1999, MP3 had already become "enormously popular for distributing and

exchanging songs and music." (*Id.*) "The most popular way of finding MP3 files

[was] through MP3 web sites. There [were] hundreds of MP3 web sites in

existence that distribute MP3 files, software, news bulletins about MP3, and

provide a forum for discussions by MP3 users." (*Id.*, at p. 37 (under "Getting MP3

Files from Web Sites").)

C. Optimization of Digital Media

28. Optimization is the process of enhancing the perceived quality of

digital media content in the face of real-world constraints. For example, an audio

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file containing a musical song may include defects that hamper the quality of the audio as perceived by the listener. As explained in U.S. Patent No. 6,560,577 to Jay G. Gilbert et al. (filed Mar. 2000) ("Gilbert") **[Ex. 1066]**, "[s]uch defects may arise from the reproduction of the information on the analog medium and may include scratch noises, clicks, pops, hissing, etc." (*Id.*, 4:15-18.) Gilbert explains that "techniques to identify and compensate for certain defects" were "well known in the art" (*id.*, 4:18-20):

> These techniques include searching for certain values of the digital audio information that are beyond a normal range to identify and correct specific audio defects. Other techniques include: applying high-pass filters to remove low frequency noise, normalizing extreme or inconsistent volume levels to an average value, adjusting the playback pitch, and comparing adjacent data to adjust inconsistent values (i.e., removing blips by averaging the values of adjacent data in a linear fashion).

(*Id.*, 4:20-29.)

29.   As disclosed in the '717 patent, optimization can also arise in the context of compression. ('717, 23:61-24:9.) Compression can create a tension between reducing the size of the file that stores the audio content, and the quality of the audio content as perceived by the user. Generally speaking, increasing the reduction in file size achieved by compression can reduce the perceived quality of

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the audio. One of the key considerations in any system that handles digital audio, therefore, is to implement optimization techniques to achieve a desirable balance between performance and audio quality. As explained in Scot Hacker, *MP3: The Definitive Guide* (2000) ("Hacker") **[Ex. 1069]**, techniques and tools that can be used to "optimize the quality" of compressed MP3 files (*id*. at p. 161), include normalization, sampling, resampling, bitrates, etc. (*Id*. at pp. 163-70.)

D.   Digital Signal Processors

30.   A digital signal processor, or "DSP," is a specialized microprocessor. It can be programmed to perform a wide variety of computations, and is particularly suited for functions related to digital signal processing including numerical operations. Off-the-shelf DSPs including NEC's μPD7720, TI's TMS32010, and Motorola's DSP56000 had been available since at least the early 1980s. And by the turn of the century, DSPs had become immensely popular. As explained in Gene Frantz, *Digital Signal Processor Trends*, IEEE Micro (2000) **[Ex. 1014]** ("Frantz"):

> The mass-storage industry depends on DSPs to produce hard-disk drives and digital versatile disc players. Ever-increasing numbers of digital subscriber line and cable modems, line cards, and other wired telecommunications equipments are based on DSPs. Digital still cameras, hearing aids, motor control, consumer audio gear such as Internet audio are just some of the many mass market applications in

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which DSPs are routinely found today. More specialized DSP
applications include image processing, medical instrumentation,
navigation, and guidance.

(*Id.*, at p. 52, left column.)

31.   The popularity of DSPs was driven by a number of factors, including
their favorable size, performance, power consumption, and price. (*Id.*, at p. 55, left
column ("[I]n the 1990s, DSPs were entering the realm of price, performance, and
power consumption making them appropriate for high-volume applications.");
Gatherer, at p. 86, left column ("Architecture design, and process enhancements
are producing new generations of processors that provide high performance while
maintaining the low power dissipation necessary for battery-powered
applications.").) Like many other computer technologies, DSPs only got better –
and were expected to continue to get better – with time. (Gatherer, Figs. 3 & 4.)
This is succinctly summarized in Table 1 in Frantz below.

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Table 1. Two decades of DSP market integration (typical DSP figures).	1982	1992	2002
Die size (mm)	50	50	50
Technology size (microns)	3	0.8	0.18
MIPS	5	40	5,000
MHz	20	80	500
RAM (words)	144	1,000	16,000
ROM (words)	1,500	4,000	64,000
Price (dollars)	150	15	1.50
Power dissipation (mW/MIPS)	150	12.5	0.1
Transistors	50,000	500,000	5 million
Wafer size (inches/mm)	3 / 75	6 / 150	12 / 300

(Frantz, at p. 55, Table 1.)

32. By the time of the alleged invention, DSPs were standard components in cell phones. As explained in Frantz, "the entire digital wireless industry operate[d] with DSP-enabled handsets." (*Id.*, at p. 52, left column.) Gatherer likewise described the presence of DSPs in cell phones as "**pervasive**." (Gatherer, at p. 84, left column.) DSPs provided much of the processing required, such as modulation/demodulation and speech coding/decoding. (*Id.*, Fig. 1.) And as their processing power improved, DSPs were also considered for newer features provided by cell phones, including the processing of "audio and visual

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entertainment." (*Id.*, at p. 89, left column; *see also id.*, at Fig. 7.) Moreover, it was well known that DSPs were designed and optimized to process signals transmitted using modulation techniques, including orthogonal frequency-division multiplexing (OFDM), which I explain below. (E. Lawrey, *Multiuser OFDM*, Fifth International Symposium on Signal Processing and its Applications (Aug. 1999) **[Ex. 1015],** at p. 761, left column ("[A] test hardware solution is presented using SHARC® Digital Signal Processors (DSP) demonstrating the feasibility of a simple multiuser OFDM system."); U.S. Patent No. 5,732,113 (published Mar. 1998) **[Ex. 1016]**, 4:26-44 ("DSP 100 performs a variety of operations on the in-phase and quadrature samples of the received OFDM signal."); U.S. Patent No. 6,711,221 (filed Feb. 2000) **[Ex. 1017]**, 3:33-48.)

E.   Orthogonal Frequency-Division Multiplexing (OFDM)

33.   Orthogonal frequency-division multiplexing, or "OFDM," is a particular type of frequency-division multiplexing ("FDM"), which refers to a technique in which discrete signals can be combined within a shared frequency band used for communication.

34.   The basic concept of FDM can be explained using the familiar concept of FM radio, in which a user turns a radio receiver to a particular frequency (e.g. 97.1 MHz) to listen to a radio broadcast. FDM divides up an

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available frequency band (characterized by a particular "bandwidth") into a number of frequency "sub-bands," sometimes referred to as "sub-channels." To reduce interference, these sub-bands usually do not overlap. To use the FM radio example, FM radio stations use a frequency band that ranges from 87.5 to 108 MHz of the radio spectrum. By dividing the available bandwidth into sub-bands, FDM allows multiple signals to be transmitted simultaneously because each sub-band can carry a distinct signal. This is essentially how "frequency division multiplexing" gets its name. FDM was used with the telegraph more than a century ago and continues to be used in numerous applications including, as noted, radio signals broadcast over the air.

35. OFDM is a more advanced variant of FDM. In broad overview, OFDM differs from ordinary FDM in that OFDM uses frequency sub-bands that overlap, but are centered at precise intervals and result in an "orthogonal" property, in which the electromagnetic waves have reduced interference with each other. The basic difference between conventional FDM and OFDM is illustrated in Figure 1.10 of Richard Van Nee et al., *OFDM for Wireless Multimedia Communications* (2000) **[Ex. 1018]** ("Van Nee"):

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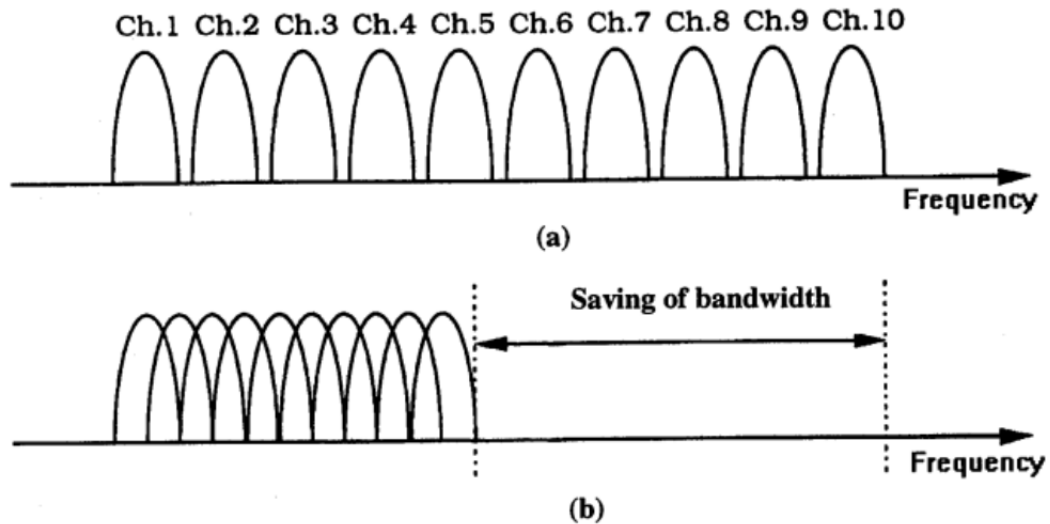
Figure 1.10 Concept of OFDM signal: (a) Conventional multicarrier technique, and (b) orthogonal multicarrier modulation technique.

(Van Nee, at p. 22, Fig. 1.10.) The top portion **(a)** of Figure 1.10 shows a conventional FDM arrangement in which each signal channel occupies a distinct frequency sub-band. The sub-bands in this example do not overlap because sub-bands are separated by what is known as a "guard band," an unused portion of the bandwidth designed to reduce interference between neighboring channels.

36. The bottom portion (b) of Figure 1.10 shows an OFDM arrangement. As shown, the sub-bands in OFDM overlap, eliminating the need for a guard band and thus resulting in a more efficient use of the available bandwidth. The spacing between the center frequency of each sub-band is precisely chosen such that the frequencies are "orthogonal" to each other, a characteristic that reduces interchannel interference notwithstanding the overlapping nature of the sub-bands.

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37.   Because the sub-bands overlap in OFDM, a mathematical method known as the fast Fourier transform ("FFT") is performed at the receiver to "demodulate" the OFDM signal to recover the individual signals carried within each sub-band. (Van Nee, at p. 47 ("[T]he basic OFDM signal is formed using the IFFT, adding a cyclic extension and performing windowing to get a steeper spectral rolloff. . . . In the receiver, the subcarriers are demodulated by an FFT, which performs the reverse operation of an IFFT.").) As I noted above, digital signal processors are well-suited for mathematical operations such as the FFT.

38.   OFDM dates back as far as 1966 to a patent and technical paper by Bell Labs inventor Robert W. Chang. (U.S. Patent No. 3,488,445 entitled "Orthogonal Frequency Multiplex Transmission System" **[Ex. 1019]**; Chang, R.W., *Synthesis of band-limited orthogonal signals for multi-channel data transmission*, Bell Labs Technical Journal, no. 45, pp. 1775-1796 (Dec. 1966) **[Ex. 1020]**.) By June 2001, the OFDM technique was well known to those skilled in the art. In fact, in 1996, the University of Hamburg began hosting an annual conference known as the International OFDM Workshop, which, as its name suggests, was specifically dedicated to OFDM technology. (Ex. 1021; Ex. 1022; Ex. 1023.)

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39. OFDM is well-suited to a shared frequency band such as the radio spectrum used for wireless communication (approximately 3 Hz to 3 THz), which includes frequency bands allocated to and used by various cellular networks. Because OFDM allows communication bandwidth to be shared by multiple signals (e.g., sent to different cell phones), OFDM was known by 2000 as one of a number of "multiple access" techniques that can be employed in cellular systems. (Rainer Grünheid et al., *Adaptive Modulation and Multiple Access for the OFDM Transmission Technique*, Wireless Personal Communications (May 2000) **[Ex. 1024]**, Abstract ("Since in OFDM the total bandwidth is divided into a large number of subcarriers, it can be flexibly shared among all the users."); *see also* EP 1039683 A2 **[Ex. 1007]**, at ¶¶ 0001, 0008; Cheong Yui Won et al., *A Real-time Sub-carrier Allocation Scheme for Multiple Access Downlink OFDM Transmission*, IEEE (1999) **[Ex. 1009]**; Wonjong Rhee et al., *Increase in Capacity of Multiuser OFDM System Using Dynamic Subchannel Allocation*, IEEE (2000) **[Ex. 1010]**.)

40. OFDM was deployed in a number of wireless systems prior to June 2001. For example, the ubiquitous wireless LAN technology commercially known as "Wi-Fi" uses OFDM. The OFDM air interface was standardized for use in Wi-Fi networks in 1999 in the IEEE 802.11a standard. (IEEE Std 802-11a-1999, Part

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11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: High-speed Physical Layer in the 5 GHz Band **[Ex. 1026]**, at p. 4 ("This subclause describes the PHY services provided to the IEEE 802.11 wireless LAN MAC by the 5 GHz (bands) OFDM system.").) The commercial Digital Audio Broadcasting and Digital Video Broadcasting systems also used OFDM for wireless transmission. (U.S. Patent No. 6,125,124 **[Ex. 1027]**, 1:19-23; *see also* U.S. Patent No. 7,133,352 **[Ex. 1028]**, 1:36-45; U.S. Patent No. 6,108,810 **[Ex. 1029]**, 1:31-53.) As explained in Ahmad R.S. Bahai, *Multi-Carrier Digital Communications* (1999) **[Ex. 1030]**: "OFDM has been particularly successful in numerous wireless applications, where its superior performance in multi-path environments is desirable." (*Id.*, at p. 14.)

41. As mentioned above, it was well-known that OFDM could be employed in cellular environments, and that there would be advantages to do so. Beyond its superior performance in multi-path environments, OFDM allows the allocated communication bandwidth (e.g., of a particular cell) to be shared among multiple cell phone users. The prior art before June 2001 is replete with references describing the use of OFDM in cellular systems:

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- Leonard J. Cimini, Jr., *Analysis and Simulation of a Digital Mobile Channel Using Orthogonal Frequency Division Multiplexing*, IEEE Trans. Commun., Vol. 33, No. 7, pp. 665-675 (July, 1985) **[Ex. 1031]**;

- Giovanni Santella, *Performance Evaluation of Broadband Microcellular Mobile Radio in M-QAM OFDM Systems*, IEEE (1996) **[Ex. 1032]**;

- H. Rohling et al., *Performance of an OFDM-TDMA Mobile Communication System*, IEEE (1996) **[Ex. 1033]**;

- Antti Toskala et al., *Cellular OFDM/CDMA Downlink Performance in the Link and System Levels*, IEEE (1997) **[Ex. 1034]**;

- Fredrik Tufvesson et al., *Pilot Assisted Channel Estimation for OFDM in Mobile Cellular Systems*, IEEE (1997) **[Ex. 1035]**;

- Branimir Stantchev et al., *An Integrated FSK-signaling Scheme for OFDM-based Advanced Cellular Radio*, IEEE (1997) **[Ex. 1036]**;

- J. C-I Chuang, *An OFDM-based System with Dynamic Packet Assignment and Interference Suppression for Advanced Cellular Internet Service*, IEEE (1998) **[Ex. 1037]**;

- Branimir Stantchev et al., *Burst Synchronization for OFDM-based Cellular Systems with Separate Signaling Channel*, IEEE (1998) **[Ex. 1038]**;

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- Kevin L. Baum, *A Synchronous Coherent OFDM Air Interface Concept for High Data Rate Cellular Systems*, IEEE (1998) **[Ex. 1039]**;

- Li Ping, *A Combined OFDM-CsDMA Approach to Cellular Mobile Communications*, IEEE Transactions on Communications, Vol. 47, No. 7, pp. 979-982 (July 1999) **[Ex. 1040]**;

- Justin Chuang et al., *High-Speed Wireless Data Access Based on Combining EDGE with Wideband OFDM*, IEEE Communications, Vol. 37, No. 11, pp. 92-98 (Nov. 1999) **[Ex. 1041]**;

- Justin Chuang et al., *Beyond 3G: Wideband Wireless Data Access Based on OFDM and Dynamic Packet Assignment*, IEEE Communications Magazine (July 2000) **[Ex. 1042]**;

- Chi-Hsiao Yih et al., *Adaptive Modulation, Power Allocation and Control for OFDM Wireless Networks*, IEEE (2000) **[Ex. 1043]**;

- Fumilhide Kojima et al., *Adaptive Sub-carriers Control Scheme for OFDM Cellular Systems*, IEEE (2000) **[Ex. 1044]**; and

- Chi-Hsiao Yih et al., *Power Allocation and Control for Coded OFDM Wireless Networks*, IEEE (2000) **[Ex. 1045]**.

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42.   By the late 1990s, in fact, key players in the wireless industry including Ericsson, Nokia and Sony were publishing technologies and filing patent applications on ways to use OFDM over cellular networks. These include:

- Ericsson's U.S. Patent No. 5,726,978 **[Ex. 1006]**, filed in June 1995 and issuing in March 1998 (*see id.*, 2:38-41);

- Nokia's U.S. Patent No. 5,828,650 **[Ex. 1046]**, filed in July 1996 and issuing in October 1998 (*see id.*, 4:26-30);

- Sony's EP 0786890 A2 **[Ex. 1047]**, filed in January 1997 and published in July 1997 (*see id.*, at p. 4:7-9; p. 5:28-31; *see also id.* at p. 3:20-21);

- Telia's WO 1997030531 A1 **[Ex. 1048]**, filed in January 1997 and published in August 1997 (*see id.* at p. 3:21-32, p. 9:15-17);[1]

- US 6,188,717 **[Ex. 1049]**, filed November 17, 1997 and published February 13, 2001 (*see id.*, Abstract, 1:51-55, 11:15-17 (Claim 17));

- Flarion's (a spin-off from Lucent) U.S. 6,711,120 **[Ex. 1050]**, filed March 11, 1999 (*see id.* at Abstract, 8:2-4);

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[1]   The Telia reference specifically notes that "[t]he design and implementation of OFDM systems are well known to those skilled in the art of telecommunications." (Ex. 1048, at p. 9:27-29.)

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- Flarion's U.S. 6,553,019 **[Ex. 1051]**, filed December 23, 1999 (*see id.* at 7:7-9);

- Lucent's U.S. 6,922,388 **[Ex. 1052]**, filed February 11, 2000 (*see id.* at 1:24-26);

- Flarion's EP 1039683 A2 **[Ex. 1007]**, filed February 28, 2000 and published September 27, 2000 (*see id.* at ¶ 0009); and

- Toshiba's U.S. 2001/0021182 **[Ex. 1053]**, filed February 26, 2001 (*see id.* at ¶¶ 0003, 0018, 0021).

43.   As demonstrated by the numerous prior art publications and patent applications listed above, the communications industry had been actively developing systems for cellular communication using OFDM since at least the mid-1990s, and this continued unabated right up to the time of the alleged invention in 2001. In fact, by 2001, commercialization of cellular systems that use OFDM was already underway.   (Laurie Ann Toupin, *Flash-OFDM 'Hops' Wireless Data Communications into the Main Stream*, Ex. 1054.)

IV.   THE '717 PATENT

A.   The Specification

44.   Part V of the Beckmann Declaration includes a section containing an overview of the specification of the '502 patent, which I understand shares the same specification with the '717 patent. To the extent applicable, I have adopted

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portions of Dr. Beckmann's analysis, but provided my own overview to emphasize points that I find pertinent here.

45.   The '717 patent purports to describe a system and method for delivering digital media files to an electronic device. ('717, Abstract.)   In one embodiment, the patent describes a server (**206**) for storing digital media files. ('717, 15:13-14; *see also id.*, 12:65-66.)   The server can store the media files in a database, which may be associated with a website. ('717, 13:56-58.)   The website can provide the stored media files for download. ('717, 3:36-38.)

46.   The basic architecture is shown in Figure 2, reproduced at right.   The right side of the figure shows a cell phone **202** (on the right) that communicates with a cellular service provider **208**. ('717, 14:21-26, 14:43-45.)   On the left side is a server **206**, which includes server software **207**. ('717, 14:32-33.) Above server **206** is a voice adapter **210** that exchanges audio (sound) signals with a public switched telephone network (PSTN), which in turn communicates with the cellular service provider **208**. ('717, 18:33-41.)
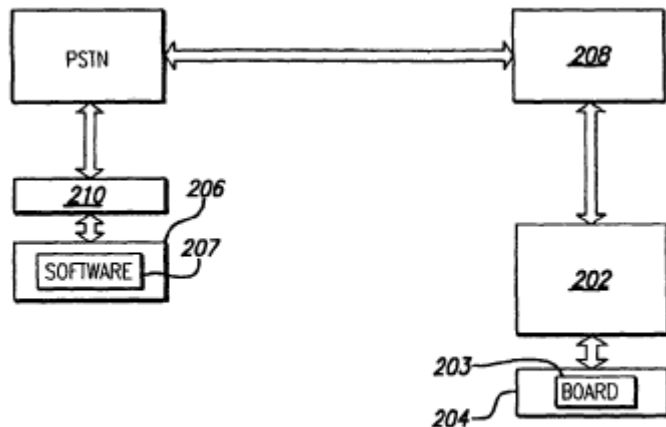
FIG. 2

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47.   The specification explains that the server can receive requests from the phone ('717, 12:45-67), "which may be given through user voice commands or commands using the phone keys." ('717, 12:67-13:1.) If the user requests to download a particular digital media file, the server allows for the file to be transmitted to the cell phone for storage and playback. ('717, 12:56-61, 13:7-12, 13:42-43, 14:65-15:1, 15:38-48.) This is shown in Figure 2 above.

48.   The '717 patent discloses that "[a]n orthogonal frequency-division multiplex (OFDM) modulation scheme" can be used for data transmission. ('717, 16:63-64.) Further, in one embodiment, the digital media file can be "compressed into an MPEG Layer 3 bit stream." ('717, 25:40-41; *see also id.*, 15:6-7, 22:37-50 (discussing "buffers" within the device memory).)

B.   The Claims of the '717 Patent

49.   This Declaration addresses claims 1-6. Claims 1 and 4 are independent claims that recite similar limitations. Claim 1 reads:

1.   A method of wirelessly delivering at least one compressed digital audio and/or visual file to a cell phone over a cellular network, said cell phone, the method comprising:

providing a website to the cell phone;

wherein the website is associated with the at least one compressed digital audio and/or visual file, said compressed

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digital audio and/or visual files are stored on one or more servers;

wherein the website includes a plurality of visual images associated with at least one compressed digital audio and/or visual file for selection of at least one compressed digital audio and/or visual file;

providing for the transmission of a representation of at least a portion of the compressed digital audio and/or visual files to the cell phone upon request, said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation;

receiving a request from the cell phone selecting the at least one compressed digital audio and/or visual file based on the visual image; and

providing for the streaming transmission of an encrypted copy of at least one compressed digital audio and/or visual file to the cell phone based on the received request using orthogonal frequency-division multiplex (OFDM) modulation over a cellular data connection.

('717, 33:2-28 (Claim 1).) Claim 4 reads:

4. A method of wirelessly delivering a compressed digital audio and/or visual file to a cell phone over a cellular network the

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method comprising:

storing a library of compressed digital audio and/or visual data files on one or more servers;

wherein the library includes a visual image associated with the compressed digital audio and/or visual file for selection of the compressed digital audio and/or visual file;

providing to the cell phone over the cellular network the visual image associated with the compressed digital audio and/or visual file;

receiving a request from the cell phone selecting at least one of the compressed digital audio and/or visual file from stored on the one or more servers said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation; and

providing for the transmission of an encrypted copy of the compressed digital audio and/or visual file to the cell phone.

('717, 34:4-24 (Claim 4).) I will address the other claims in the '717 patent in my detailed analysis in **Part V** below.

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V.   APPLICATION OF THE PRIOR ART TO THE CLAIMS

50.   I have reviewed and analyzed the prior art references and materials listed in **Part I.B** above. In my opinion, each limitation of claims 1-2 and 4-5 is disclosed and rendered obvious by the teachings in Rolf (Ex. 1003), Forta (Ex. 1004), Gatherer (Ex. 1005), Gould (Ex. 1073), O'Hara (Ex. 1061), Tagg (Ex. 1060), and Pinard (Ex. 1070). Each limitation of claims 3 and 6 is disclosed and rendered obvious by the teachings of Rolf, Forta, Gatherer, Gould, O'Hara, Tagg, and Pinard in further view of Hacker (Ex. 1069).

51.   Counsel has informed me that Rolf, Tagg, Pinard, and Gould qualify as prior art to the '717 patent at least because they are U.S. patents issuing from applications filed before June 27, 2001, the filing date of the earliest application to which the '717 patent could claim priority. I am also informed by counsel that Forta, O'Hara, Pinard, Gatherer, and Hacker qualify as prior art to the '717 patent at least because they were published before June 27, 2001. I will provide a brief summary of these references before applying them to the claims.

A.   Brief Description and Summary of the Prior Art

1.   Brief Summary of Rolf [Ex. 1003]

52.   **Rolf**, U.S. Patent No. 7,065,342, entitled "System and Mobile Cellular Telephone Device for Playing Recorded Music," describes a "system and method for wirelessly transmitting encoded music, via a wireless communications link, to a

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portable or mobile communications device which includes a player for playing the

music or audio." (Rolf, Ex. 1003, 1:17-21.) This is generally shown in Figure 1,

reproduced below.
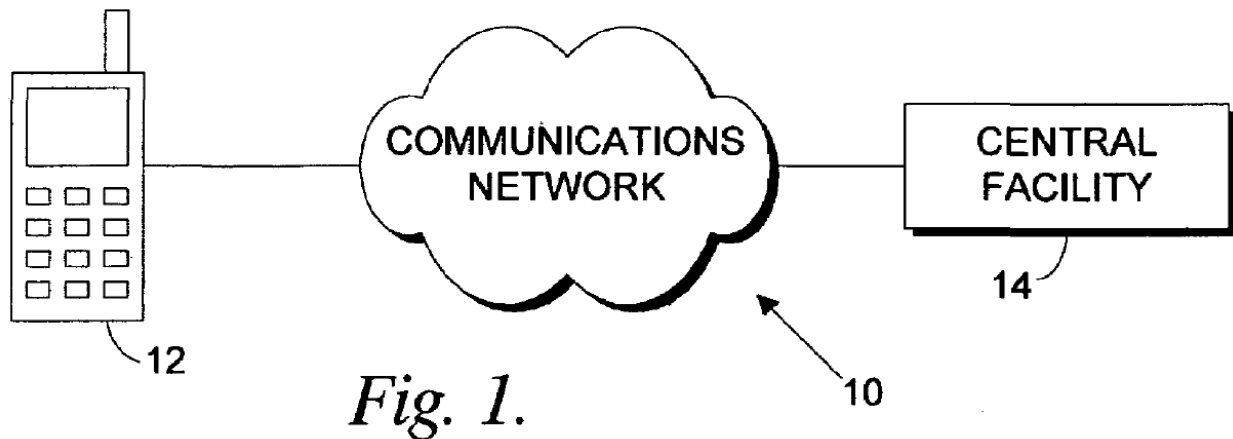
Fig. 1.

(*Id.*, Fig. 1.) As shown, the communications device can be a "cellular telephone."

(*Id.*, 1:27-28.) This Declaration relies on Rolf as the primary reference that

discloses the majority of the limitations of the claims.

53.   Rolf explains that "a user of the cellular telephone (for example) may

use the telephone to establish a wireless communications link …, and then

wirelessly download one or more selected music recordings for storage in a

memory of the cellular telephone. In particular, the selected music recording(s)

is/are transmitted via a wireless data communications link to the cellular

telephone." (*Id.*, 1:28-35.) Rolf also explains that the music recording "need not

be fully stored" within the cell phone, but rather could be "streamed" to the cell

phone via the communications link. (*Id.*, 6:21-26.)

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54.   Moreover, Rolf teaches that the music can be "encoded by a compression algorithm into an encoded (such as MP3 or other) format." (*Id.*, 1:35-38 (underlining added); *see also id.*, 5:37-39; 8:63-9:6.) Further details about Rolf are provided in my detailed analysis of the claim limitations below.

The Rolf Provisional

55.   Even though I understand that Rolf is, on its own, prior art to the '717 patent, I have also been asked to examine U.S. Provisional Patent Application No. 60/167,179 ("Rolf Provisional") **[Ex. 1071]**, in case Patent Owner should attempt to swear behind Rolf in some way. On its face, Rolf claims priority to the Rolf Provisional, which appears to have been filed on November 23, 1999. (Rolf, 1:8-11.) I understand that for Rolf to be considered prior art to the '717 patent as of the earlier filing date of the Rolf Provisional (rather than simply the filing date of the non-provisional application from which Rolf issued), (1) portions of Rolf cited for invalidity must be supported by disclosure in the Rolf Provisional, and (2) at least one claim issued in Rolf must be supported by disclosure in the Rolf Provisional. It is my opinion that the Rolf Provisional satisfies these requirements.

56.   First, I note that the text of the Rolf Provisional and Rolf are substantively identical apart from the title, abstract, the claim language, and four paragraphs where some language was added in the non-provisional application. I

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have created an exhibit comparing the textual contents of Rolf and the Rolf Provisional. ("Rolf Redline") **[Ex. 1072].** The exhibit shows differences between the two documents with blue indicating the matter added or deleted from the Rolf Provisional. As can be seen from the few differences, much of the added language appears to be non-substantive.

57.   Even the figures of Rolf and the Rolf Provisional are the same, despite being hand-drawn in the provisional and formally rendered in the issued patent. (*Compare* Rolf, Figs. 1-10 *with* Rolf Provisional, Figs. 1-10.) In terms of its substantive disclosure, the Rolf Provisional has been entirely carried forward (with the exception of its title and claims) into the later non-provisional application that gave rise to Rolf.

58.   In this Declaration, to the extent I cite language from Rolf that is not literally contained verbatim in the Rolf Provisional, I have included cites to substantially similar language that is contained in the Rolf Provisional and provides adequate support for the same proposition. All citations to Rolf made in this Declaration are supported by disclosures from the Rolf Provisional, as shown in **Exhibit B** to this Declaration.

59.   Second, I have determined that there is sufficient description and support within the Rolf Provisional for at least one of the claims that issued in

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Rolf, such that a person of ordinary skill would have understood and been able to practice that claim. In fact, I performed the analysis for eight exemplary claims for the avoidance of any doubt that the claims of Rolf are adequately supported by the Rolf Provisional. The chart in **Exhibit C** to this Declaration contains a listing of exemplary issued claims of Rolf (claims 1-3) with corresponding support from the Rolf Provisional. I have included exemplary support, but I will provide additional detail should it be required to address any arguments made by Patent Owner in response.

