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. 9,203,870

TITLE: MEDIA DELIVERY PLATFORM

DECLARATION OF TAL LAVIAN, PH.D.

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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

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.

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,

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.

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. 9,203,870 ("'870" or "'870 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 '870 patent. I have cited to the following documents in my analysis below:

Exhibit No.	Title of Document
1001	U.S. Patent No. 9,203,870 to John Mikkelsen et al.

Exhibit No.	Title of Document
1003	U.S. Patent No. 7,065,342 to Devon A. Rolf
1004	U.S. Patent No. 6,233,682 to Bernhard Fritsch
1005	Alan Gatherer et al., *DSP-Based Architectures for Mobile Communications: Past, Present and Future*, IEEE Communications Magazine (January 2000)
1006	U.S. Patent No. 5,726,978 to Carl Magnus Frodigh et al.
1025	U.S. Patent No. 5,815,811 to Patrick Pinard et al.
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)`
1062	Hacker, *MP3: The Definitive Guide* (2000)
1068	U.S. Application No. 2002/0065826 to Christopher Nathan Bell et al.

13. 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") ("'502 Beckmann Declaration"). I am informed that the '502 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 '870 patent, as well as the same earliest claimed priority date. I have also read the "Declaration of William H. Beckmann, Ph.D." dated October 13, 2016, in support of the Petition for Covered Business Method (CBM) Review of the '870 patent ("'870 Beckmann Declaration"). Collectively, I will refer to the prior submissions

as the "Beckmann Declarations." Although I agree with the opinions provided by Dr. Beckmann, 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. To the extent the analysis in the Beckmann Declarations 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 Declarations 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 '870 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 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 ’870 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 Declarations includes an overview of the underlying technology of the ’502 and the ’870 patent, which I understand share the same specification. 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 ’870 patent, entitled “Media Delivery Platform,” purports to disclose and claim a system and method for delivering digital media files to an

electronic device. ('870, Abstract.) In this section, I provide a brief background discussion on technologies pertinent to the '870 patent prior to June 2001.

A. Cellular Telephones

20. Cellular phones (also known as "cell phones") were well known prior to June 2001. The '870 patent itself recognizes the existence of "commercially available cellular phone[s]." ('870, 14:27-28.) 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 '870 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" networks known as the Advanced Mobile Phone System (AMPS). Similar cellular phones and networks were also deployed in other countries throughout the 1980s.

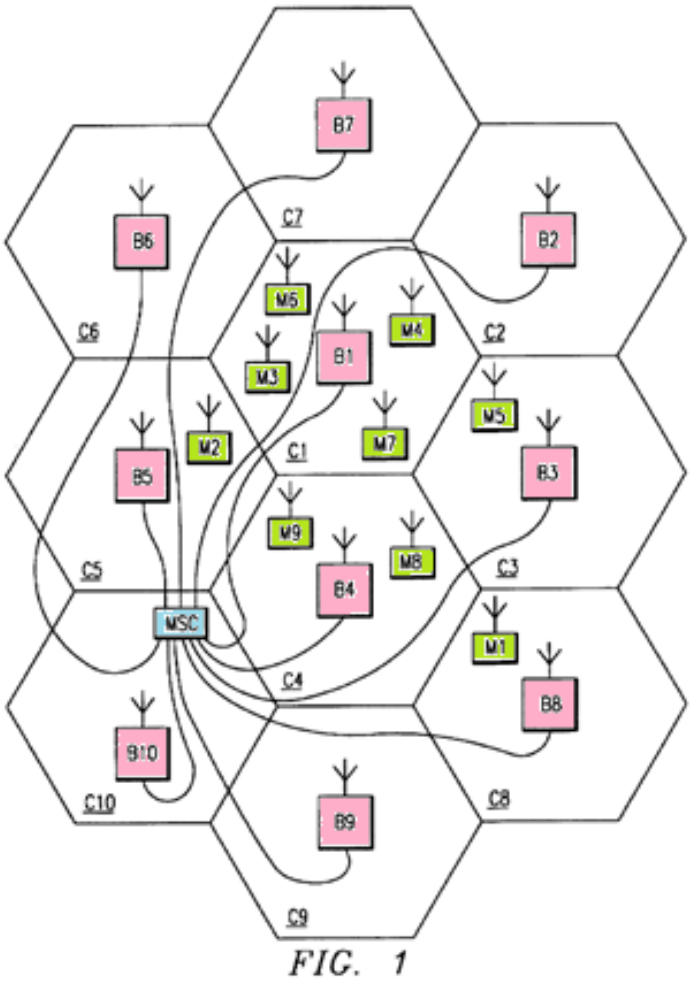


FIG. 1

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 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 cellular phone and networking techniques 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 ¶¶ 0002-08; 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, it was also well-known that cell phones could be used to download and playback digital media. The Background Art section of the '870 patent acknowledges, for example, the existence of cell phones that can play music in a compressed format such as MP3. ('870, 1:36-40.) 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*, IEEE Communications (Jan. 2000) ("Gatherer") **[Ex. 1005]**. I discuss Rolf and Gatherer in detail in **Parts V.A** and **V.B.1** below.

B. Digital Signal Processors

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

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

26. 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, 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.

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, p. 55, Table 1.)

27. 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.*, 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 entertainment." (*Id.*, p. 89, left column; *see also id.* 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.)

C. Orthogonal Frequency-Division Multiplexing (OFDM)

28. 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.

29. 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 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.

30. 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"):

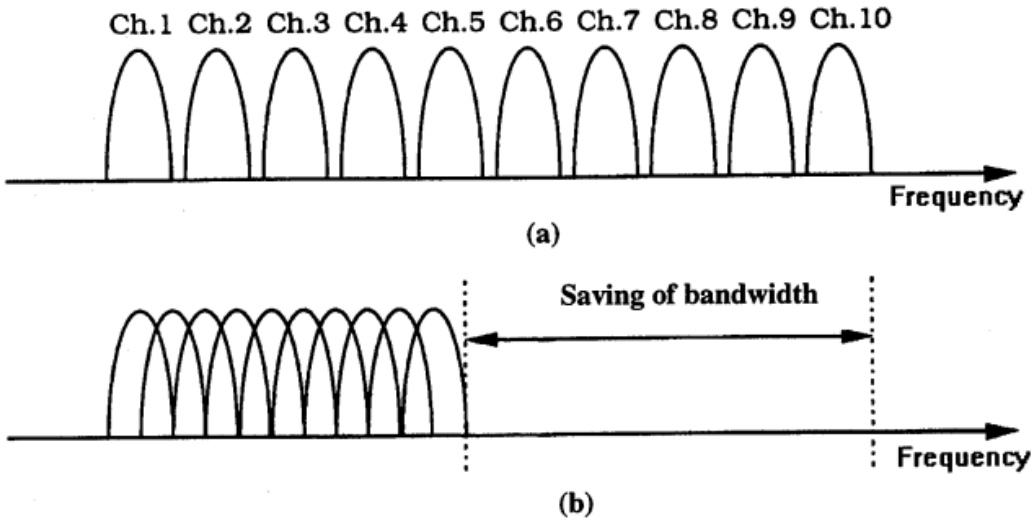


Figure 1.10 Concept of OFDM signal: (a) Conventional multicarrier technique, and (b) orthogonal multicarrier modulation technique.

(Van Nee, Fig. 1.10, at p. 22.) The top portion **(a)** of Figure 1.10 shows a conventional FDM arrangement with 10 signal channels in which each channel occupies a distinct frequency sub-band. The sub-bands in this example do not overlap because each sub-band is separated by what is known as a "guard band," which is an unused portion of the bandwidth designed to reduce interference between neighboring channels.

31. The bottom portion **(b)** of Figure 1.10 shows an OFDM arrangement also having ten signal channels or sub-bands. As shown, the sub-bands overlap, which obviates the need for a guard band and thus results 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.

32. 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.

33. 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. 1775-96 (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.)

34. 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 used by various cellular systems. 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]**.)

35. 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" or "WiFi" 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 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.)

36. As mentioned above, it was well-known that OFDM could be employed in cellular environments, and that there would be advantages to doing 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:

- 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. 665-75 (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]**;

- 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. 979-82 (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]**.

37. 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);

[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.)

- Flarion's U.S. 6,553,019 **[Ex. 1051]**, filed December 23, 1999 (*see id.*, 7:7-9);
- Lucent's U.S. 6,922,388 **[Ex. 1052]**, filed February 11, 2000 (*see id.*, 1:24-26);
- Flarion's EP 1039683 A2 **[Ex. 1007]**, filed February 28, 2000 and published September 27, 2000 (*see id.*, ¶ 0009); and
- Toshiba's U.S. 2001/0021182 **[Ex. 1053]**, filed February 26, 2001 (*see id.*, ¶¶ 0003, 0018, 0021).

38. 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 '870 PATENT

A. The Specification

39. Part V of the Beckmann Declarations includes a section containing an overview of the specifications of the '502 patent and the '870 patent, which I understand share the same specification. To the extent applicable, I have adopted

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

40. The '870 patent purports to describe a system and method for delivering digital media files to an electronic device. ('870, Abstract.) 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**. ('870, 14:13-18, 14:36-38.) On the left side is a server **206**, which includes server software **207**. ('870, 14:25-26.) In one embodiment, the patent describes a server (**206**) for storing digital media files. ('870, 15:6-7; *see also id.*, 12:65-66.) 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**. ('870, 18:28-36.)

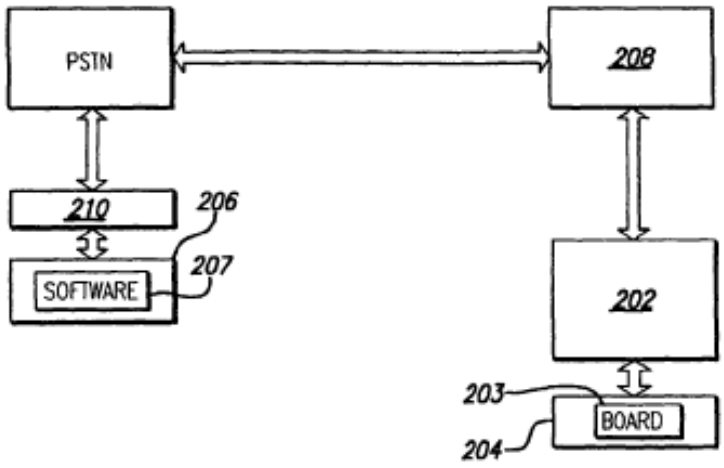


FIG. 2

41. The specification explains that the server can receive requests from the phone (’870, 12:36-59), “which may be given through user voice commands or commands using the phone keys.” (’870, 12:58-59.) 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. (’870, 12:47-52, 12:65-13:3, 13:34-35, 14:58-61, 15:32-42.) This is shown in Figure 2 above. The specification also notes that a user may listen to a sample or portion of a song and then decide to purchase and download a complete copy of the song. (’870, 9:27-55, 31:32-48.)

42. The ’870 patent discloses that “[a]n orthogonal frequency-division multiplex (OFDM) modulation scheme” can be used for data transmission. (’870, 16:57-58.) Further, in one embodiment, the digital media file can be “compressed into an MPEG Layer 3 bit stream.” (’870, 25:34-35; *see also id.*, 14:66-67, 22:31-44 (discussing “buffers” within the device memory).)

43. The ’870 patent states that its method of distributing music and audiovisual works may account for “copyright owners of the works,” such as by coding files with identification relating to copyright owners and reporting information about downloads to copyright owners. (’870, 31:37-65.)

B. The Claims of the ’870 Patent

44. This Declaration addresses independent claim 8, and claims 10-14, which depend, directly or indirectly from claim 8. Claim 8 reads:

> 8. A method for distributing electronic content over a cellular network to a user operating a cellular phone, the method being executable by a computer system that includes server hardware and a database, the method comprising:
>
> providing for the transmission to the cellular phone by orthogonal frequency-division multiplex (OFDM) modulation of a database of electronically accessible data files, each data file being subject to a copyright owner;
>
> receiving, by the computer system, a selection from the cellular phone corresponding to at least one of the data files;
>
> providing for the transmission of, by the computer system and in response to the received selection, a portion of the selected data file to the cellular phone electronic device;
>
> receiving, by the computer system, a request for the data file for which the portion was provided to the cellular phone electronic device; and
>
> providing for the transmitting, by the computer system, of the requested data file to the cellular phone, said cellular phone including a digital signal processor configured to receive the

> data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation.

('870, Claim 8.) I will address the other claims in the '870 patent in my detailed analysis in **Part V** below.

V. APPLICATION OF THE PRIOR ART TO THE CLAIMS

45. I have reviewed and analyzed the prior art references and materials listed in **Part I.B** above. In my opinion, each limitation of claims 8 and 12-14 is disclosed and rendered obvious by Rolf (Ex. 1003), Hacker (Ex. 1062), Fritsch (Ex. 1004), Gatherer (Ex. 1005), and Frodigh (Ex. 1006). Each limitation of claims 10-11 is disclosed and rendered obvious by Rolf (Ex. 1003), Hacker (Ex. 1062), Fritsch (Ex. 1004), Gatherer (Ex. 1005), and Frodigh (Ex. 1006), in further view of Bell (Ex. 1068).

46. I have also provided an alternative ground below which substitutes the Frodigh (Ex. 1006) reference with O'Hara, Tagg and Pinard (Exs. 1061, 1060, and 1025) for purposes of disclosing the cellular network and OFDM limitations in claim 8. Under this alternative ground, in my opinion, each limitation of claims 8 and 12-14 is disclosed and rendered obvious by Rolf (Ex. 1003), Hacker (Ex. 1062), Fritsch (Ex. 1004), and Gatherer (Ex. 1005), in further view of O'Hara, Tagg, and Pinard (Exs. 1061, 1060, and 1025). And each limitation of claims 10-11 is disclosed and rendered obvious by Rolf (Ex. 1003), Hacker (Ex. 1062),

Fritsch (Ex. 1004), Gatherer (Ex. 1005), and Bell (Ex. 1064), in further view of O'Hara, Tagg, and Pinard (Exs. 1061, 1060, and 1025).

47. I understand that each reference cited in the grounds identified above qualifies as prior art vis-à-vis the claims of the '870 patent. Counsel has informed me that Rolf, Fritsch, and Tagg qualify as prior art to the '870 patent at least because they are U.S. patents that issued from applications filed before June 27, 2001, the filing date of the earliest application to which the '870 patent could claim priority. I am also informed by counsel that Frodigh, Gatherer, O'Hara, Pinard, and Hacker qualify as prior art to the '870 patent because they were published before June 27, 2001. I am also informed by counsel that Bell qualifies as prior art to the '870 patent because it is a published U.S. patent application filed 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]

48. **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 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.