2. Brief Summary of Forta [Ex. 1004]

60. **Forta** is a 2000 book, entitled *WAP Development with WML and WMLScript*, that describes an industry standard known as Wireless Application Protocol (WAP). Each of the independent claims requires a "**website**" that is accessible to a cell phone. This Declaration relies on Forta to disclose well-known technologies for providing websites to cell phones.

61. As Forta explains, "WAP is the Wireless Application Protocol, a communications protocol (based on HTTP) designed specifically for wireless communication and managed by the WAP Forum. WAP is the transport used to communicate between devices (phones initially, but other devices eventually) and servers." (Forta, at p. 1.) Thus, "WAP does for wireless devices what HTTP does

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for Web browsers—it allows them to become clients in an Internet-based

client/server world." (*Id.*, at p. 10.)

62. Forta discloses that by the time of its

publication in September 2000, well-known

companies such as Amazon and Yahoo! were already

using WAP to provide their websites to cell phone

users. (*Id.*, pp. 316, 317, Figs. 13.3 & 13.5.) Figure

13.3 (shown at right) shows "the Amazon.com site

that is written explicitly for phones with a WAP

browser in them." (*Id.*, at p. 316.) Forta also
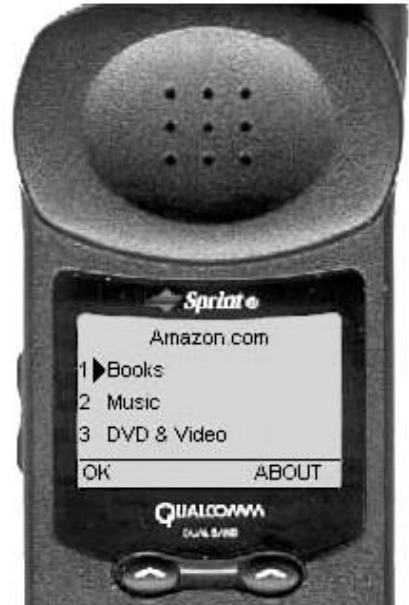
teaches, in detail, how to design and provide a website for mobile e-commerce.

(*Id.*, at pp. 429-63 ("Chapter 18. E-Commerce").)

3. Brief Summary of Gatherer [Ex. 1005]

63. **<u>Gatherer</u>**, entitled "DSP-Based Architectures for Mobile

Communications: Past, Present and Future," is an article appearing in the January

2000 issue of the IEEE Communications Magazine. The independent claims of the

'717 patent recite a cell phone that includes a "**digital signal processor**." This

Declaration cites Gatherer to confirm that digital signal processors, and their use in

cell phones, was known prior to June 2001.

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64. Gatherer confirms that DSPs were "pervasive" in cell phones at the time of the alleged invention (Gatherer, at p. 84, left column), and that one of ordinary skill in the art would have been motivated to program a DSP to perform a variety of functions provided by the cell phone. (*Id.*, at p. 84, right column ("[O]nce the DSP was included a certain amount of 'mission creep' started to occur. As DSPs became more powerful, they started to take on other physical layer 1 tasks until all the functions in the 'DSP functions' box in Fig. 1 were included."), Fig. 1; *see also id.*, at p. 85, left column ("After 1994, a single DSP was powerful enough to do all the DSP functions, making the argument for a DSP-only solution for the baseband even more compelling.").

4. Brief Summary of Hacker [Ex. 1069]

65. **Hacker** is a 2000 book, entitled *MP3 The Definitive Guide*, that describes various techniques for creating, downloading, and building collections of audio files compressed using MP3. (Hacker, at p. vii (Preface).)

66. Dependent claims 3 and 6 recite "optimizing the digital audio and/or visual file according to an optimization scheme." This Declaration relies on Hacker to disclose the claimed optimization.

67. Hacker discloses a number of techniques for maximizing sound quality of MP3 files while maintaining acceptable levels of compression. Hacker

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explains that, generally speaking, the more the audio is compressed, the more degraded the audio quality can be. (*Id.* at p. 161 ("The more you throw away, the worse your files will sound and the smaller your MP3 files will be. The more you keep, the better they'll sound and the larger the resulting files will be. Only you can decide where on this spectrum you want to sit.").) In a section entitled, "Pre-encoding optimizations," Hacker asks, "what can you do prior to encoding to optimize the quality of the final results?" (*Id.* (underlining added).) Hacker provides several answers, including "any necessary equalization, de-hissing, de-popping, and de-scratching." (*Id.* at p. 162.) Also, "[y]ou can cut the silent bits off the beginning and end of your files, add effects, alter the levels, and more." (*Id.*)

5. Brief Summary of Gould [Ex. 1073]

68. **Gould**, U.S. Patent No. 6,693,236, entitled "User Interface for Simultaneous Management of Owned and Unowned Inventory" describes a simple user interface for managing inventory, such as purchased and unpurchased music recordings. (Gould, 1:7-14, 3:16-30.) Each independent claim of the '717 patent recites "visual image(s)" associated with compressed digital audio and/or visual data files. This Declaration relies on Gould to disclose limitations regarding the visual image(s). As I explain below, Gould discloses a menu-based user interface that

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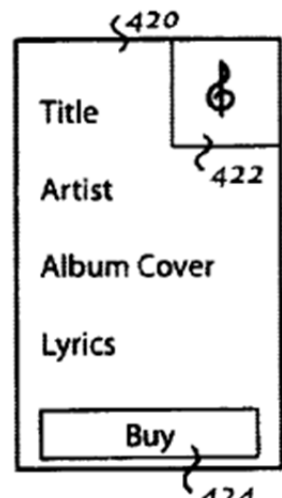
displays album cover graphics for a song and buttons to sample and buy the song.

(Gould, 5:51-60, Fig. 4 (excerpt at right).)

6. Brief Summary of O'Hara [Ex. 1061], Tagg [Ex. 1060], and Pinard [Ex. 1070]

69. I rely on the teachings of O'Hara, Tagg and Pinard to show the transmission of information using OFDM, cellular network, and cellular data connection features recited in the claims.

70. Just about anyone who has used a cellular phone or a laptop computer would be familiar with IEEE 802.11 wireless networking, commercially referred to as "WiFi." IEEE 802.11 refers to a series of international standards initially published in the late 1990s by the Institute of Electrical and Electronics Engineers (IEEE). Generally speaking, IEEE 802.11 describes a series of technical standards for providing wireless networking services through one or more wireless "access points" (APs). IEEE 802.11 is a wildly popular technology that has spawned a number of variants, including IEEE 802.11a and 802.11b, the early variants published in the late 1990s, and later variants such as 802.11g, 802.11n, and 802.11ac. IEEE 802.11 is important to my analysis because IEEE 802.11**a** – one of the earlier variants of 802.11 published in the late 1990s – transmits information to mobile devices using OFDM.

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71.   I have cited O'Hara because, as I explain below, it discloses and confirms that IEEE 802.11a wireless networking involves the transmission of digital information to mobile devices using OFDM. I have cited to Tagg because it discloses that it was known, prior to the alleged invention, to incorporate IEEE 802.11 functionality into a cell phone. It therefore would have been obvious to adapt the cellular phone **12** of Rolf to receive digital audio and/or visual files wirelessly using IEEE 802.11a, thus disclosing transmission of digital audio and/or visual files using OFDM as recited in the challenged claims.

72.   **O'Hara**, published in 1999, provides "a guide for those who will implement interoperable IEEE 802.11 2.4 GHz and 5GHz LAN (WLAN) product." (O'Hara, at p. v (under "Acknowledgment").) O'Hara explains that wireless LANs "are exploding in popularity." (*Id.*, at p. viii.) "One of the key drivers of this new market expansion," according to O'Hara, "is the IEEE 802.11 standard." (*Id.*) O'Hara confirms that the IEEE 802.11a variant used OFDM. (*Id.*, at p. 143 ("In July of 1998, the IEEE 802.11 Working Group adopted OFDM modulation as the basis for IEEE 802.11a.")); *id.*, at p. 139 ("The IEEE 802.11a PHY is one of the physical layer (PHY) extensions of IEEE 802.11a and is referred to as the orthogonal frequency division multiplexing (OFDM) PHY. The OFDM PHY

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provides the capability to transmit PSDU[2] frames at multiple data rates up to 54

Mbps for WLAN networks where transmission of multimedia content is a

consideration.").)

73.   **Tagg**, entitled "Cooperative Network for Mobile Internet Access,"

discloses a technique for allowing a mobile device (such as a cellular phone) to

communicate over the Internet using a number of IEEE 802.11 access points. I

have relied on Tagg for the simple proposition that a cellular phone, such as cell

phone **12** in Rolf, could incorporate IEEE 802.11 wireless networking capability,

and use that technology (instead of connections with traditional cell towers) to

receive data files. Figure 1 of Tagg provides a basic overview of the system:

---

[2]   The term "PSDU" refers to a PLCP data unit, a basic unit of data for

transmission over an IEEE network.   (O'Hara, at p. 174 (explaining PSDU

acronym), *id.* at p. 141 (Fig. 7-1, showing OFDM header and PSDU).)

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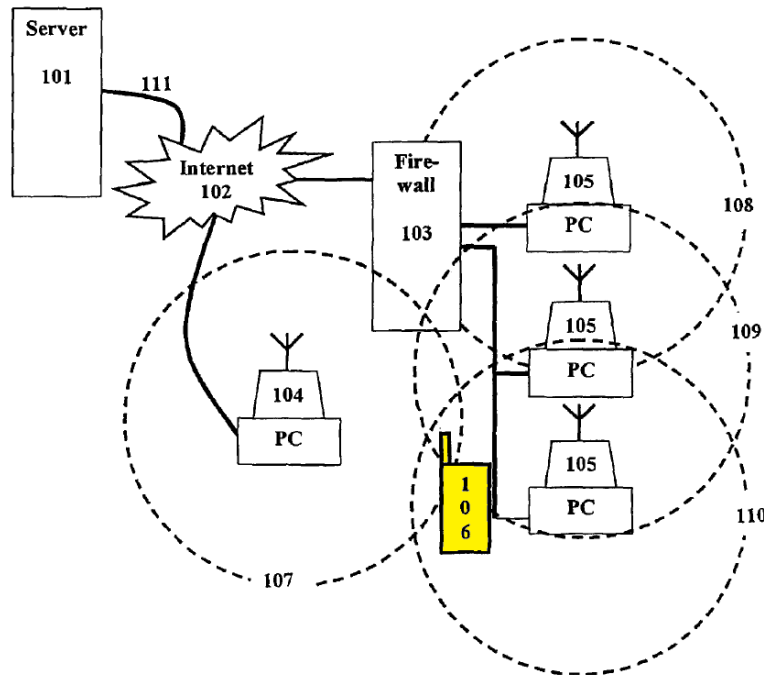
Fig. 1

(Tagg, Fig. 1.) Mobile roaming device **106**, shown highlighted in yellow, may be a "mobile computer, PDA, cellular telephone, or home appliance." (*Id.*, 7:63-66 (underlining added).) The circles shown in Figure 1 (**107-110**) show the range of wireless network access provided by fixed devices **104** and **105**. (*Id.*)

74.   The gist of the Tagg reference is the ability of the mobile device **106** to switch between a number of available wireless technologies that will provide the best connectivity. As explained in Tagg, "[t]he mobile device determines the connection methodologies available to it and their relative merits and then connects to the host using the best available standards." (*Id.*, 6:67-7:2.) Although Tagg discloses Cooperative Tunneling Agent (CTA) software for evaluating available

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networks and performing a handoff from one wireless network to another, those details go far beyond the requirements of the challenged claims. I have cited Tagg for the more pedestrian proposition that a cell phone (such as the one in Rolf) can incorporate IEEE 802.11 wireless networking – a proposition that Tagg clearly confirms. In one embodiment in Tagg, for example, a cellular phone can determine when a suitable IEEE 802.11 wireless network is available, and then switch to that network to access the Internet or carry out voice telephone calls. (*Id.*, 5:22-34, 11:20:46, 11:60-12:26 (describing handoff process from cellular to 802.11 networks); Fig. 9.)

75.   Tagg confirms that allowing a cellular phone to alternatively switch to IEEE 802.11 wireless networks has distinct and obvious advantages. For example, Tagg explains that some cellular networks often provided limited potential connection speeds (*id.*, 11:24-28 ("9.6 Kbps")), and the greater network throughput provided by alternative wireless networks allows mobile users to take advantage of "high bandwidth services such as MP3 files and movies." (*Id.*, 5:27-29.) The cost savings are, of course, obvious. It was well-known that use of cellular services provided by traditional carriers (such as AT&T), including cellular data services, was potentially costly. Tagg explains, however, that "[a] cell phone located within 100 feet of a fixed host device can connect to the Internet through that device,

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obtaining phone calls at a fraction of the cost of a regular cellular connection."

(*Id.*, 5:31-33; *see also id.*, 5:64-66 ("Our technology sits between the user and the

Internet constantly negotiating the most cost effective means by which they can

gain access.").)

76.   I note that claim 1 further recites that "the data file is routed through a

cellular network," and recites transmission over a "**cellular data connection**," for

which I have cited the **Pinard** reference.   The term "cellular network" is often

equated by the lay public with large scale commercial cellular telephone providers

such as AT&T, T-Mobile, and Sprint.   But the term "cellular network" has a more

precise and technical definition.   A cellular network is a network in which wireless

communications are provided through a series of "cells," each cell providing

network access for a particular geographic area.   Similarly, a "cellular data

connection" in this context is a data connection in a network in which wireless

communications are provided through a series of "cells," each cell providing

network access for a particular geographic area. *See also:*

- *Webster's New Dictionary of the English Language* (2001), **[Ex. 1055]**, at p. 84, (definition of "cellular" as "of, relating to, or being a radiotelephone system in which a geographical area is divided into small sections each served by a transmitter of limited range");

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- *The Dictionary of Multimedia Terms & Acronyms* (1997), **[Ex. 1056]**, at p. 38 ("Describes a means of dividing an area into regions, or cells, so that each region becomes a network in which every point exists within the range of a central transmission facility");

- *Encarta World English Dictionary* (1999), **[Ex. 1057]**, at p. 294 ("organized as a system of cells, especially for radio communication");

- *Modern Dictionary of Electronics* (1999), **[Ex. 1058]**, at p. 106 ("Type of mobile telephone service in which the geographic serving area is divided into subregions (cells), each with its own antenna and switching node");

- *The Oxford American Desk Dictionary* (1998), **[Ex. 1059]**, at p. 91 ("system of mobile radiotelephone transmission with an area divided into 'cells,' each served by its own transmitter");

- *Merriam-Webster's Collegiate Dictionary* (1996), **[Ex. 1067]**, at p. 184 ("of, relating to, or being a radiotelephone system in which a geographical area (as a city) is divided into small sections each served by a transmitter of limited range so that any available radio channel can be used in different parts of the area simultaneously");

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- *McGraw-Hill Illustrated Telecom Dictionary* (2000), **[Ex. 1068]**, at p.

  116 ("A wireless local telephone service that operates by dividing a

  geographical area into sections (*cells*). Each cell has its own

  transmitter/receiver that tracks and operates with cellular telephones

  within its area. The dimensions of a cell can range from several

  hundred feed to several miles.").

77.   The terms "cellular network" and "cellular data connection" under

their broadest reasonable constructions, therefore, are not limited to a particular

type of wireless networking technology, or technology that provides the same type

of wireless range as a commercial cellular carrier.

78.   In this regard, I have cited **Pinard** for the simple proposition that a

"cellular network" can be built based on IEEE 802.11 wireless access points,

thereby providing a "cellular data connection."   Pinard states that it "relates

generally to preemptive roaming among cells in a cellular network. In particular

the invention relates to a local area wireless network including a plurality of

mobile units and a plurality of access points."   (Pinard, 1:21-24.)   More

specifically, Pinard discloses a technique for improving the way in which a mobile

unit selects the access point with which it will associate for purposes of wireless

communication. (*Id.*, 2:16-22.) "Each mobile unit may select a group of eligible

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access points and select the most eligible access point from that group." (*Id.*, 2:45-47.) The selection may be based on the signal strength of the access points and the number of mobile units connected to each access point (the "loading factor"). (*Id.*, 2:30-50.) Pinard expressly confirms that "[t]he cellular communications network may comprise a 1 Mbps frequency-hopping spread spectrum wireless LAN conforming to the IEEE 802.11 draft specification." (*Id.*, 2:50-53.)[3] Pinard further explains that this cellular network provides data connections for communication. (*Id.*, 1:39-40 (describing the "data rates" featured in the draft 802.11 specification) (underlining added), 2:31-41, 4:26-35 (explaining that the invention "provide[s] a data communications network").)

79.   As I will explain below, the OFDM, cellular network, and cellular data connection features of the challenged claims would have been obvious over O'Hara, Tagg, and Pinard.

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[3]   Pinard refers to the "IEEE 802.11 <u>draft</u> specification" because the standard had not yet been finalized when Pinard was filed in 1995. A person of ordinary skill in the art by June 2001 would have understood "IEEE 802.11," as referenced in Pinard, to include the wider range of IEEE 802.11 technologies available by the time the standard was published, including IEEE 802.11a and its higher bit rates.

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B.   Independent Claim 1

80.   I have reproduced independent claim 1 below, and divided up the limitations using bracketed notations (e.g. "[a]," "[b]," etc.) to facilitate easier identification of the limitations in my analysis below:

1.   A method of wirelessly delivering at least one compressed digital audio and/or visual file to a cell phone over a cellular network, said cell phone, the method comprising:

[a]   providing a website to the cell phone;

[b]   wherein the website is associated with the at least one compressed digital audio and/or visual file, said compressed digital audio and/or visual files are stored on one or more servers;

[c]   wherein the website includes a plurality of visual images associated with at least one compressed digital audio and/or visual file for selection of at least one compressed digital audio and/or visual file;

[d]   providing for the transmission of a representation of at least a portion of the compressed digital audio and/or visual files to the cell phone upon request, said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation;

[e]   receiving a request from the cell phone selecting the at least one

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> compressed digital audio and/or visual file based on the visual image; and
>
> [f] providing for the streaming transmission of an encrypted copy of at least one compressed digital audio and/or visual file to the cell phone based on the received request using orthogonal frequency-division multiplex (OFDM) modulation over a cellular data connection.

('717, 33:2-28 (Claim 1).) Each limitation of claim 1 is disclosed and rendered obvious by Rolf in view of Forta, Gatherer, Frodigh, and Gould.

81. The preamble of claim 1 recites, "**[a] method of wirelessly delivering at least one compressed digital audio and/or visual file to a cell phone over a cellular network, said cell phone [sic]**."[4] Assuming the preamble of claim 1 provides a claim limitation, it is fully disclosed by Rolf.

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[4] While the term "said cell phone" in the preamble points back to the antecedent "a cell phone" introduced earlier in the phrase, it appears to be included in error. The term "said cell phone" in the preamble is orphaned text—that is, it is a fragment that does not connect to any subsequent limitation grammatically. The remainder of the limitations in claim 1 connect instead to the term "the method comprising." As such, I will treat "said cell phone" as redundant for the sake of my analysis, although, as shown below, Rolf clearly discloses a cell phone.

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82.   Rolf describes a "method for wirelessly transmitting encoded music, via a wireless communications link, to a portable or mobile communications device which includes a player for playing the music or audio." (Rolf, Ex. 1003, 1:18-21.)   Rolf explains that the communications device can be a "cellular telephone." (*Id.*, 1:27-28.)   "[A] user of the cellular telephone (for example) may use the telephone to establish a wireless communications link with a remote central facility, and then wirelessly download one or more selected music recordings for storage in a memory of the cellular telephone. In particular, the selected music recording(s) is/are transmitted via a wireless data communications link to the cellular telephone." (*Id.*, 1:28-35.)   Rolf explains that the central facility stores digital audio and/or visual files. (Rolf, 5:32-35, 14:56-58; *see also id.*, 9:54, 13:5-8.)   Rolf also explains that the music recording "need not be fully stored" within the cell phone, but rather could be "streamed" to the cell phone via the communications link. (*Id.*, 6:21-26.)

83.   Rolf further explains that "the wireless communications link established between the wireless communications device and the central facility is a <u>cellular communications link</u>." (Rolf, 3:17-21 (emphasis added).)   Rolf's disclosure centers around use of a communications network, circled in red in the reproduction of Figure 1 below, connected to cell phone **12**.

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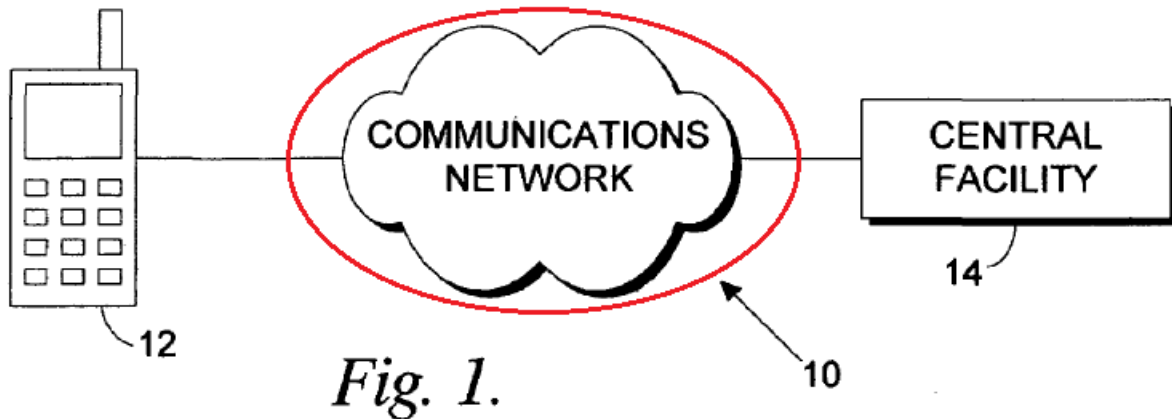
Fig. 1.

(*Id.*, Fig. 1 (red circle added).) One of ordinary skill in the art would have understood that Rolf's disclosure of the above-referenced cellular phones and "cellular communications link" discloses delivery of files "over a cellular network."[5]

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[5] In the event it is argued that Rolf does not expressly disclose a "cellular network," this would have been obvious in view of O'Hara, Tagg, and Pinard. I discuss Rolf's combinability with the 802.11 cellular network teachings of these references in my analysis of claim 1[d] and 1[f] below, which would apply equally here. As discussed below in connection with claim 1[d] and 1[f], these references together disclose and render obvious the use of a cellular data connection for data transmission over a cellular network, under the broadest reasonable interpretation of those terms.

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84.   Rolf discloses that the recordings can be "encoded by a <u>compression</u> <u>algorithm</u> into an encoded (such as <u>MP3</u> or other) format."   (*Id.*, 1:35-38 (underlining added); *see also id.*, 5:37-39; 8:63-9:6.)   One of ordinary skill in the art would have understood that "MP3" refers to a compression technique for digital audio files. (Andy Rathbone, *MP3 for Dummies* (1999), Ex. 1065, at p. 1 ("MP3 is simply another boring, compression mechanism – a pair of computerized vice-grips for sound. MP3 squeezes music files down to roughly one-tenth of their size while preserving their near-CD-quality sound.").)[6]   Compressed recordings are delivered to the cell phone. (Rolf, 8:63-9:6 ("[T]he encoder **58** may be utilized to encode the music, according to any preferred encryption and/or compression algorithm (such as mp3, liquid audio, etc.), for transmission of the encoded recording(s) to the wireless communications device **12**.").)

85.   Rolf therefore discloses "[a] method of wirelessly delivering at least one compressed digital audio and/or visual file to a cell phone over a cellular network," as recited in the preamble.

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[6] Rolf also expressly notes that its teachings with respect to music files are "applicable to recordings of other types, such as <u>video recordings</u>." (Rolf, 14:57-58 (underlining added).)

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1. "providing a website to the cell phone" (Claim 1[a])

86. Rolf discloses this limitation. The "website" in Rolf is provided to the

"cell phone **12**" by a "facility **14**," shown in Figure 1 below.

Fig. 1.

(Rolf, Fig. 1 (red circle added).) Figure 5 (below) illustrates the facility **14** in

greater detail. (*Id.*, 5:1-2, 8:54-9:18.)
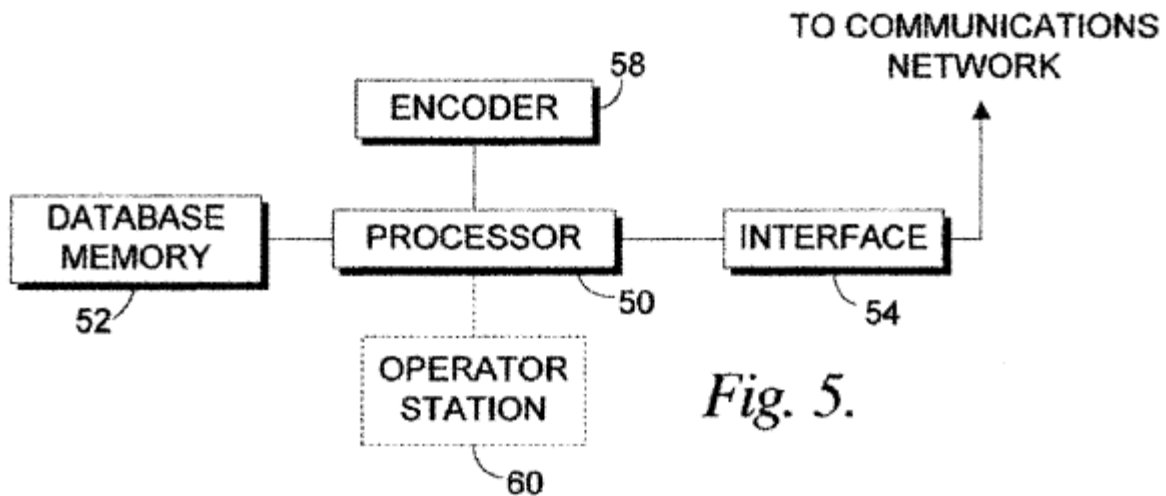
Fig. 5.

(*Id.*, Fig. 5.) As shown in Figure 5 above, the "facility" (**14**) in Rolf is a set of

hardware and software components connected to a communications network. (*See*

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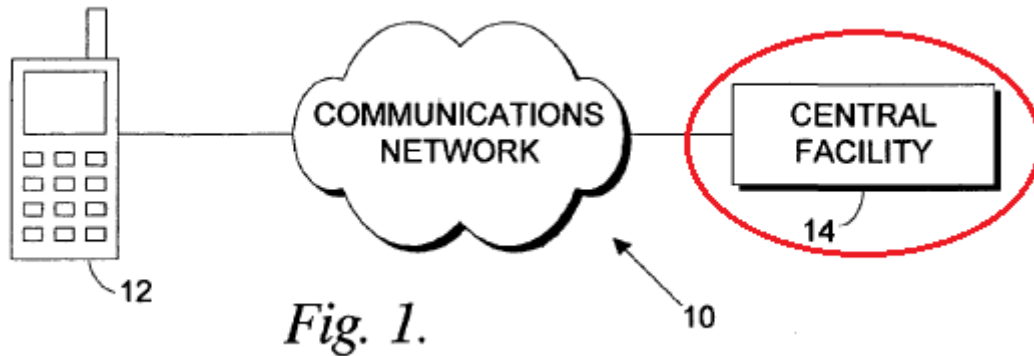*also id.*, 8:61-62 ("The encoder **58** is a set of <u>processing instructions stored in a</u>

<u>memory</u> …"), 9:11 ("[P]rocessor **50** invokes <u>application software</u> …")

(underlining added).) These components include "a processor **50**. Connected to the

processor **50** are a data base memory **52** and a [sic] interface **54** (such as a

transceiver or modem) for transmitting and receiving communications signals."

(*Id.*, 8:56-59.) The data base memory **52** stores music recordings, which as I

discussed above, may be stored in compressed form. (*Id.*, 9:4-6.) Although Figure

5 shows the facility **14** as including an encoder **58** and operator station **60**, Rolf

makes clear that these components are "not necessary." (*Id.*, 9:6, 9:7.)

87.   The hardware and software comprising the facility **14** have an

"address on the world wide web." (*Id.*, 5:32-34.) As Rolf explains, "the facility **14**

has a <u>uniform resource locator (URL)</u> on a global communications network (such

as the **world-wide web**)," and as such, the cell phone **12** (shown in Figure 1 above)

can "access[] the facility **14** via a <u>server in the communications network</u>." (*Id.*,

12:52-55 (underlining added); *see also id.* 3:11-12 ("[A]n identifier, such as a

server address, associated with the remote central facility …").) A user can thus

use the keypad and input on the cell phone **12** to select music stored in the data

base memory **52** (of the facility **12**) for download. (*Id.*, 5:49-53; *see also id.* 1:39-

41; 5:63-66; 9:10-15.) Accordingly, one of ordinary skill in the art would have

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understood that the facility **14** includes a server (on the World Wide Web) that

"**provid[es] a website**" to cell phone **12** as recited in claim 1.

88.   But Rolf does not disclose specific details about the website provided

by facility **14**. In the event it is argued that Rolf does not disclose the facility **14**

providing a website, such a step would have been obvious over the teachings of

Forta. As I discussed above in **Part V.A.2**, Forta describes a technique for

providing websites to cell phones called "Wireless Application Protocol," or

"WAP" for short. (Forta, Ex. 1004, at p.1.) As Forta explains, "WAP is the

Wireless Application Protocol, a communications protocol (based on HTTP)

designed specifically for wireless communication and managed by the WAP

Forum. WAP is the transport used to communicate between devices (phones

initially, but other devices eventually) and servers." (*Id.*) Thus, "WAP does for

wireless devices what HTTP does for Web browsers—it allows them to become

clients in an Internet-based client/server world." (*Id.*, at p. 10.)

89.   Forta explains that "WAP devices connect to servers to retrieve and

send information in much the same way as Web browsers connect to HTTP

servers." (*Id.*, at p.11.) "If you want to serve WAP content you can install a WAP

server. This is a piece of software, much like an HTTP server (and indeed, the two

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can usually run on the same machine)." (*Id.*) The WAP technique is generally

illustrated in Figure 1.1, shown below.
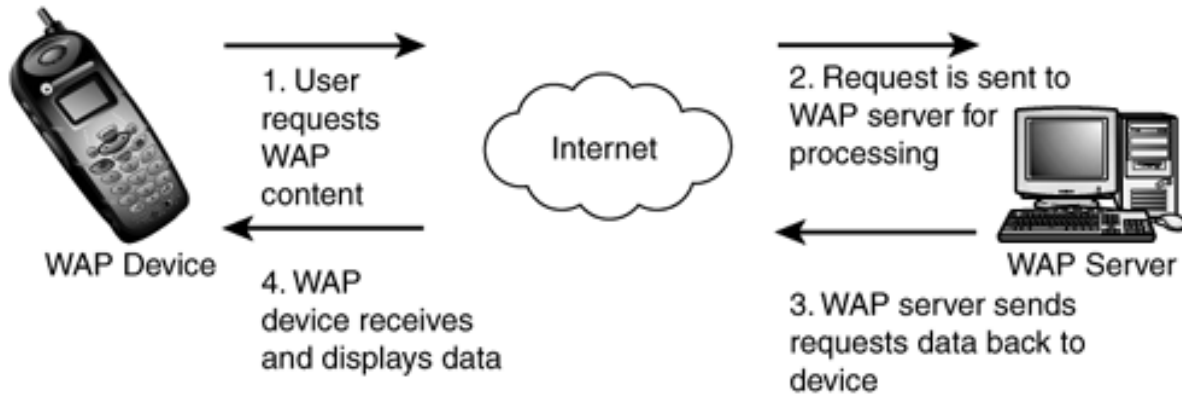
(*Id.*, Fig. 1.1.)[7]

90. Forta discloses that using WAP, a visual interface for display can be

received from a server as a WML document. (*Id.*, at pp. 40 ("WML pages—

content viewed on separate screens—are called *cards* and those cards are all placed

within a *deck* of related pages which constitute one single file."), 20 ("[H]ow to

configure your Web server to serve WML content and how to view that content

with several common devices …"); *see also id.*, at p. 21 (section on "WML's

Functionality").) As Forta explains, "Wireless Markup Language (WML) is a

markup language used for describing the structure of documents to be delivered to

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[7] Forta also explains that "WAP devices can request and receive data from HTTP

servers via WAP gateways." (*Id.*, at p. 12; *see also id.* Fig. 1.2.)

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wireless devices. WML is to wireless browsers as HTML is to a browser on a desktop computer. WML was created to address the display, bandwidth, and memory limitations of mobile and wireless devices, such as cellular phones . . . ." (*Id.*, at p. 20.)

91.   Forta discloses that by the time of its publication in September 2000, well-known companies such as Amazon and Yahoo! were already using WAP to provide their websites to cell phone users.   Figure 13.3 (shown at right) shows "the Amazon.com site that is written explicitly for phones with a WAP browser in them."   (*Id.*, at p. 316.) Similarly, Figure 13.5 (below) shows the Yahoo! website provided to cell phones.

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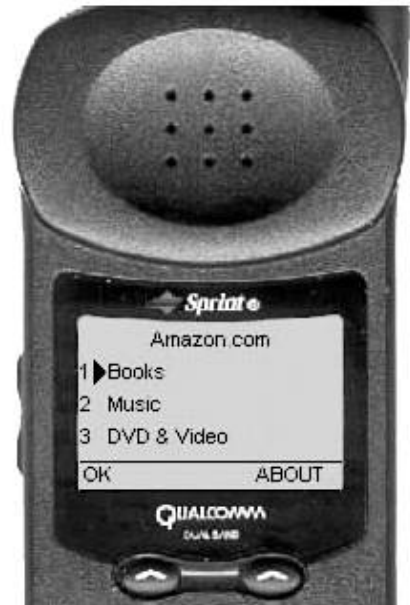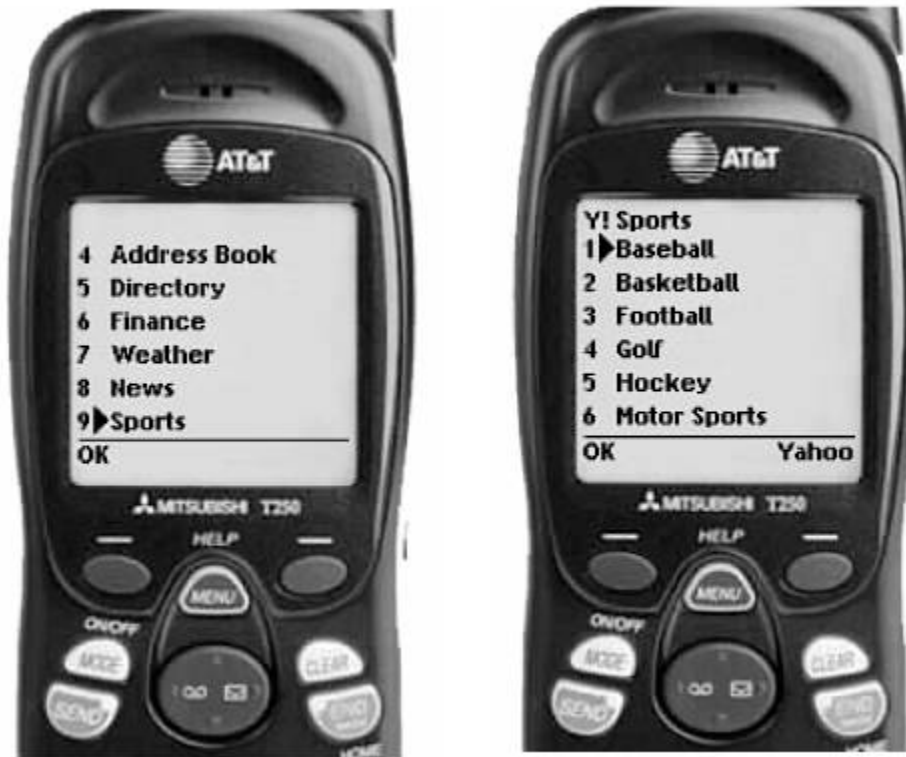
(*Id.*, Fig. 13.5; *see also id.*, at p. 317 ("Clearly, Yahoo! has done some considerable work here to build a powerful wireless site that works as a companion to its HTML site.").) Forta goes on to teach, in detail, the use of WAP to provide a website for mobile e-commerce. (*Id.*, at pp. 429-63 ("Chapter 18. E-Commerce").)

92.   ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Forta with Rolf, with no change in their respective functions. The combination would have predictably resulted in a server on the World Wide Web, as disclosed in Rolf, that provides a website to a cellular phone according to the WAP techniques of Forta.

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93. One of ordinary skill in the art would have found this to be a largely trivial combination. As noted above, Rolf discloses a server on the World Wide Web accessible to cell phones, but does not appear to provide a detailed discussion of the technologies that can be used to implement that Web server. (Rolf, 5:30-35, 5:46-53, 12:49-55; *see also id.*, 5:64-66, 9:10-15.) A person of ordinary skill in the art would have found this omission insignificant in light of already known and industry standard techniques for providing websites to cell phones, such as those described in Forta. Forta provides an express motivation to combine by explaining that WAP "promises to be one of the most important protocols and standards ever developed," and stating that the Forta book is intended for any developer who "want[s] to learn how to generate content for wireless devices…." (Forta, at p. 1.) As such, one of ordinary skill in the art would have naturally consulted Forta to ascertain the details involved in providing a website to a cell phone.

94. Forta provides several other express motivations to combine. It states that WAP and its associated technologies were "created to address the display, bandwidth, and memory limitations of mobile and wireless devices, such as cellular phones." (Forta, at p. 20.) Forta further explains that "WAP will succeed because it is being supported by almost every major hardware, software, device, data carrier, and telecom vendor. And with that kind of muscle behind a common

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goal, anything is possible." (*Id.*, at p. 1.) Thus, one of ordinary skill in the art would have appreciated that the WAP techniques described in Forta are particularly suitable for the cell phone in Rolf, and would have appreciated the advantages of using such a widely adopted technology, including the advantages of interoperability with other existing systems and technologies.

95. Moreover, Rolf and Forta are analogous references in the same field of wireless communication and computing. Forta's "Introduction" section explains that while "[w]ireless data communication is not a new idea, … wireless computing is becoming a reality and in ways no one could have imagined." (Forta, at p. 1.) Consistent with Forta's description, Rolf teaches a cell phone that can not only be used to communicate wirelessly, but also play music. (Rolf, 1:17-21.) The analogous nature of these references is further confirmed by the fact that both recognized that cell phones can be used as instruments of e-commerce. Forta specifically notes that "[e]-commerce is a highly practical and exciting application for mobile users" (Forta, at p. 462), and devotes an entire chapter to this topic. (*Id.*, at pp. 429-63 ("Chapter 18. E-Commerce").) Rolf, for its part, teaches that cell phones can be used to electronically purchase products such as music and concert tickets. (Rolf, 6:53-7:23, 14:35-53.) Thus, a person of ordinary skill in the

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art would have understood that the two references pertain to the same technology

area and are readily combinable.

>   **2.   "wherein the website is associated with the at least one
>   compressed digital audio and/or visual file, said compressed
>   digital audio and/or visual files are stored on one or more
>   servers" (Claim 1[b])**

96.   As I discussed above, Rolf discloses a set of hardware and software

components, collectively referred to as "facility **14**," that can be accessed by a cell

phone **12** via a Web server. (Rolf, 12:49-55; *see also id.*, 3:11-12 ("[A]n identifier,

such as a server address, associated with the remote central facility …").) Rolf

further explains that the facility stores the compressed digital audio and/or visual

files:

> A communications link may be established between wireless
> communications device **12** and a remote storage facility, denoted by
> reference numeral **14**. The remote storage facility may, for example,
> be at an address on the world wide web, and includes a data base
> having a plurality of music recordings therein. Preferably, the music
> recordings are categorized by a plurality of selectable fields, such as
> "title", "artist", "album or CD type", "recording label", etc.
> Additionally, the music recordings are preferably encoded in an
> encoded format, such as MP3 (Mpeg-1 Audio layer 3).

(*Id.*, 5:30-39 (underlining added); *see also id.*, 9:4-6 ("[T]he music recording

stored within data base memory **52** may be stored in an encoded/compressed

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manner, …").) Because the facility may be accessible at a Web World Wide address and also stores the compressed files, Rolf accordingly discloses that the web site is associated with the compressed files. Moreover, as mentioned above, Rolf discloses that these music recordings can be selected for download using the keypad and input on the cell phone **12**. (*Id.*, 5:49-53; *see also id.*, 1:39-41, 5:64-66, 9:10-15.) Rolf further discloses that the selection can be made via a "menu or listing of recordings." (*Id.*, 9:14-15; *see also id.*, 5:35-37 ("Preferably, the music recordings are categorized by a plurality of selectable fields, such as 'title', 'artist', 'album or CD type', 'recording label', etc.").) One of ordinary skill in the art would have understood and found it obvious that the Web server in facility **14** (*id.*, 3:11, 12:54) would present this menu or listing of recordings as part of an associated website where selection is made using the "keypad and input" of the cell phone (*e.g.* as opposed to "voice commands"). (*Id.*, 5:49-50; *see also id.*, 1:39-41.)

97.   Rolf therefore discloses that "the website is associated with the at least one compressed digital audio and/or visual file, said compressed digital audio and/or visual files are stored on one or more servers."

98.   This limitation is also obvious in view of the additional teachings of Forta. As I explained at length with respect to the previous limitation, Forta describes a technique known as "WAP" for providing websites to cell phones.

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Forta discloses that these websites can have a visually displayed interface that presents a menu or listing of options to the user for selection, as shown below.
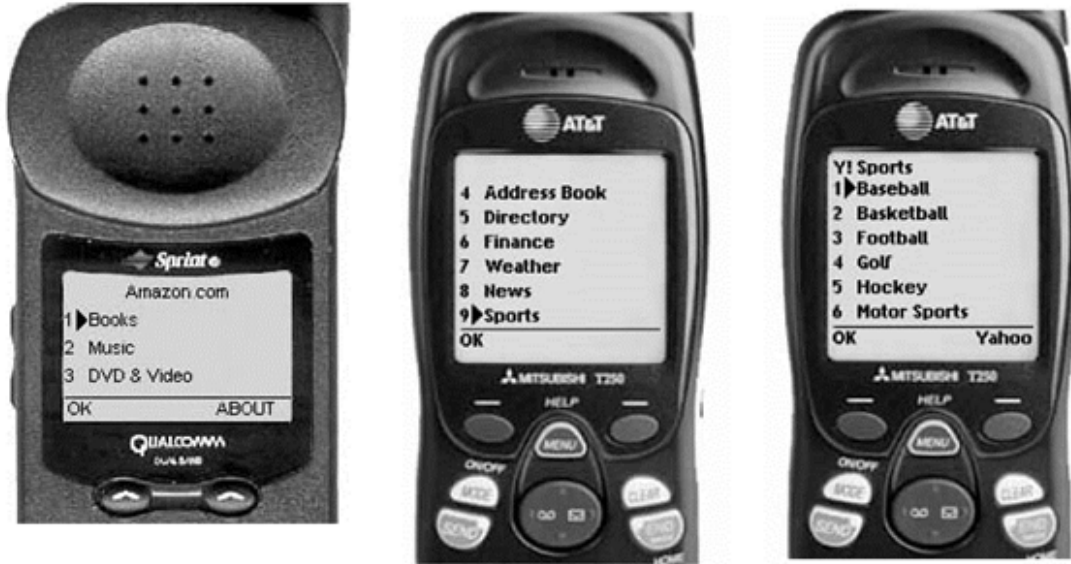
(Forta, Figs. 13.3 (screen on the left), 13.5 (screens in the middle and on the right); *see also id.* at p. 317 ("Since Sports was option 9 on the main Yahoo! page, I had to scroll down to find it. When I select option 9, I am presented with a meaningful menu to choose from.").)

99.   In fact, Forta specifically teaches how to provide displayable menus for e-commerce, illustrated using a "fictitious store, Burgerworld.com—the one stop shop for hungry computer professionals, which sells burgers, fries, and computers." (*Id.*, at p. 430.) As Forta

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explains, "[t]he application will select all of the categories from the database and
present them as main menu choices. Then, under each category, the application
will construct a card that will serve as the submenu." (*Id.*, at p. 435.) If the user
selects a product from the submenu, she is presented "with details about a
particular product" and an option to place an order. (*Id.*, at p. 441.) This is shown
in Figures 18.7, 18.8 and 18.10, reproduced below.

(*Id.*, Figs. 18.7, 18.8 and 18.10 (in order from left to right).) As shown above, the
user is first presented with a "menu, listing Computers and Soda." (*Id.*, at p. 438,
Fig. 18.7 (shown above to the left).) Upon selecting "Computers," the "Computers
category's submenu is displayed." (*Id.*, at p. 440, Fig. 18.8 (shown above in the
middle).) If the user then selects the "PDP8" computer, the user is "ask[ed] what
quantity of the item the user would like to purchase." (*Id.*, at p. 444, Fig. 18.10

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(shown above at the right).)

100. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Forta with Rolf, with no change in their respective functions, predictably resulting in the Web server of Rolf providing a website that provides, and is associated with, a plurality of the compressed digital audio or audio-visual data files, according to the techniques described in Forta. The rationale and motivation for combining and citing Rolf and Forta is provided in my analysis of claim 1**[a]** above, which applies here.

101. Forta provides further express motivations to combine in this manner, emphasizing that its techniques present the user with a "meaningful menu to choose from" compared to alternative methods. (Forta, at p. 317; *see also id.* ("In the wireless version of Yahoo, the Sports link is presented on the first page, and my sports choices are immediately available. Two clicks and I'm in.").) For example, as Forta explains, "[w]hen I access the content from my phone, I don't get the banner ads, I don't get the extraneous links, and I get direct access to the content that I want to see the most." (*Id.*) A person of ordinary skill in the art would have found it obvious to display the plurality of compressed digital audio or audio-visual data files in Rolf through interactive menus as described in Forta.

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> **3.** **"wherein the website includes a plurality of visual images associated with at least one compressed digital audio and/or visual file for selection of at least one compressed digital audio and/or visual file" (Claim 1[c])**

102. As I discussed above, Rolf discloses a set of hardware and software components (collectively referred to as "facility **14**") that can be accessed by a cell phone **12** via a Web server. (Rolf, 12:49-55; *see also id.*, 3:11-12 ("[A]n identifier, such as a server address, associated with the remote central facility …").) As mentioned above, Rolf discloses that a cellular phone user accessing the facility **14** components from cell phone **12** can make a selection via a "<u>menu</u> or <u>listing</u> of recordings." (*Id.*, 9:14-15 (underlining added); *see also id.* 5:35-37 ("Preferably, the music recordings are categorized by a plurality of selectable fields, such as 'title', 'artist', 'album or CD type', 'recording label', etc.").) Rolf discloses that the music recordings can be selected for download using the keypad and input on the cell phone **12**. (*Id.*, 5:49-53; *see also id.*, 1:39-41, 5:64-66, 9:10-15.) As also described above, one of ordinary skill in the art would have understood and found it obvious that the Web server in facility **14** (*id.*, 3:11, 12:54) would present this menu or listing of recordings as part of a website where selection is made using the "keypad and input" of the cell phone. (*Id.*, 5:49-50; *see also id.* 1:39-41.) Rolf therefore discloses a "**website . . . for selection of at least one compressed digital audio and/or visual file**." To the extent that there is any question that Rolf does

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not fully disclose this portion of the limitation, it is disclosed by and obvious over

Rolf in view of Forta, for the reasons discussed above for the previous limitation.

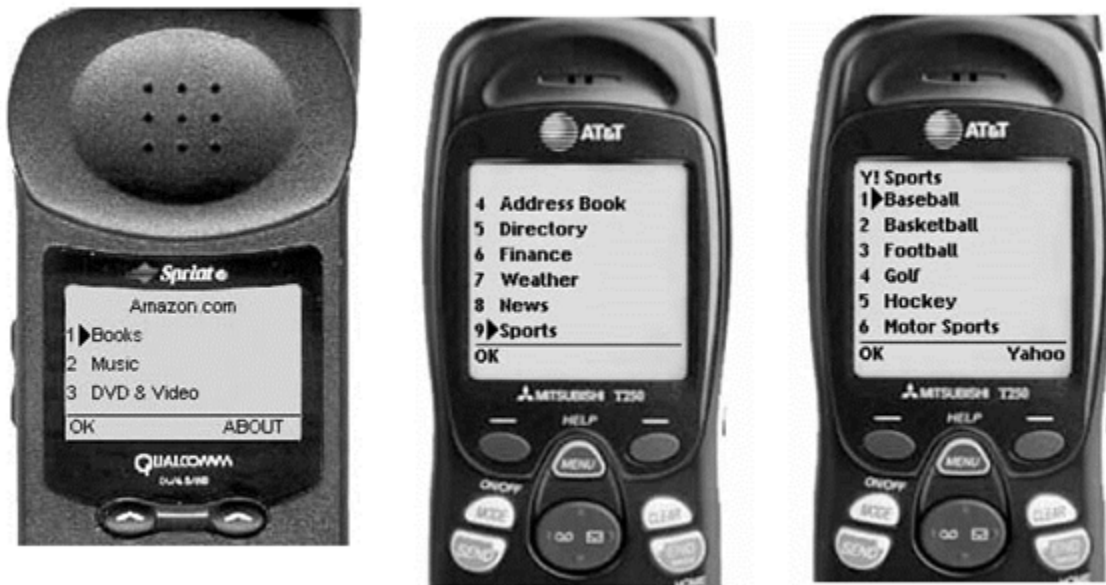103. While Rolf does not expressly disclose that the website "**includes a**

plurality of visual images associated with at least one compressed digital audio

and/or visual file" for selection of a file, this would have been obvious in view of

Forta and Gould. As I explained at length with respect to the previous limitation,

Forta describes a technique known as "WAP" for providing websites to cell

phones. Forta discloses that these websites can have a visually displayed interface

that presents a menu or listing of options to the user for selection, as shown below.

(Forta, Figs. 13.3 (screen on the left), 13.5 (screens in the middle and on the right);

see also id., at p. 317 ("Since Sports was option 9 on the main Yahoo! page, I had

to scroll down to find it. When I select option 9, I am presented with a meaningful

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menu to choose from.").) As described in further detail above, Forta discloses various techniques for providing a website to cell phones, which apply here.

104. Forta additionally discloses associating "**a plurality of visual images**" with WAP menu items made available on a cellular phone. (*See e.g., id.*, at p. 136, Fig. 6.5 (shown to the right).) As can be seen in figure 6.5, Forta discloses a menu with four options ("Email," "Content Se" [sic], "CustCare," and "Bookmarks"), each with an associated visual image. For example, an image of an envelope is associated with the Email menu option. Forta explains that WAP applications and webpages can include visual images, such as icons, that are provided in wireless bitmap (WBMP) format. (*Id.*, at p. 128.) A variety of images or icons can be used in a WAP webpage, and Forta describes how custom images can be created "using a drawing tool you are comfortable with," and placed on a "Web server" for subsequent delivery. (*Id.*, at pp. 128-29.)

105. Forta explains that the WML code for image display has both a "src" and a "localsrc" attribute to specify the location of an image to display:

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> The actual WML code to use images is simple, straightforward, and
> nearly identical to HTML: <img alt="text" src="url" localsrc="icon"
> align="alignment" height=" n" width=" n" vspace=" n" hspace=" n"/>

(*Id.*, at p. 129 (underlining added).) The "src" attribute is "required" and specifies

the uniform resource identifier (URI), which can include a uniform resource

locator (URL), for the visual image to be displayed on the WAP application. (*Id.*,

at p. 130.) The "localsrc" attribute is "optional" and represents the URI of a locally

stored image to be displayed on the WAP application, if the image identified by

"src" cannot be found. (*Id.*) As the description of this WML code suggests, one of

ordinary skill in the art would have been very familiar with this method of

specifying visual images on a webpage, as it is "nearly identical to HTML." As

such, one of ordinary skill would have understood and found it obvious that, when

included on the file selection website taught in Rolf and elsewhere in Forta, the

visual image display techniques taught in Forta could associate visual images with

at least one audio and/or visual file. Forta further explains that an image itself may

serve as a link that can be selected. (Forta, p. 53 ("WML links are very similar to

their HTML counterparts. The text (or image) to be linked is enclosed within <a>

and tags, and the browsers uses some indicator (usually underlining) to
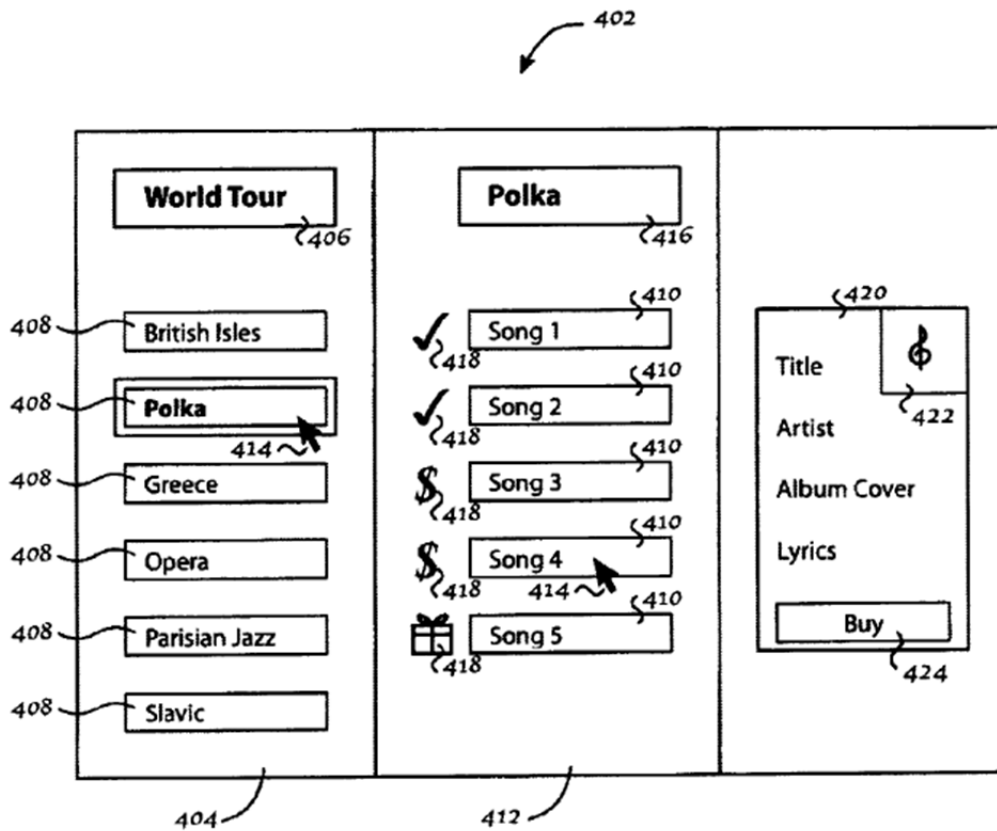
indicate that it can be selected." (underlining added)).)

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106. While Forta makes clear that it would have been obvious to a person of ordinary skill in the art to associate visual images with the audio and/or visual files, **Gould** provides additional disclosures confirming the applicability of such a practice to the music-recording-based system of Rolf.

107. Gould discloses a simple menu-based user interface that allows a user to manage music recordings, as shown below:

(Gould, Fig. 4.) Gould explains that in region **404**, a selection of lists is displayed.

(Gould, 5:4-5.) Each list is represented in the region **404** by a list icon **408**.

(Gould, 5:8-9.) Gould explains that the user can select one of the lists **408**, which

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will cause items **410** contained in that list to be displayed in region **412**. (Gould, 5:28-31.) A title status icon **418** appears next to each listed title **410**, which indicates the status of the item in the list. (Gould, 5:41-44.) "For example, a check mark might appear next to an item to indicate that the item is already in possession of the user. Another icon, for example a dollar sign, might appear next to items which have not yet been purchased." (Gould, 5:44-47.) Gould explains that selecting one of the title icons **410** will initiate various activities depending on the status of the item:

> For example, if a title has not yet been purchased, selecting the title will cause information regarding the title, such as artist, record label, and <u>album cover graphics</u>, etc., to be displayed in the title description window **420**. A "sample" icon **422** will be displayed which will initiate a sample play of the music, and a "buy" icon **424** will also be displayed, selection of which will initiate a purchase of the title.

(Gould, 5:53-60 (underlining added).) Gould therefore discloses "**visual images**" in the form of "album cover graphics" associated with music recordings for selecting the songs to sample or purchase.

108. Therefore, Rolf, Forta, and Gould disclose and render obvious the claim limitation "wherein the website includes a plurality of visual images associated with at least one compressed digital audio and/or visual file for selection of at least one compressed digital audio and/or visual file."

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109. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Forta and Gould with Rolf, with no change in their respective functions, predictably resulting in the Web server of Rolf providing a website that provides a plurality of the compressed digital audio or audio-visual data files, according to the menu, selection, and image techniques described in Forta and Gould. The rationale and motivation for combining and citing Rolf and Forta is provided in my analysis of claim 1**[a]** above, which applies here.

110. Forta provides further express motivations to combine in this manner, emphasizing that its techniques present the user with a "meaningful menu to choose from" compared to alternative methods. (Forta, at p. 317; *see also id.* ("In the wireless version of Yahoo, the Sports link is presented on the first page, and my sports choices are immediately available. Two clicks and I'm in.").) A person of ordinary skill in the art would have found it obvious to display the plurality of compressed digital audio or audio-visual data files in Rolf through interactive menus as described in Forta.

111. One of ordinary skill in the art would have also understood the advantages of providing visual images or icons on a user-facing website. Forta

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confirms what one of ordinary skill would have known regarding the desirability of

such visual images:

> One of the most compelling features of the Internet is the ability to
> convey messages using images. Images not only make a site more
> interesting, but they convey messages and information much more
> efficiently than is possible with pure text. Graphics give your site a
> unique look and feel, allow you to brand your site, and can bridge
> language barriers simply. Today on the Web it is not unusual to
> encounter pages that are composed solely of single or multiple
> images.

(*Id.*, at p. 128.)

112. A person of ordinary skill in the art would have also appreciated the

applicability and benefits of using the interface disclosed in Gould, and in

particular, the interface for displaying album cover art for a recording along with

buttons to sample or purchase the recording. Gould and Rolf are a natural

combination. Gould explains that the user interface can be "used with music

which can be downloaded directly from a network such as the Internet using MP3

or similar technology." (Gould, 6:1-3.) Rolf is directed to a system for

downloading music recordings over a network such as the Internet. (Rolf, 3:17-

21.) Rolf and Gould both further disclose a menu or listing-based interface and the

ability of a user to initiate a purchase of a recording from an interface. (*E.g.*, Rolf,

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3:64-4:6, 6:53-59, 9:10-15; Gould, 3:23-30, 5:57-60, Fig. 4.) A person of ordinary skill in the art would have been motivated to improve the interface of Rolf by incorporating the display of album cover graphics taught in Gould in order to provide a richer, more informative visual experience.

113. Therefore, one of ordinary skill in the art would have been motivated to enhance the usability of the website disclosed in Rolf by employing the well-known visual image display techniques of Forta and Gould.

4. **"providing for the transmission of a representation of at least a portion of the compressed digital audio and/or visual files to the cell phone upon request, said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation" (Claim 1[d])**

114. In light of the length of this claim limitation, I will divide it into pieces to ensure that I cover all of its elements. As I explain below, this limitation is disclosed by, and obvious over, Rolf, alone or with Forta, in further view of Gatherer, O'Hara, and Tagg.

**"providing for the transmission of a representation of
at least a portion of the compressed digital audio
and/or visual files to the cell phone upon request"**

115. Rolf, alone or with Forta, discloses this portion of claim 1[d]. As I explain below, Rolf teaches that the system provides for the transmission of a menu or listing of recordings to a cell phone upon request.

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116. In particular, Rolf discloses that "when wireless communications device **12** accesses the central facility **14** via the communications network for purpose of retrieving one or more selected recordings . . . processor **50** invokes application software for providing a menu driven system to wireless communications device **12**, such that the wireless communications device **12** can be utilized to select [a] recording via a menu or listing of recordings." (*Id.*, 8:64-9:15 (underlining added); *see also id.*, 1:39-41 ("Using an input of the cellular telephone, a user may select one or more recordings for transmission to the cellular telephone."), 5:64-66 ("[A] wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings.").) Rolf explains that processor **50** is located within facility **14**. (*Id.*, 8:56.) And as I noted above, Rolf discloses that the wireless communications device may be a cellular telephone. (Rolf, 1:64-67, 5:21-22.)

117. Because processor **50** is within facility **14** and "invokes application software for providing a menu driven system to wireless communications device **12**" to allow a user to "select [a] recording via a menu or listing of recordings," one of ordinary skill in the art would have understood that the "menu or listing of recordings" was transmitted to the cell phone. One of ordinary skill in the art would have also understood that a "menu or listing of recordings" is a

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"representation of at least a portion of the compressed digital audio and/or visual files."