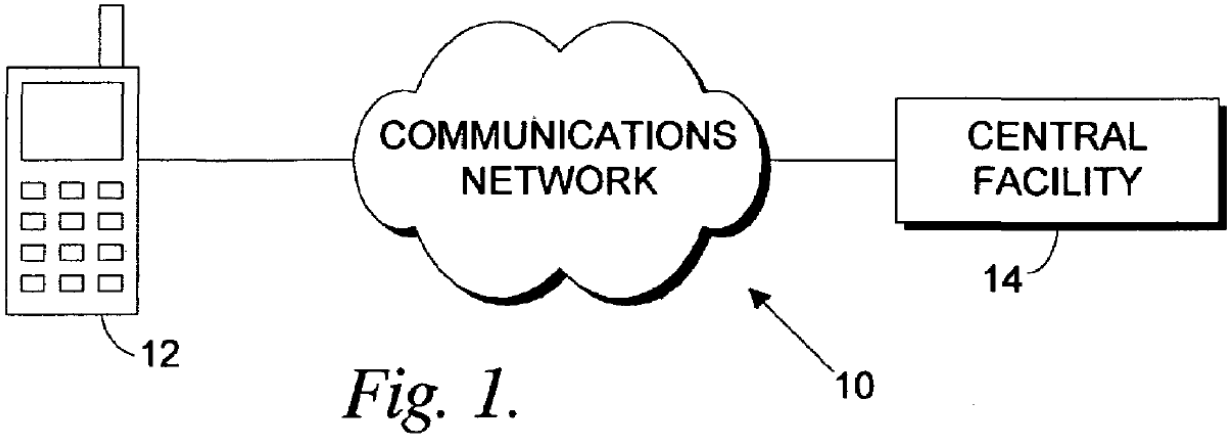


Fig. 1.

(*Id.*, Fig. 1.) This Declaration relies on Rolf as the primary reference that discloses the majority of the limitations of the claims.

49. As shown in Figure 1 above, the communications device (labeled **12**) can be a "cellular telephone." (*Id.*, 1:27-28, 5:21-22.) Rolf explains that "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." (*Id.*, 1:28-35.) Rolf further explains that the central facility, labeled **14** in the figure above, is a set of hardware and software components connected to a communications network. (*Id.*, 8:56-9:18, Fig. 5.) For example, the facility **14** can include a Web server.

(*Id.*, 3:10-16 ("an identifier, such as a server address, associated with the remote central facility"); 12:52-55 ("[T]he 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.").) The facility **14** also includes a database. (*Id.*, 5:32-35 ("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.") (underlining added), 8:56-59 ("a central facility **14** has a processor **50**. Connected to the processor **50** are a data base memory **52** and a [sic; an] interface **54** (such as a transceiver or modem) for transmitting and receiving communications signals.") (underlining added), Fig. 5 (showing database memory **52**).)

50. Finally, 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

51. Even though I understand that Rolf is, on its own, prior art to the '870 patent, I have also been asked to examine U.S. Provisional Patent Application No. 60/167,179 ("Rolf Provisional") **[Ex. 1066]**, 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 '870 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.

52. 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 have created an exhibit comparing the textual contents of Rolf and the Rolf Provisional. ("Rolf Redline") **[Ex. 1067].** 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.

53. 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.

54. 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.

55. 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 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 Fritsch [Ex. 1004]

56. Fritsch, entitled "Distribution of Musical Products Over the Internet," discloses a system and website for enabling the purchase of digital music files over the Internet. I rely on Fritsch primarily for a limitation of claim 8 that requires transmission of **a portion** of a selected data file to a cellular phone.

57. Fritsch discloses a music download computer system similar in many respects to Rolf, discussed above. (Fritsch, 2:58-3:12.) Fritsch discloses that the computer system receives a selection of a musical song, and in response, transmits just a portion of the song (e.g. a "20-second clip") to the requesting device:

> If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example—as illustrated in FIG. 1C. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album, as also shown in FIG. 1C.

(*Id.*, 4:54-61 (underlining added); *see also id.*, 5:52-56 ("On the web site, the on-line customer may pre-listen to the desired music prior to the purchase" and then purchase the music for immediate digital delivery), 3:4-12, Fig. 1C.)

58. Although Fritsch describes an embodiment in which a website is provided to a PC user, Fritsch expressly notes that "[c]onsumers may access the web site via a personal computer or any other wired or wireless Internet access device, such as . . . cellular telephone." (*Id.*, 2:60-63.)

3. Brief Summary of Gatherer [Ex. 1005]

59. **Gatherer**, 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. Claim 8 of the '870 patent recites 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.

60. 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 Frodigh [Ex. 1006]

61. **Frodigh**, U.S. Patent No. 5,726,978, entitled "Adaptive Channel Allocation in a Frequency Division Multiplexed System," describes a method and

system for cellular communication using OFDM. Claim 8 of the '870 patent recites the transmission of data to a cell phone by "orthogonal frequency-division multiplex (OFDM) modulation." This Declaration relies on Frodigh to disclose the OFDM transmission technique and its use with cell phones.

62. As Frodigh explains, "Frequency division multiplexing (FDM) is a method of transmitting data that has application to cellular systems. Orthogonal frequency division multiplexing (OFDM) is a particular method of FDM that is particularly suited for cellular systems." (*Id.*, 1:59-2:18.) Frodigh describes the use of OFDM modulation to transmit voice and data to a "mobile station" in a cellular system. (*Id.*, 7:51-63; Fig. 2.) Frodigh also discloses a receiver that can be implemented in the mobile station to receive data transmitted by OFDM modulation. (*Id.*, 8:1-9 ("In the downlink the receiver **330** is located in the mobile station … The link receiver **330** and link transmitter communicate over RF channel **380** using a subset of M of the available subcarriers."), 8:10-14, 8:33-63, Fig. 3C.)

5. Brief Summary of Hacker [Ex. 1062]

63. **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).) Hacker provides a detailed description of technical, practical, and legal subject matters relating to

MP3 files, which are audio files that have been compressed according to the MPEG-1/MPEG-2 Layer III standards. (*See* Hacker, at pp. 7-8). I rely on Hacker for its teachings that music files are subject to copyright owners, as recited in claim 8 and dependent claims 10 and 14, and its disclosure that data files include identifiers associated with the copyright owner, as recited in claim 14.

64. Hacker contains a chapter describing legal issues relating to MP3 music files (Chapter 7, Hacker at pp. 261-83) and discloses that every recorded song is copyrighted and therefore subject to a copyright owner (Hacker at pp. 262-63). Hacker also describes that MP3 files can include meta-data, such as in ID3 tags, that can contain identification information, including identifiers associated with copyright owners. (Hacker at p. 116 ("Every MP3 file has the ability to store 'meta-data' related to the track in the file itself . . ."), p. 117 ("The number of possible applications of ID3v2 data is staggering. Right off the bat, it gives artists and labels a place to store copyright information, terms of use and proof of ownership."), p. 118 ("ID3 tags are commonly used by hardware MP3 players such as portable 'Walkman'-type devices and home MP3 units.").)

6. Brief Summary of Bell [Ex. 1068]

65. **Bell**, U.S. Application Publication No. US 2002/0065826, entitled "Systems and Processes for Measuring, Evaluating and Reporting Audience

Response to Audio, Video, and Other Content," describes "systems and processes for measuring, evaluating, and reporting audience response to various forms of content including audio, video, and information-based content." (Bell, ¶ 0002.) Claims 10-11 of the '870 patent recite "tracking, by the computer system, the user of the cellular phone receiving the data file to determine data about the user." Claim 10 further recites "reporting, by the computer system and to the copyright owner, the data about the user." This Declaration relies on Bell to disclose tracking and reporting techniques used with content distribution servers.

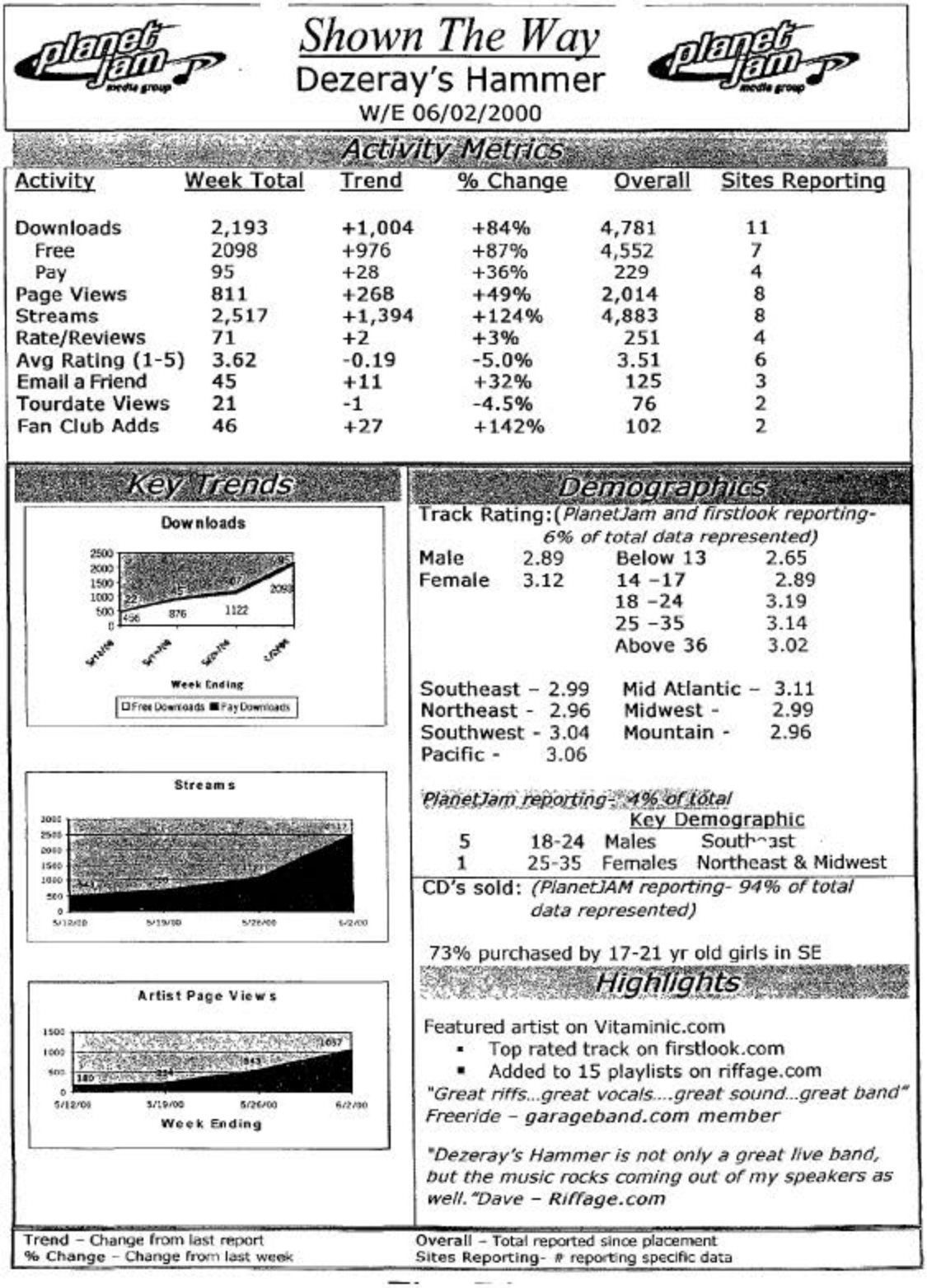
66. Bell describes a computer platform **100** that remote users can access to download or stream digital content such as music. (Bell, ¶¶ 0084, 0085-87; *see also id.*, ¶¶ 0103-04, 0106, Figs 2 & 3, ¶¶ 0022 ("music tracks for downloading"), 0028 ("streaming audio/video, downloading audio/video").) As Bell explains, "[u]sers **104** access platform **100** . . . in order to interact or engage in certain activities. These include: [¶] 1. downloading content; [¶] 2. streaming files," among other activities. (*Id.*, ¶¶ 0085-99 (underlining added).) Bell further explains:

> Each of these activities may be assigned a code and **tracked** as the user participates. The activity code may be combined with user disembodied demographic data including, for instance, an identification number or other unique user ID, age, gender, and zip

> code. This information which may be tracked and recorded as the user participates can be stored in the platform **100** mass memory or database **for processing** in privacy-sensitive reporting to artists **102**, labels **106**, advertisers **108**, producers **100**, affiliate companies **114**, retailers **116**, and others who may desire to know concretely what users **102** are responding to when and why. The key is that activity codes matched to disembodied user demographic data shows what categories of music and artists users are responding to and not responding to in real time in order to reflect a sort of "music DNA."

(*Id.*, ¶ 0100 (underlining and emphasis added); *see also id.*, ¶¶ 0104, 0106-12, 0115-29, Fig. 5.)

67. Bell thus discloses tracking and reporting user data to artists and record labels. Bell also provides an example of such reporting in Fig. 54, reproduced below:



Shown The Way
Dezeray's Hammer
W/E 06/02/2000

Activity Metrics

Activity	Week Total	Trend	% Change	Overall	Sites Reporting
Downloads	2,193	+1,004	+84%	4,781	11
Free	2098	+976	+87%	4,552	7
Pay	95	+28	+36%	229	4
Page Views	811	+268	+49%	2,014	8
Streams	2,517	+1,394	+124%	4,883	8
Rate/Reviews	71	+2	+3%	251	4
Avg Rating (1-5)	3.62	-0.19	-5.0%	3.51	6
Email a Friend	45	+11	+32%	125	3
Tourdate Views	21	-1	-4.5%	76	2
Fan Club Adds	46	+27	+142%	102	2

Key Trends

Downloads

Streams

Artist Page Views

Demographics

Track Rating: (*PlanetJam and firstlook reporting- 6% of total data represented*)

Male	2.89	Below 13	2.65
Female	3.12	14 -17	2.89
		18 -24	3.19
		25 -35	3.14
		Above 36	3.02

Southeast -	2.99	Mid Atlantic -	3.11
Northeast -	2.96	Midwest -	2.99
Southwest -	3.04	Mountain -	2.96
Pacific -	3.06		

PlanetJam reporting - 4% of total

Key Demographic			
5	18-24	Males	Southeast
1	25-35	Females	Northeast & Midwest

CD's sold: *(PlanetJAM reporting- 94% of total data represented)*

73% purchased by 17-21 yr old girls in SE

Highlights

Featured artist on Vitaminic.com
- Top rated track on firstlook.com
- Added to 15 playlists on riffage.com

"Great riffs...great vocals....great sound...great band" Freeride – garageband.com member

"Dezeray's Hammer is not only a great live band, but the music rocks coming out of my speakers as well."Dave – Riffage.com

Trend – Change from last report
% Change – Change from last week
Overall – Total reported since placement
Sites Reporting- # reporting specific data

(Fig. 54; *see also id.*, ¶¶ 0195-96.)

7. Brief Summary of O'Hara [Ex. 1061], Tagg [Ex. 1060], and Pinard [Ex. 1025]

68. As I explained above, I have relied upon Frodigh (Ex. 1006) for its disclosures of transmitting information to a cell phone using OFDM. I have also provided an alternative ground in which, instead of Frodigh, I have relied on the teachings of O'Hara, Tagg and Pinard to show the OFDM and cellular network limitations in the claims.

69. 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.

70. 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 of Rolf to receive data files wirelessly using IEEE 802.11a, thus disclosing transmission of data files using OFDM as recited in the challenged claims.

71. **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

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.").)

72. **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).)