118. Rolf therefore discloses this portion of the claim limitation. It would also have been obvious to one of ordinary skill in the art to combine Forta with Rolf, with no change in their respective functions, predictably resulting in the Web server of Rolf providing a "menu or listing of recordings" to a cell phone, according to the menu, selection, and graphics techniques described in Forta. The rationale and motivation for combining and citing Rolf and Forta is provided in my analysis of claims 1**[a]** and 1[**b**] above, which applies here.

119. Rolf, alone or with Forta, therefore discloses "**providing for the transmission of a representation of at least a portion of the compressed digital audio and/or visual files to the cell phone upon request.**"

"cell phone having a digital signal processor"

120. As shown in Figure 4 of Rolf, reproduced below, the cell phone includes a processor **20**. Rolf explains that the processor **20**, shown circled in red below, performs functions including processing data packets received by the cell phone and outputting information to be displayed. (Rolf, 10:45-46, 13:39-40.)

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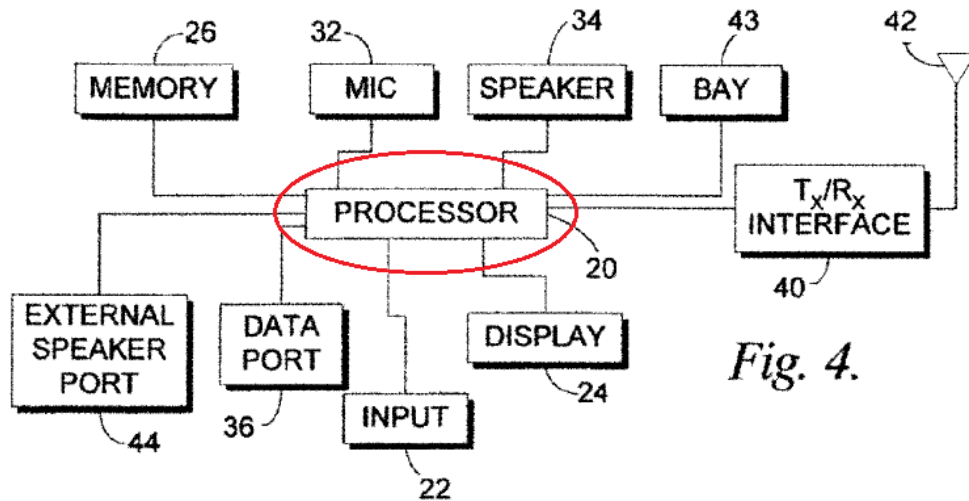
Fig. 4.

(*Rolf*, Fig. 4 (red circle added).)

121.   Rolf does not appear to expressly disclose that the cell phone includes

a "**digital signal processor**." However, it was well-known to persons of ordinary

skill in the art that cell phones of the sort disclosed in Rolf could include one or

more digital signal processors, which were advantageously used for functions such

as speech coding and noise suppression. Thus, one of ordinary skill in the art

would have understood and found it obvious that the cell phone in Rolf could

include a digital signal processor. To the extent there is any question, this detail is

confirmed and expressly disclosed by Gatherer.

122. As Gatherer explains, "[p]rogrammable digital signal processors

(DSPs) are pervasive in the wireless handset market for digital cellular telephony."

(Gatherer, at p. 84, left column (underlining added).)   In fact, according to

Gatherer, one historical approach to the implementation of cell phones had

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"emphasize[d]" programmable DSPs. (Gatherer, at p. 84, left column.) For example, as I mentioned above, "[t]he voice coder is the part of the architecture that <u>most engineers agree should be done on a DSP</u>." (*Id.*, at p. 84, right column (emphasis added).) Gatherer also discloses that digital signal processors <u>were widely used</u> in cell phones for a variety of other functions. (*Id.*, p. 85, Figs 1 & 2 (showing DSP functions as including vocoding, speech coding, noise suppression, echo cancellation, speech recognition, equalizing, interleaving, channel coding, ciphering, burst formatting, <u>demodulating</u>, equalizing, and PCA).)

123. ***Rationale and Motivation to Combine:*** It would have been obvious to a person of ordinary skill in the art to combine Rolf with Gatherer, predictably resulting in a cell phone that included one or more digital signal processors. Rolf and Gatherer are analogous references in the same field of describing features of cellular phones. In fact, like Rolf, Gatherer recognized that cell phones can be used to provide "[a]udio and visual entertainment . . . delivered wirelessly to mobile subscribers." (Gatherer, at p. 89, left column.) A person of ordinary skill in the art implementing the cell phone of Rolf would naturally have consulted Gatherer in ascertaining the features and components of cell phones, and would have understood that the two references pertain to the same technology area and are readily combinable.
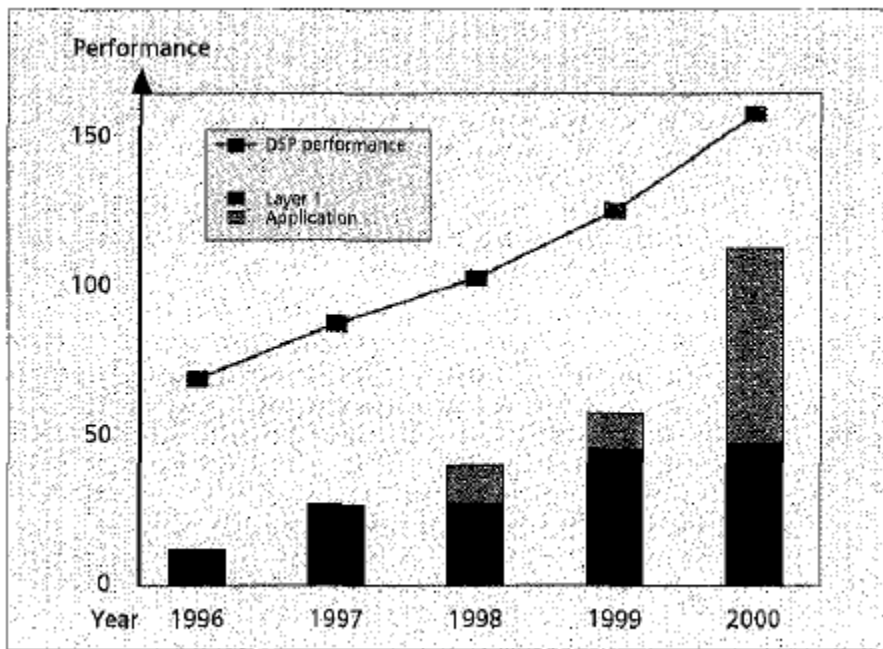
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124.   Gatherer also provides express motivations to combine in the manner described above. Gatherer explains that relying on DSPs rather than application-specific integrated circuits (ASICs) to perform the processing required by cell phones provides flexibility because DSPs are programmable. (*Id.*, at p. 84, left column ("We summarize some of the up and coming applications for the new third-generation wireless personal assistants to show that, if anything, <u>flexibility is becoming more of an issue, and therefore the programmability offered by DSPs is even more desirable</u>."), at 85, left column ("[E]ach generation of phone had a slightly different physical layer from the previous one, and upgrades to ASIC-based solutions became costly and difficult. <u>Because DSPs were now being designed with low-power wireless applications in mind, the power savings to be had from ASIC implementation of DSP functions was not significant enough that system designers were willing to live with the lack of flexibility.</u>") (emphasis added).)   As such, "programmable DSPs [were] **<u>essential</u>** to provide a cost-effective, flexible upgrade path for the variety of evolving standards." (*Id.*, at p. 85, right column – p. 86, left column (emphasis added).)

125.   The advantages provided by DSPs were not limited to their flexibility. Gatherer notes that DSPs were known for their ever-increasing performance (measured in "MIPS"), and as such, were well suited for applications beyond

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traditional voice functionality. (Gatherer, at p. 85, left column ("It is also true that as GSM phones have evolved, they have gradually moved beyond the simple phone function, and this has led to an increase in the fraction of the DSP MIPS used by something other than physical layer 1. <u>This evolution is shown in Fig. 3. With the advent of wireless data applications and the increased bandwidth of 3G, we expect this trend to accelerate.</u>") (underlining added), Figs. 3 & 7 (reproduced below).)

■ Figure 3. *Layer 1 and application MIPS with time.*

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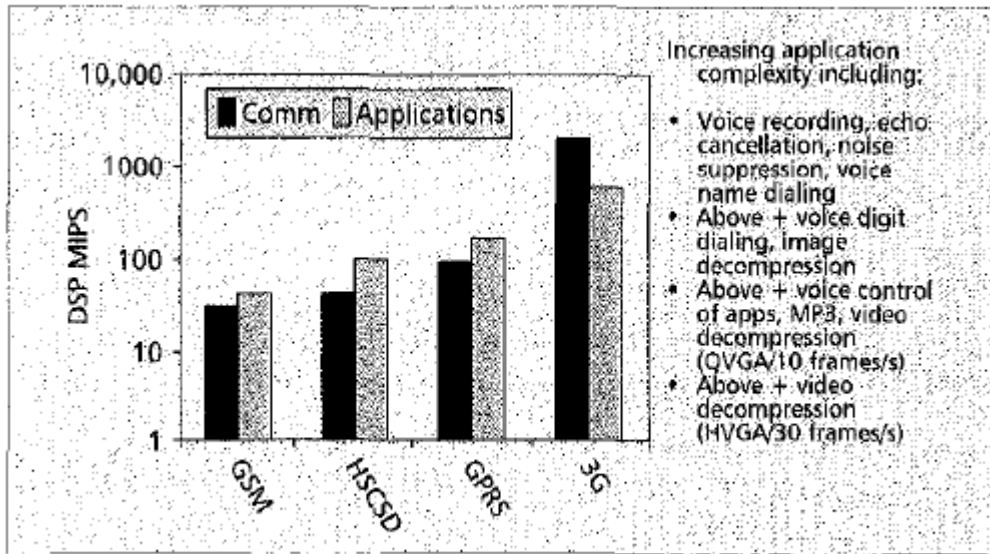
■ Figure 7. *Applications drive DSP MIPS.*

126.   Accordingly, the advantages offered by DSPs in terms of flexibility

and processing power would have motivated a person of ordinary skill in the art to

implement the cell phone in Rolf using a digital signal processor. Indeed, Gatherer

explicitly predicted that the "power-efficient media processing" and "flexibility

and upgradeability" provided by digital signal processors would secure their place

in "future data-centric mobile devices." (Gatherer, at p. 89, right column.)

127.   One of ordinary skill in the art would also have been motivated to

make the proposed combination by the widespread availability of off-the-shelf

DSPs. In fact, using DSP for such wireless applications was mainstream in the

cellphone industry, and not using DSP could be considered as out of the

mainstream, and in some cases even awkward. As Gatherer explains, "because of

the growing importance of the wireless market (more than 400 million units

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projected for 2000), there [were] [then] several DSPs on the market that have been designed with wireless applications in mind, for instance, the Lucent 16000 series and the ADI21xx series. This level of effort by several companies [was] a sign that the collective wisdom of the marketplace has chosen to bet on a programmable DSP future for wireless technology." (Gatherer, at p. 86, right column.) This environment would have motivated a person of ordinary skill in the art to incorporate one or more digital signal processors into the cell phone described in Rolf.

"cell phone having . . . a receiver"

128. As I noted above, Rolf discloses a "wireless communications device **12**, such as a cellular telephone." (Rolf, 5:21-22.) This cell phone is shown in Figure 4, reproduced below. (*Id.*, 4:65-67, 7:49-50.)

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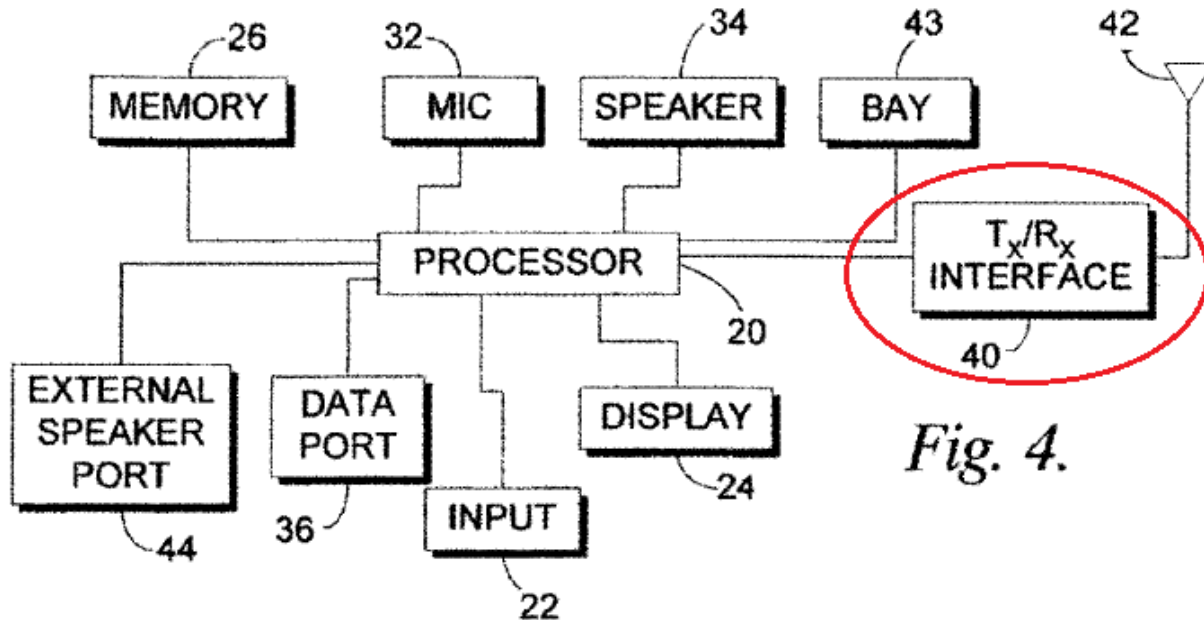
Fig. 4.

(*Id.*, Fig. 4 (red circle added).) As shown, the cell phone includes a "transceiver

40." (*Id.*, 7:54.) One of ordinary skill in the art would have understood that a

"transceiver" serves as a receiver. (*Comprehensive Dictionary of Electrical*

Engineering, Ex. 1025, at p. 647 ("transceiver [:] a device that can serve as both a

transmitter and receiver.).) Indeed, box **40** (circled in red) in Figure 4 above is

labeled as a "Tx/Rx Interface" (Transmitter/Receiver), thus expressly disclosing

that the transceiver **40** serves as a receiver. Rolf therefore discloses that the cell

phone includes a claimed "**receiver**."

> **"for receiving and processing compressed digital audio
> and/or visual files transmitted using orthogonal
> frequency-division multiplex (OFDM) modulation"**

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129. As I explained above, Rolf discloses a cell phone that is configured to receive music files transmitted over a wireless communication network. (Rolf, 1:28-35, 5:46-53, 6:23-26; Fig. 1; *see also id.* 5:64-66.) Rolf further discloses that the cell phone can "play" the music files received. (*Id.*, 1:20, 5:19, 6:21.) Rolf therefore discloses a cell phone "**for receiving and processing compressed digital audio and/or visual files**."

130. While the music files in Rolf are not disclosed as being "**transmitted using orthogonal frequency-division multiplex (OFDM) modulation**," this would have been obvious in view of O'Hara and Tagg. As I explained in **Part V.A** above, I cite O'Hara and Tagg for two straightforward propositions: that (1) prior art IEEE 802.11a wireless networking transmits digital information to mobile devices using OFDM modulation (O'Hara); and (2) IEEE 802.11 wireless networking functionality can be incorporated into a cell phone, such as the cell phone **12** of Rolf (Tagg).

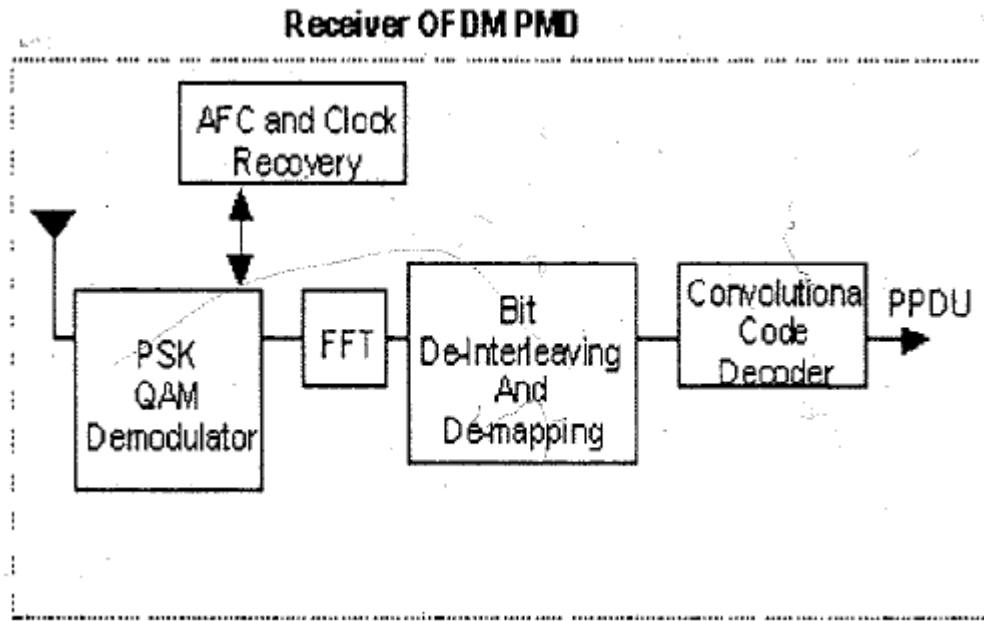131. With respect to the first proposition, O'Hara clearly confirms that at least the IEEE 802.11a variant of IEEE 802.11 uses OFDM to wirelessly transmit data. (*Id.* at p. 143 ("In July of 1998, the IEEE 802.11 Working Group adopted OFDM modulation as the basis for IEEE 802.11a."); *id.* at p. 139 ("The IEEE 802.11a PHY is one of the physical layer (PHY) extensions of IEEE 802.11a and is

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referred to as the orthogonal frequency division multiplexing (OFDM) PHY. The

OFDM PHY provides the capability to transmit PSDU[8] frames at multiple data

rates up to 54 Mbps for WLAN networks where transmission of multimedia

content is a consideration.").) O'Hara further teaches an 802.11a receiver that can

be implemented in mobile devices to receive and process OFDM signals. (*Id.*, at p.

144 ("At the receiver, the carrier is converted back to a multicarrier lower data rate

form using an FFT. The lower data subcarriers are combined to form the high rate

PPDU[9]. An example of an IEEE 802.11a OFDM PMD[10] is illustrated in Figure 7-

2.").) This is shown in Figure 7-2, reproduced in relevant part below.

---

[8] The term "PSDU" refers to a PLCP service data unit, a basic unit of data for

transmission over an IEEE network. (O'Hara, at p. 174 (explaining PSDU

acronym), *id.* at p. 141 (Fig. 7-1, showing OFDM header and PSDU).)

[9] The term "PPDU" refers to a PLCP protocol data unit, a unit of data that

includes a preamble and header. (O'Hara, at p. 174 (explaining PPDU acronym);

id. at p. 141 (Fig. 7-1, showing OFDM PPDU).)

[10] The term "PMD" refers to "Physical Medium Dependent," which is a

description of the details of transmission and reception of individual bits on a

physical medium. (O'Hara, at p. 174 (explaining PMD acronym).)

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(*Id.*, p. 145, Fig. 7-2.)

132. With respect to the second proposition, as I explained in detail in **Part**

V.A, Tagg discloses a cell phone that can receive data using IEEE 802.11. Figure

1 of Tagg provides a basic overview of the system:
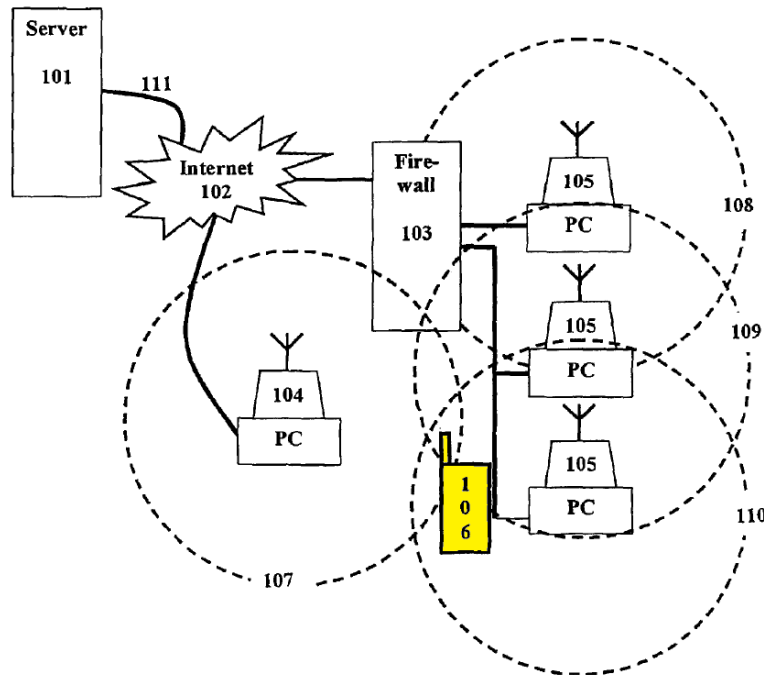
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Fig. 1

(Tagg, Fig. 1.) Mobile roaming device **106**, shown highlighted in yellow, may be a "mobile computer, PDA, <u>cellular telephone</u>, or home appliance." (*Id.*, 7:63-66(underlining added).) The circles shown in Figure 1 (**107-110**) show the range of wireless network access provided by fixed devices **104** and **105**. (*Id.*.)

133. Tagg confirms that the mobile device **106** can switch between a number of available wireless technologies. As explained in Tagg, "[t]he mobile device determines the connection methodologies available to it and their relative merits and then connects to the host using the best available standards." (*Id.*, 7:67-8:2.) An example of how this might work is illustrated in Figure 9:

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U.S. Patent No. 9,124,717
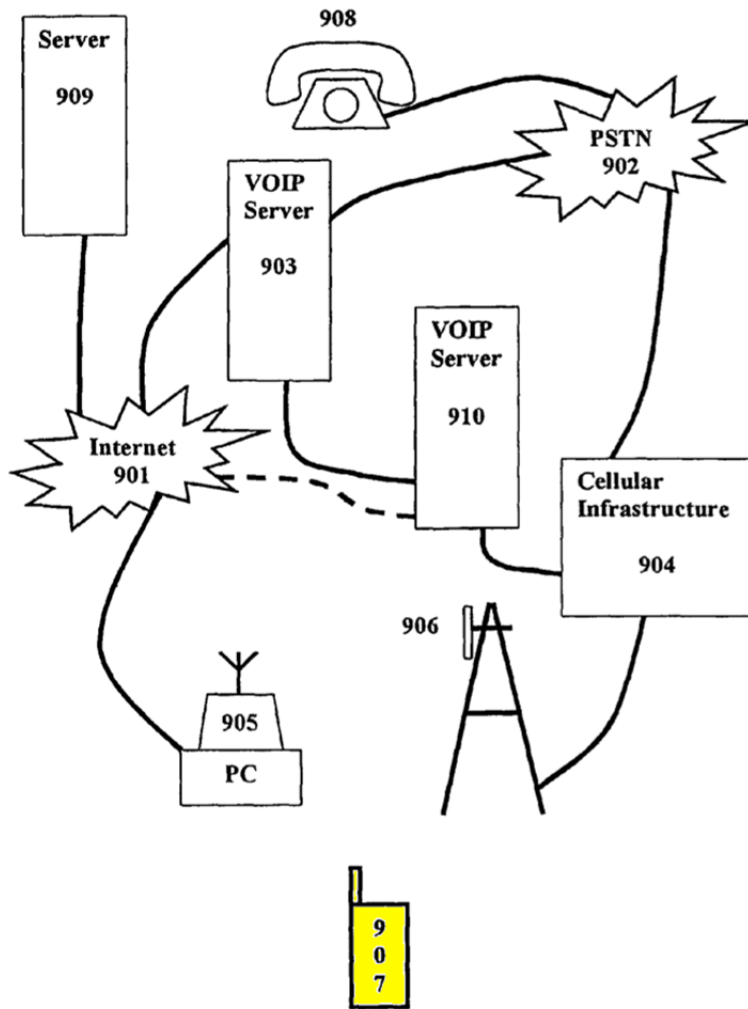
Fig. 9

134. Figure 9 above shows a cellular phone **907**, highlighted in yellow, and illustrates "the handoff between a fixed wireless, Internet based, VOW [voice over WLAN] system and a cellular system. A mobile user **907** is within range of two methods for placing a call; a PC running our cooperative networking service and a cellular tower. The call might preferentially be placed to either unit based on the user[']s pre-set preferences or based on the current situation." (*Id.*, 11:60-66.) "In

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the case of connection made over the Internet voice packets are sent over the air

using a wireless link such as Bluetooth or IEEE802.11 to the host **905**[.] These

packets are routed thru [sic] the Internet **901** to a VOW server **903**. The VOW

server converts IP packets to a form suitable for use over the PSTN and handles

making and breaking the connection to users." (*Id.*, 11:67-12:6.) Although the

example above involves use of voice-over-IP (VOIP), Tagg makes clear that an

IEEE 802.11 network can also be used to transmit digital data instead of voice.

(*Id.*, 5:22, 5:27-29 ("The link can transport either data or voice... The software

allows the user to access the Internet, send and receive e-mail and obtain high

bandwidth services such as MP3 files and movies.").)

135. As I noted previously, the details of the handoff, and the Cooperative

Tunneling Agent (CTA) software for evaluating available networks and

performing a handoff from one wireless network to another, is not relevant to my

analysis. The disclosures above simply confirm the more basic point that a cell

phone can incorporate IEEE 802.11 wireless networking, and use that capability to

receive data such as data files.

136. In contrast to the express limitation of claim 1[f], the OFDM

limitation of claim 1[d] does not explicitly require transmission of files over a

cellular network or cellular data connection. However, to the extent that this

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limitation were interpreted to require that such transmission occur over a cellular network or cellular data connection, the method would have been obvious in further view of Pinard. A detailed explanation of Pinard's disclosure of file transmission over a cellular network is provided in relation to claim 1[f] below, along with the motivation to combine Rolf with the teachings of O'Hara, Tagg, and Pinard. (*See* **Part V.B.6**.) That analysis would equally apply to claim 1[d].

137. ***Rationale and Motivation to Combine:*** It would have been obvious to a person of ordinary skill in the art to combine Rolf with O'Hara and Tagg, predictably resulting in a cell phone **12** of Rolf configured to receive and process compressed digital audio or visual files in which the files are transmitted to the cell phone by use of IEEE 802.11a networking, thus using OFDM modulation. Tagg, as noted, specifically discloses the ability to incorporate IEEE 802.11 wireless networking technology into a cell phone, and discloses two basic and fundamental reasons why such a combination would be desirable: (a) speed and (b) cost.

138. **Speed**: It was well-known to persons of ordinary skill in the art in June 2001 that IEEE 802.11 wireless networks were capable of much greater network performance than existing cellular data networks provided by traditional carriers (e.g., AT&T). For example, Tagg describes a scenario in which a user switches to a traditional cellular data connection, causing performance to drop to

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just 9.6 kilobits per second (Kbps). (Tagg, 11:24-28.) But O'Hara confirms that

IEEE 802.11a (using OFDM[11]) could transmit digital multimedia content at up to

54 megabits per second (54 Mbps), which is more than 5,000 times faster than the

9.6 Kbps data rate reported in Tagg. (O'Hara, at p. 139 ("The OFDM PHY

provides the capability to transmit PSDU frames at multiple data rates up to 54

Mbps for WLAN networks where transmission of multimedia content is a

consideration.").) It is therefore no surprise that O'Hara suggests use of short-

range wireless networks, such as IEEE 802.11, to allow mobile users to take

advantage of "high bandwidth services" such as "MP3 files" (Tagg, 5:27-29),

precisely the use case contemplated in Rolf. Accordingly, a person of ordinary

skill in the art would have been amply motivated to incorporate IEEE 802.11

wireless networking into a cell phone (as disclosed in Tagg) to achieve the

dramatically improved network performance for multimedia content (as disclosed

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[11]   One of ordinary skill in the art would have also appreciated that the use of

OFDM offers advantages, including reduced intersymbol interference. (*See*

O'Hara, at p. 143 ("The basic principal of operation first divides a high-speed

binary signal to be transmitted into a number of lower data rate subcarriers. . . .

Intersymbol interference is generally not a concern for lower speed carrier, ...").)

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in O'Hara), which could have reduced download times for selected MP3 files and significantly improved user experience.

139. **Cost**: It was also well-known to persons of ordinary skill in the art that cellular data services provided by traditional carriers (e.g., AT&T) in June 2001 could be costly, with users potentially having to pay based on the amount of time or amount of bandwidth consumed. Tagg makes clear that these types of cellular connection charges can be dramatically reduced by allowing the cell phone to switch a short-range wireless network such as IEEE 802.11. For example, Tagg explains that "[a] cell phone located within 100 feet of a fixed host device can connect to the Internet through that device, obtaining phone calls at a fraction of the cost of a regular cellular connection." (*Id.*, 5:31-33; *see also id.*, 5:64-66 ("Our technology sits between the user and the Internet constantly negotiating the most cost effective means by which they can gain access.").) A person of ordinary skill in the art would have understood that the same rationale for voice telephone calls would also apply to data transmissions, such as downloads of MP3 files from a server.

140. The dual motivations – speed and cost – are also interrelated. Because of the more limited bandwidth of a traditional cellular data connection as compared to IEEE 802.11, the time it would take to download MP3 files over a

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traditional cellular data connection could be considerable, resulting in even higher connection time charges and an even greater cost disparity. A person of ordinary skill in the art would have been motivated to incorporate IEEE 802.11 into the cell phone **12** of Rolf to obtain these performance and cost benefits.

141. Tagg does not explicitly disclose that the IEEE 802.11 wireless network uses OFDM, but it was well-known and understood that IEEE 802.11**a**, one of the two variants of IEEE 802.11 introduced in the late 1990s, used OFDM. This point was expressly confirmed by O'Hara. It would therefore have been obvious to a person of ordinary skill in the art to incorporate IEEE 802.11a wireless networking into the cell phones of Tagg and Rolf, predictably resulting in those devices receiving digital audio and/or visual files using OFDM. Although Tagg does not disclose any particular variant of IEEE 802.11 (it simply refers to "802.11" without any "a" or "b" suffix), a person of ordinary skill in the art would have readily understood that IEEE 802.11a was one of a finite number of potential variants of IEEE 802.11. Nothing in Tagg limits IEEE 802.11 to one particular variant or would otherwise prevent the use of IEEE 802.11a. Moreover, a person of ordinary skill in the art would have appreciated that because IEEE 802.11a enabled data rates of up to 54 Mbps (compared to 11 Mbps for IEEE 802.11b), the 802.11a variant would have provided enormous advantages in terms of speed,

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which I explained at length above. (*See* O'Hara, at p. 139 ("In October 1997 the IEEE 802 Executive Committee approved two projects to for higher rate physical layer (PHY) extensions to IEEE 802.11. The first extension, IEEE 802.11a, defines requirements for a PHY operating in the 5.0 GHz U-NII frequency and data rates ranging from 6 Mbps to 5,4 Mbps. The second extension, IEEE 802.11b, defines a set of PHY specifications operating in the 2.4 GHz ISM frequency band up to 11 Mbps.").) Finally, by September 2000, inexpensive chipsets for implementing IEEE 802.11a were already commercially available and designed for incorporation into existing IEEE 802.11 products. (Bryan E. Braswell, *Modeling Data Rate Agility in the IEEE 802.11a Wireless Local Area Networking Protocol*, Ex. 1064, at pp. 8-9.)

142. I acknowledge that the claim presents an ambiguity as to which recited element must be "for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation." For context, claim 1 recites a "cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted by orthogonal frequency-division multiplex (OFDM) modulation." There are two reasonable ways to interpret this limitation. First, it could be that the "**cell phone**" is for receiving and processing files, as

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recited in the claim. Second, the claim could be interpreted to require that the

"**digital signal processor and receiver**" be for receiving and processing

compressed digital audio and/or visual files, as recited.

143. In my opinion, it does not matter which interpretation is employed, as

neither would give rise to a meaningful distinction over the prior art. Even if the

claim requires that the "digital signal processor and receiver" (and not just the cell

phone itself) be "for receiving and processing compressed digital audio and/or

visual files transmitted using orthogonal frequency-division multiplex (OFDM)

modulation," this would nevertheless have been obvious, as I explain below.

<u>Receiver</u>

144. Any requirement that the <u>receiver</u> be configured for receiving and

processing files transmitted by OFDM is disclosed and obvious in view of O'Hara.

145. As I mentioned above, O'Hara teaches an 802.11a receiver that can be

implemented in mobile devices to receive data transmitted by OFDM modulation.

(O'Hara, at p. 144 ("At the receiver, the carrier is converted back to a multicarrier

lower data rate form using an FFT. The lower data subcarriers are combined to

form the high rate PPDU[12]. An example of an IEEE 802.11a OFDM PMD[13] is

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[12] The term "PPDU" refers to a PLCP protocol data unit, a unit of data that

includes a preamble and header. (O'Hara, at p. 174 (explaining PPDU acronym);

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illustrated in Figure 7-2.").) The receiver is shown in Figure 7-2, reproduced in

relevant part below.

Receiver OFDM PMD
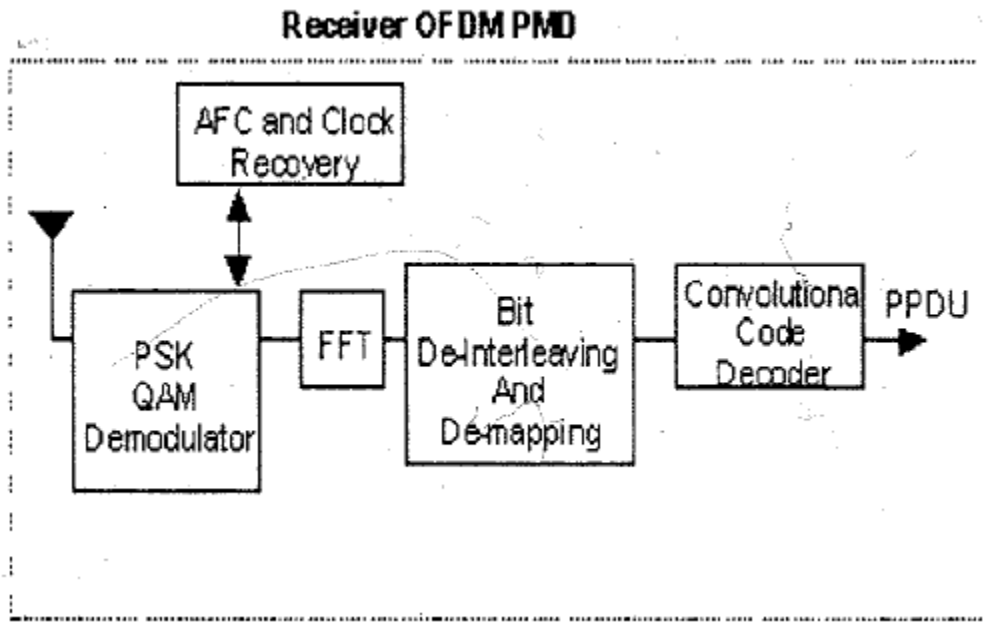
(*Id.*, at p. 145, Fig. 7-2.)

146. As shown, the IEEE 802.11a receiver includes a PSK QAM

demodulator, AFC and clock recovery, FFT (fast fourier transform), and bit de-

interleaving and de-mapping components, and a convolutional code decoder.

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id., at p. 141 (Fig. 7-1, showing OFDM PPDU).)

[13] The term "PMD" refers to "Physical Medium Dependent," which is a

description of the details of transmission and reception of individual bits on a

physical medium. (O'Hara, at p. 174 (explaining PMD acronym).)

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O'Hara describes in detail how data is processed for transmission by OFDM modulation:

> The basic principle of operation first divides a high-speed binary signal to be transmitted into a number of lower data rate subcarriers. There are 48 data subcarriers and 4 carrier pilot subcarriers for a total of 52 nonzero subcarriers defined in IEEE 802,11a. Each lower data rate bit stream is used to modulate a separate subcarrier from one of the channels in the 5 GHz band. . . . [B]it interleaving and convolutional encoding is used to improve the bit error rate performance. The scheme uses integer multiples of the first subcarrier, which are orthogonal to each other. This technique is known as orthogonal frequency division multiplexing (OFDM). Prior to transmission the PPPU is encoded using a convolutional coded rate R = 1/2, and the bits are reordered and bit interleaved for the desired data rate. Each bit is then mapped into a complex number according the modulation type and subdivided in 48 data subcarriers and 4 pilot subcarriers. The subcarriers are combined using an inverse fast fourier transform and transmitted.

(*Id.*, at pp. 143-44.)

147. O'Hara further explains that "[a]t the receiver, the carrier is converted back to a multicarrier lower data rate form using an FFT. The lower data subcarriers are combined to form the high rate PPDU." (*Id.*, at p. 144.) One of ordinary skill in the art would have understood that the receiver, upon receiving

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data transmitted by OFDM, would perform the reverse of the process described for the transmitter.

148. O'Hara therefore discloses a <u>receiver</u> "for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation," to the extent this is required by the claim. The rationale and motivation for adapting the OFDM receiver of O'Hara to the cell phone in Rolf is provided above.

<div align="center">Digital Signal Processor</div>

149. Any requirement that the <u>digital signal processor</u> be for receiving and processing files transmitted by OFDM is also satisfied by the prior art. As I explain below, it would have been obvious in view of Gatherer that a digital signal processor included in the cell phone could process data transmitted by OFDM modulation, thus satisfying any requirement imposed by the claim that the <u>digital signal processor</u> be for "processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation." Unlike a traditional CPU, the digital signal processor is optimized to process digital signals such as physical layer processing, voice processing and other numeric processing.

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150. As I mentioned above, Gatherer discloses that a desirable feature of digital signal processors is their programmability. (Gatherer, at p. 84, left column ("[F]lexibility is becoming more of an issue, and therefore the programmability offered by DSPs is even more desirable.").) Gatherer further explains that as digital signal processors became more powerful, they were used to implement a growing number of functions performed by cell phones. (*Id.*, at p. 84, right column ("[O]nce the DSP was included a certain amount of 'mission creep' started to occur. As DSPs became more powerful, they started to take on other physical layer 1 tasks until all the functions in the 'DSP functions' box in Fig. 1 were included."), p. 85, Fig. 1 (showing that DSP functions include GSM vocoder, channel codec, interleaving/deinterleaving, ciphering/deciphering, burst formating, demodulator, and equalizer); *see also id.* at p. 85, left column ("After 1994, a single DSP was powerful enough to do all the DSP functions, making the argument for a DSP-only solution for the baseband even more compelling.").) As such, one of ordinary skill in the art would have understood and found it obvious that, when included in a cell phone that receives files transmitted by OFDM modulation, the digital signal processor could process the OFDM signals.

151. One of ordinary skill in the art would have had ample motivations to implement functions of the OFDM receiver, as described in O'Hara, using a digital

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signal processor. To begin with, it was well known that DSPs could be programmed to receive and process OFDM signals. (E. Lawrey, *Multiuser OFDM*, Fifth International Symposium on Signal Processing and its Applications (Aug. 1999), Ex. 1015, at p. 761, left column ("[A] test hardware solution is presented using SHARC® Digital Signal Processors (DSP) demonstrating the feasibility of a simple multiuser OFDM system."); U.S. Patent No. 5,732,113 (published Mar. 1998), Ex. 1016, 4:26-44 ("DSP 100 performs a variety of operations on the in-phase and quadrature samples of the received OFDM signal."); U.S. Patent No. 6,711,221 (filed Feb. 2000), Ex. 1017, 3:33-48.)

152. In fact, a person of ordinary skill in the art would have been motivated to use a DSP to perform the functions of the OFDM receiver described in O'Hara because she would have appreciated that DSPs can efficiently implement the mathematical algorithms involved in the processing of OFDM signals, such as the Fast Fourier Transform (FFT). (O'Hara, at p. 144 ("At the receiver, the carrier is converted back to a multicarrier lower data rate form using an FFT."")), Fig. 7-2.) Indeed, Gatherer provides express suggestions for doing so. (Gatherer, at p.86, right column ("Another strategy used by DSP designers is to add instructions that, although fairly generic in themselves, allow efficient implementation of algorithms important to wireless applications.").)

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153. Gatherer provides additional express motivations for implementing functions of the OFDM receiver using a digital signal processor. Gatherer explains that DSPs have traditionally performed tasks of the "**physical layer**" in cell phones. (*Id.*, at p. 84, right column ("As DSPs became more powerful, they started to take on other physical layer 1 tasks until all the functions in the 'DSP functions' box in Fig. 1 were included."); *see also id.*, at p. 85, Fig. 1.) Because the receipt and processing of OFDM signals would be a physical layer task in an IEEE 802.11a-compliant cell phone, one of ordinary skill in the art would have found DSPs to be a natural candidate for performing functions of the OFDM receiver. (O'Hara, at p. 139 ("IEEE 802.11a PHY is one of the physical layer (PHY) extensions of IEEE 802.11 and is referred to as the orthogonal frequency division multiplexing (OFDM) PHY.") (underlining added); *see also id.*, at p. 143-144.) In fact, OFDM was one of a finite number of known techniques for implementing wireless physical layer, and in many cases DSPs were optimized specifically to perform physical layer signal processing. Moreover, as Gatherer explains, "[a] DSP-based baseband approach can cope better with different radio frequency (RF) and mixed-signal offerings which occur due to technology improvements and market changes." (Gatherer, at p. 85, right column.) One of ordinary skill in the art would therefore have appreciated that DSPs are well-suited for evolving OFDM

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technologies developed for cellular systems, discussed at length in **Part III.E**
above. Accordingly, it would have been obvious to configure a digital signal
processor included in a cell phone to receive and process files transmitted by
OFDM modulation.

154. A person of ordinary skill in the art would also have been motivated
to implement functions of the music player using a digital signal processor. As
Gatherer explains, digital signal processors "can provide power-efficient <u>media
processing</u>." (Gatherer, at p. 89, right column (underlining added).) Gatherer
specifically discloses in Figure 7 (shown below) that DSPs can be also used in cell
phones for MP3 decompression.

■ **Figure 7.** *Applications drive DSP MIPS.*

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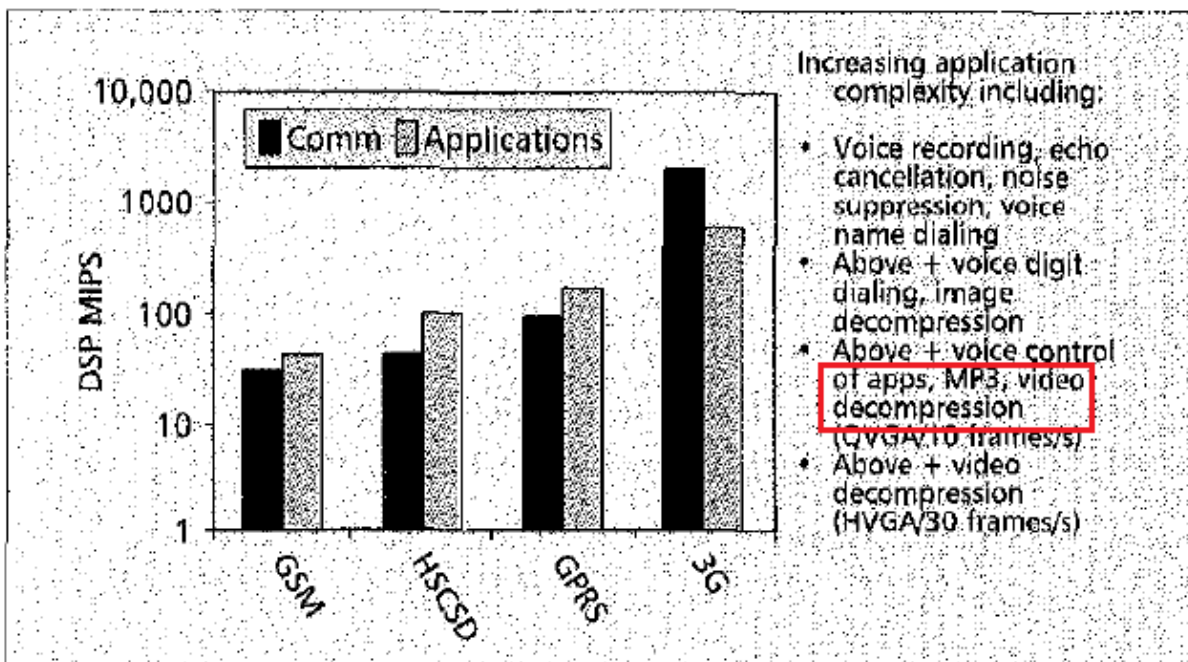
(Gatherer, Fig. 7 (red emphasis added).) It would therefore have been obvious that the digital signal processor could be configured to receive and process for playback the music files that were transmitted to the cell phone by OFDM modulation.

155. Accordingly, the prior art satisfies the limitation "providing for the transmission of a representation of at least a portion of the compressed digital audio and/or visual files to the cell phone upon request, said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation," as recited in the claim.

> **5.** **"receiving a request from the cell phone selecting the at least one compressed digital audio and/or visual file based on the visual image" (Claim 1[e])**

156. As I explained above, the teachings of Rolf, alone or with Forta, discloses providing a website and delivering one or more compressed digital audio and/or visual files to a cell phone.

157. Rolf further teaches the step of "**receiving a request from the cell phone selecting the at least one compressed digital audio and/or visual file**." Rolf discloses "providing a menu driven system to wireless communications device **12**, such that the wireless communications device **12** can be utilized to select [a] recording via a menu or listing of recordings." (*Id.*, 9:12-15 (underlining

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added).) The selection can be made "using a keypad and input on the wireless communications device," and accordingly, "<u>one or more selected music recordings may be retrieved from the storage facility **14**, for transmission</u>, via wireless communications link, to the device **12**." (*Id.*, 5:49-53 (underlining added); *see also id.*, 1:39-41 ("Using an input of the cellular telephone, a user may select one or more recordings for transmission to the cellular telephone."), 5:64-66 ("[A] wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings.").) Because a music recording is retrieved for transmission in response to a selection made from the cell phone, one of ordinary skill in the art would have understood that a request from the cell phone for that music recording was received. Rolf and Forta therefore disclose "**receiving a request from the cell phone selecting the at least one compressed digital audio and/or visual file.**"

158. While Rolf does not expressly disclose that the claimed request resulting from selection of a "recording via a menu or listing of recordings" is "**based on the visual image**" of claim 1[c], this would have been obvious in view of Forta and Gould for the reasons expressed above. The disclosures of Forta and Gould with respect to the "visual images" limitation and the rationale for combining are explained at length above, and apply equally here. One of ordinary

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skill in the art would have further understood that, if the teachings of Rolf, Forta, and Gould were combined in accordance with my discussion above, the received request would have been "based on the visual image" presented as part of a visual menu or listing. This is also the predictable result of a system employing a menu or listing where visual images are presented to facilitate selection. Rolf, Forta, and Gould therefore disclose "receiving a request from the cell phone selecting the at least one compressed digital audio and/or visual file based on the visual image," as recited by the claim.

> **6.** **"providing for the streaming transmission of an encrypted copy of at least one compressed digital audio and/or visual file to the cell phone based on the received request using orthogonal frequency-division multiplex (OFDM) modulation over a cellular data connection." (Claim 1[f])**

159. As I explained above, Rolf discloses providing for the wireless transmission of requested music files from the facility **14** to the cell phone based on the received request. (Rolf, 1:18-21, 1:25-28, 5:46-53 ("… [U]sing a keypad and input on the wireless communications device, or by voice commands, one or more selected music recordings may be retrieved from the storage facility **14**, for transmission, via wireless communications link, to the device **12**.").) Rolf further explains that the system provides for streaming transmission of music files:

> [A] music recording desired to be played on wireless communications device **12** need not be fully stored within the device **12**. In this regard,

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for example, <u>a music recording stored in central facility **14** or personal storage unit **16** may be streamed to the wireless device **12** via an established communications link</u>. In such an instance, data packets are streamed through a buffer for play by a player each of which are in a memory **26** (see FIG. 4), such that, as one data packet is played within the buffer, and then exits the buffer, an additional data packet is streamed into the buffer.

(*Id.*, 6:20-30 (underlining added).) Rolf additionally discloses that the music files are "preferably compressed and <u>encrypted</u> such that subsequent decoding involves both decompression and de-encryption." (*Id.*, 10:40-42 (underlining added); *see also, id.*, 1:35-38, 5:37-39, 8:63-9:6 (describing use of encoder **58** to "encode the music, according to any preferred encryption and/or compression algorithm . . . for transmission of the encoded recoding(s) to the wireless communications device **12**.").) Rolf therefore discloses "**providing for the streaming transmission of an encrypted copy of at least one compressed digital audio and/or visual file to the cell phone based on the received request**."

160. Rolf further teaches that such streaming transmission may be over a "**cellular data connection**." Rolf discloses the "music recording(s) is/are transmitted via a <u>wireless data communications link</u> to the cellular telephone" and that the link "is a <u>cellular communications link</u>." (Rolf, 1:33-35, 3:17-21 (underlining added to both).)

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161. While Rolf does not disclose that the streaming transmission occurs "**by orthogonal frequency-division multiplex modulation over a cellular data connection**," this would have been obvious in view of O'Hara, Tagg, and Pinard. The disclosures of O'Hara and Tagg with respect to the "orthogonal frequency-division multiplex modulation" limitation and the rationale for combining are explained at length above, and apply equally here. In addition, Pinard discloses that the OFDM transmission could occur "**over a cellular data connection**."

162. As I explained above in **Part V.B.4**, I have cited O'Hara and Tagg for the propositions that (1) prior art IEEE 802.11a wireless networking transmits digital information to mobile devices using OFDM (O'Hara) and (2) IEEE 802.11 wireless networking functionality can be incorporated into a cell phone such as the cell phone **12** of Rolf (Tagg). As further explained in **Part V.A**, Pinard teaches that an IEEE 802.11 wireless network is a cellular network. I now cite Pinard for the proposition that (3) a "cellular data connection," as recited in claim 1, can be provided based on IEEE 802.11 wireless networking technology.

163. I explained previously that the term "cellular data connection" simply refers to a data connection in a network in which wireless communications are provided through a series of "cells," each cell providing network access for a particular geographic area. The term "cellular data connection" under its broadest

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reasonable construction, therefore, is not limited to a particular type of wireless networking technology, or technology that provides the same type of wireless range as a commercial cellular carrier.

164. In this regard, I have cited **Pinard** for the simple proposition that a "cellular data connection" can be implemented based on IEEE 802.11 wireless technology. Pinard states that it "relates generally to preemptive roaming among cells in a cellular network. In particular the invention relates to a local area wireless network including a plurality of mobile units and a plurality of access points." (Pinard, 1:21-24.) More specifically, Pinard discloses a technique for improving the way in which a mobile unit selects the access point with which it will associate. (*Id.*, 2:16-22.) "Each mobile unit may select a group of eligible access points and select the most eligible access point from that group." (*Id.*, 2:45-47.) The selection may be based on the signal strength of the access points and the number of mobile units connected to each access point (the "loading factor"). (*Id.*, 2:30-50.) Pinard expressly confirms that "[t]he <u>cellular communications network</u> <u>may comprise a 1 Mbps frequency-hopping spread spectrum wireless LAN</u> <u>conforming to the IEEE 802.11 draft specification</u>." (*Id.*, 2:50-53 (underlining added).) Pinard further explains that this cellular network provides a data connection for communication. (*Id.*, 1:39-40 (describing the "<u>data</u> rates" featured

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in the draft 802.11 specification) (underlining added), 2:31-41, 4:26-35 (explaining

that the invention "provide[s] a <u>data</u> communications network") (underlining

added).)[14] Pinard therefore confirms that a cellular network, which provides a

cellular data connection, can be built from IEEE 802.11 access points.

165. As noted previously, Pinard refers to the "IEEE 802.11 <u>draft</u>

specification" because as of the filing of Pinard in 1995, IEEE 802.11 was still in

draft form. It is common for persons of ordinary skill in the art to describe

implementations using then-available "draft" standards, with the understanding

that the final standard will be used when it becomes available. Accordingly, a

person of ordinary skill in the art by June 2001 would have understood the

reference to IEEE 802.11 in Pinard to include at least the full range of IEEE 802.11

technologies available by the time the standard was published by 2001, including

IEEE 802.11a and its higher bit rates.

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[14] To the extent there is any question as to whether an IEEE 802.11**a** cellular

network provides "data connections" for communication, this is expressly

disclosed in O'Hara. (O'Hara, at pp. 143 ("Each lower data rate bit stream is used

to modulate a separate subcarrier from one of the channels in the 5 GHz band."),

144-146 (section entitled "OFDM Operating Channels and Transmit Power

Requirements").)

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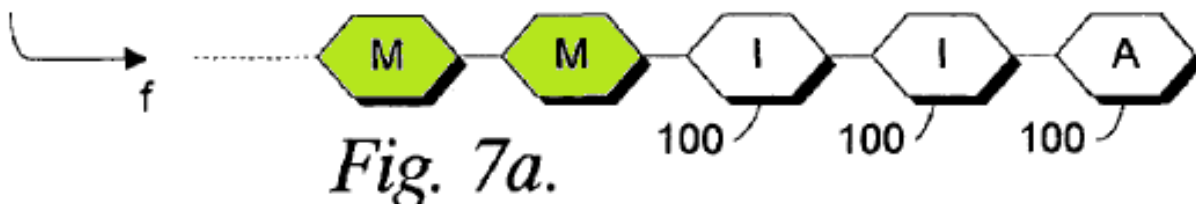U.S. Patent No. 9,124,717

166. ***Rationale and Motivation to Combine:*** It would have been obvious to a person of ordinary skill in the art to combine Rolf with O'Hara, Tagg, and Pinard, predictably resulting in the transmission of an MP3 file to the cell phone **12**, as described in Rolf, in which the MP3 file is transmitted over an IEEE 802.11a cellular data connection, thereby using OFDM modulation. As noted previously, Pinard expressly confirms that a cellular data connection can be provided using IEEE 802.11 access points. (*See also* O'Hara, at pp. 166-67 (discussing "WLAN cells" implemented using IEEE 802.11 access points).) And Tagg, as I explained for claim 1[b] above, specifically discloses the ability to incorporate IEEE 802.11 wireless networking technology into a cell phone.

167. **Part V.B.4** above sets forth the motivations for transmitting data to a cell phone by use of IEEE 802.11a networking, thus using OFDM modulation. Those motivations, including the benefits of speed and cost, apply with full force here. Moreover, a person of ordinary skill in the art would have appreciated that using multiple of 802.11a-compliant access points to provide wireless communication for a series of cells (as opposed to a single access point) would be beneficial because it would enable network access over a larger geographical area. A person of ordinary skill in the art would be motivated to build a Pinard-style 802.11 network to achieve the dual and interrelated benefits of increased speed and

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decreased cost, and by using 802.11-based cells that provide a wider geographical range, to exploit these speed and cost benefits even further and avoid the disadvantages of more traditional cellular networks. (*See* O'Hara, at p. 3 ("In a laptop equipped with an IEEE 802.11 WLAN connection, the connection to the network is available in a coworker's office, down the hall in the conference room, downstairs in the lobby, across the parking lot in another building, even across the country on another campus.").)

C. **Dependent Claim 2: "The method of claim 1, further comprising storing at least a portion of the at least one compressed digital audio and/or visual file on the cell phone."**

168. Rolf provides two independent ways for satisfying the limitation of claim 2. As discussed, Rolf discloses that a music file can be streamed to the cell phone. (Rolf, 6:20-30.) And as noted, Rolf makes clear that these music files can be compressed. (*Id.*, 1:35-38, 5:37-39, 8:63-9:3.) Rolf discloses that during streaming, the music file is transmitted to the cell phone as a series of "data packets." (*Id.*, 6:26.) This is shown in Figure 7a, reproduced below.

Fig. 7a.

(*Id.*, Fig. 7a (green highlighting added); *see also id.*, 10:7-20 (explaining that the

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packets labeled "A" and "I" "serve as a header" for the streaming transmission, and "[t]he remainder of the packets include data indicative of the music recording being transmitted, and are labeled 'M'").) The data packets of the music file being transmitted (labeled "M") are highlighted in green above. (*Id.*, 10:16-20.) Each "M" data packet corresponds to a "**portion**" of the music file being transmitted.

169. Rolf further explains that these data packets are "streamed through a buffer for play by a player each of which are in a memory **26** (see FIG. 4), such that, as one data packet is played within the buffer, and then exits the buffer, an additional data packet is streamed into the buffer." (*Id.*, 6:26-30 (underlining added).) Because each data packet corresponding to a portion of the music file to be played is "in a memory **26**" of the cell phone (*id.*, 6:28, Fig. 4), one of ordinary skill in the art would have understood that individual data packets are "**stored**," as recited in the claim, notwithstanding the fact that the music file as a whole may not be "fully stored" within the cell phone. (*Id.*, 6:22.) Rolf therefore provides one way of satisfying the step of "**storing at least a portion of the at least one compressed digital audio and/or visual file on the cell phone**."

170. Rolf also discloses that during streaming, "data indicative of a site at which the particular music recording is being [sic] played … can be ordered is transmitted and associated with a particular input" (*e.g.* keypad input) on the cell

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phone. (*Id.*, 11:48-51; *see also id.*, 10:8-11 ("[T]he first set of data packets, including one or more packets **100**, may include information pertaining to an identifier or address associated with a source of the streamed data."), 10:57-59.) "Accordingly, while listening to the music recording, an individual may activate the order key and be connected with a source for ordering that particular music recording." (*Id.*, 11:54-57.) "[U]pon activation of the order key," a data link may be "established with the source at which the music recording is to be purchased, and the purchase may be conducted in a purely electronic fashion." (*Id.*, 11:61-65.) "For example, purchase may be made such that a complete copy of the sound recording (or its associated album) is downloaded to the memory **26** within wireless communications device **12**." (*Id.*, 12:4-7 (underlining added).) Rolf thus provides a second way of satisfying the "storing" step. Accordingly, claim 2 would have been obvious in view of the prior art.

D. Dependent Claim 3: "The method of claim 1, further comprising optimizing the digital audio and/or visual file according to an optimization scheme."

171. As explained above for claim 1, Rolf discloses compressed audio and/or visual files, such as MP3-encoded files. (Rolf, *e.g.*, 1:18-21, 1:25-28, 1:35-38, 5:32-39, 5:46-53, 8:63-9:6.) But Rolf does not appear to disclose the additional step of optimizing a file "according to an optimization scheme."

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172. In my opinion, this step provides no meaningful distinction over the prior art and is disclosed by **Hacker** [Ex. 1069]. Hacker, entitled "MP3: The Definitive Guide," is a textbook that discloses a number of techniques for maximizing the sound quality of MP3 files while maintaining acceptable levels of compression. Hacker discloses optimizing the digital audio MP3 file according to an optimization scheme, as recited in the claim, in several different ways.

173. First, Hacker confirms that the process of converting audio data into a compressed MP3 file includes optimization of the digital audio according to an optimization scheme. When creating an MP3 audio file, MP3 "provides a means of analyzing patterns in an audio stream and comparing them to models of human hearing and perception," which "preserve[s] only the data absolutely necessary to reproduce an intelligible signal." (*Id.*, at p.2.) This model is referred to as a "psychoacoustic" model, which guides the compression based on the idiosyncrasies of how human beings hear and perceive sounds. As explained in Hacker, during the MP3 encoding process:

> The frequency spread for each frame is compared to mathematical models of human psychoacoustics, which are stored in the codec as a reference table. From this model, it can be determined which frequencies need to be rendered accurately, since they'll be perceptible to humans, and which ones can be dropped or allocated fewer bits, since we wouldn't be able to hear them anyway. Why

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store data that can't be heard.

(*Id.* at p.26.)

174. This process discloses the step of "optimizing the [MP3] data file according to an optimization scheme," as recited in the claim. The process described above optimizes the audio signal based on the frequencies that are most perceptible to humans. The "optimization scheme" includes the psychoacoustic models, "which are stored in the codec as a reference table." (*Id.*)

175. As a second and separate basis for disclosing the claimed optimization, Hacker explains that creating an MP3 compressed audio file requires that the user consider the trade-off between compression performance and audio quality. (Hacker, at p.161 ("The more you throw away, the worse your files will sound and the smaller your MP3 files will be. The more you keep, the better they'll sound and the larger the resulting files will be.").) Hacker explains that "[o]nly you can decide where on this spectrum you want to sit." (*Id.*)

176. For example, the user can specify a "samplerate" that measures how many times per second the audio signal is digitally represented by the final stream. (*Id.*, at p.163.) A lower sample rate, therefore, generally means a smaller the file size but poorer audio quality. (*Id.*) For example, "[y]ou might want much smaller file sizes at the expense of fidelity when working with the spoken word—for

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encoding class lectures." (*Id.*) Hacker therefore discloses optimization according to an optimization scheme because, in compressing audio data into MP3 files, the user can decide how to balance audio quality and file size to achieve the optimum balance ("optimization scheme"). (*Id.* at p.2 ("The amount of data preserved is configurable by the person doing the compressing, so an optimal balance between file size and quality can be achieved.").)