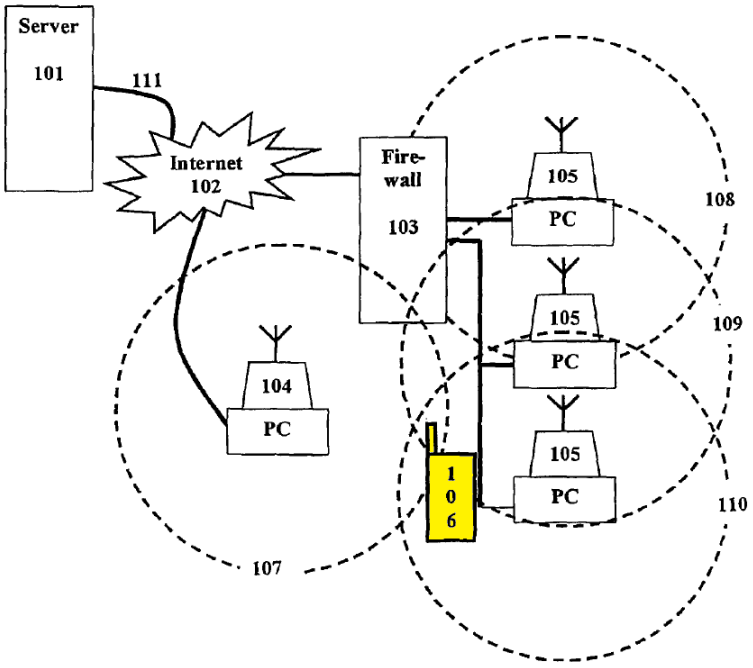


Fig. 1

(Tagg, Fig. 1.) Mobile roaming device **106**, shown highlighted in yellow, may be a "mobile computer, PDA, cellular telephone, or home appliance." (*Id.*, 8:53-66 (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.*, 7:63-66.)

73. 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

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.)

74. 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, 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.").)

75. I note that claim 8 further recites receiving a data file "over a **cellular network**," 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. As I explained in **Part III.A** above, 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. *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");
- *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. 1063]**, 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");
- *McGraw-Hill Illustrated Telecom Dictionary* (2000), **[Ex. 1065]**, 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.").

76. The term "cellular network" under its broadest 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.

77. 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. 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.)

78. 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 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.) Pinard refers to the "IEEE 802.11 draft specification" because the standard had not yet been finalized when Pinard was filed in 1995.

79. 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.

80. As I will explain in **Part V.C** below, the OFDM and cellular network limitations of the challenged claims would have been obvious over O'Hara, Tagg, and Pinard.

B. Claims 8 and 10-14

1. Independent Claim 8

81. I have reproduced independent claim 8 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:

8. A method for distributing electronic content over a cellular network to a user operating a cellular phone, the method being

executable by a computer system that includes server hardware and a database, the method comprising:

[a] providing for the transmission to the cellular phone by orthogonal frequency-division multiplex (OFDM) modulation of a database of electronically accessible data files, each data file being subject to a copyright owner;

[b] receiving, by the computer system, a selection from the cellular phone corresponding to at least one of the data files;

[c] providing for the transmission of, by the computer system and in response to the received selection, a portion of the selected data file to the cellular phone electronic device;

[d] receiving, by the computer system, a request for the data file for which the portion was provided to the cellular phone electronic device; and

[e] providing for the transmitting, by the computer system, of the requested data file to the cellular phone, said cellular phone including a digital signal processor configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation.

('870, Claim 8.) Each limitation of claim 8 is disclosed and rendered obvious by Rolf in view of Fritsch, Gatherer, Frodigh, and Hacker.

82. The preamble of claim 8 recites, "**[a] method for distributing electronic content over a cellular network to a user operating a cellular phone,**

the method being executable by a computer system that includes server hardware and a database." Assuming the preamble of claim 8 provides a claim limitation, it is fully disclosed by Rolf.

83. 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.) This is generally shown in Figure 1, reproduced below.

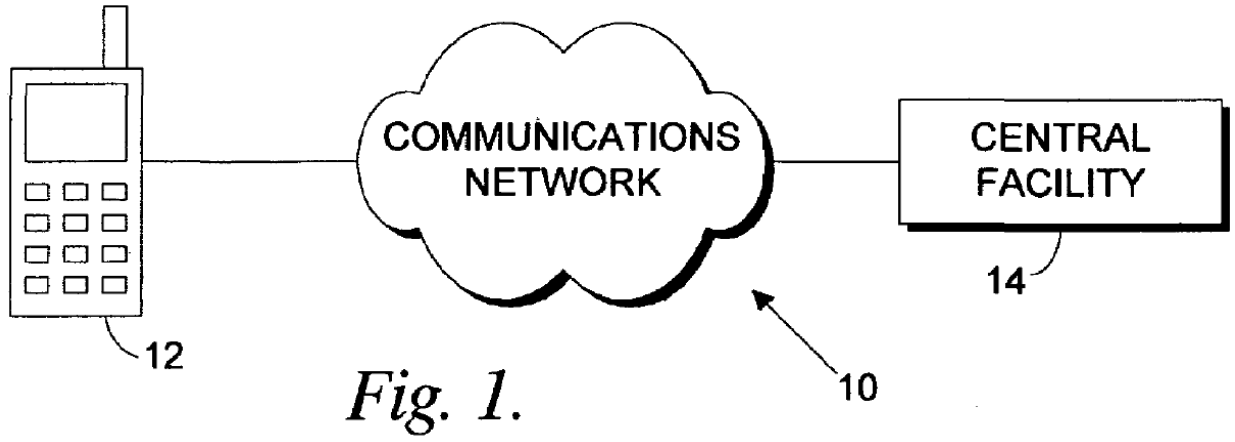


Fig. 1.

(*Id.*, Fig. 1.) As shown, the mobile communications device, labeled **12** in the figure above, can be a "cellular telephone." (*Id.*, 1:27-28, 5:21-22.) "[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." (*Id.*, 1:28-35; *see also id.*, 5:18-25.)[3]

84. Rolf makes clear that the music recordings wirelessly delivered to the cell phone are "**electronic content**." Rolf discloses that the music can be "encoded by a compression algorithm into an encoded (such as MP3 or other) format." (*Id.*, 1:35-38; *see also id.*, 5:37-39; 8:63-9:6.) Rolf further explains that "the wireless communications link established between the wireless communications device and the central facility is a cellular communications link." (*Id.*, 3:17-21 (underlining added).) One of ordinary skill in the art would have understood that, where a "cellular communications link" is used for wireless communication with the cell phone, the distribution of music content occurs "**over a cellular network**."[4] Rolf therefore discloses "**[a] method for distributing**

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

[4] To the extent there is any question as to whether Rolf discloses distribution over a cellular network, it would have been obvious to combine Rolf's system and method for delivering music with the cellular network disclosed in Frodigh (which uses OFDM), as I explain for claim 8[a] and claim 8[e] (**Parts V.B.1.a** and

electronic content over a cellular network to a user operating a cellular phone."

85. Rolf next discloses that the method is "**executable by a computer system that includes server hardware and a database**." The "**computer system**" in Rolf takes the form of central facility **14** shown in Figure 1 above. (Rolf, Fig. 1, 5:30-53.) Central facility **14** confirms that it includes a "**database**" and other "**server hardware**," as shown in Figure 5:

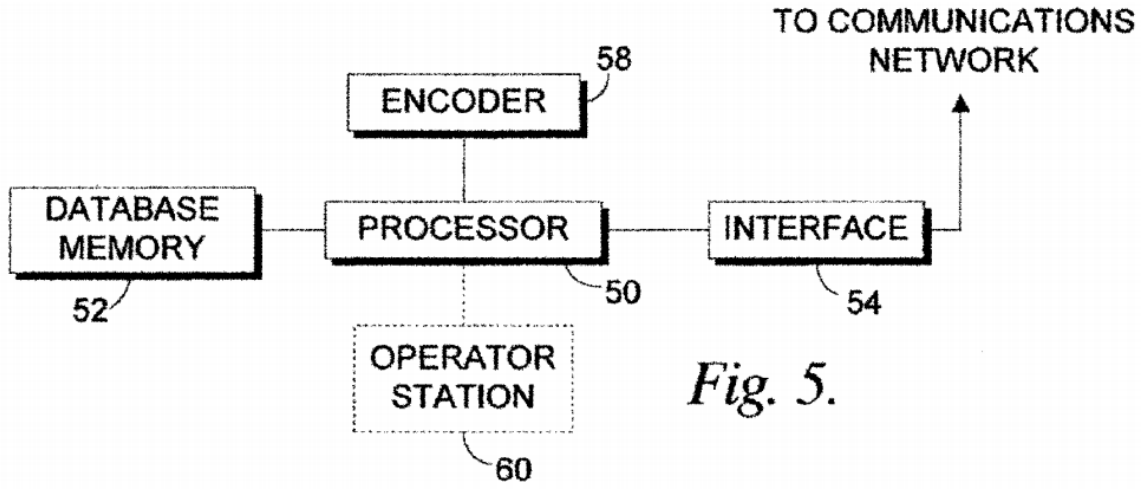


Fig. 5.

(*Id.*, Fig. 5; 5:1-2 ("FIG. 5 is a block diagram of a central facility of the present invention").) As shown, "central facility **14** has a processor **50**. Connected to the

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V.B.1.e) below. (*See* Frodigh, Ex. 1006, 1:61-63 ("Orthogonal frequency division multiplexing (OFDM) is a particular method of FDM that is particularly suited for cellular systems."), 5:29-30 ("FIG. 1 illustrates a cellular telecommunications network within which the present invention may be implemented;"), Fig. 1.)

processor **50** are a data base memory **52** and a [sic; an] interface **54** (such as a transceiver or modem) for transmitting and receiving communications signals." (*Id.*, 8:56-61 (underlining added); *see also id.* 5:32-35 ("The remote storage facility . . . includes a data base having a plurality of music recordings therein.") (underlining added).) One of ordinary skill in the art would have understood the "processor," "interface," and other components to be server hardware.

86. Although Rolf refers to the computer system as a central "facility," Rolf clearly regards it as a server. Rolf explains that "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." (*Id.*, 12:52-55 (underlining added); *see also id.* 3:10-16 ("an identifier, such as a server address, associated with the remote central facility") (underlining added), 5:32-35 ("The remote storage facility may, for example, be at an address on the world wide web . . . .) (underlining added).) Central facility **14** in Rolf therefore includes "server hardware," such as its processor, interface, database and other components.

87. As I will explain in detail below, central facility **14** in Rolf executes the steps recited in limitations of this claim. Rolf discloses that the facility **14** stores electronic data files, such as MP3 files, and distributes them to cell phones:

> 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. . . . [T]he 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 retrieved music recording or recordings may be stored in a memory within the communications device **12** . . . .

(Rolf, 5:30-35, 5:47-56 (underlining added); *see also, e.g.*, *id.*, 1:18-21, 1:25-28, 1:35-38, 8:63-9:6.) Rolf therefore discloses "[a] method for distributing electronic content over a cellular network to a user operating a cellular phone, the method being executable by a computer system that includes server hardware and a database," as recited in the preamble.

a. "providing for the transmission to the cellular phone by orthogonal frequency-division multiplex (OFDM) modulation of a database of electronically accessible data files, each data file being subject to a copyright owner" (Claim 8[a])

88. In light of the length of this claim limitation, I will divide it into three pieces to ensure that I cover all of its elements. As I explain below, this limitation is disclosed by and obvious over Rolf in view of Frodigh and Hacker.

"providing for the transmission to the cellular phone . . . of a database of electronically accessible data files"

89. As discussed above in connection with the preamble, Rolf discloses that the remote storage facility **14** includes a database that stores electronically accessible music files. As Rolf explains:

> 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).

(Rolf, 5:32-39 (underlining added).)

90. Rolf further discloses that the facility **14** provides for the transmission of the database of music files to a cellular phone. As Rolf explains, "processor **50** [of the facility **14**] 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.*, 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 telephone.") (underlining added), 5:64-66 ("[A] wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings.").) As previously noted, the device **12** can be a "cellular telephone." (*Id.*, 1:27-28, 5:21-22.) Moreover, because "one or more" music files may be selected for download (*id.*, 1:39-41, 5:49-53 (underlining added)), one of ordinary skill in the art would have understood and found it obvious that the facility **14** allows for the transmission of the entire database of music files. Rolf therefore discloses "**providing for the transmission to the cellular phone . . . of a database of electronically accessible data files**."

transmission to the cellular phone "by orthogonal frequency-division multiplex (OFDM) modulation"

91. While the music files in Rolf are not disclosed as being transmitted "by orthogonal frequency-division multiplex (OFDM) modulation," this would have been obvious in view of Frodigh. As I discussed in **Part V.A.4** above, Frodigh describes a data transmission technique called "orthogonal frequency division multiplexing," or "OFDM" for short. (Frodigh, 1:61.) As Frodigh explains:

> Frequency division multiplexing (FDM) is a method of transmitting data that has application to cellular systems. Orthogonal frequency division multiplexing (OFDM) is a particular method of FDM that is **particularly suited for cellular systems**. An OFDM signal consists of a number of subcarriers multiplexed together, each subcarrier at a different frequency and each modulated by a signal which varies discretely rather than continuously. … Generally, N serial data elements modulate N subcarrier frequencies, which are then frequency division multiplexed. …

(*Id.*, 1:59-2:18 (emphasis added).) Frodigh goes on to describe the use of OFDM modulation to transmit voice and data to a "mobile station"[5] over a cellular

[5] A person of ordinary skill in the art would have understood that the term "mobile station" includes a cellular phone. (Frodigh, 1:13-16 ("In a cellular telecommunications system the user of a mobile station communicates with the

network. (*Id.*, 7:51-63, Fig. 2; *see also id.*, 5:29-30 ("FIG. 1 illustrates a cellular telecommunications network within which the present invention may be implemented;"), Fig. 1.) In particular, Frodigh describes a "receiver **330**" that can be implemented in the mobile station to receive and process data transmitted by OFDM modulation. (*Id.*, 8:1-9 ("In the downlink the receiver **330** is located in the mobile station … The link receiver **330** and link transmitter communicate over RF channel **380** using a subset of M of the available subcarriers."), 8:10-14, 8:33-63, Fig. 3C.)

92. ***Rationale and Motivation to Combine:*** It would have been obvious to a person of ordinary skill in the art to combine Rolf with Frodigh, predictably resulting in the transmission of a database of music files to a cell phone, as disclosed in Rolf, in which the transmission occurs by OFDM modulation over a cellular network, as described in Frodigh. Rolf and Frodigh are analogous references in the same field of cellular communication. Further confirming their analogous nature is the fact that like Rolf, Frodigh recognized that "data," in addition to "voice," can be received by a mobile device over a cellular connection. (Frodigh, 7:58-59 ("Voice and data to be transmitted on each link are modulated

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system through a radio interface while moving about the geographic coverage area of the system.").)

onto a number (M) subcarriers.") (underlining added).) As such, one of ordinary skill in the art would have found the OFDM transmission technique in Frodigh to be a natural combination with the cell phone of Rolf.