177. This is consistent with the written description of the '717 patent, which explains that "[t]he server audio data optimization and compression element **1205**, utilizes a music compression algorithm outlined in FIG. 15, which converts common music files into compressed files in order to reduce the audio clip size for minimizing its download time, while maintaining predetermined audio quality." ('717, 23:61-66 (underlining added).) The step of compressing the audio file based on a user-selected balance between file size and audio quality entails optimization "according to an optimization scheme," as recited in the claim.

178. Third, a section entitled, "***Pre-encoding optimizations***," Hacker asks, "what can you do prior to encoding to optimize the quality of the final results?" (Hacker, at p. 161 (bold italics in original; underlining added).) Hacker provides several answers, including "any necessary equalization, de-hissing, de-popping, and de-scratching." (*Id.* at p.162.) Also, "[y]ou can cut the silent bits off the

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beginning and end of your files, add effects, alter the levels, and more." (*Id.*) Any one of these processes would disclose the claimed optimization. In specifying what optimizations to perform on the audio data, *e.g.* equalization, de-hissing, altering levels, etc., optimization is being performed according to an optimization scheme.

179. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Rolf with Hacker, with no change in their respective functions. This would have predictably resulted in the system of Rolf in which MP3 files are created for storage on the central facility **14**, with an optimization being performed as part of the process of creating the MP3 file.

180. A person of ordinary skill in the art would have found the combination of these references straightforward for a simple reason – Rolf specifically discloses that audio files can be stored in MP3 compressed format. (Rolf, 5:35-39.) A person of ordinary skill in the art would have naturally consulted Hacker to provide further details into the very MP3 compression technique that Rolf uses for storage of compressed audio files.

181. Hacker provides several express motivations to combine by explaining that the optimizations discussed above are specifically designed to achieve an optimal balance between storage efficiency and audio quality. With

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respect to the psychoacoustic models, for example, Hacker explains that it can achieve more effective compression by eliminating audio frequencies that are not human perceptible. (Hacker, at p.26 ("Why store data that can't be heard?").) Similarly, Hacker explains that a user can achieve smaller file size by reducing the MP3 encoding samplerate. (*Id.*, at p.163.) A person of ordinary skill in the art implementing the system of Rolf would have appreciated that storage space and network bandwidth are finite resources, and thus, would have been motivated to optimize the digital files according to the optimization schemes discussed above to increase storage efficiency while maintaining good audio quality.

E.   Independent Claim 4

182.   I have reproduced independent claim 4 below, and divided up the limitations using bracketed notations (e.g. "[a]," "[b]," etc.) to facilitate easier identification of the limitations in my analysis below:

4.   A method of wirelessly delivering a compressed digital audio and/or visual file to a cell phone over a cellular network the method comprising:

[a]   storing a library of compressed digital audio and/or visual data files on one or more servers;

[b]   wherein the library includes a visual image associated with the compressed digital audio and/or visual file for selection of the compressed digital audio and/or visual file;

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[c]   providing to the cell phone over the cellular network the visual image associated with the compressed digital audio and/or visual file;

[d]   receiving a request from the cell phone selecting at least one of the compressed digital audio and/or visual file from stored on the one or more servers said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation; and

[e]   providing for the transmission of an encrypted copy of the compressed digital audio and/or visual file to the cell phone.

('717, 34:4-24 (Claim 4).) Each limitation of claim 4 is disclosed and rendered obvious by Rolf in view of Forta, Gatherer, O'Hara, Tagg, Pinard, and Gould.

183. The preamble of claim 4 recites, "**[a] method of wirelessly delivering a compressed digital audio and/or visual file to a cell phone over a cellular network**." Assuming the preamble of claim 4 provides a claim limitation, it is fully disclosed by Rolf for the reasons discussed above for the preamble of claim 1. The only difference between the preambles of claims 1 and 4 is that claim recites "delivering at least one compressed digital audio and/or visual file" while claim 4 recites "delivering a compressed digital audio and/or visual file." This

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difference is not material. Because Rolf discloses *at least one* file, it necessarily

discloses delivering *a* file.

1. "storing a library of compressed digital audio and/or visual data files on one or more servers" (Claim 4[a])

184. As I explained in more detail in my discussion of claim 1[**b**] above,

which applies here, Rolf discloses "**storing . . . compressed digital audio and/or**

visual data files on one or more servers."[15] As discussed above, Rolf discloses

that the compressed digital audio and/or visual files are cataloged and stored in a

database. (Rolf, 5:30-39 ("The remote storage facility may, for example, be at an

address on the world wide web, and includes a data base having a plurality of

music recordings therein. Preferably, the music recordings are categorized by a

plurality of selectable fields . . . ."); *see also id.*, 9:4-6.) Figure 5 clearly shows

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[15] I note that the preamble of claim 4 recites "compressed digital audio and/or

visual file," while limitation 4[**a**] instead recites "compressed digital audio and/or

visual <u>data</u> file<u>s</u>." (Underlining added to show differences.) Limitations 4[**b**]-[**e**]

also use the same term as the preamble. In my opinion, there is no substantive

distinction between a "file" and "data files" in the context of the '717 specification

or the BRI of claim 4. Therefore, for purposes of my present analysis, I will treat

them as interchangeable.

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that the database is part of facility **14**. (*Id.*, Fig. 5, 5:1-2; 8:54-9:18.) As explained

above, the database memory **52** is one of the components of facility **14**, which Rolf

teaches is a server. (Rolf, 3:10-16 ("server address" associated with facility),

12:51-55.) Therefore, one of ordinary skill in the art would have understood and,

further found it obvious, that the database containing the compressed digital audio

and/or visual files would be a part of one or more servers.

185. Rolf also discloses a "**library of compressed digital audio and/or**

visual data files," as claimed. As I noted above, Rolf discloses storing and

cataloging a collection of compressed music recordings in a database. (Rolf, 5:30-

39 ("The remote storage facility . . . <u>includes a data base having a plurality of</u>

<u>music recordings therein</u>. Preferably, the music recordings are categorized by a

plurality of selectable fields, such as "title", "artist", "album or CD type",

"recording label", etc. Additionally, <u>the music recordings are preferably encoded in</u>

<u>an encoded format, such as MP3 (Mpeg-1 Audio layer 3)</u>." (underlining added);

see also id., 9:1-2 (identifying MP3 as a compression algorithm).) One of ordinary

skill in the art would therefore have understood that Rolf discloses a library as

claimed. (Random House Webster's College Dictionary (1999), Ex. 1062, at p.

764 ("**library** [:] **1. a.** a place, as a building or set of rooms, containing books,

recordings, or other reading, viewing, or listening materials arranged and cataloged

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in a fixed way. … **3.** any set of items resembling a library in appearance,

organization, or purpose: *a library of computer software*.").)

186. Accordingly, Rolf discloses "storing a library of compressed digital

audio and/or visual data files on one or more servers," as recited in the claim.
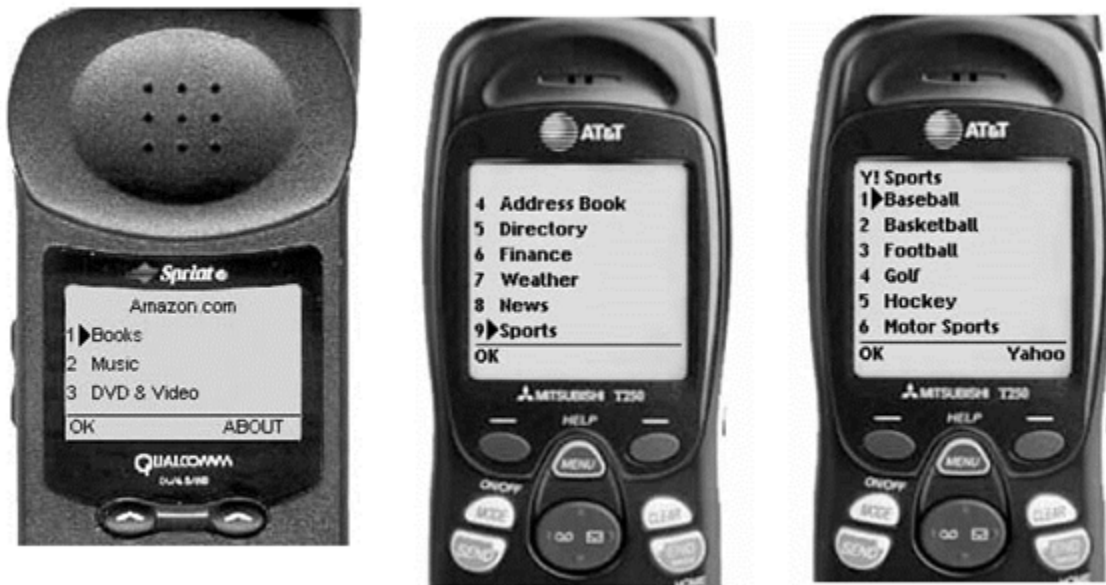
> **2.** **"wherein the library includes a visual image associated with the compressed digital audio and/or visual file for selection of the compressed digital audio and/or visual file" (Claim 4[b])**

187. As I explained in more detail in my discussion of claims 1**[a]-[b]**

above, which applies here, Rolf, Forta, and Gould disclose "**a visual image**

associated with the compressed digital audio and/or visual file for selection of

the compressed digital audio and/or visual file." As mentioned above, Rolf

discloses that a cellular phone user accessing the facility **14** components from cell

phone **12** can make a selection via a "<u>menu</u> or <u>listing</u> of recordings." (*Id.*, 9:14-15

(underlining added).) Rolf discloses that the music recordings can be selected for

download using the keypad and input on the cell phone **12**. (*Id.*, 5:49-53; *see also*

id. 1:39-41, 5:64-66, 9:10-15.) As also described above, one of ordinary skill in the

art would have understood and found it obvious that the Web server in facility **14**

(*id.*, 3:11, 12:54) would present this menu or listing of recordings as part of a

website where selection is made using the "keypad and input" of the cell phone

(*e.g.* as opposed to "voice commands"). (*Id.*, 5:49-50; *see also id.*, 1:39-41.) Rolf

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therefore discloses a menu or listing of recordings "**for selection of the compressed digital audio and/or visual file**."

188. As discussed above, while Rolf does not expressly disclose "**a visual image associated with the compressed digital audio and/or visual file**," this would have been obvious in view of Forta and Gould. As I explained at length with respect to claim 1**[a]** above, Forta describes a technique known as "WAP" for providing websites to cell phones. Forta discloses that these websites can have a visually displayed interface that presents a menu or listing of options to the user for selection, as shown below.

(Forta, Figs. 13.3 (screen on the left), 13.5 (screens in the middle and on the right); *see also id.*, at p. 317 ("Since Sports was option 9 on the main Yahoo! page, I had to scroll down to find it. When I select option 9, I am presented with a meaningful

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menu to choose from.").) As described in further detail above, Forta discloses various techniques for providing a website to cell phones, which apply here.

189. Forta additionally discloses associating "**a visual image associated**" with WAP menu items made available on a cellular phone. (*See e.g., id.*, at p. 136; Fig. 6.5 (shown to the right).) As can be seen in figure 6.5, Forta discloses a menu with four options ("Email, "Content Se" [sic], "CustCare," and "Bookmarks"), each with an associated visual image, in this case, representing the corresponding menu option. The right-facing black triangle displayed to the right next to the number 1 in figure 6.5 indicates the currently selected menu option, "EMail." As discussed above, Forta further explains that WAP applications and webpages can include visual images. (*Id.*, at p. 128.) Forta also explains that an image itself may serve as a link that can be selected. (Forta, at p. 53 ("WML links are very similar to their HTML counterparts. The text (or <u>image</u>) to be linked is enclosed within <a> and tags, and the browsers uses some indicator (usually underlining) to indicate that it can be selected." (underlining added)).)

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190. As discussed above, Forta describes the WML code used to include an image to any WAP website or application. (*Id.*, at pp. 129-30.) One of ordinary skill would have understood and found it obvious that, when included on the file selection website taught in Rolf and elsewhere in Forta, the visual image display techniques taught in Forta could associate a visual image with an audio and/or visual file and used for selection of the audio and/or visual file.

191. As I discussed above for claim 1**[c]**, while Forta makes clear that it would have been obvious to a person of ordinary skill in the art to associate visual images with the audio and/or visual files, **<u>Gould</u>** provides additional disclosures confirming the applicability of such a practice to the music-recording-based system of Rolf. In particular, Gould discloses an interface in which information about a music recording, including album cover graphics, are displayed to a user, along with buttons for the user to initiate playback of a sample of the recording and to purchase the recording. (Gould, 5:53-60, Fig. 4; *see also id.*, 5:4-47.)

192. As discussed above in claim 4**[a]**, Rolf discloses the "library," which stores and catalogs music recordings. Because Gould teaches that music recordings have associated album cover graphics, Rolf and Gould disclose that the "library" "includes a visual image," as claimed. It would have been obvious in

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view of Forta that visual images can be stored with the library of music recordings

in the "remote storage facility" of Rolf. (Rolf, 5:32-39; *see also id.*, 9:4-6.)

193. Accordingly, Rolf, Forta, and Gould disclose "wherein the library

includes a visual image associated with the compressed digital audio and/or visual

file for selection of the compressed digital audio and/or visual file," recited in the

claim. The rational and motivation for combining and citing Rolf, Forta, and Gould

is provided in my analysis of claims 1**[a]** and 1**[c]** above.

> **3.   "providing to the cell phone over the cellular network the
> visual image associated with the compressed digital audio
> and/or visual file" (Claim 4[c])**

194. As described in greater detail immediately above and in my analysis

of limitations 1**[a]-[b]** above, which applies here, Rolf, Forta, and Gould disclose

and render obvious the "**visual image associated with the compressed digital

audio and/or visual file**."

195. Rolf and Forta also disclose "**providing to the cell phone over the

cellular network**" the claimed visual image. As I described at length in my

analysis of the preamble of claim 1 and limitation 1**[a]** above, which applies here,

Rolf describes a "method for wirelessly transmitting encoded music via a wireless

communications link, to a portable or mobile communications device which

includes a player for playing the music or audio." (Rolf, 1:18-21.) Rolf explains

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that the communications device can be a "cellular telephone." (*Id.*, 1:27-28.) "[A]

user of the cellular telephone (for example) may use the telephone to establish a

wireless communications link …, and then wirelessly download one or more

selected music recordings for storage in a memory of the cellular telephone. In

particular, the selected music recording(s) is/are transmitted via a wireless data

communications link to the cellular telephone." (*Id.*, 1:28-35.)

196. Rolf further explains that "the wireless communications link

established between the wireless communications device and the central facility is

a <u>cellular communications link</u> and, more particularly, is an Internet link." (Rolf,

3:17-21 (emphasis added).) One of ordinary skill in the art would have understood

that Rolf's disclosure of the above-referenced cellular phones and cellular

communication links discloses providing data "**over the cellular network**."

197. As discussed above, while Rolf does not

expressly disclose "**<u>the visual image</u> associated with**

the compressed digital audio and/or visual file," this

would have been obvious in view of Forta and Gould for

the reasons I give in my analysis of limitations 1**[a]**-**[c]**

above. Forta additionally discloses associating "**a visual**

image associated" with WAP menu items made

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available on a cellular phone. (*See e.g., id.*, at p. 136; Fig. 6.5 (shown to the right).) As discussed above, Forta further explains that WAP applications and webpages can include visual images. (*Id.*, at p. 128.)

198. As discussed above, Forta explains that the WML code for image display has both a "src" and a "localsrc" attribute to specify the location of a WBMP image to display:

> The actual WML code to use images is simple, straightforward, and nearly identical to HTML:

(*Id.*, at p. 129 (underlining added).) The "src" attribute is "required" and specifies the uniform resource identifier (URI), which can include a uniform resource locator (URL), for the visual image to be displayed on the WAP application. (*Id.*, at p. 130.) The "localsrc" attribute is "optional" and represents the URI of a locally stored image to be displayed on the WAP application, if the image identified by "src" cannot be found. (*Id.*) Figure 6.3, reproduced at the right, is an example of an image stored at a non-local URI and sent wirelessly to a cellular phone. (*Id.*, Fig. 6.3, pp. 131-32.) One of ordinary skill in the art would have

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understood that any such image with a non-local URI would necessarily be "provid[ed] to the cell phone."

199. As I discussed above for claim 1**[c]**, while Forta makes clear that it would have been obvious to a person of ordinary skill in the art to associate visual images with the audio and/or visual files, **<u>Gould</u>** provides additional disclosures confirming the applicability of such a practice to the music-recording-based system of Rolf. In particular, Gould discloses an interface in which information about a music recording, including album cover graphics, are displayed to a user, along with buttons for the user to initiate playback of a sample of the recording and to purchase the recording. (Gould, 5:53-60, Fig. 4; *see also id.*, 5:4-47.)

200. Accordingly, Rolf, Forta, and Gould disclose "providing to the cell phone over the cellular network the visual image associated with the compressed digital audio and/or visual file," recited in the claim.

> **4.** **"receiving a request from the cell phone selecting at least one of the compressed digital audio and/or visual file from stored on the one or more servers said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation" (Claim 4[d])**

201. In light of the length of this claim limitation, I will divide it into pieces to ensure that I cover all of its elements.

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**"receiving a request from the cell phone selecting at least one of
the compressed digital audio and/or visual file from stored on the
one or more servers"[16]**

202.   As described in greater detail in my analysis of limitation 1**[e]** above,

which applies here, Rolf discloses "**receiving a request from the cell phone**

selecting at least one of the compressed digital audio and/or visual file." As I

explained above, Rolf discloses a facility **14** that provides plurality of compressed

digital audio and/or visual files. Rolf discloses "providing a menu driven system to

wireless communications device **12**, such that the wireless communications device

12 can be utilized to select [a] recording via a menu or listing of recordings." (*Id.*,

9:12-15 (underlining added).) The selection can be made "using a keypad and

input on the wireless communications device," and accordingly, "one or more

selected music recordings may be retrieved from the storage facility **14**, for

transmission, via wireless communications link, to the device **12**." (*Id.*, 5:49-53

(underlining added); *see also id*., 1:39-41 ("Using an input of the cellular

telephone, a user may select one or more recordings for transmission to the cellular

---

[16] I note that this limitation appears to include an extraneous word that appears to

have been a drafting error: "receiving a request from the cell phone selecting at

least one of the compressed digital audio and/or visual file from stored on the one

or more servers." (Underlining to show the extraneous word.)

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telephone."), 5:64-66 ("[A] wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings.").) Because a music recording is retrieved for transmission in response to a selection made from the cell phone, one of ordinary skill in the art would have understood that a request from the cell phone for that music recording was received.

203. As described in greater detail in my analysis of limitation 1**[b]** and limitation 4**[a]** above, which applies here, Rolf also discloses that the audio and/or visual files are "**stored on the one or more servers**." As I discussed above, Rolf discloses that the compressed digital audio and/or visual files are stored in a database. (Rolf, 5:30-39 ("The remote storage facility may, for example, be at an address on the world wide web, and includes a data base having a plurality of music recordings therein."); *see also id.*, 9:4-6.) Figure 5 clearly shows that the database is part of facility **14**. (*Id.*, Fig. 5, 5:1-2, 8:54-9:18.) As explained above, the database memory **52** is one of the components of facility **14**, which Rolf teaches is a server. (Rolf, 3:10-16 ("server address" associated with facility), 12:51-55.) Therefore, one of ordinary skill in the art would have understood and, further found it obvious, that the database containing the compressed digital audio and/or visual files would be a part of one or more servers.

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"said cell phone having a digital signal processor"

204. This limitation is substantially the same as the textually identical limitation in claim 1 (*compare* '717, 33:16-17 *with* 34:17-18). As such, the prior art discloses this limitation for the same reasons given in my corresponding analysis of limitation 1**[d]** above (under identical sub-heading).

"said cell phone having a . . . receiver"

205. This limitation is substantially the same as the textually identical limitation in claim 1 (*compare* '717, 33:16-17 *with* 34:17-18). As such, the prior art discloses this limitation for the same reasons given in my corresponding analysis of limitation 1**[d]** above (under identical sub-heading).

"for receiving and processing compressed digital audio and/or visual files transmitted using orthogonal frequency-division multiplex (OFDM) modulation"

206. This limitation is substantially the same as the textually identical limitation in claim 1 (*compare* '717, 33:17-20 *with* 34:18-21). As such, the prior art discloses this limitation for the same reasons given in my corresponding analysis of limitation 1**[d]** above (under identical sub-heading).

207. Accordingly, the prior art satisfies the limitation "receiving a request from the cell phone selecting at least one of the compressed digital audio and/or visual file from stored on the one or more servers said cell phone having a digital signal processor and a receiver for receiving and processing compressed digital

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audio and/or visual files transmitted using orthogonal frequency-division multiplex

(OFDM) modulation," as recited in the claim.

> **5.** **"providing for the transmission of an encrypted copy of the compressed digital audio and/or visual file to the cell phone" (Claim 4[e])**

208. As I explained above, Rolf discloses providing for the transmission of

requested music files from the facility **14** to the cell phone. (Rolf, 1:18-21, 1:25-

28, 5:46-53 ("… [U]sing a keypad and input on the wireless communications

device, or by voice commands, one or more selected music recordings may be

retrieved from the storage facility **14**, for transmission, via wireless

communications link, to the device **12**.").) Rolf additionally discloses that the

music files are "preferably compressed and encrypted." (*Id.*, 10:40-42 (underlining

added); *see also, id.*, 1:35-38, 5:37-39, 8:63-9:6 (describing use of encoder **58** to

"encode the music, according to any preferred encryption and/or compression

algorithm . . . for transmission of the encoded recording(s) to the wireless

communications device **12**.") (underlining added).) Rolf therefore discloses this

limitation.

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F. **Dependent Claim 5: "The method of claim 4, further comprising storing at least a portion of the compressed digital audio and/or visual file on the cell phone."**

209. Dependent claim 5 is substantially similar, for purposes of my Declaration, to claim 2. A side-by-side listing of claims 2 and 5 is shown in the table below (with common or overlapping language shown in underlining):

Dependent Claim 5	Dependent Claim 2
5. The method of claim 4, further comprising storing at least a portion of the compressed digital audio and/or visual file on the cell phone.	2. The method of claim 1, further comprising storing at least a portion of the at least one compressed digital audio and/or visual file on the cell phone.

210. As shown, there is no material difference between claims 2 and 5 (other than claim dependency) that could be used to distinguish claim 5 from the prior art. For the same reasons as for claim 2, therefore, claim 5 would have been obvious in view of the prior art.

G. **Dependent Claim 6: "The method of claim 4, further comprising optimizing the digital audio and/or visual file according to an optimization scheme."**

211. Dependent claim 6 is substantially similar, for purposes of my Declaration, to claim 3. A side-by-side listing of claims 3 and 6 is shown in the table below (with common or overlapping language shown in underlining):

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Dependent Claim 6	Dependent Claim 3
6. The method of claim 4, further comprising optimizing the digital audio and/or visual file according to an optimization scheme.	3. The method of claim 1, further comprising optimizing the digital audio and/or visual file according to an optimization scheme.

212. As shown, there is no material difference between claims 3 and 6 (other than claim dependency) that could be used to distinguish claim 6 from the prior art. For the same reasons as for claim 3, therefore, claim 6 would have been obvious in view of the prior art.

VI. ENABLEMENT OF THE PRIOR ART

213. I am informed that in an *inter partes* review, the petitioning party does not have a burden to show that the prior art is enabling. Nevertheless, in my opinion, the Rolf, Forta, O'Hara, Tagg, Pinard, Gatherer, Gould, and Hacker references provide sufficient detail to enable a person of ordinary skill in the art to practice the limitations of the claims to which they apply without undue experimentation. To begin with, I am informed that, for purposes of assessing the prior art, the disclosures in issued U.S. patents (such as Rolf, Tagg, Pinard, and Gould) are presumed enabling, and that this presumption extends to claimed and unclaimed material.

214. Nevertheless, the disclosures in these references are enabling regardless of whether they are issued patents. As I have explained in **Part III**

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above, the technological underpinnings of the challenged '717 patent claims were

firmly in place well before June 2001. Cell phones with digital signal processors

were well-known and in use by millions of users. (Gatherer, Ex. 1005, at p. 89.)

The '717 patent itself acknowledges that "[t]he cellular telephone **202** may be any

commercially available cellular phone." ('717, 14:34-35.) As I discussed above,

commercially available cell phones were also capable of accessing the Internet and

displaying web content. In fact, by June 2001 there existed industry standards for

providing websites to cell phones (e.g., WAP), and well-known companies such as

Amazon and Yahoo! were specifically designing their websites to be accessible to

cell phones. (Forta, Ex. 1004, at pp. 314-18.)

215. Orthogonal frequency-division multiplexing (OFDM) was also a well-

known transmission technology. (*See* **Part III.E**.) As I explained in **Part III.E**

above, the use of OFDM in cellular systems was well known years before the '717

patent. Indeed, as I noted, telecom heavyweights such as Ericsson and Nokia were

developing technologies and systems for using OFDM in cellular networks prior to

June 2001.

216. Rolf, Forta, O'Hara, Tagg, Pinard, Gatherer, Gould, and Hacker all

pre-date the '717 patent, and those references themselves treat cell phones, digital

signal processors, websites, and OFDM as firmly in the prior art. As I explained

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above, a person of ordinary skill in the art would have been motivated to combine their teachings and could have done so, due to the maturity of those technologies.

217. As I discussed above, the ability to add media selection, download, and playback (including streaming) to commercially available cell phones was also known. This is confirmed by Rolf, which predates the earliest possible priority date of the '717 patent by more than six months and claims priority to the Rolf Provisional, which in turn predates the '717 by more than a year and a half. Rolf describes in detail a system enabling a cell phone user to wirelessly select, download, and play music, using standard equipment. (E.g., Rolf, Abstract, 1:25-42.) In my opinion, the system described in Rolf could have been implemented using well-known hardware, networking, and software techniques familiar to persons of ordinary skill in the art.

218. In short, by June 2001, each aspect of the disclosures that I have cited from Rolf, Forta, O'Hara, Tagg, Pinard, Gatherer, Gould, and Hacker was already well-known and was the subject of extensive public documentation. A person of ordinary skill in the art would not have required disclosures any more detailed than the disclosures in the prior art to apply the prior art teachings in the manner described in this Declaration.

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VII. CONCLUSION

219. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in this proceeding. If required, I will appear for cross-examination at the appropriate time. I reserve the right to offer opinions relevant to the invalidity of the '717 patent claims at issue and/or offer testimony in support of this Declaration.

220. I hereby declare 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 18 U.S.C. § 1001.

Dated: January 15, 2017   Respectfully submitted,
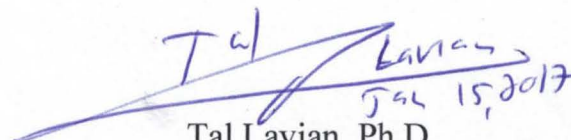
Tal Lavian, Ph.D.
Sunnyvale, California

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EXHIBIT A

Tal Lavian, Ph.D.

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http://cs.berkeley.edu/~tlavian
tlavian@telecommnet.com

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Sunnyvale, CA 94087
(408)-209-9112

Research and Consulting:Telecommunications,Network Communications, and Mobile Wireless Technologies

Scientist, educator, and technologist with over 25years of experience; co-author on over 25 scientific publications, journal articles, and peer-reviewed papers; named inventor on over 100 issued and filed patents; industry fellow and lecturer at UC Berkeley Engineering–Center for Entrepreneurship and Technology (CET)

EDUCATION

- **Ph.D.**, Computer Science specializing in networking and communications, UC Berkeley
- **M.Sc.**, Electrical Engineering, Tel Aviv University
- **B.Sc.**, Mathematics and Computer Science, Tel Aviv University

EXPERTISE

Network communications, telecommunications, Internet protocols, and mobile wireless:
- **Communication networks:** Internet protocols; TCP/IP suite; TCP; UDP; IP; VoIP; Ethernet; network protocols; network software applications; data link, network, and transport layers (L2, L3, L4)
- **Internet software:** Internet software applications; distributed computing; cloud computing; Web applications; FTP; HTTP; Java; client server; file transfer; multicast; streaming media
- **Routing/switching:** LAN; WAN; VPN; routing protocols; RIP; BGP; MPLS; OSPF; IS-IS; DNS; QoS; switching; packet switching; network infrastructure; network communication architectures
- **Mobile wireless:** wireless LAN; 802.11; cellular systems; mobile devices; smartphone technologies

ACCOMPLISHMENTS

- Selected as principal investigator for three US Department of Defense (DARPA) projects
- Directed research project on networking computation for the US Air Force Research Lab (AFRL)
- Led and developed the first network resourcescheduling service for grid computing
- Administered wireless research project for an undisclosed US federal agency
- Managed and engineered the first demonstrated transatlantic dynamic allocation of 10Gbs Lambdas as a grid service
- Spearheaded the development of the first demonstrated wire-speed active network on commercial hardware
- Invented over 100 patents; over 50 prosecuted *pro se* in front of the USPTO
- Created and chaired Nortel Networks' EDN Patent Committee

PROFESSIONAL EXPERIENCE

University of California, Berkeley, Berkeley, California   2000-Present
Berkeley Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, Nortel's Scientist Liaison
Some positions and projects were concurrent, others sequential

- Serves as an industry fellow and lecturer at the Center for Entrepreneurship and Technology (CET).
- Studied network services, telecommunication systems and software, communications infrastructure, and data centers
- Developed long-term technology for the enterprise market, integrating communication and computing technologies
- Conducted research projects in data centers (RAD Labs), telecommunication infrastructure (SAHARA), and wireless systems (ICEBERG)
- Acted as scientific liaison between Nortel Research Lab and UC Berkeley, providing tangible value in advanced technologies
- Earned a Ph.D. in Computer Science with a specialization in communications and networking

TelecommNet Consulting, Inc.(Innovations-IP) Sunnyvale, California   2006-Present
Principal Scientist

- Consults in the areas of network communications, telecommunications, Internet protocols, and smartphone mobile wireless devices
- Provides architecture and system consultation for projects relating to computer networks, mobile wireless devices, and Internet web technologies
- Acts as an expert witness in network communications patent infringement lawsuits

VisuMenu, Inc., Sunnyvale, California   2010-Present
Co- Founder and Chief Technology Officer (CTO)

- Designs and develops architecture and system of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications
- Designs crawler/spider system for IVR / PBX using Asterisk, SIP, and VoIP
- Deploys the system as cloud networking and cloud computing utilizing Amazon Web Services

Ixia, Santa Clara, California   2008 - 2008
Communications Consultant

- Researched and developed advanced network communications testing technologies:
  • IxNetwork/IxN2X — tested IP routing and switching devices and broadband access equipment. Provided traffic generation and emulation for the full range of protocols: routing, MPLS, layer 2/3 VPNs, carrier Ethernet, broadband access, and data center bridging
  • IxLoad — quickly and accurately modeled high-volume video, data, and voice subscribers and servers to test real-world performance of multiservice delivery and security platforms
  • IxCatapult — emulated a broad range of wireless access and core protocols to test wireless components and systems that, when combined with IxLoad, provides an end-to-end solution for testing wireless service quality
  • IxVeriWave — employed a client-centric model to test Wi-Fi and wireless LAN networks by generating repeatable large-scale, real-world test scenarios that are virtually impossible to create by any other means

- Test automation — provided simple, comprehensive lab automation to help test engineering teams create, organize, catalog, and schedule execution of tests

Nortel Networks, Santa Clara, California   1996 - 2007
Originally employed by Bay Networks, which was acquired by Nortel Networks
Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer

- Held scientific and research roles at Nortel Labs, Bay Architecture Labs, and in the office of the CTO

Principal Investigator for US Department of Defense (DARPA) Projects
- Conceived, proposed, and completed three research projects: active networks, DWDM-RAM, and a networking computation project for Air Force Research Lab (AFRL)
- Led a wireless research project for an undisclosed US federal agency

Academic and Industrial Researcher
- Analyzed new technologies to reduce risks associated with R&D investment
- Spearheaded research collaboration with leading universities and professors at UC Berkeley, Northwestern University, University of Amsterdam, and University of Technology, Sydney
- Evaluated competitive products relative to Nortel's products and technology
- Proactively identified prospective business ideas, which led to new networking products
- Predicted technological trends through researching the technological horizon and academic sphere
- Designed software for switches, routers, and network communications devices
- Developed systems and architectures for switches, routers, and network management
- Researched and developed the following projects:
  - Data-Center Communications: network and server orchestration   2006-2007
  - DRAC: SOA-facilitated L1/L2/L3 network dynamic controller   2003-2007
  - Omega: classified wireless project for undisclosed US Federal Agency   2006-2006
  - Open platform: project for the US Air Force Research Laboratory (AFRL) 2005-2005
  - Network resource orchestration for Web services workflows   2004-2005
  - Proxy study between Web/grids services and network services   2004-2004
  - Streaming content replication: real-time A/V media multicast at edge   2003-2004
  - DWDM-RAM: US DARPA-funded program on agile optical transport   2003-2004
  - Packet capturing and forwarding service on IP and Ethernet traffic   2002-2003
  - CO2: content-aware agile networking   2001-2003
  - Active networks: US DARPA-funded research program   1999-2002
  - ORE: programmable network service platform   1998-2002
  - JVM platform: Java on network devices   1998-2001
  - Web-based device management: network device management   1996-1997

Technology Innovator and Patent Leader
- Created and chaired Nortel Networks' EDN Patent Committee
- Facilitated continuous stream of innovative ideas and their conversion into intellectual property rights
- Developed intellectual property assets through invention and analysis of existing technology portfolios

Aptel Communications, Netanya, Israel   1994-1995
Software Engineer, Team Leader
Start-up company focused on mobile wireless CDMA spread spectrum PCN/PCS
- Developed a mobile wireless device using an unlicensed band [Direct Sequence Spread Spectrum (DSSS)]
- Designed and managed a personal communication network (PCN) and personal communication system (PCS), which are the precursors of short text messages (SMS)
- Designed and developed network communications software products (mainly in C/C++)
- Brought a two-way paging product from concept to development

Scitex Ltd.,Herzeliya, Israel   1990-1993
Software Engineer, Team Leader
Software and hardware company acquired by Hewlett Packard (HP)
- Developed system and network communications (mainly in C/C++)
- Invented Parallel SIMD Architecture
- Participated in the Technology Innovation group

Shalev, Ramat-HaSharon, Israel   1987-1990
Start-up company
Software Engineer
- Developed real-time software and algorithms (mainly in C/C++ and Pascal)

PROFESSIONAL ASSOCIATIONS
- IEEE senior member
- IEEE CNSV co-chair, Intellectual Property SIG (2013)
- President Next Step Toastmasters (an advanced TM club in the Silicon Valley) (2013-2014)
- Technical co-chair, IEEE Hot Interconnects 2005 at Stanford University
- Member, IEEE Communications Society (COMMSOC)
- Member, IEEE Computer Society
- Member, IEEE Systems, Man, and Cybernetics Society
- Member, IEEE-USA Intellectual Property Committee
- Member, ACM, ACM Special Interest Group on Data Communication (SIGCOM)
- Member, ACM Special Interest Group on Hypertext, Hypermedia, and Web (SIGWEB)
- Member, IEEE Consultants' Network (CNSV)
- Global Member, Internet Society (ISOC)
- President Java Users Group – Silicon Valley Mountain View, CA,1999-2000
- Toastmasters International

ADVISORY BOARDS
- Quixey –search engine for wireless mobile apps
- Mytopia – mobile social games
- iLeverage – Israeli Innovations

PROFESSIONAL AWARDS
- Top Talent Award – Nortel
- Top Inventors Award – Nortel EDN
- Certified IEEE-WCET - Wireless Communications Engineering Technologies
- Toastmasters International - Competent Communicator (twice)
- Toastmasters International - Advanced Communicator Bronze

Patents and Publications

(Not an exhaustive list)
Patents Issued

US 9,184,989	Grid proxy architecture for network resources	Link
US 9,083,728	Systems and methods to support sharing and exchanging in a network	Link
US 9,021,130	Photonic line sharing for high-speed routers	Link
US 9,001,819	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,949,846	Time-value curves to provide dynamic QoS for time sensitive file transfers	Link
US 8,929,517	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,903,073	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,898,274	Grid proxy architecture for network resources	Link
US 8,880,120	Device and method for providing enhanced telephony	Link
US 8,879,703	System method and device for providing tailored services when call is on-hold	Link
US 8,879,698	Device and method for providing enhanced telephony	Link
US 8,867,708	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,787,536	Systems and methods for communicating with an interactive voice response system	Link
US 8,782,230	Method and apparatus for using a command design pattern to access and configure network elements	Link
US 8,762,963	Translation of programming code	Link
US 8,762,962	Methods and apparatus for automatic translation of a computer program language code	Link
US 8,745,573	Platform-independent application development framework	Link
US 8,731,148	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,688,796	Rating system for determining whether to accept or reject objection raised by user in social network	Link
US 8,619,793	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 8,572,303	Portable universal communication device	Link
US 8,553,859	Device and method for providing enhanced telephony	Link

US 8,548,131	Systems and methods for communicating with an interactive voice response system	Link
US 8,537,989	Device and method for providing enhanced telephony	Link
US 8,341,257	Grid proxy architecture for network resources	Link
US 8,161,139	Method and apparatus for intelligent management of a network element	Link
US 8,146,090	Time-value curves to provide dynamic QoS for time sensitive file transfer	Link
US 8,078,708	Grid proxy architecture for network resources	Link
US 7,944,827	Content-aware dynamic network resource allocation	Link
US 7,860,999	Distributed computation in network devices	Link
US 7,734,748	Method and apparatus for intelligent management of a network element	Link
US 7,710,871	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 7,580,349	Content-aware dynamic network resource allocation	Link
US 7,433,941	Method and apparatus for accessing network information on a network device	Link
US 7,359,993	Method and apparatus for interfacing external resources with a network element	Link
US 7,313,608	Method and apparatus for using documents written in a markup language to access and configure network elements	Link
US 7,260,621	Object-oriented network management interface	Link
US 7,237,012	Method and apparatus for classifying Java remote method invocation transport traffic	Link
US 7,127,526	Method and apparatus for dynamically loading and managing software services on a network device	Link
US 7,047,536	Method and apparatus for classifying remote procedure call transport traffic	Link
US 7,039,724	Programmable command-line interface API for managing operation of a network device	Link
US 6,976,054	Method and system for accessing low-level resources in a network device	Link
US 6,970,943	Routing architecture including a compute plane configured for high-speed processing of packets to provide application layer support	Link
US 6,950,932	Security association mediator for Java-enabled devices	Link
US 6,850,989	Method and apparatus for automatically configuring a network switch	Link

US 6,845,397	Interface method and system for accessing inner layers of a network protocol	Link
US 6,842,781	Download and processing of a network management application on a network device	Link
US 6,772,205	Executing applications on a target network device using a proxy network device	Link
US 6,564,325	Method of and apparatus for providing multi-level security access to system	Link
US 6,175,868	Method and apparatus for automatically configuring a network switch	Link
US 6,170,015	Network apparatus with Java co-processor	Link
US 8,687,777	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,681,951	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,625,756	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,594,280	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,548,135	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,406,388	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,345,835	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,223,931	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,160,215	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,155,280	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,054,952	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,000,454	Systems and methods for visual presentation and selection of IVR menu	Link
EP 1,905,211	Technique for authenticating network users	Link
EP 1,142,213	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
EP 1,671,460	Method and apparatus for scheduling resources on a switched underlay network	Link
CA 2,358,525	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link

Patent Applications Published and Pending
(Not an exhaustive list)

US 20150058490	Grid Proxy Architecture for Network Resources	Link
US 20150010136	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20140379784	Method and Apparatus for Using a Command Design Pattern to Access and Configure Network Elements	Link
US 20140105025	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140105012	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140012991	Grid Proxy Architecture for Network Resources	Link
US 20130080898	Systems and Methods for Electronic Communications	Link
US 20130022191	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20130022183	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20130022181	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20120180059	Time-Value Curves to Provide Dynamic QOS for Time Sensitive File Transfers	Link
US 20120063574	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20110225330	Portable Universal Communication Device	Link
US 20100220616	Optimizing Network Connections	Link
US 20100217854	Method and Apparatus for Intelligent Management of a Network Element	Link
US 20100146492	Translation of Programming Code	Link
US 20100146112	Efficient Communication Techniques	Link
US 20100146111	Efficient Communication in a Network	Link
US 20090313613	Methods and Apparatus for Automatic Translation of a Computer Program Language Code	Link
US 20090313004	Platform-Independent Application Development Framework	Link
US 20090279562	Content-aware dynamic network resource allocation	Link
US 20080040630	Time-Value Curves to Provide Dynamic QoS for Time Sensitive File	Link

Transfers

US 20070169171	Technique for authenticating network users	Link
US 20060123481	Method and apparatus for network immunization	Link
US 20060075042	Extensible Resource Messaging Between User Applications and Network Elements in a Communication Network	Link
US 20050083960	Method and Apparatus for Transporting Parcels of Data Using Network Elements with Network Element Storage	Link
US 20050076339	Method and Apparatus for Automated Negotiation for Resources on a Switched Underlay Network	Link
US 20050076336	Method and Apparatus for Scheduling Resources on a Switched Underlay Network	Link
US 20050076173	Method And Apparatus for Preconditioning Data to Be Transferred on a Switched Underlay Network	Link
US 20050076099	Method and Apparatus for Live Streaming Media Replication in a Communication Network	Link
US 20050074529	Method and apparatus for transporting visualization information on a switched underlay network	Link
US 20040076161	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20020021701	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
WO 2006/063052	Method and apparatus for network immunization	Link
WO 2007/008976	Technique for authenticating network users	Link
WO2000/0054460	Method and apparatus for accessing network information on a network device	Link
US 20140156556	Time-variant rating system and method thereof	Link
US 20140156758	Reliable rating system and method thereof	Link

Publications

(Not an exhaustive list)

- "R&D Models for Advanced Development & Corporate Research" Understanding Six Models of Advanced R&D - Ikhlaq Sidhu, Tal Lavian, Victoria Howell - University of California, Berkeley. Accepted paper for 2015 ASEE Annual Conference and Exposition- June 2015
- "Communications Architecture in Support of Grid Computing",Tal Lavian,Scholar's Press 2013ISBN 978-3-639-51098-0.
- "Applications Drive Secure Lightpath Creation across Heterogeneous Domains, Feature Topic Optical Control Planes for Grid Networks: Opportunities, Challenges and the Vision." Gommans L.; Van Oudenaarde B.; Dijkstra F.; De Laat C.; Lavian T.; Monga I.; Taal A.; Travostino F.; Wan A.; IEEE Communications Magazine, vol. 44, no. 3, March 2006, pp. 100-106.
- *Lambda Data Grid: Communications Architecture in Support of Grid Computing*. Tal I. Lavian, Randy H. Katz; Doctoral Thesis, University of California at Berkeley. January 2006.
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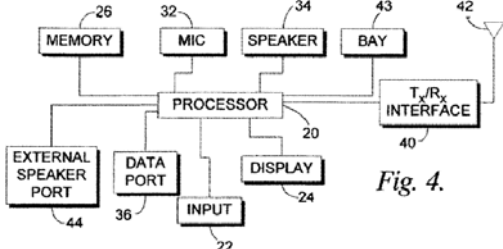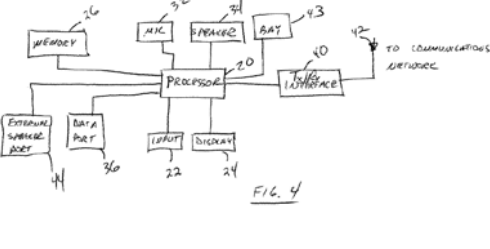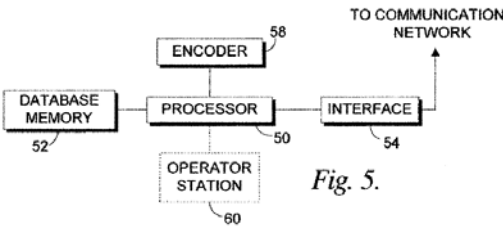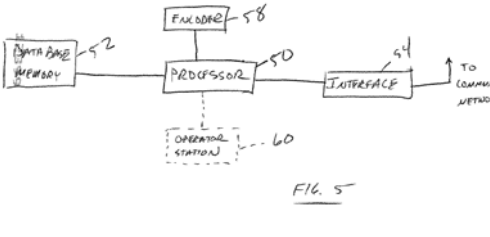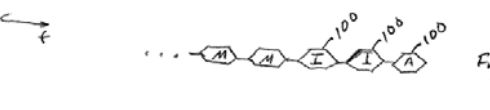
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- Abundant Bandwidth and how it affects us?
- Active Content Networking(ACN)
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- Application-engaged Dynamic Orchestration of Optical Network Resources
- A Platform for Data Intensive Services Enabled by Next Generation Dynamic Optical Networks
- Optical Networks
- Grid Optical Network Service Architecture for Data Intensive Applications
- Optical Networking & DWDM
- OptiCal Inc.
- OptiCal & LUMOS Networks
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- Active Nets Technology Transfer through High-Performance Network Devices
- Programmable Network Node: Applications
- Open Innovation via Java-enabled Network Devices
- Practical Considerations for Deploying a Java Active Networking Platform
- Open Java-Based Intelligent Agent Architecture for Adaptive Networking Devices

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- Active Networking On A Programmable Networking Platform
- Open Networking through Programmability
- Open Programmable Architecture for Java-enabled Network Devices
- Integrating Active Networking and Commercial-Grade Routing Platforms
- Programmable Network Devices
- To be smart or not to be?

EXHIBIT B

Cite	Rolf	Rolf Provisional
Fig. 1		
Fig. 4		
Fig. 5		
Fig. 7a		
1:17-21	"The present invention is generally directed to a system and method for wirelessly transmitting encoded music, via a wireless communications link, to a portable or mobile communications device which includes a player for playing the music or audio."	"The present invention is generally directed to a system and method for wirelessly transmitting encoded music, via a wireless communications link, to a portable or mobile communications device which includes a player for playing the music or audio." P. 1
1:25-38	"In one embodiment, the present invention is a system for transmitting encoded music from a remote, central facility to a wireless communications device, such as a cellular telephone or personal	"In one embodiment, the present invention is a system for transmitting encoded music from a remote, central facility to a wireless communications device, such as a cellular telephone or personal

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	digital assistant. In particular, a user of the cellular telephone (for example) may use the telephone to establish a wireless communications link with the remote, central facility, and then wirelessly download one or more selected music recordings for storage in a memory of the cellular telephone. In particular, the selected music recording(s) is/are transmitted via a wireless data communications link to the cellular telephone. Preferably, the music recordings are encoded and transmitted in packets, and may particularly be encoded by a compression algorithm into an encoded (such as MP3 or other) format."	digital assistant. In particular, a user of the cellular telephone (for example) may use the telephone to establish a wireless communications link with the remote, central facility, and then wirelessly download one or more selected music recordings for storage in a memory of the cellular telephone. In particular, the selected music recording(s) is/are transmitted via a wireless data communications link to the cellular telephone. Preferably, the music recordings are encoded and transmitted in packets, and may particularly be encoded by a compression algorithm into an encoded (such as MP3 or other) format." P. 1
1:39-42	"Using an input of the cellular telephone, a user may select one or more recordings for transmission to the cellular telephone. The selected music recordings, upon receipt by the cellular telephone, are stored in a memory."	"Using an input of the cellular telephone, a user may select one or more recordings for transmission to the cellular telephone. The selected music recordings, upon receipt by the cellular telephone, are stored in a memory." P. 1
1:64-67	"Additionally, the wireless communications device is preferably a cellular communications device and, in particular, is a cellular voice communications device, such as a cellular telephone."	"Additionally, the wireless communications device is preferably a cellular communications device and, in particular, is a cellular voice communications device, such as a cellular telephone." P. 2
2:1-6	"In accordance with yet an additional aspect of the present invention, the wireless	"In accordance with yet an additional aspect of the present invention, the wireless

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	communications device of the present invention (whether it be handheld or installed within a vehicle) retrieves recorded music from a personal storage unit of the user."	communications device of the present invention (whether it be handheld or installed within a vehicle) retrieves recorded music from a personal storage unit of the user." P. 2
2:52-57	"It should be understood that the transmittal of the recording to the personal storage account may embody transmitting only a portion of the recording, such as the title and memory (e.g., address) storage location of the recording, such that the personal storage account serves as a directory or index for retrieval of acquired or accumulated recordings."	"In accordance with an additional aspect of the present invention, information pertaining to the music recording, such as the artist, title of the recording, an album from which the recording came, the date of the recording, etc. is also transmitted with the recorded music, such that the informational data is displayed on a display of, or associated with, the wireless communications device when the particular recording is being played. Additionally, it is an aspect of the present invention that an identifier, such as a server address, associated with the remote central facility is encoded along with the transmitted data, such that a selected input on (or associated with) the wireless communications device may be pressed for automatically reconnecting with the central facility or personal storage unit." PP. 3-4 "In accordance with an aspect of the invention, information relating to a music recording is preferably transmitted along with music recording data for storage in memory 26. For example, data

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		indicative of the artist, the title of the recording, the album or CD from which the recording came, the recording label, the date of the recording, or any other desired information may be stored along with the recording at storage facility 14, and transmitted for storage in memory 26. Preferably, the informational data is stored as a header (e.g., in one or more integrally transmitted data packets) (See Fig. 1), such that processor 20 outputs the information to display 24." P. 22
2:62-67	"Upon access to the personal storage account by the account holder (via a communications device), and after entry of any required passwords, the user may select one or more recordings for streaming or download, whereupon the recording(s) will be retrieved."	"A plurality of recordings may be stored in the personal storage unit. The personal storage unit is accessible via a wireless communications link from the wireless communications device, to thereby enable the retrieval of selected music from the user's own storage facility. Additionally, such a system permits the user to easily mix recordings from a number of different recordings from his or her own storage unit." PP. 2-3 "In accordance with one aspect of the invention, personal storage unit 16 may also be a memory storage location at the central facility 14, or other remote site. In this way, a user of device 12 may have a personal account for storing pure based recordings, such that the account (e.g., personal storage unit

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		16) is accessible via device 12 and other devices (such as a personal computer)." P. 16

"In accordance with yet an additional object of the present invention, the music recordings transmitted to the wireless communications device from the central storage facility, or from the personal storage unit of the user, may be transmitted in a real, or substantially real, time basis. In other words, rather than downloading one or more recordings to a memory within the wireless communications device, encoded music may be streamed directly from its source, for input into a buffer within the communications device, and for play at the communications device, without being otherwise stored in the device. In other words, the music is played as it is streamed from the central storage facility or personal storage unit of the user." P. 4

"In making the purchase, the user may select whether to have the sound recording or its associated album downloaded to the wireless communications device (if memory space permits), or to a remote personal storage unit or account of the user, or to have the sound recording or album stored on a |

Cite	Rolf	Rolf Provisional
		storage medium and transmitted to an address of the user by mail or courier." PP. 5-6 "In summary, the wireless communications device may be used to download selected, encoded music recordings and played via the vehicle speakers., or to stream a real time encoded broadcast." P. 25
3:11-12	"Additionally, it is an aspect of the present invention that an identifier, such as a server address, associated with the remote central facility is encoded along with the transmitted data..."	"Additionally, it is an aspect of the present invention that an identifier, such as a server address, associated with the remote central facility is encoded along with the transmitted data..." P. 4
3:17-21	"In preferred embodiments of the present invention, the wireless communications link established between the wireless communications device and the central facility is a cellular communications link and, more particularly, is an Internet link."	"In preferred embodiments of the present invention, the wireless communications link established between the wireless communications device and the central facility is a cellular communications link and, more particularly, is an Internet link." P. 4
3:64-4:3	"For example, when a music recording is being played at the wireless communications device, data indicative of that recording may be displayed on the display, and, additionally, a selected key on the wireless communications device may be pressed to transmit a signal to the source of the stream that the user of wireless communications device wishes to purchase the music recording."	"For example, when a music recording is being played at the wireless communications device, data indicative of that recording may be displayed on the display, and, additionally, a selected key on the wireless communications device may be pressed to transmit a signal to the source of the stream that the user of wireless communications device wishes to purchase the music recording." P.

Cite	Rolf	Rolf Provisional
		5
4:65-67	"FIG. **4** is a block diagram of a conventional wireless communications device utilized in accordance with the principles of the present invention;"	"FIG. 4 is a block diagram of a conventional wireless communications device utilized in accordance with the principles of the present invention;" P. 7
5:1-2	"FIG. **5** is a block diagram of a central facility of the present invention;"	"FIG. 5 is a block diagram of a central facility of the present invention;" P. 7
5:18-22	"With reference initially to FIG. **1**, a system of the present invention for playing encoded music on a wireless communications device is denoted generally by reference numeral **10**. In particular, system **10** has a wireless communications device **12**, such as a cellular telephone."	"With reference initially to FIG. 1, a system of the present invention for playing encoded music on a wireless communications device is denoted generally by reference numeral 10. In particular, system 10 has a wireless communications device 12, such as a cellular telephone." PP. 7-8
5:30-39	"A communications link may be established between wireless communications device **12** and a remote storage facility, denoted by reference numeral **14**. The remote storage facility may, for example, be at an address on the world wide web, and includes a data base having a plurality of music recordings therein. Preferably, the music recordings are categorized by a plurality of selectable fields, such as 'title', 'artist', 'album or CD type', 'recording label', etc. Additionally, the music recordings are preferably encoded in an encoded format, such as MP3 (Mpeg-1 Audio layer 3)."	"A communications link may be established between wireless communications device 12 and a remote storage facility, denoted by reference numeral 14. The remote storage facility may, for example, be at an address on the world wide web, and includes a data base having a plurality of music recordings therein. Preferably, the music recordings are categorized by a plurality of selectable fields, such as 'title', 'artist', 'album or CD type', 'recording label', etc. Additionally, the music recordings are preferably encoded in an encoded format, such as MP3 (Mpeg-1 Audio layer 3)." P. 8

Cite	Rolf	Rolf Provisional
5:46-53	"As will become apparent from the detailed discussion below, the wireless communications device **12** may be utilized to establish a communications link with the remote storage facility **14**. Then, using a keypad and input on the wireless communications device, or by voice commands, one or more selected music recordings may be retrieved from the storage facility **14**, for transmission, via wireless communications link, to the device **12**."	"As will become apparent from the detailed discussion below, the wireless communications device 12 may be utilized to establish a communications link with the remote storage facility 14. Then, using a keypad and input on the wireless communications device, or by voice commands, one or more selected music recordings may be retrieved from the storage facility 14, for transmission, via wireless communications link, to the device 12." P. 8
5:63-66	"In the embodiment of the present invention illustrated in FIG. **2**, a wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings. "	"In the embodiment of the present invention illustrated in FIG. 2, a wireless communications device 12 communicates with a central facility 14 for retrieval of one or more stored music recordings. " P. 9
6:20-30	"In accordance with yet an additional aspect of the invention, a music recording desired to be played on wireless communications device **12** need not be fully stored within the device **12**. In this regard, for example, a music recording stored in central facility **14** or personal storage unit **16** may be streamed to the wireless device **12** via an established communications link. In such an instance, data packets are streamed through a buffer for play by a player each of which are in a memory **26** (see FIG. **4**), such that, as one data	"In accordance with yet an additional aspect of the invention, a music recording desired to be played on wireless communications device 12 need not be fully stored within the device 12. In this regard, for example, a music recording stored in central facility 14 or personal storage unit 16 may be streamed to the wireless device 12 via an established communications link. In such an instance, data packets are streamed through a buffer for play by a player each of which are in a memory 26 (see FIG. 4), such that, as one data

Cite	Rolf	Rolf Provisional
	packet is played within the buffer, and then exits the buffer, an additional data packet is streamed into the buffer."	packet is played within the buffer, and then exits the buffer, an additional data packet is streamed into the buffer." PP. 9-10
6:53-7:7	"In accordance with a particular aspect of the present invention, at least a portion of that informational data is associated with a selected input on communications device **12**, such that upon activation of the input, the user of communications device **12** may order (for purchase) an authorized copy of the recording, or the album upon which the recording is placed. In this regard, upon activation of the key associated with the informational data, in one embodiment, while pressing the key associated with the selected information, data indicating that the user desires to make a purchase is transmitted to the station/source **17** or other facility. It should also be understood that the informational data may be retained at the server which is sourcing the recording, such that activation of a selected input causes a signal to be transmitted to the server, the receipt of which is matched with the information pertaining to the recording being transmitted. In any case, the purchase can be effected via the station/source **17** or other site, such as indicated by music storage source **19**, either through appropriate inputs on the	"In accordance with a particular aspect of the present invention, at least a portion of that informational data is associated with a selected input on communications device 12, such that upon activation of the input, the user of communications device 12 may order (for purchase) an authorized copy of the recording, or the album upon which the recording is placed. In this regard, upon activation of the key associated with the informational data, in one embodiment, while pressing the key associated with the selected information, data indicating that the user desires to make a purchase is transmitted to the station/source 17 or other facility. It should also be understood that the informational data may be retained at the server which is sourcing the recording, such that activation of a selected input causes a signal to be transmitted to the server, the receipt of which is matched with the information pertaining to the recording being transmitted. In any case, the purchase can be effected via the station/source 17 or other site, such as indicated by music storage source 19, either through appropriate inputs on the

Cite	Rolf	Rolf Provisional
	communications device **12**, or by establishment of a voice communications link with the central facility **14**."	communications device 12, or by establishment of a voice communications link with the central facility 14." PP. 10-11
7:8-18	"In addition to the user having a choice of whether to buy the single being played, or the entire album on which the single is located, the user also has the opportunity to select the manner in which the purchased recording or album will be distributed to the user. For example, the purchased recording or album may be downloaded to the wireless communications device **12** (if memory space suffices) or, alternatively, may be downloaded to the user's personal storage unit **16**. Alternatively, the user can select to have a storage medium upon which the music is recorded (such as a CD, for example) mailed to a selected address of the user."	"In addition to the user having a choice of whether to buy the single being played, or the entire album on which the single is located, the user also has the opportunity to select the manner in which the purchased recording or album will be distributed to the user. For example, the purchased recording or album may be downloaded to the wireless communications device 12 (if memory space suffices) or, alternatively, may be downloaded to the user's personal storage unit 16. Alternatively, the user can select to have a storage medium upon which the music is recorded (such as a CD, for example) mailed to a selected address of the user." P. 11
7:19-23	"Accordingly, the present invention provides a very unique feature for the distribution and purchasing of music recordings, by allowing an individual to make a purchase of a recording and/or its associated album upon hearing the recording."	"Accordingly, the present invention provides a very unique feature for the distribution and purchasing of music recordings, by allowing an individual to make a purchase of a recording and/or its associated album upon hearing the recording." P. 11
7:49-55	"With additional reference to FIG. **4**, wireless communications device **12** has a processor **20**. Connected to processor **20** are an input (such as a keypad **22**), a display **24**, a	"With additional reference to FIG. 4, wireless communications device 12 has a processor 20. Connected to processor 20 are an input (such as a keypad 22), a display 24, a

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	memory **26**, a microphone **32**, a speaker **34**, and a port **36**. Additionally, a DTMF encoder/decoder (or just an encoder, if desired) **38**, and a transceiver **40**, and antenna **42** are connected as shown."	memory 26, a microphone 32, a speaker 34, and a port 36. Additionally, a DTMF encoder/decoder (or just an encoder, if desired) 38, and a transceiver 40, and antenna 42 are connected as shown." P. 12
8:54-55	"With reference initially to FIG. **5**, a block diagram of the central facility **14** is illustrated and described."	"With reference initially to FIG. 5, a block diagram of the central facility 14 is illustrated and described." P. 14
8:56-9:18	"In particular, a central facility **14** has a processor **50**. Connected to the processor **50** are a data base memory **52** and a interface **54** (such as a transceiver or modem) for transmitting and receiving communications signals. In addition, the central facility **14** may also have an encoder **58** and an operator station **60**. The encoder **58** is a set of processing instructions stored in a memory for encoding music recordings stored within data base memory **52**. In particular, when wireless communications device **12** accesses the central facility **14** via the communications network for purpose of retrieving one or more selected recordings, the encoder **58** may be utilized to encode the music, according to any preferred encryption and/or compression algorithm (such as mp3, liquid audio, etc.), for transmission of the encoded recording(s) to the wireless	"In particular, a central facility 14 has a processor 50. Connected to the processor 50 are a data base memory 52 and a interface 54 (such as a transceiver or modem) for transmitting and receiving communications signals. In addition, the central facility 14 may also have an encoder 58 and an operator station 60. The encoder 58 is a set of processing instructions stored in a memory for encoding music recordings stored within data base memory 52. In particular, when wireless communications device 12 accesses the central facility 14 via the communications network for purpose of retrieving one or more selected recordings, the encoder 58 may be utilized to encode the music, according to any preferred encryption and/or compression algorithm (such as mp3, liquid audio, etc.), for transmission of the encoded recording(s) to the wireless