93. Frodigh also provides express motivations to combine in the manner described above. As noted, Frodigh teaches that OFDM modulation is "particularly suited for cellular systems." (Frodigh, 1:62-63.) Indeed, Frodigh explains in detail the advantages of using OFDM in a cellular system:

> OFDM offers several advantages that are desirable in a cellular system. In OFDM the orthogonality of the subcarriers in the frequency spectrum allows the overall spectrum of an OFDM signal to be close to rectangular. This results in efficient use of the bandwidth available to a system. OFDM also offers advantages in that interference caused by multipath propagation effects is reduced. Multipath propagation effects are caused by radio wave scattering from buildings and other structures in the path of the radio wave. Multipath propagation may result in frequency selective multipath fading. In an OFDM system the spectrum of each individual data element normally occupies only a small part of the available bandwidth. This has the effect of spreading out a multipath fade over many symbols. This effectively randomizes burst errors caused by the frequency selective multipath fading, so that instead of one or several symbols being completely destroyed, many symbols are only slightly distorted. Additionally, OFDM offers the advantage that the time

> period T may be chosen to be relatively large as compared with symbol delay time on the transmission channel. This has the effect of reducing intersymbol interference caused by receiving portions of different symbols at the same time.[6]

(*Id.*, 2:38-60 (underlining added).) One of ordinary skill in the art would have been motivated by the advantages described in Frodigh to use the OFDM modulation technique to transmit data files such as compressed music to cellular phones over a cellular network.

94. Moreover, as I noted in **Part III.C** above, OFDM was one of a finite number of known techniques for enabling "multiple access," a requisite feature of cellular networks. As further noted, the communications industry – including telecom heavyweights Ericsson and Nokia – had actively developed cellular systems employing OFDM for over a decade, and commercialization of such systems were already underway. Under these circumstances, a person of ordinary skill in the art would have had every expectation of success in combining Frodigh with Rolf in the manner described above.

[6] I note that the mitigation of intersymbol interference is a benefit of OFDM that the '870 patent itself acknowledges. ('870, 16:58-60.)

95. Rolf in combination with Frodigh therefore discloses the claim limitation, "providing for the transmission to the cellular phone by orthogonal frequency-division multiplex (OFDM) modulation of a database of electronically accessible data files."

"**each data file being subject to a copyright owner**"

96. Rolf does not expressly disclose the limitation of "each data file being subject to a copyright owner." But basic copyright issues associated with the distribution of digital music files would have been familiar to persons of ordinary skill in the art. It is common knowledge that music works originate from musical artists, who may retain rights in the musical works they create in the form of a copyright. This is confirmed by Rolf, which discloses that each of its music files may be associated with an "artist" and "recording label." (Rolf, 3:3-10, 5:35-37, 11:10-14, 13:33-38; *see also id.*, Figs. 9a & 9c.) Accordingly, a person of ordinary skill in the art would have understood and found it obvious that the music files in Rolf could be subject to one or more copyright owners.

97. To the extent there is any question as to whether Rolf satisfies the requirement that each music file be subject to a copyright owner, this is clearly disclosed by **Hacker**.

98. 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).) Hacker makes clear that a musical work, including the digital music files in Rolf, may be subject to a copyright owner such as its creator:

> Copyright is, quite simply, the right to copy, and the creator is the person who holds that right. Of course, the owner of a copyrighted work also has the right to sell the right to someone else. In the music industry, artists typically sell their copyright to the label that publishes their work.
>
> In order for a work to be copyrighted, it must exist tangibly in the real world—not just in your head. . . . A song that you make up and write out on paper or record to DAT tape or post to Usenet is copyrighted.

(Hacker, at p. 262 (underlining added); *see also id.* at p. 263 (describing similar copyright laws throughout "most of the world's countries" where "a work becomes copyrighted the moment it's put into tangible form.").)

99. Hacker further explains that MP3 files may be subject to copyright owners in the form of record companies. As I noted previously, Hacker describes that artists typically sell their copyrights to a label (record company) for commercial purposes. As a result, digital music files such as MP3s are typically subject to a copyright owner that is the record company. (*Id.*, at p. 16 ("An artist

signed to a label generally does not have the right to post his own songs to the Internet, because the label owns the copyright to those songs.") (underlining added).)

100. Moreover, Hacker describes the use of "ID3" tags, which are part of the MP3 file, that can directly identify the copyright owner. As Hacker explains, "[t]he number of possible applications of ID3v2 data is staggering. Right off the bat, it gives artists and labels a place to store copyright information, terms of use and proof of ownership." (*Id.*, at p. 117 (underlining added).) Hacker describes a software program that can display the ID3 tag fields for a particular MP3 file, including the "Copyright" field. This is shown Figure 4-4 below.

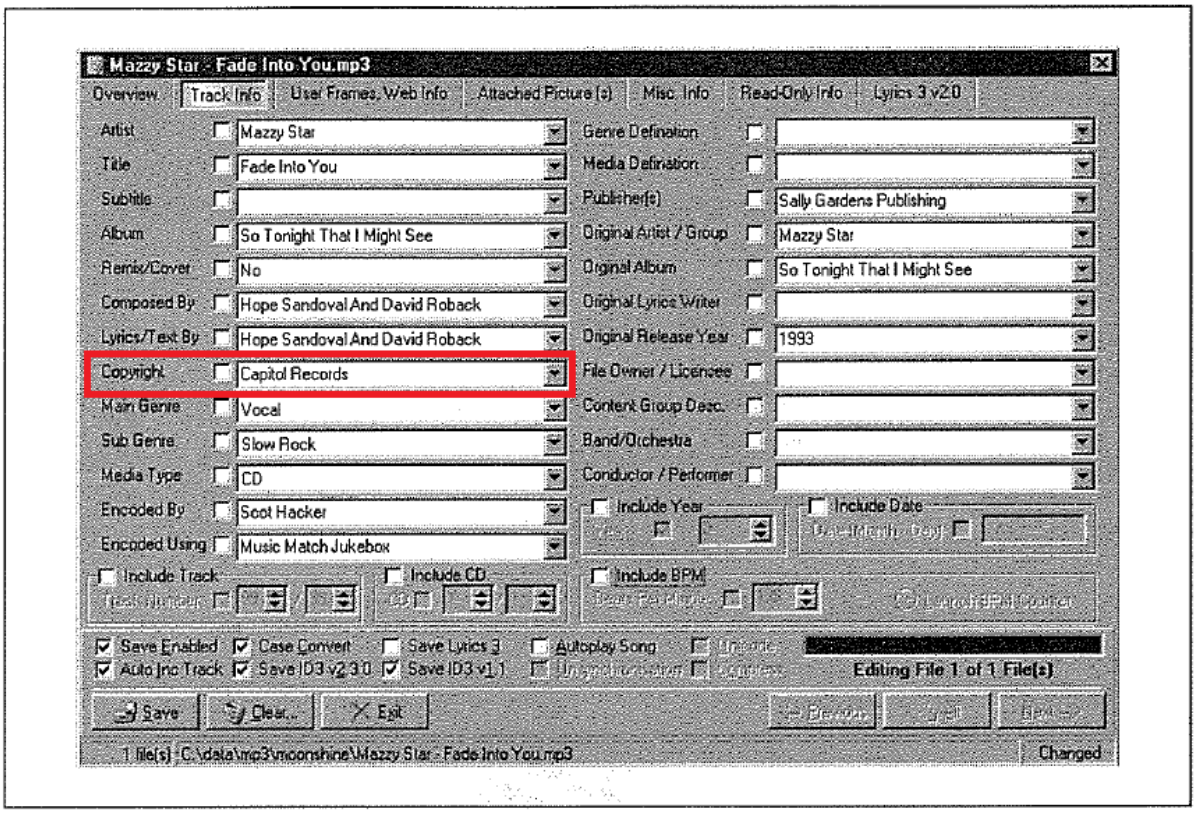


Figure 4-4. Helium's tag editor offers the majority of ID3v2 frames; buttons along the top let you navigate amongst major classes of allowable ID3v2 data

(*Id.*, at p.124 (red annotation added).) As shown in the red box that I added for emphasis, the "Copyright" field identifies the well-known record company Capitol Records. And as such, the "Mazzy Star – Fade Into You" MP3 file shown in Figure 4-4 is subject to the copyright owner, Capitol Records. Indeed, the fact that "Copyright" is a "major class[] of allowable ID3v2 data," as explained in the caption to Figure 4-4 above, confirms that it is standard for an MP3 file (such as the ones disclosed in Rolf) to be subject to a copyright owner.

101. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill to combine Rolf and Hacker, predictably resulting in the digital music system of Rolf in which each digital audio file is subject to a copyright owner, as disclosed in Hacker. As noted, Hacker specifically discloses that audio works are typically subject to copyright protection, and in fact, that MP3 files often record the name of the copyright owner. A person of ordinary skill in the art would have found this to be a trivial combination because, among other things, MP3 is the same format used for the collection of music files in Rolf. (Rolf, 1:36-37, 5:37-39 ("[T]he music recordings are preferably encoded in an encoded format, such as MP3 (Mpeg-1 Audio layer 3)").) A person of ordinary skill in the art would have therefore understood that each music file in Rolf could be subject to a copyright owner, such as the artist or a record company.

102. A person of ordinary skill in the art, as a matter of common sense, would also have appreciated that the music files in Rolf would be subject to copyright owners because they are commercial works. (*Id.*, 5:35-37 ("[T]he music recordings are categorized by a plurality of selectable fields, such as <u>"title", "artist", "album or CD type", "recording label"</u>, etc.") (underlining added).) This appreciation would have been expressly reinforced by Hacker, which explains that copyright owners have a financial interest in protecting their commercial works.

(Hacker at p. 263 ("Of course, money is the reason most copyright holders want to retain control over their right to copy. If that right slips away, the creator is deprived of potential earnings they might make from controlling the right to copy.").) It would therefore come as no surprise that each of the music recordings in Rolf could be subject to a copyright owner.

103. Accordingly, Rolf in view of Frodigh and Hacker render obvious the limitation "providing for the transmission to the cellular phone by orthogonal frequency-division multiplex (OFDM) modulation of a database of electronically accessible data files, each data file being subject to a copyright owner."

b. "receiving, by the computer system, a selection from the cellular phone corresponding to at least one of the data files" (Claim 8[b])

104. As I have explained for the previous claim limitations, Rolf discloses a remote facility **14** that stores a database of music files and allows for selection of one or more of those files for download. (Rolf, 5:30-39, 9:4-6.) The "**selection**" for purposes of claim 8[b] occurs in Rolf when the user of the cell phone **12** requests download of a music recording stored in the database memory **52** of storage facility **14**. (*Id.*, 5:49-53; *see also id.*, 1:39-41; 5:63-66; 9:10-15.) In particular, 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 may be made "using a keypad and input on the wireless communications device," which causes "one or more selected music recordings [to] be retrieved from the storage facility **14**, for transmission, via wireless communications link, to the device **12**." (*Id.*, 5:49-53 (underlining added).) As noted above, device **12** may be a cellular telephone. (*See id.*, 1:39-41, 1:64-67.) Rolf therefore discloses "**a selection from the cellular phone corresponding to at least one of the data files**."

105. Rolf also discloses that this selection is received by "**the computer system**," as recited in the claim. Rolf makes clear that the central facility **14** (the "computer system") receives the request from the cell phone **12**. (*Id.*, 5:64-66 ("[A] wireless communications device **12** communicates with a central facility **14** for retrieval of one or more stored music recordings."), 12:49-61 ("In use, a user of communications device **12** may establish a communications link via the communications network with the remote storage facility **14** . . . Using keypad input **22**, or microphone **32**, when storage facility **14** includes voice recognition equipment, the user may select one or more music recordings for downloading to the wireless communications device.") (underlining added to both).)

c. "providing for the transmission of, by the computer system and in response to the received selection, a portion of the selected data file to the cellular phone electronic device" (Claim 8[c])

106. As I discussed above, in response to the selection of a music recording by the user, the central facility **14** transmits the selected music file to cell phone **12**. As Rolf explains:

> 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. . . . Using keypad input **22**, . . . the user may select one or more music recordings for downloading to the wireless communications device. If the selected recordings are already encoded, they are transmitted to the wireless communications device **12** via the communications network, and stored in memory **32**.

(Rolf, 12:49-64 (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 manner, such that the encoder **58** is not necessary."), 5:63-66, 8:63-9:3.)

107. Rolf thus discloses transmitting a selected data file to a cellular phone in response to receiving a selection from the user. Rolf does not appear to

expressly disclose transmission of just "**a portion of the selected file**," but this feature would have been obvious in view of the "pre-listen" functionality in **Fritsch**.

108. Fritsch discloses a music download computer system similar in many respects to Rolf. (Fritsch, 2:58-3:12.) Fritsch discloses that the computer system receives a selection of a musical song, and in response, transmits just a portion of the song (e.g. a "20-second clip") to the requesting device:

> If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example—as illustrated in FIG. 1C. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album, as also shown in FIG. 1C.

(*Id.*, 4:54-58 (underlining added); *see also id.*, 5:52-56 ("On the web site, the on-line customer may pre-listen to the desired music prior to the purchase" and then purchase the music for immediate digital delivery), 3:4-12.) Figure 1C of Fritsch shows a webpage interface including a "Prelisten" link. (*Id.*, Fig. 1C.) Fritsch therefore discloses "providing for the transmission of, by the computer system and in response to the received selection, a portion of the selected data file," as claimed.

109. It is not clear from Fritsch how the "pre-listen" feature generates the "portion" of the music file delivered to the user device. A person of ordinary skill in the art would have understood that the pre-listen feature could have been implemented, for example, by accessing the complete digital music file from the server and sending only a portion, or by creating and storing "premade" clips corresponding to each selectable music file. A person of ordinary skill in the art would have regarded the mechanics of generating the "pre-listen" portion as a basic and routine implementation decision. Fritsch would therefore render claim 8[c] obvious regardless of the how the feature was implemented.

110. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine the disclosures of Rolf and Fritsch by adding the "pre-listen" feature to Rolf. This would have predictably resulted in the system of Rolf in which central facility **14** transmits a portion of a selected digital audio recording to the cell phone in response to a user selection received from the cell phone.

111. A person of ordinary skill in the art would have had many reasons to make this combination. To begin with, I observe that the '870 patent itself admits that "pre-listen" functionality was a known technique for selling digital recordings to consumers, for example with websites such as Amazon.com. ('870, 1:31-33.)

Fritsch discloses that users can purchase copies of files to download, and Rolf discloses that users may pay for music recording files through periodic subscription fees, account number charges, or other means. (Fritsch, 3:4-10, 4:16-28; Rolf, 8:38-53.) A person of ordinary skill in the art would have appreciated that the "pre-listen" functionality of Fritsch would provide benefits to the system of Rolf by increasing purchases of digital audio recordings.

112. It is common sense that a customer may feel less reluctant to purchase a digital audio recording from central facility **14** if the customer has heard a sample clip of that recording. This concept is as basic as the age-old practice of "Try Before You Buy," referring to the practice of allowing a customer a free yet limited test of a product before committing to purchase it. (Fritsch, 5:52-56 ("On the web site, the on-line customer may pre-listen to the desired music prior to the purchase. Following the pre-listen operation, the on-line customer may place an order for an immediate digital delivery of the selected music, book, etc., if available in digital format.").) The ability to assuage customer reluctance at making purchases would have been particularly useful to a system of Rolf, which discloses a subscription-based payment system in which, in one embodiment, a user is permitted to download only a maximum number of recordings before additional fees are incurred. (Rolf, 8:38-46.) A cap on the number of music

downloads would have made customers cautious or reluctant in their musical downloads, which would have made the "pre-listen" feature of Fritsch potentially even more useful to Rolf.

113. The pre-listen feature of Fritsch would permit the music seller to increase sales revenue in yet another way. By allowing potential customers to sample a portion of the music recording for free, the recording may be exposed to a broader market of potential purchasers. These clear benefits would have motivated the person of ordinary skill in the art to incorporate Fritsch's pre-listen functionality into the system of Rolf.

114. I also observe that Rolf already discloses, in one embodiment, a similar technique in which a user can purchase a recording for download while listening to a real-time streaming broadcast of it. (Rolf, 11:45-61, 12:2-7; *id.*, 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.").)[7] This disclosure is naturally complementary with the pre-listen feature of Fritsch, and further reinforces the combinability of the references.

[7] In this respect, Rolf discloses a type of "pre-listen" feature insofar as a user can listen to a real-time streaming music broadcast before deciding whether to purchase and download a copy of the music file.

115. I am aware of no technological obstacle to a combination of Rolf and Fritsch in the manner described above. Rolf also discloses, as noted above, a "menu driven system" provided to cell phone **12** that "can be utilized to select [a] recording via a menu or listing of recordings." (Rolf, 9:12-15.) Modifying the user interface of Rolf to allow a request for only a "portion" of a music recording, as disclosed in Fritsch, would have been trivial from an implementation standpoint. Fritsch also discloses that its music distribution website can be accessed by any wireless Internet access device including a cellular phone. (Fritsch, 2:61-64.) Although my combination cites Rolf (and not Fritsch) for claim limitations relating to selecting and transmitting audio files to a cell phone, the fact that Fritsch also contemplates the transmission of complete audio files confirms its technological combinability. A person of ordinary skill in the art would also have found it trivial to adapt central facility **14** in Rolf to allow only a portion of a selected audio recording to be transmitted in response to a user selection. Rolf discloses a mechanism in which central facility **14** breaks a recording into a series of packets and sends the packets to the cellular phone. (*See* Rolf, 1:35-36, 6:20-30, 7:4-20, Fig. 7a.) A person of ordinary skill in the art would have known that the "pre-listen" feature could have been implemented by sending only a portion of a digital recording file to a cell phone (using a technique similar to Rolf), or alternatively,

by creating and storing a pre-made excerpt of the recording for transmission to the cell phone upon request. Neither of these approaches would have been viewed as technologically challenging.

116. Finally, Rolf and Fritsch are analogous references in the same field of distributing music content over the Internet. In fact, as noted, Fritsch specifically discloses that its music distribution website can be accessed by a cell phone. (Fritsch, 2:61-64.) A person of ordinary skill in the art implementing the music download of Rolf would naturally have consulted Fritsch in ascertaining potential features of music distribution systems, and would have understood that the two references pertain to the same technology area and are readily combinable.

d. "receiving, by the computer system, a request for the data file for which the portion was provided to the cellular phone electronic device; and" (Claim 8[d])

117. As noted in the preceding claim limitation, central facility **14** in Rolf can transmit a selected recording to cell phone **12** in response to the selection from the user. (Rolf, 5:63-66, 8:63-9:3, 12:4-7, 12:49-67.) But this claim limitation recites receiving a second request, "**for the data file for which the portion was provided to the cellular phone electronic device**," which occurs after the first request corresponding to the selection recited in claim 8[b] above. Rolf does not appear to disclose this second request because, as noted above, it transmits a digital

recording (and not just a portion) in response to the user selection. But this feature would have been obvious in view of Fritsch.

118. Fritsch explains that "a consumer may browse through artists, tracks or albums, pre-listen to a portion of the song and purchase the selected song," such as by "downloading the digital data to her computer hard drive." (Fritsch, 2:64-3:1 (underlining added).) As further explained in Fritsch:

> If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example—as illustrated in FIG. 1C. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album, as also shown in FIG. 1C. The order will be reflected in the shopping basket, always visible on the screen. As the PC user selects more items, each and every item is displayed in the shopping basket . . . When the PC user has developed a satisfactory list, she can submit her order by clicking on the "Purchase Items" button, as illustrated in FIG. 1E showing the magnified right portion of the screen, including the shopping basket. The purchased items will be delivered immediately over the Internet to the user's computer if the selected music is in downloadable digital format.

(*Id.*, 4:55-5:5 (underlining added); *see also id.* 5:52-6:18, Figs. 1C & 1E.) One of ordinary skill in the art would have understood that because digital music is delivered in response to the user submitting an order for a particular music file

after "pre-listening," the computer system in Fritsch "**receiv[es], . . . a request for the data file for which the portion was provided**."

119. It would therefore have been obvious to adapt this functionality from Fritsch to the system of Rolf, predictably resulting in the system of Rolf in which the central facility **14** could receive a second request for a digital file for which a "portion" was previously provided to the cell phone. The rationale and motivation to combine was provided in my discussion of the preceding limitation 8[c].

e. "providing for the transmitting, by the computer system, of the requested data file to the cellular phone, said cellular phone including a digital signal processor configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation." (Claim 8[e])

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

"providing for the transmitting, by the computer system, of the requested data file to the cellular phone"

121. As I explained previously, the central facility **14** in Rolf can transmit a selected music recording (in its entirety) to cell phone **12** in response to a selection from the user. "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**." (Rolf, 12:4-7 (underlining added), 8:63-9:3, 5:63-66, 12:49-67.) As noted previously, however, Rolf does not

disclose the transmission of a full copy of the music recording after a second "request" for the digital file for which a "portion" was previously provided.

122. But as I discussed above, Fritsch discloses that subsequent to a request to purchase a music file that the user has previously "pre-listened," the server can transmit the entire music file to the remote user's device:

> If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example—as illustrated in FIG. 1C. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album, as also shown in FIG. 1C. The order will be reflected in the shopping basket, always visible on the screen. As the PC user selects more items, each and every item is displayed in the shopping basket . . . When the PC user has developed a satisfactory list, she can submit her order by clicking on the "Purchase Items" button, as illustrated in FIG. 1E showing the magnified right portion of the screen, including the shopping basket. <u>The purchased items will be delivered immediately over the Internet to the user's computer if the selected music is in downloadable digital format.</u>

(*Id.*, 4:55-5:5 (underlining added); *see also id.* 5:52-6:18, Figs. 1C & 1E.)

123. It would therefore have been obvious to add this functionality from Fritsch to the system of Rolf, predictably resulting in the system of Rolf in which central facility **14** transmits the entire music file – the same file for which a

"portion" (e.g. pre-listen) was previously provided – to cell phone **12** after a second request for the music file. The rationale and motivation to combine was provided in the discussion of claim 8[c] above.

"said cellular phone including a digital signal processor configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation"

124. As I explained for claim 8[a] above, it would have been obvious to a person or ordinary skill in the art, in view of Frodigh, to transmit of a data file to cell phone **12** of Rolf using OFDM. Because this limitation essentially repeats that same requirement, my analysis from claim 8[a] applies with full force here.

125. Rolf discloses that cell phone **12** includes a "**processor**" **20** that performs functions including processing data packets received by the cell phone over a network and outputting information to be displayed. (Rolf, 10:45-46, 13:39-40; Fig. 4; 7:49-60 (discussing components depicted in Figure 4 that may be in "cellular phones").) Figure 4 below shows that any data received by the cell phone through antenna **42** and transceiver interface **40** (including the downloaded music files) is received by processor **20**:

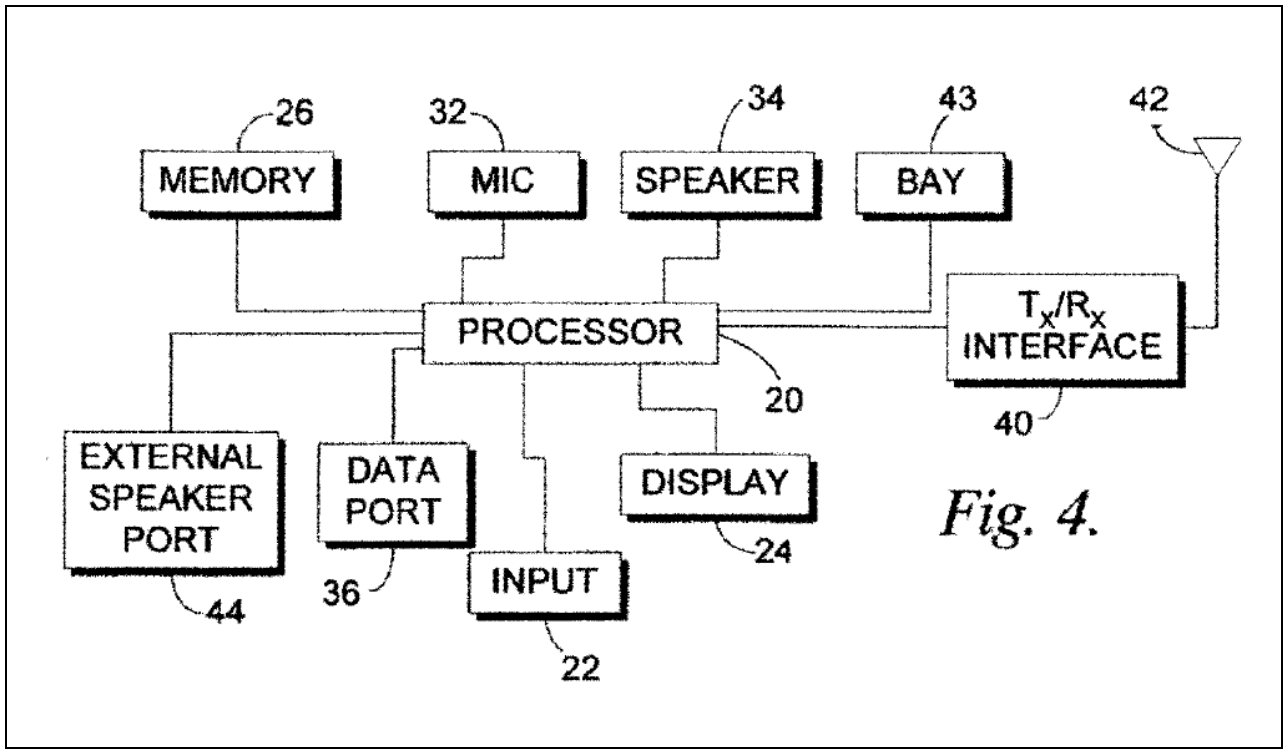


Fig. 4.

(*Id.*, Fig. 4.)

126. 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.

127. 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 "emphasize[d]" programmable DSPs. (*Id.*, at p. 84, left column.) For example, "[t]he voice coder is the part of the architecture that most engineers agree should be done on a DSP." (*Id.*, at p. 84, right column (underlining added).) Gatherer also discloses that digital signal processors were widely used in cell phones for a variety of other functions. (*Id.*, at 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, demodulating, equalizing, and PCA).)

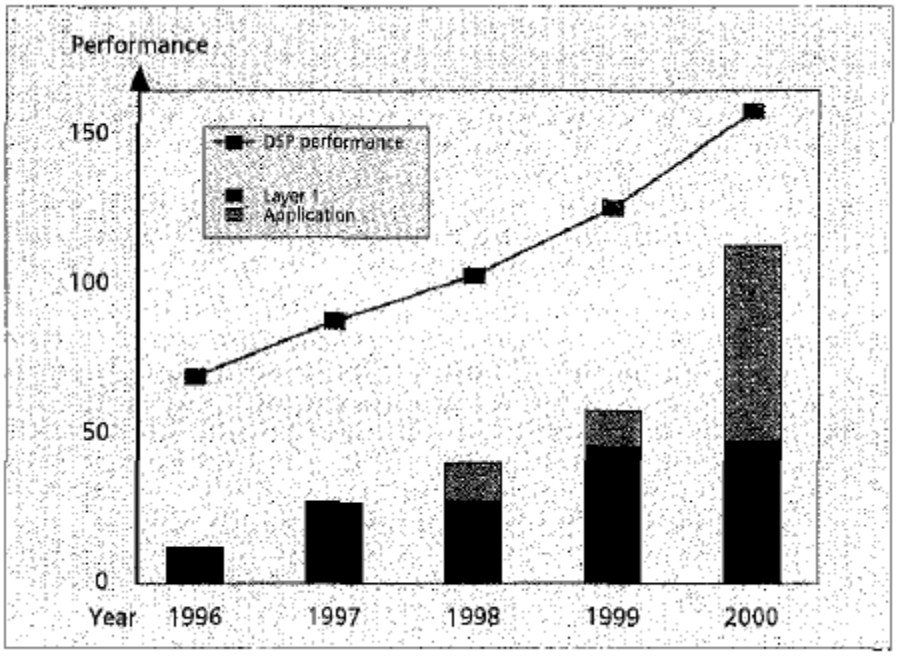
128. ***Rationale and Motivation to Combine:*** It would have been obvious to a person of ordinary skill in the art to combine Rolf with Gatherer, predictably resulting in a cell phone that included one or more digital signal processors. Rolf and Gatherer are analogous references in the same field of 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." (*Id.*, 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.

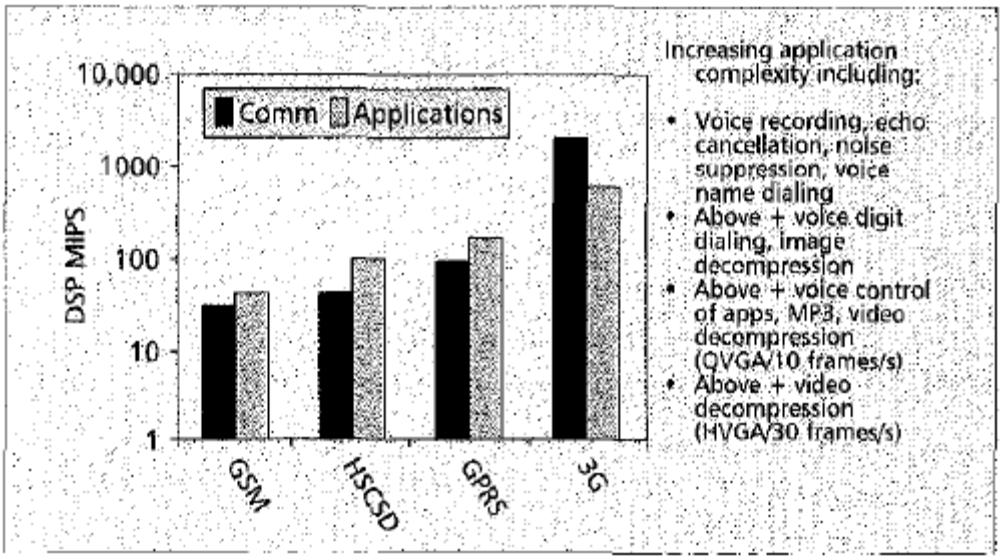
129. Gatherer also provides express motivations to combine in the manner described above. Gatherer explains that relying on DSPs rather than application-specific integrated circuits (ASICs) to perform the processing required by cell phones provides flexibility because DSPs are programmable. (*Id.*, at 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, flexibility is becoming more of an issue, and therefore the programmability offered by DSPs is even more desirable."), p. 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. 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.") (underlining added).) As such, "programmable DSPs [were] **essential** 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).)

130. 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 traditional voice functionality. (*Id.*, 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. 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.") (underlining added); *id.*, at Figs. 3, 7 (reproduced below).)