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	communications device **12**. Alternatively, the music recording stored within data base memory **52** may be stored in an encoded/compressed manner, such that the encoder **58** is not necessary. While the operator station **60** is not necessary, it may be provided for allowing the user of wireless communications device **12** to have a voice conversation with an operator employed at the operator station **60**. As will be appreciated, in the absence of an operator, processor **50** invokes application software for providing a menu driven system to wireless communications device **12**, such that the wireless communications device **12** can be utilized to select recording via a menu or listing of recordings. Alternatively, the central facility **14** may be equipped with a voice response system, such that an individual at wireless communications device **12** makes necessary entries/selections via voice commands."	communications device 12. Alternatively, the music recording stored within data base memory 52 may be stored in an encoded/compressed manner, such that the encoder 58 is not necessary. While the operator station 60 is not necessary, it may be provided for allowing the user of wireless communications device 12 to have a voice conversation with an operator employed at the operator station 60. As will be appreciated, in the absence of an operator, processor 50 invokes application software for providing a menu driven system to wireless communications device 12, such that the wireless communications device 12 can be utilized to select recording via a menu or listing of recordings. Alternatively, the central facility 14 may be equipped with a voice response system, such that an individual at wireless communications device 12 makes necessary entries/selections via voice commands." PP. 14-15
9:39-42	"Alternatively, it should be understood and appreciated that the encoded music received by the personal storage unit **16** may be stored in an encoded fashion, such that the decoder/encoder is unnecessary."	"Alternatively, it should be understood and appreciated that the encoded music received by the personal storage unit 16 may be stored in an encoded fashion, such that the decoder/encoder is unnecessary." PP. 15-16
10:6-20	"In particular, with reference to FIG. **7a**, data is transmitted in a	"In particular, with reference to FIG. 7 a, data is transmitted in a

Cite	Rolf	Rolf Provisional
	plurality of data packets **100**. In particular, for example, the first set of data packets, including one or more packets **100**, may include information pertaining to an identifier or address associated with a source of the streamed data. In the example of FIG. **7a**, the packet is marked with a 'A', and is an initially transmitted packet. Additional packets may contain information pertaining to a music recording being transmitted, and as illustrated in FIG. **7a**, any such packets are designated by a 'I'. The remainder of the packets include data indicative of the music recording being transmitted, and are labeled 'M'. In the example of FIG. **7a**, the address identifier and the information pertaining to the music recording are transmitted first, and thus serve as a header."	plurality of data packets 100. In particular, for example, the first set of data packets, including one or more packets 100, may include information pertaining to an identifier or address associated with a source of the streamed data. In the example of FIG. 7 a, the packet is marked with a 'A', and is an initially transmitted packet. Additional packets may contain information pertaining to a music recording being transmitted, and as illustrated in FIG. 7 a, any such packets are designated by a 'I'. The remainder of the packets include data indicative of the music recording being transmitted, and are labeled 'M'. In the example of FIG. 7a, the address identifier and the information pertaining to the music recording are transmitted first, and thus serve as a header." P. 16
10:44-48	"For example, data packets received by wireless communications device **12** are processed by processor **20**, and passed through at least one buffer."	"For example, data packets received by wireless communications device 12 are processed by processor 20, and passed through at least one buffer." P. 17
10:57-59	"As illustrated, each of the buffers **102**, **104** have corresponding buffer locations, indicated as Bdn, for streaming data packets..."	"As illustrated, each of the buffers 102, 104 have corresponding buffer locations, indicated as Bdn, for streaming data packets..." P. 17
11:48-51	"In accordance with an aspect of the present invention, data indicative of a site at which the	"In accordance with an aspect of the present invention, data indicative of a site at which the

Cite	Rolf	Rolf Provisional
	particular music recording is being played (and/or it associated album or video) can be ordered is transmitted and associated with a particular input…"	particular music recording is being played (and/or it associated album or video) can be ordered is transmitted and associated with a particular input…" P. 19
11:54-57	"Accordingly, while listening to the music recording, an individual may activate the order key and be connected with a source for ordering that particular music recording."	"Accordingly, while listening to the music recording, an individual may activate the order key and be connected with a source for ordering that particular music recording." P. 19
11:61-12:2	"Additionally, upon activation of the order key, either a data, a voice, or a combined voice/data link may be established with the source at which the music recording is to be purchased, and the purchase may be conducted in a purely electronic fashion, or by speaking with an operator. Preferably, such a link terminates the link with the streaming source, although terminating the initial link may not be necessary if there is sufficient bi-directional bandwidth available."	"Additionally, upon activation of the order key, either a data, a voice, or a combined voice/data link may be established with the source at which the music recording is to be purchased, and the purchase may be conducted in a purely electronic fashion, or by speaking with an operator. Preferably, such a link terminates the link with the streaming source, although terminating the initial link may not be necessary if there is sufficient bi-directional bandwidth available." P. 19
12:4-12	"For example, purchase may be made such that a complete copy of the sound recording (or its associated album) is downloaded to the memory **26** within wireless communications device **12**. Alternatively, the user can specify, either by input, or through a previously established account with the source at which the recording is being purchased, to have the music	"For example, purchase may be made such that a complete copy of the sound recording (or its associated album) is downloaded to the memory 26 within wireless communications device 12. Alternatively, the user can specify, either by input, or through a previously established account with the source at which the recording is being purchased, to have the music

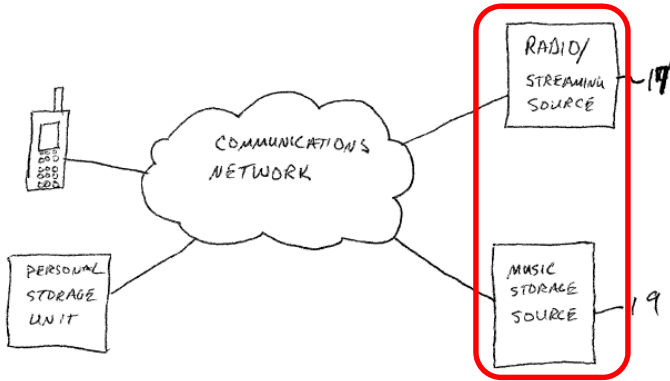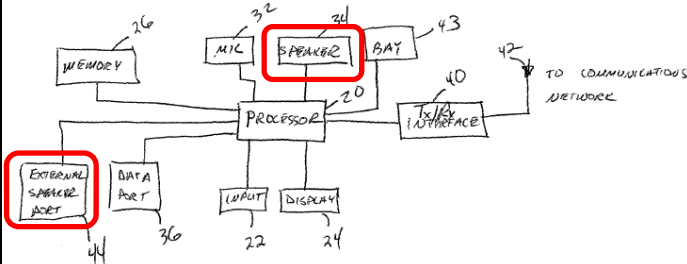| Cite	Rolf	Rolf Provisional
	recording downloaded to a remote, personal storage unit..."	recording downloaded to a remote, personal storage unit..." PP. 19-20
12:49-55	"In use, a user of communications device **12** may establish a communications link via the communications network with the remote storage facility **14**. In a preferred embodiment, the facility **14** has a uniform resource locator (URL) on a global communications network (such as the world-wide web), and device **12** accesses the facility **14** via a server in the communications network. "	"In use, a user of communications device 12 may establish a communications link via the communications network with the remote storage facility 14. In a preferred embodiment, the facility 14 has a uniform resource locator (URL) on a global communications network (such as the world-wide web), and device 12 accesses the facility 14 via a server in the communications network. " P. 21
13:5-13	"As described, the personal storage unit **16** may be a memory storage location at an address on the global communications network and, indeed, may be located at the remote storage facility **14**. In such an instance, when a communications link with a remote storage facility **14** is established with wireless communications device **12**, the user can select whether he or she wishes to select new recordings, or enter his or her personal storage unit account for retrieval of recordings that have already been purchased."	"As described, the personal storage unit 16 may be a memory storage location at an address on the global communications network and, indeed, may be located at the remote storage facility 14. In such an instance, when a communications link with a remote storage facility 14 is established with wireless communications device 12, the user can select whether he or she wishes to select new recordings, or enter his or her personal storage unit account for retrieval of recordings that have already been purchased." PP. 21-22
13:38-41	"Preferably, the informational data is stored as a header (e.g., in one or more integrally transmitted data packets) (See FIG. **1**), such that processor **20** outputs the information to display **24**."	"Preferably, the informational data is stored as a header (e.g., in one or more integrally transmitted data packets) (See FIG. 1), such that processor 20 outputs the information to display 24." P. 22

Cite	Rolf	Rolf Provisional
14:35-53	"However, in accordance with an additional aspect of the invention, a concert schedule of the artist or group that recorded the song being played may be accessed at the source, for the purpose of buying concert tickets. Accordingly, upon hearing a particular song, a user of communications device **12** can activate a single input and establish a communications link with a source for purchasing concert link may be a voice communications link or, alternatively, may be a voice and/or data communications link, such that the tickets may be purchased electronically. In particular, while the concert information may be available at the described source, it should be understood and appreciate that additional data may be encoded in the data stream, and associated with a different input, such that activation of a first input establishes a communications link with a first source at which the music recording may be purchased, while activation of a second input establishes a communications link with a second source at which concert tickets may be purchased."	"However, in accordance with an additional aspect of the invention, a concert schedule of the artist or group that recorded the song being played may be accessed at the source, for the purpose of buying concert tickets. Accordingly, upon hearing a particular song, a user of communications device 12 can activate a single input and establish a communications link with a source for purchasing concert link may be a voice communications link or, alternatively, may be a voice and/or data communications link, such that the tickets may be purchased electronically. In particular, while the concert information may be available at the described source, it should be understood and appreciate that additional data may be encoded in the data stream, and associated with a different input, such that activation of a first input establishes a communications link with a first source at which the music recording may be purchased, while activation of a second input establishes a communications link with a second source at which concert tickets may be purchased." PP. 24-25
14:55-58	"It should also be understood that, while the invention has been described with respect to music or sound recordings, various features of the invention are applicable to	"In particular, the data stream is a stream of data packets which are streamed through a buffer of the wireless communications device

Declaration of Tal Lavian, Ph.D., in Support of
Petition for *Inter Partes* Review of
U.S. Patent No. 9,203,956

Cite	Rolf	Rolf Provisional
	recordings of other types, such as video recordings."	for decoding and play." P. 5 "In accordance with an aspect of the present invention, data indicative of a site at which the particular music recording is being played (and/or it associated album or video) can be ordered is transmitted and associated with a particular input, as evidenced by 'order' on the display at which location is associated with a particular keypad input on the wireless communications device." P. 19

EXHIBIT C

EXHIBIT C

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	Note: The entirety of the Rolf Provisional would have been understood by a person of ordinary skill to disclose the support for the issued claims in Rolf. I intend this chart simply to highlight exemplary portions, not to be an exhaustive mapping of all support.
Claim 1	
A system for playing prerecorded music, said system comprising:	A person of ordinary skill would have understood that the Rolf Provisional describes a system for playing music, including the ability to download and stream music for replay that has been previously recorded. *See, e.g.*: Fig. 3 (annotated). Showing two sources of prerecorded music available for download and playback. Fig. 4 (annotated). Showing the internals of a cellular phone, having both internal speaker

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	and external speaker port for playing prerecorded music. "The present invention is generally directed to a system and method for wirelessly transmitting encoded music, via a wireless communications link, to a portable or mobile communications device which includes a player for playing the **music or audio**." P. 1 (emphasis added). "Using an input of the cellular telephone, **a user may select one or more recordings for transmission to the cellular telephone.** The selected music recordings, upon receipt by the cellular telephone, are stored in a memory. In one embodiment, the memory is an internal memory. Alternatively, the memory may be a separate cartridge or memory stick (such as a flash memory cartridge) for movable installation in a bay on the telephone. **A player within the cellular telephone may then be initiated to play the music recordings, for output on a speaker.** In particular, the speaker may include earphones or earplugs connected to a port on the cellular telephone. Alternatively, the player may output the music through an internal speaker of the cellular telephone." PP. 1-2 (emphasis added).
a portable, handheld wireless cellular telephone having a memory, a display[,] a player, a microphone for voice communications, and a speaker; and	A person of ordinary skill would have understood that the Rolf Provisional describes a cellular telephone with the components and features claimed in this limitation. *See, e.g.*: "In particular, system 10 has a **wireless communications device 12, such as a cellular telephone**. Preferably, wireless

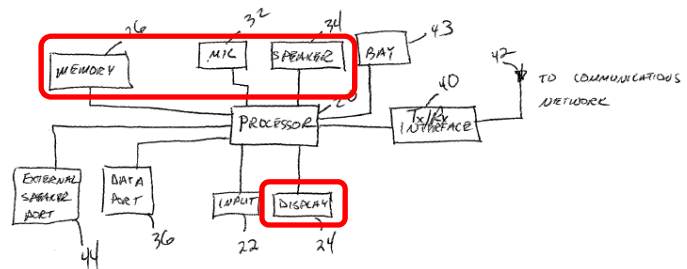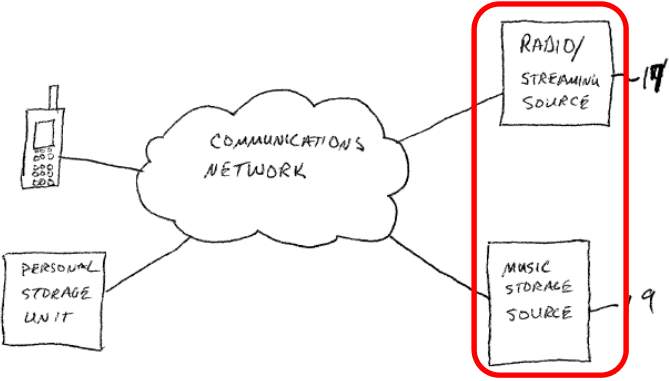| Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	communications device 12 is a digital, cellular communications device, and is **portable and handheld**." P. 8 (emphasis added). Fig. 1 (annotated). Showing a portable, handheld wirless cellular telephone. Fig. 4 (annotated). Showing the internals of the cellular telephone, including a memory, a display, a microphone, and a speaker. The cellular telephone also has a player: "The present invention is generally directed to a system and method for wirelessly transmitting encoded music, via a wireless communications link, to **a portable or mobile communications device which includes a player for playing the music or audio**." P. 1 (emphasis added). The microphone component is used to facilitate voice communication:

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	"Additionally, the wireless communications device is preferably a cellular communications device and, in particular, is a **cellular voice communications device**, such as a cellular telephone." P. 9 (emphasis added). "In this regard, and in accordance with an aspect of the invention, a user of communications device 12 **may establish a communications link** with a central facility, such as storage facility 14, and utilizing inputs on the device, such as a keypad, **or a microphone (where the inputs are by voice)**, make appropriate selections for retrieving an encoded player for storage in the communications device 12." P. 13 (emphasis added). "Preferably, the wireless communications device is also a **voice communications** device, such that **voice connections** may be made with the device, as well." P. 25 (emphasis added).
a remote storage facility, wherein said remote storage facility stores a plurality of music recordings,	A person of ordinary skill would have understood that the Rolf Provisional describes a remote storage facility that stores multiple music recordings. *See, e.g.*: Fig. 1 (annotated). Showing a central facility that is remote from the cellular telephone.

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	This is where music recordings are stored. "In use, a user of communications device 12 may establish a communications link via the communications network with the **remote storage facility 14**." P. 21 (emphasis added). The remote storage facility stores multiple music recordings: Fig. 3 (annotated). Showing two categories of music recordings stored at the remote storage facility for both streaming and full download. "As will by now be appreciated in view of the foregoing, the communications device 12 may also be used for retrieving **one or more music recordings from a remote storage facility 14**…" P. 21 (emphasis added).
wherein said wireless cellular telephone is used to wirelessly select and retrieve from said remote storage facility at least one of said music recordings for complete storage of said music recording in said memory, and for playback through said speaker by said player,	A person of ordinary skill would have understood that the Rolf Provisional describes a wireless cellular telephone selecting and retriving at least one music recording for storage and playback on the cellular phone. *See, e.g.*:

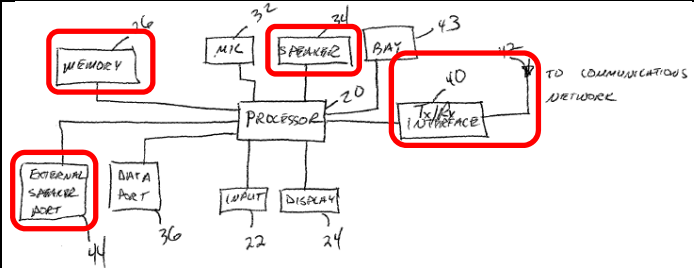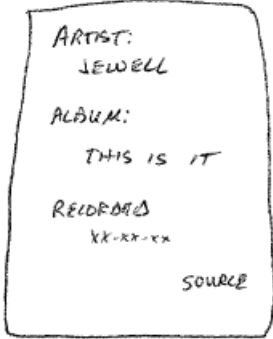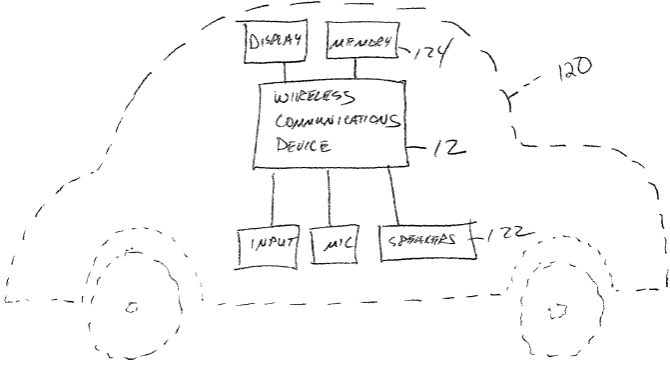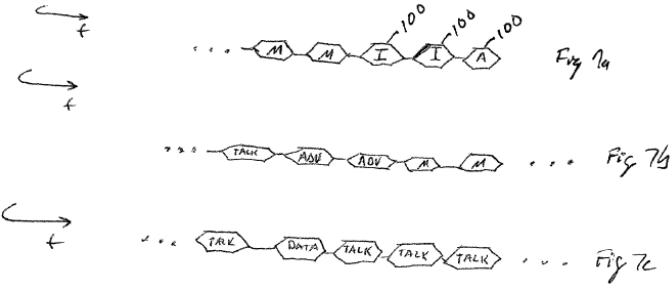| Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	Fig. 4 (annotated). Showing the internals of the cellular telephone, including a memory where music recordings are stored, an internal speaker, an external speaker port for playback, and a wireless transciever and antenna. The cellular phone wirelessly selects and retrieves music recordings and stores them in its internal memory: "In particular, a user of the cellular telephone (for example) may use the telephone to establish a wireless communications link with the remote, central facility, and then **wirelessly download one or more selected music recordings for storage in a memory of the cellular telephone**." P. 1 (emphasis added). "**Using an input of the cellular telephone, a user may select one or more recordings for transmission to the cellular telephone**. The selected music recordings, upon receipt by the cellular 20 telephone, are **stored in a memory**." P. 1 (emphasis added). The player within the cellular telephone then plays back the music recording stored in the memory of the cellular telephone through the speaker (either internal or external):

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	"Once an encoded **music recording is stored in memory 26, or on a memory cartridge, of the wireless communications device 12**, the input 22 may be utilized to control the **player to play the recording**. In this regard, when a music recording is retrieved from memory for play, the player decodes the encoded data packet according to conventional steaming techniques in the buffer. **The player outputs the music via speaker 34** or, in the event earplugs or headphones are connected to port 44 of communications device 12, then **the music is outputted via the headphones or earplugs**." P. 22 (emphasis added).
wherein at least one of a name of an artist who recorded said selected music recording and a title of said music recording is wirelessly transmitted from said storage facility in conjunction with said music recording and is displayed on said display of said cellular telephone in conjunction with playback of said music recording, and	A person of ordinary skill would have understood that the Rolf Provisional describes transmitting artist name and title corresponding to a music recording to the cellular telephone for display during playback of the music recording. *See, e.g.*: "In accordance with an additional aspect of the present invention, **information pertaining to the music recording, such as the artist, title of the recording**, an album from which the recording came, the date of the recording, etc. **is also transmitted with the recorded music, such that the informational data is displayed on a display** of, or associated with, the wireless communications device **when the particular recording is being played**." PP. 3-4 (emphasis added).

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	Fig. 9a. Showing a display on the user's cellular telephone of artist name and title associated with a music recording (in this case a collection of individual songs within an album by the artist Jewell).
wherein said storage facility further comprises a personal account associated with at least one of said cellular telephone and a user of said cellular telephone,	A person of ordinary skill would have understood that the Rolf Provisional describes a storage facility with personal accounts associated with particular cellular telephones and/or users. *See, e.g.*: "For example, **a user may have** a CD tower, flash memory unit, etc. in his or her home or apartment, or may have **a personal storage account at a central facility**." P. 2 (emphasis added). "The personal storage unit may comprise a personal computer or an entertainment center, including such components as a display screen (e.g., TV or information TV), stereo, speakers, etc, or as stated, **an account at a storage location**." P. 3 (emphasis added). "In accordance with one aspect of the invention, personal storage unit 16 may also be a memory storage location at the central facility 14, or other remote site. In this way, a

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	user of device 12 may have a personal account for storing pure based recordings, such that the account (e.g., personal storage unit 16) is accessible via device 12 and other devices (such as a personal computer)." P. 16 (emphasis added).
wherein at least a title of said selected and retrieved music recording is stored in said personal account.	A person of ordinary skill would have understood that the Rolf Provisional describes the system storing at least a title of the selected and retrieved music recording in the personal account. *See, e.g.*: The Rolf Provisional describes embodiments where the personal account is comprised of a personal storage unit at a storage location within the central facility or another location: Fig. 2 (annotated). Showing remote personal storage unit. "**The personal storage unit may comprise** a personal computer or an entertainment center, including such components as a display screen (e.g., TV or information TV), stereo, speakers, etc, or as stated, **an account at a storage location**." P. 3 (emphasis added). "In accordance with one aspect of the

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	invention, **personal storage unit 16 may also be a memory storage location at the central facility 14, or other remote site**. In this way, a user of device 12 may have a personal account for storing pure based recordings, such that **the account (e.g., personal storage unit 16)** is accessible via device 12 and other devices (such as a personal computer)." P. 16 (emphasis added). The Rolf Provisional describes that information such as the title of a music recording is transmitted along with the music and stored together at both the storage facility and in the cellular telephone: "In accordance with an additional aspect of the present invention, information pertaining to the music recording, such as the artist, **title of the recording**, an album from which the recording came, the date of the recording, etc. is also transmitted with the recorded music…" P. 3 (emphasis added). "For example, data indicative of the artist, **the title of the recording**, the album or CD from which the recording came, the recording label, the date of the recording, or any other desired information **may be stored along with the recording at storage facility 14, and transmitted for storage in memory 26**." P. 22 (emphasis added). A person of ordinary skill would have understood that the Rolf Provisional describes embodiments where the title of music recordings could be stored along with the music recordings themselves in a personal storage unit or personal account.

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
Claim 2	
The system as set forth in claim 1, in combination with a vehicle, wherein said wireless cellular telephone is installed in said vehicle.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 combined with and installed in a vehicle. *See, e.g.*: Fig. 10. Showing the system described in my analysis of claim 1 above, as combined with and installed in a vehicle, in this case an automobile. "In an alternate embodiment, the wireless communications device is **utilized in combination with a vehicle**, and a player, a memory for storing the music, and at least one speaker, are **located within the vehicle, such that selected recordings may be retrieved from the remote central facility, and played in the vehicle**." P. 2 (emphasis added).
Claim 3	
The system as set forth in claim 1, wherein a selected music recording is wirelessly transmitted from said remote storage facility in data packets.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 where wireless transmission is carried out using data packets. *See, e.g.*: "In particular, the data stream is **a stream of data packets** which are streamed through a

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	buffer of the wireless communications device for decoding and play." P. 5 (emphasis added).
	Figs. 7a, 7b, 7c. Showing packetization of transmissions of music recordings.
	"With reference now to Fig. 7, a representative example of how **data packets** are transmitted in accordance with a protocol of the present invention is illustrated. In particular, with reference to Fig. 7a, data is transmitted in a plurality of **data packets** 100." P. 16 (emphasis added).
Claim 4	
The system as set forth in claim 3, wherein said data packets are transmitted via a third generation network.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 3 where the data packets are transmitted through a third generation network. *See, e.g.*: "In preferred embodiments of the present invention, the wireless communications link established between the wireless communications device and the central facility is a cellular communications link and, more particularly, is an Internet link. In other words, the encoded music and/or informational data is preferably transmitted via a packet switch network, and particularly is preferably transmitted at transmission

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	speeds greater than 50 KHz, such as by a next- or **third-generation wireless communications network**." P. 4 (emphasis added). "In accordance with a preferred aspect of the present invention, the music recordings are encoded in **data packets for transmission via a packet switched network**. In particular, it is preferred that the wireless communications network be a next or **third generation network**, such that data transmissions are at sufficiently high speeds, and preferably greater than 50 KHz." P. 22 (emphasis added).
Claim 5	
The system as set forth in claim 1, wherein said retrieved music recording is encoded in mp3 format.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 where the music recording is encoded in mp3 format. *See, e.g.*: "Preferably, the music recordings are encoded and transmitted in packets, and may particularly be **encoded by a compression algorithm into an encoded (such as MP3 or other) format**." P. 1 (emphasis added). "Additionally, the music recordings are preferably **encoded in an encoded format, such as MP3 (Mpeg-1 Audio layer 3)**." P. 8 (emphasis added).
Claim 6	
The system as set forth in claim 1, wherein said at least one music recording stored in said memory can be played without the need to establish and maintain a communications link with said	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 where music recordings can be played without the need to establish and maintain communication links with the remote storage facility. *See, e.g.*:

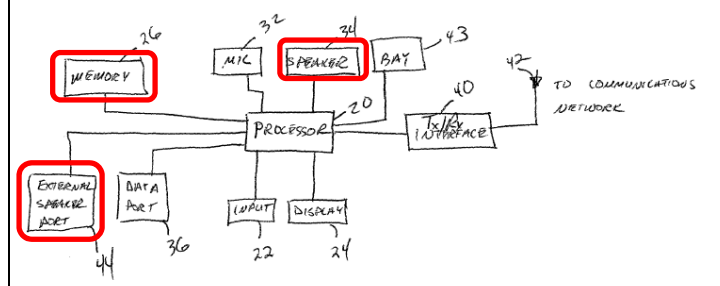| Issued Claims in Rolf	Exemplary Support in Rolf Provisional
remote storage facility.	The most obvious situation where a music recording can be played without a communications link to the remote storage facility is where the music recording was transmitted to and stored on the cellular telephone itself (i.e. not streamed). The Rolf Provisional discloses this: Fig. 4 (annotated). Showing the internals of the cellular telephone, including an internal memory, internal speaker, and external speaker port for playback. "Once an encoded **music recording is stored in memory 26, or on a memory cartridge, of the wireless communications device 12**, the input 22 may be utilized to control the **player to play the recording**. In this regard, when a music recording is retrieved from memory for play, the player decodes the encoded data packet according to conventional steaming techniques in the buffer. **The player outputs the music via speaker 34** or, in the event earplugs or headphones are connected to port 44 of communications device 12, then **the music is outputted via the headphones or earplugs**." P. 22 (emphasis added). A person of ordinary skill would have understood from this disclosure that music

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	stored on internal memory could later be replayed without the need for a communications link to a remote storage facility.
Claim 7	
The system as set forth in claim 1, wherein said system further makes said selected and retrieved music recording available for download to a personal computer associated with a user of said cellular telephone.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 making the music recording available for download to a personal computer associated with a cellular telephone user. *See, e.g.*: The Rolf Provisional discloses an embodiment where the personal storage unit itself, which is associated with the user, is a personal computer: "**The personal storage unit may comprise a personal computer** or an entertainment center, including such components as a display screen (e.g., TV or information TV), stereo, speakers, etc, or as stated, an account at a storage location." P. 3 (emphasis added). "**In this embodiment, when a user selects one or more recordings from the central facility**, rather than the recordings being transmitted to the wireless communications unit directly via a wireless communications link, **they are rather transmitted to the personal storage unit of the user.**" P. 3 (emphasis added). The Rolf Provisional also discloses an embodiment where the personal account is accessible via a personal computer: "In accordance with one aspect of the invention, personal storage unit 16 may also

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	be a memory storage location at the central facility 14, or other remote site. In this way, a user of device 12 may have a personal account for storing pure based recordings, **such that the account (e.g., 5 personal storage unit 16) is accessible via device 12 and other devices (such as a personal computer**)." P. 16 (emphasis added). A person of ordinary skill would have understood from this disclosure that the personal computer in either embodiment could download music recordings.
Claim 8	
The system as set forth in claim 1, wherein said selected and retrieved music recording is purchased from said remote storage facility.	A person of ordinary skill would have understood that the Rolf Provisional describes the system of claim 1 where the music recording is purchased from the remote storage facility. *See, e.g.*: "Alternatively, the signal may be transmitted to a **remote music storage facility for effecting a purchase of the recording** or its associated album. In this regard, the purchase can be conducted in an electronic input mode or, alternatively, a **link may be established for transmitting voice communications to and from the source or music storage facility (as the case may be) at which the sound recording or its associated album is to be purchased**." P. 5 (emphasis added). "As such, the **purchase** can be effected via the station/source 17 or other site, such as indicated by music storage source 19, either through appropriate inputs on the communications device 12, or **by establishment of a voice communications link with the central facility 14**." P. 11

Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	(emphasis added). "In such an instance, when a communications link with a **remote storage facility 14** is established with wireless communications device 12, **the user can select whether he or she wishes to select new recordings, or** enter his or her personal storage unit account **for retrieval of recordings that have already been purchased.**" PP. 21-22 (emphasis added).