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



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

131. 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." (*Id.*, at p. 89, right column.)

132. 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 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." (*Id.*, 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.

133. I acknowledge that the claim presents an ambiguity as to which recited element must be "configured to receive the data file over a cellular network

by orthogonal frequency-division multiplex (OFDM) modulation." For context, claim 8 recites a "cellular phone including a digital signal processor configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation." There are two reasonable ways to interpret this limitation. First, it could be that the "**cellular phone**" is configured as recited. Second, the claim could be interpreted to require that the "digital signal processor" be configured for receiving the data file over a cellular network, as recited.

134. 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 not just the cell phone itself) be "configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation," this would nevertheless have been obvious, as I explain below.

135. It would have been obvious in view of Gatherer that a digital signal processor included in the cell phone could receive data transmitted by OFDM modulation, thus satisfying any requirement imposed by the claim that the digital signal processor be configured to receive the data file. 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."), *id.*, at 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.

136. One of ordinary skill in the art would have had ample motivations to use a digital signal processor to receive data transmitted by OFDM modulation. 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. …"); *see also* U.S. Patent No. 6,711,221 (filed Feb. 2000), Ex. 1017, 3:33-48.)

137. In fact, a person of ordinary skill in the art would have been motivated to use a DSP to receive OFDM signals 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). (Frodigh, 8:34-35.) 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.").)

138. Gatherer provides additional express motivations for using a digital signal processor to receive OFDM signals. 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.*, p.85, Fig. 1.) Because the receipt and processing of OFDM signals would be a physical layer task in cell phones, one of ordinary skill in the art would have found DSPs to be a natural candidate for performing functions of an OFDM receiver. 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." (*Id.*, at p. 85, right column.) One of ordinary skill in the art would therefore have appreciated that DSPs are well-suited for evolving OFDM technologies developed for cellular systems, discussed at length in **Part III.C** above. Accordingly, it would have been obvious to a person of ordinary skill in the art to include a digital signal processor in a cell phone, and configure the digital signal processor to receive a data file transmitted by OFDM modulation.

139. 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 media processing." (*Id.*, 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.

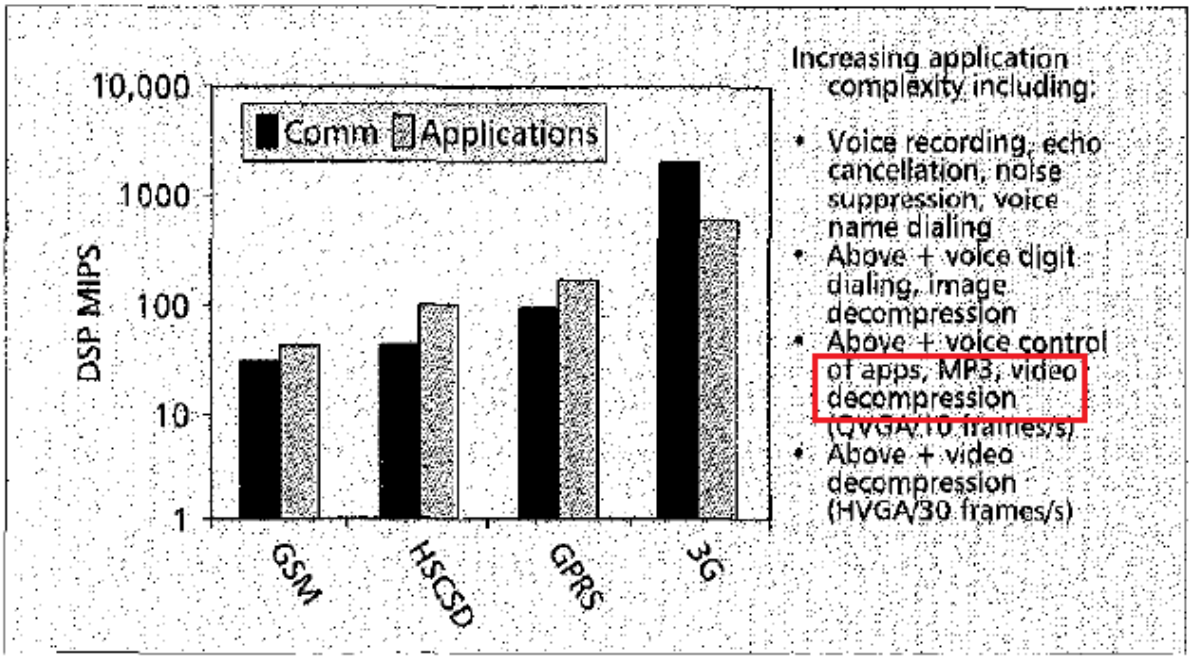


Figure 7. *Applications drive DSP MIPS.*

(*Id*., Fig. 7 (red emphasis added).) Rolf discloses that the music recording files in its system are preferably MP3 files. (Rolf, 5:37-39.) It would therefore have been that the digital signal processor could be configured to receive and process for playback the music files that were transmitted to the cell phone of Rolf by OFDM modulation.

140. Accordingly, the prior art satisfies the limitation "said cellular phone including a digital signal processor configured to receive the data file over a cellular network by orthogonal frequency-division multiplex (OFDM) modulation," as recited in the claim.

2. Dependent Claim 10: "The method of claim 8, further comprising: tracking, by the computer system, the user of the cellular phone receiving the data file to determine data about the user; and reporting, by the computer system and to the copyright owner, the data about the user."

141. As I explained above, claim 8 is disclosed by and obvious over Rolf, Fritsch, Gatherer, Frodigh, and Hacker. The additional limitations in claim 10 would have been obvious in view of **Bell**, as I explain below. I will divide claim 10 into pieces to ensure that I cover all of its elements.

"tracking, by the computer system, the user of the cellular phone receiving the data file to determine data about the user"

142. As discussed above for claim 8, Rolf describes a computer system ("facility **14**") for distributing digital music content to remote users over a communications network. (Rolf, *e.g.*, 1:18-21, 1:25-28, 1:35-38, 5:32-39, 5:46-53, 8:63-9:6, Fig. 1.) Like Rolf, Bell discloses a computer platform **100** that remote users can access to download or stream digital content. (Bell, ¶ 0084 ("Platform **100** may be an interactive platform such as a web site running on conventional platforms and containing processing, memory, input/output, and other conventional computer components. . . . Platform **100** can interacts [sic] through Internet or other data or telecomms network **118** with . . . consumers **104**, ..."), ¶¶ 0085-87 ("Users **104** access platform **100** . . . in order to interact or engage in certain activities. These include: [¶] 1. downloading content; [¶] 2. streaming files;"); *see*

also id. ¶¶ 0103-4, 0106, Figs. 2 & 3.) Bell explains that content available for download and streaming via platform **100** includes digital music and video. (*Id.*, ¶¶ 0022 ("[S]ystems and processes according to the present invention present via dedicated and/or third-party web sites music tracks for downloading, ..."), 0028 ("consumption of digital media including streaming audio/video, downloading audio/video") (underlining added).)

143. Bell discloses that platform **100** can "**track[], . . . the user . . . receiving the data file to determine data about the user**." As noted, "[u]sers **104** access platform **100** . . . in order to interact or engage in certain activities. These include: [¶] 1. downloading content; [¶] 2. streaming files," among other activities. (*Id.*, ¶¶ 0085-99 (underlining added).) Bell further explains:

> Each of these activities may be assigned a code and **tracked** as the user participates. The activity code may be combined with user disembodied demographic data including, for instance, an identification number or other unique user ID, age, gender, and zip code. This information which may be tracked and recorded as the user participates can be stored in the platform **100** mass memory or database **for processing** in privacy-sensitive reporting to artists **102**, labels **106**, advertisers **108**, producers **100**, affiliate companies **114**, retailers **116**, and others who may desire to know concretely what users **102** are responding to when and why. The key is that activity codes matched to disembodied user demographic data shows what

> categories of music and artists users are responding to and not responding to in real time in order to reflect a sort of "music DNA."

(*Id.*, ¶ 0100 (underlining added).) The platform **100** thus "tracks using activity codes, correlates them with disembodied demographic data, . . . and reports information as desired to industry entities." (*Id.*, ¶ 0104; *see also id.*, ¶ 0106, Fig. 5.)

144. Bell explains that the platform **100** receives user demographic data directly from users during registration, or from third-party affiliates. (*Id.*, ¶ 0158 ("FIGS. 8A and 8B show a member registration interface which can be supported in html or otherwise. The user is asked for username and e-mail address information as well as a clickwrap set of provisions to which the user must agree. Name, city, state, zip, country, birthday, gender, referral source, and educational status information are solicited.") (underlining added), Figs. 8A & 8B; ¶ 0106 ("[P]latform **100** which also receives, if the request was initiated to an affiliate site **112**, disembodied demographic information from site **112** . . . ."); *see also id.*, ¶¶ 0115-21.) Thus, by tracking the user downloading or streaming a music file and correlating with user demographic information, the platform **100** can determine data about the user including:

- Data related to "who" the user is (e.g., user ID, gender, age, zip code);

- Data related to "what" the user downloaded or streamed (e.g., media info, file/format type);
- Data related to "when" the user accessed content (e.g., time stamp which can include start, stop, length of play); and
- The user's "genre preference."

(*Id.*, ¶¶ 0107-12.) Moreover, additional processing can be performed by the platform **100** to generate reports that show "geographic information about what tracks and artists are hot where," "that [sic; what] is being streamed by whom when," and "linkage between particular categories of users' response to certain artists or tracks compared to their response to other artists and/or tracks." (*Id.*, ¶¶ 0122, 0124, 0126, 0129; *see also id.*, ¶ 0100 ("This information which may be tracked and recorded as the user participates can be stored . . . for processing in privacy-sensitive reporting . . . ."), ¶¶ 0195-96, Fig. 54.)

145. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Rolf with Bell, with no change in their respective functions. This would have predictably resulted in the music distribution system of Rolf in which the facility **14** tracks users that download music files to determine data about the users, as taught by Bell.

146. Bell provides express motivations to combine in the manner described above. Bell explains that its techniques "for measuring, evaluating, and reporting audience response to various forms of content . . . are of value to various entities in the recording, other audio, television, film, other video, information-based and other content fields, including artists or other talent, record labels, studios, producers, publishers, advertisers, retailers, content owners, media providers, various intermediaries, and consumers." (Bell, ¶ 0002 (underlining added).) Bell further explains;

> The present invention seeks to benefit various participants in these industries by, among other things, providing new ways to measure and report information relating to how listeners, viewers and others are responding and reacting to content in real time. This possibility allows participants, among other things, to identify potentially successful content or talent early, monitor audience or consumer reaction to talent or content, and tailor marketing and promotion of talent or content based on such information.

(*Id.*, ¶ 0004 (underlining added); *see also id.*, ¶ 0021.)

147. Bell further emphasizes that its techniques are particularly applicable to the music industry. Bell recognized that "[r]ecent developments in packet-based data networks, including the Internet," are changing the way commercial music gets consumed. (*Id.*, ¶ 0013.) In particular:

> With the advent of data modulation and formatting techniques which allow users to connect to the Internet with reasonable speed and bandwidth, music tracks began to be distributed in packetized form either by file transfer or real time or "streaming" techniques. Standards such as Moving Picture Expert Group Level 3 or so-called "MP3" standards and other proprietary streaming standards allowed users to select, listen to and download single tracks of music. These could be stored on computer hard drives and on stand-alone devices such as portable players. Tracks could be copied and disseminated anywhere in the world almost instantaneously.

(*Id.*) In this new environment, it became critical for industry stakeholders to be able to accurately track the increasing number of music consumers who receive their music via the Internet. (*Id.*, ¶¶ 0015-19; *see also id.*, ¶¶ 0005, 0010 ("[O]ne of the objectives of the present invention is to discover and promote the emerging artists and tracks which will start or fuel future broader musical trends.").)

148. Indeed, one of ordinary skill in the art would have appreciated that adapting the tracking techniques described in Bell to the facility **14** of Rolf would create additional synergies on top of the individual benefits provided to various stakeholders. Specifically, the ability to accurately track and determine user-related data would entice rights holders such as artists and record labels to provide music content to the facility **14** of Rolf for distribution. Having additional content available for download, in turn, would attract more consumers to the Rolf system.

And an increase in the number of potential customers would entice even more content providers to distribute their music using the facility **14** of Rolf. (*See* Rolf, 8:32-53 (disclosing the ability to charge users for downloads).)

149. Bell further explains that its tracking techniques attempt to exploit "the full potential offered by the Internet." (*Id.*, ¶ 0014.) In other words, "its principles leverage the real-time distribution and information-gathering potential of the connected environment to allow more effective, efficient and profitable identification, financing, production, marketing and distribution" of music content. (*Id.*, ¶ 0020 (underlining added).) As such, one of ordinary skill in the art would have appreciated that Bell's Internet-based tracking techniques are especially suitable for the Internet-based content distribution system of Rolf. This is confirmed in Bell, which expressly contemplates that its techniques can be applied to existing "third party platforms, systems or networks." (*Id.*, ¶ 0026.)

150. Finally, Rolf and Bell are analogous references in the same field of distributing digital content to remote users over a communications network. As noted above, Bell discloses the download and streaming of MP3 files over the Internet, the exact use case described in Rolf. One of ordinary skill in the art would have found the content server in Rolf to be naturally combinable with the tracking techniques disclosed in Bell.

"reporting, by the computer system and to the copyright owner, the data about the user"

151. As I explained above, Bell discloses that the computer platform **100** can track a user downloading or streaming a music file to determine data about the user, including data related to "who" the user is (e.g., user ID, gender, age, zip code), data related to "what" the user downloaded or streamed (e.g., media info, file/format type), data related to "when" the user accessed content (e.g., time stamp which can include start, stop, length of play); and the user's "genre preference." (Bell, ¶¶ 0100, 0107-12.) And as noted, "[t]his information which may be tracked and recorded as the user participates can be stored in the platform **100** mass memory or database for processing in privacy-sensitive **reporting** to artists **102**, labels **106**, advertisers **108**, producers **100**, affiliate companies **114**, retailers **116**, and others who may desire to know concretely what users **102** are responding to when and why." (*Id.*, ¶ 0100; *see also id.*, ¶ 0106 ("Platform **100** correlates the activity code or request with this demographic data which can include unique identification information, age, gender, and zip code. That information can be stored and then processed in order to report in Step **6** demographic, psycho graphic, media consumed or other information to industry entities such as content owners or controllers **106** (such as labels **106**), advertisers **108**, producers **110**, affiliate companies **114**, retailers **116**, and others.") (underlining added).) As I

discussed above for claim 8[a], one of ordinary skill in the art would have understood and found it obvious that the artist or record label would be the "**copyright owner**." This is confirmed by Bell, which refers to record labels as "content controllers." (*Id.*, ¶ 0106.)

152. The computer component in the platform **100** that performs the "reporting" discussed above is referred to as "reporting communications functionality **126.**" (*Id.*, ¶ 0103; *see also id.*, Claim 6 ("a reporting communications functionality adapted to inform third parties of said activities engaged in by said user and said user demographic data").) The reporting functionality **126** is operably connected to the other components of the platform **100**, as shown in Figure 2, reproduced below.

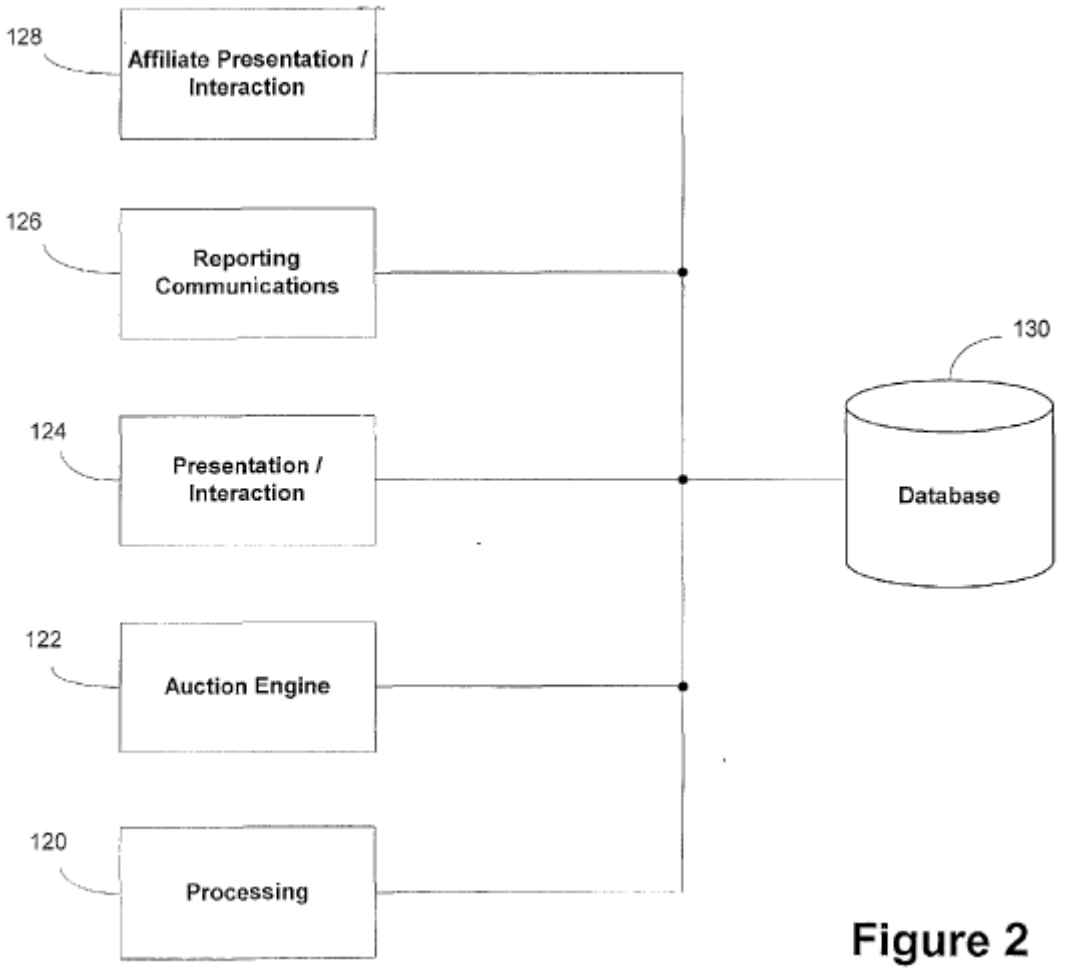


Figure 2

(*Id.*, Fig. 2.) "Platform **100** can interacts [sic] through Internet or other data or telecomms network **118** with any or all of talent or artists **102**, . . . content owners or providers or other intermediaries **106**, ..." (*Id.*, ¶ 0084.)

153. Bell goes on to provide an example of reporting provided to artists and record labels. "FIG. 54 shows one form of report which can be provided to labels, other talent intermediaries, advertising agencies, or any other entity who perceives user-related information . . . to be of value and who is willing to pay for

it monetarily or in other forms." (*Id.*, ¶ 0195; *see also id.*, ¶ 0196.) Figure 54 is reproduced below.

Shown The Way

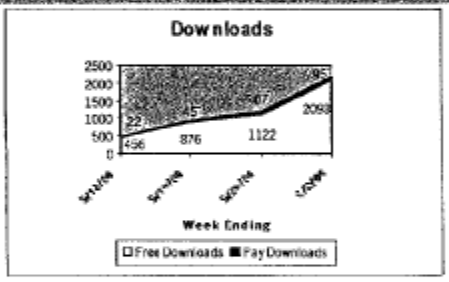
Dezeray's Hammer

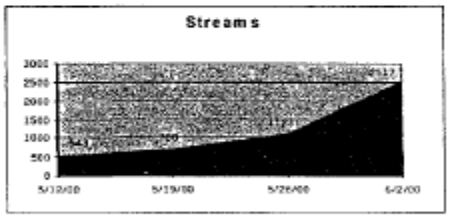
W/E 06/02/2000

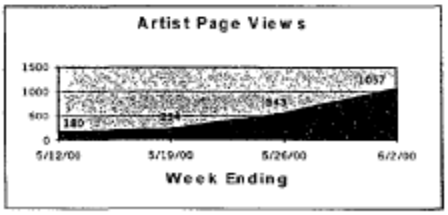
Activity Metrics

Activity	Week Total	Trend	% Change	Overall	Sites Reporting
Downloads	2,193	+1,004	+84%	4,781	11
Free	2098	+976	+87%	4,552	7
Pay	95	+28	+36%	229	4
Page Views	811	+268	+49%	2,014	8
Streams	2,517	+1,394	+124%	4,883	8
Rate/Reviews	71	+2	+3%	251	4
Avg Rating (1-5)	3.62	-0.19	-5.0%	3.51	6
Email a Friend	45	+11	+32%	125	3
Tourdate Views	21	-1	-4.5%	76	2
Fan Club Adds	46	+27	+142%	102	2

Key Trends







Demographics

Track Rating: (*PlanetJam and firstlook reporting- 6% of total data represented*)

Male	2.89	Below 13	2.65
Female	3.12	14 –17	2.89
		18 –24	3.19
		25 –35	3.14
		Above 36	3.02

Southeast –	2.99	Mid Atlantic –	3.11
Northeast -	2.96	Midwest -	2.99
Southwest -	3.04	Mountain -	2.96
Pacific -	3.06		

PlanetJam reporting- 4% of total

Key Demographic			
5	18-24	Males	Southeast
1	25-35	Females	Northeast & Midwest

CD's sold: (*PlanetJAM reporting- 94% of total data represented)*

73% purchased by 17-21 yr old girls in SE

Highlights

Featured artist on Vitaminic.com

- Top rated track on firstlook.com
- Added to 15 playlists on riffage.com

"Great riffs...great vocals....great sound...great band" Freeride – garageband.com member

"Dezeray's Hammer is not only a great live band, but the music rocks coming out of my speakers as well."Dave – Riffage.com

Trend – Change from last report
% Change – Change from last week
Overall – Total reported since placement
Sites Reporting- # reporting specific data

(*Id.*, Fig. 54.) As shown, user data such as age, gender, and geographic location is reported by the computer platform **100**.

154. ***Further motivation to combine with Bell***: As I explained above, it would have been obvious to combine Rolf with Bell such that facility **14** in Rolf tracks users that download music files to determine data about the users. Moreover, it would have been obvious to combine Rolf and Bell, with no change in their respective functions, predictably resulting in the facility **14** reporting the user data to copyright owners, as disclosed in Bell.

155. The rationale and motivation for combining Rolf with Bell has been provided above, and applies here with full force. For example, as discussed previously, Bell provides express motivations by explaining that its method of tracking, determining, and ultimately reporting user data "allows participants, among other things, to identify potentially successful content or talent early, monitor audience or consumer reaction to talent or content, and tailor marketing and promotion of talent or content based on such information." (*Id.*, ¶ 0004 (underlining added); *see also id.*, ¶ 0023.) In other words, copyright owners would be provided with "fresher[,] more reliable information about which content listeners, viewers or other users prefer, their level of commitment in such preferences, changes in preferences and level of commitment, and other

information that is useful or desirable about which content should be made available in which manner on which media with which business entities." (*Id.*, ¶ 0021 (underlining added).) Reporting user data to copyright owners, in short, would allow them to make better business decisions regarding the music content they own. And as I explained previously, adapting this reporting functionality to the facility **14** of Rolf would entice more copyright owners to use the facility **14** for distribution, and the availability of additional content would, in turn, attract more users to the ultimate benefit of the operator of the facility **14**. (*See* Rolf, 8:32-53 (disclosing the ability to charge users for downloads).)

156. Accordingly, claim 10 is rendered obvious by the prior art.

3. Dependent Claim 11: "The method of claim 8, further comprising tracking, by the computer system, the user of the cellular phone receiving the data file to determine data about the user."

157. Claim 11 depends from claim 8 and recites "[t]he method of claim 8, further comprising tracking, by the computer system, the user of the cellular phone receiving the data file to determine data about the user." As I explained above, claim 8 is disclosed by and obvious over Rolf, Fritsch, Gatherer, Frodigh, and Hacker.

158. Claim 11 recites the same language as the first part of claim 10, as set forth above. For the same reasons provided above for claim 10, Rolf and Bell disclose and render obvious the additional limitation in claim 11.

4. Dependent Claim 12: "The method of claim 8, further comprising providing an interface, by the computer system, for the selection of one of the electronically-accessible data files."

159. Claim 12 depends from claim 8 and recites "[t]he method of claim 8, further comprising providing an interface, by the computer system, for the selection of one of the electronically-accessible data files." As I explained above, claim 8 is disclosed by and obvious over Rolf, Fritsch, Gatherer, Frodigh, and Hacker. The additional limitation added by claim 12 is disclosed by Rolf and also by Fritsch.

160. Rolf discloses that the central facility **14** ("computer system") provides an "**interface, . . . for the selection of one of the electronically-accessible data files**" in the form of a "menu or listing of recordings." (Rolf, 9:12-15.) As explained in Rolf, "processor **50** [of the facility **14**] 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 <u>select [a] recording via a menu or listing of recordings</u>." (*Id.* (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; *see also id.*, 1:39-41, 5:64-66.)[8]

161. Moreover, Fritsch provides an independent basis for satisfying the additional limitation in claim 12. As noted previously, Fritsch discloses that its server system provides a website interface for the selection of one or more music files that the user can select. For example, Fritsch describes how the user can select files for purchase and download through the web interface:

> As the PC user selects more items, each and every item is displayed in the shopping basket (to the extent that space permits—a scroll bar may be necessary should the PC user select a large number of items).

[8] Rolf also discloses a separate voice-based interface. (*Id.*, 9:15-18 ("[T]he 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."), 12:57-61 ("[D]evice **12** may be utilized to dial directly a telephone number associated with the storage facility **14**. Using keypad input **22**, or microphone **32**, when storage facility **14** includes voice recognition equipment, the user may select one or more music recordings for downloading to the wireless communications device.") (underlining added).)

> At any point in time, the PC user can review her selections, deleting items she no longer desires. When the PC user has developed a satisfactory list, she can submit her order by clicking on the "Purchase Items" button, as illustrated in FIG. 1E showing the magnified right portion of the screen, including the shopping basket. The purchased items will be delivered immediately over the Internet to the user's computer if the selected music is in downloadable digital format.

(Fritsch, 4:61-5:5, Fig. 1E.) One of ordinary skill in the art would have appreciated that the interface described in Fritsch would provide advantages to the music download computer system of Rolf because it would allow the user to select multiple music files for download in a single browsing session.

162. Accordingly, claim 12 would have been obvious in view of the prior art.

5. Dependent Claim 13: "The method of claim 12, wherein the electronically-accessible data files are organized on the interface by at least one of: a type of media file, a title, a subject, an actor, an artist, a description of the media file, an alphabetical ordering, or a chronological ordering."

163. Claim 13 depends from claim 12 and recites "[t]he method of claim 12, wherein the electronically-accessible data files are organized on the interface by at least one of: a type of media file, a title, a subject, an actor, an artist, a description of the media file, an alphabetical ordering, or a chronological ordering." As I explained above, the additional limitation in claim 12 is disclosed

by Rolf, and separately by Fritsch. Rolf and Fritsch further disclose and render obvious the limitations of claim 13.

164. As I explained for claim 12, the "**interface**" in Rolf takes the form of a "menu or listing of recordings" through which the user can select a music file for download from a remote database. (Rolf, 9:12-15; *see also id.*, 1:39-41, 5:49-53, 5:64-66.) Rolf further discloses that the music files are categorized by "selectable fields" in the database:

> 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.

(*Id.*, 5:30-38 (underlining added).) A person of ordinary skill in the art would have understood and found it obvious that because the music files are categorized by "selectable fields," the "menu or listing of recordings" presented to the user could be organized according to those same fields, i.e., "title", "artist", "album or CD type", and/or "recording label." One of ordinary skill in the art would have appreciated that organizing music files on the menu according to those fields would allow users to more easily navigate through the database of music available for download, and thus provide for a superior user experience.

165. Indeed, it would have been readily apparent to a person of ordinary skill in the art that a main motivation for organizing files by "selectable" fields for storage is to facilitate subsequent access and retrieval. As such, where the method of retrieval is "via a menu or listing" (*id.*, 9:12-15), as expressly described in Rolf, it would have been natural for the menu to be organized by those same fields. Moreover, Rolf expressly discloses the ability to transmit information related to music recordings, such as title, artist, and recording label, to the cell phone. (*Id.*, 3:3-10, 13:29-38.) It would therefore have been obvious for the music files to be organized on the interface by "**title**" and/or "**artist**," as recited in claim 13.

166. To the extent there is any question as to whether Rolf satisfies the additional limitation in claim 13, it is disclosed by Fritsch. As I discussed above, Fritsch describes a website "**interface**" through which users can select songs for download. (Fritsch, 4:48-50, 5:3-5 ("The PC user logs onto the vendor's web site and browses the songs available for purchase. . . . The purchased items will be delivered immediately over the Internet to the user's computer if the selected music is in downloadable digital format.").) Fritsch expressly discloses that "[t]he songs can be arranged by artist, music style, etc." (*Id.*, 4:50-51 (underlining added).) Fritsch therefore discloses that the music files are organized on the interface by "**artist**" and/or "**subject**" ("music style"). The rationale and motivation for

combining Rolf with Fritsch has been provided for claim 8[c] above, and applies with equal force here. Moreover, as I explained previously, one of ordinary skill in the art would have appreciated that organizing songs available for purchase on an interface according to fields such as artist and subject would allow for easier navigation, and thus provide for a superior user experience.

167. I note that this combination would have been obvious notwithstanding the fact that Fritsch describes a website interface intended for PCs rather than cell phones. I am relying on Rolf for its "menu or listing" of available music recordings, and on Fritsch only for the manner of organizing items in that list. Organizing musical recordings by artist and title, as disclosed in Fritsch, is a basic technique adaptable to any type of display, including a cell phone. In fact, given the smaller displays used in cell phones as of June 2001, it would have been even more important to organize the "menu or listing" of Rolf to ease the identification of desired music recordings.

168. Finally, organizing songs by artist (as disclosed in Rolf and Fritsch), title (Rolf), and/or music style (Fritsch) are mere choices among a finite number of ways to present a user interface for browsing music. A person of ordinary skill in the art would have had every expectation of success in implementing the

organization schemes disclosed in Rolf and Fritsch. Accordingly, claim 13 would have been obvious in view of the prior art.

6. Dependent Claim 14: "The method of claim 12, wherein each of the electronically-accessible data files comprises an identifier associated with the copyright owner."

169. Claim 14 depends from claim 12 and recites "[t]he method of claim 12, wherein each of the electronically-accessible data files comprises an identifier associated with the copyright owner." As I explained above, claim 12 is disclosed by and obvious over Rolf, Fritsch, Gatherer, Frodigh, and Hacker. Hacker further discloses the additional limitation in claim 14.

170. As I noted previously for claim 8[a], Hacker explains that MP3 audio files can include "ID3 tags" that can contain an identification of the copyright owner. (Hacker at p. 116 ("Every MP3 file has the ability to store 'meta-data' related to the track in the file itself, in the form of what are known as 'ID3 tags.'").) "For example, a file's ID3 tags may store the song's artist, album, year, genre, and comments in ID3 tags." (*Id.*) As I discussed previously in connection with claim 8[a], Hacker also describes that the artist who records a song is a default copyright owner. (*Id.*, at pp. 262-263.) Thus, the person of ordinary skill in the art would understand that an ID3 tag storing the name of the song's artist discloses an identifier associated with the copyright owner.

171. Hacker further explains that "[t]he number of possible applications of ID3v2 data is staggering. Right off the bat, it gives artists and labels a place to store copyright information, terms of use and proof of ownership." (*Id.*, at p. 117 (underlining added).) The "proof of ownership" and "copyright information" that artists and labels can store in ID3 tags further discloses and renders obvious identifiers associated with the copyright owners.

172. Moreover, as I discussed previously for claim 8[a], Hacker describes a software program that can display the ID3 tag fields for a particular MP3 file, including the "Copyright" field, as shown Figure 4-4 below:

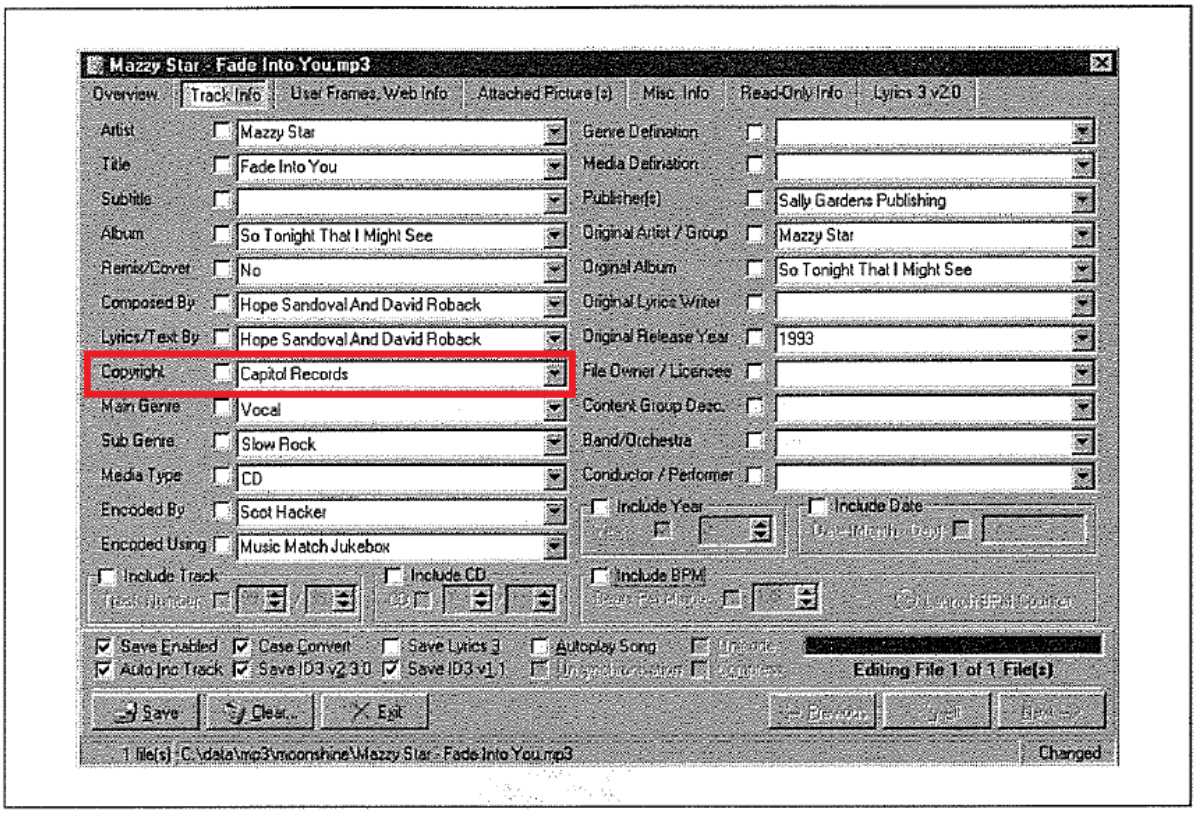


Figure 4-4. Helium's tag editor offers the majority of ID3v2 frames; buttons along the top let you navigate amongst major classes of allowable ID3v2 data

(*Id.*, at p.124 (red annotation added).)

173. In this illustration, the "Copyright" field is an identifier associated with Capitol Records. In view of Hacker's teachings regarding copyright owners such as record company labels, which I discussed above for claim 8[a], a person of ordinary skill in the art would have understood that Capitol Records is a copyright owner, and the "Copyright" field contains an identifier associated with the copyright owner. Indeed, the fact that "Copyright" is a "major class[] of allowable ID3v2 data," as explained in the caption to Figure 4-4 above, confirms that it is

standard for an MP3 file (such as the ones disclosed in Rolf) to include an identifier associated with the copyright owner.

174. The rationale and motivation for combining Rolf with Hacker has been provided in my analysis for claim 8[a] above, and applies equally here. Claim 14 is therefore obvious in view of the prior art.

C. Alternative Ground Based on O'Hara, Tagg, and Pinard

175. In Part **V.B** above, I explained why the claims of the '870 patent are invalid based on the combinations with the primary reference Rolf, and I cited Frodigh for its disclosure of how to send digital information to a wireless device using OFDM over a cellular network. I have also been asked to opine on whether the claims of the '870 patent would have been obvious if I were to rely on O'Hara, Tagg and Pinard instead of Frodigh with respect to OFDM and the transmission of data over a cellular network. In my opinion, the claims would have been obvious to a person of ordinary skill in the art based on this alternative combination.

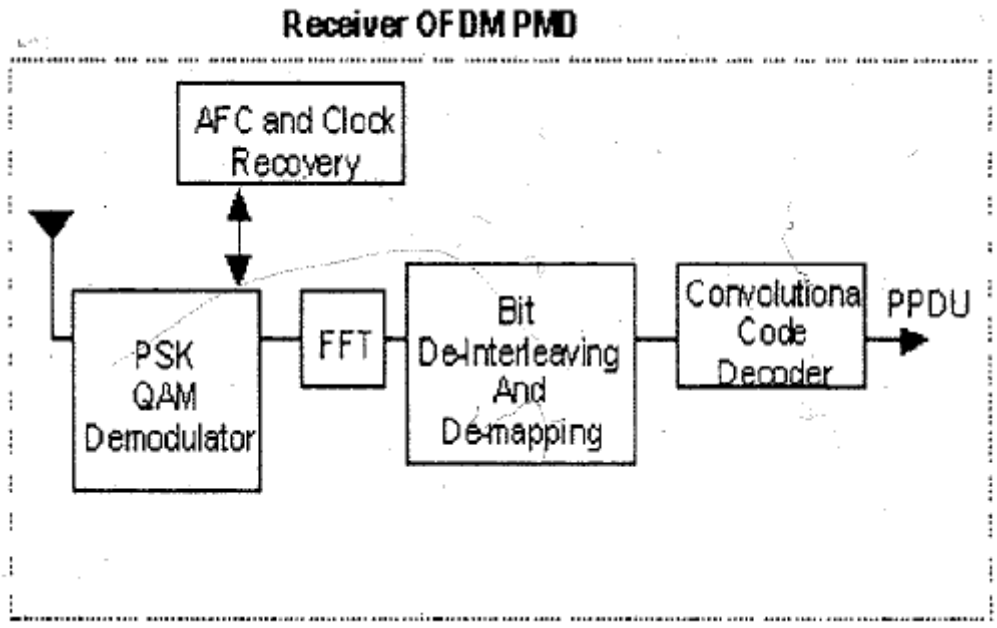
176. As I explained in **Part V.A.7** above, I have cited O'Hara, Tagg and Pinard for three straightforward propositions: that (1) prior art IEEE 802.11a wireless networking transmits digital information to mobile devices using OFDM (O'Hara), (2) IEEE 802.11 wireless networking functionality can be incorporated into a cell phone (Tagg), such as the cell phone **12** of Rolf, and (3) a "cellular

network," as recited in claim 8, can be built based on IEEE 802.11 wireless networking technology (Pinard).

177. 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 referred to as the orthogonal frequency division multiplexing (OFDM) PHY. The OFDM PHY provides the capability to transmit PSDU[9] 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 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

[9] 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).)

PPDU[10]. An example of an IEEE 802.11a OFDM PMD[11] is illustrated in Figure 7-2.").) This is shown in Figure 7-2, reproduced in relevant part below.



(*Id.*, p. 145, Fig. 7-2.)[12]

[10] 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).)

[11] 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).)

[12] O'Hara thus discloses a receiver that can be implemented in a cell phone to

178. With respect to the second proposition, as I explained in detail in **Part V.A.7**, Tagg discloses a cell phone that can send and receive data using IEEE 802.11. Figure 1 of Tagg provides a basic overview of the system:

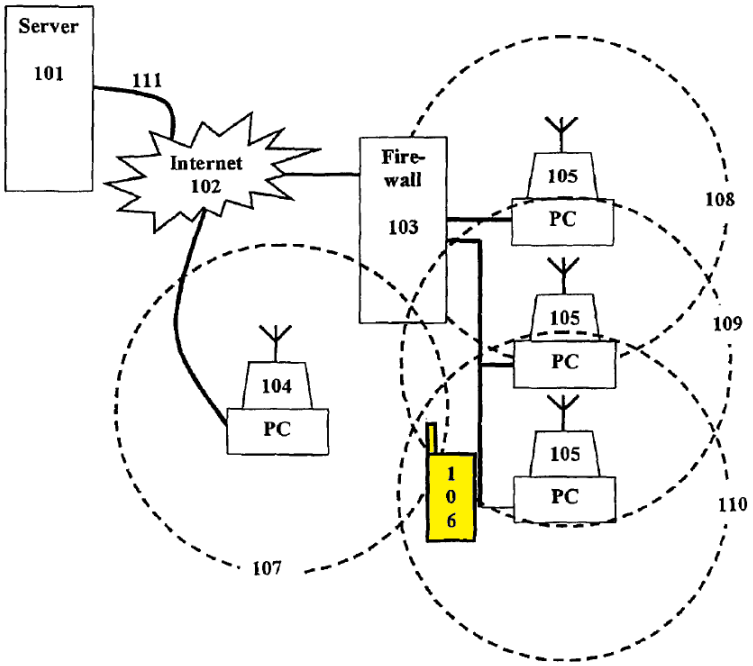


Fig. 1

(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.*)

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receive data files by OFDM modulation. Any requirement that the digital signal processor be configured to receive data files by OFDM modulation would also have been obvious in view of Gatherer, as I explained in **Part V.B.1.e** above.

179. 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:

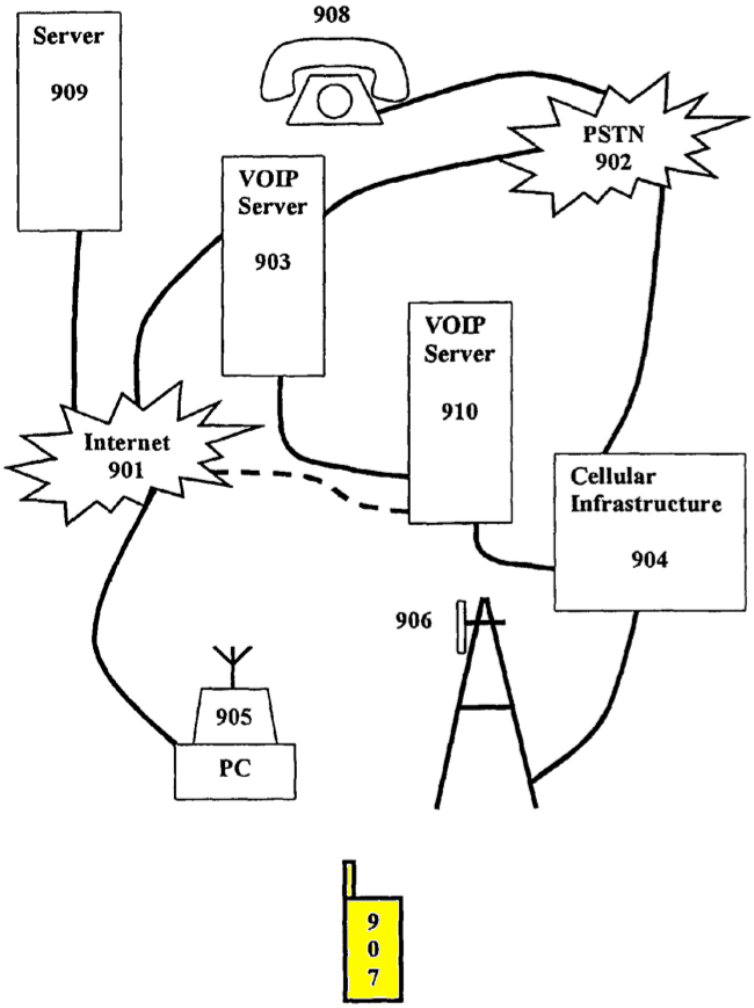

Fig. 9

180. 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 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.)

181. 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.").)

182. 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.

183. Finally, with respect to the third proposition, as I explained above in **Part V.A.7**, Pinard teaches that an IEEE 802.11 wireless network is a cellular network. I explained previously that the term "cellular network" simply refers to a network in which wireless communications are provided through a series of "cells," each cell proving network access for a particular geographic area. The term "cellular network" under its broadest 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.

184. In this regard, I have cited **Pinard** for the simple proposition that a "cellular network" can be built 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.)

185. 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 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 (underlining added).) Pinard therefore confirms that a "cellular network" can be built from IEEE 802.11 access points. (*See also* O'Hara, p. 166-67 (discussing "WLAN cells" implemented using IEEE 802.11 access points).)

186. As noted previously, Pinard refers to the "IEEE 802.11 draft 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.

187. ***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 music files transmitted over an IEEE 802.11a cellular network by OFDM modulation. As noted previously, Pinard expressly confirms that a "cellular communications network" can be built from IEEE 802.11 access points. And 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.

188. **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 just 9.6 kilobits per second (Kbps). (Tagg, 11:24-28.) But O'Hara confirms that IEEE 802.11a (using OFDM[13]) could transmit digital multimedia content at up to

[13] One of ordinary skill in the art would also have also appreciated that the use of OFDM in IEEE 802.11a offers the advantages explained in Frodigh and discussed above, including reduced intersymbol interference. (*See* O'Hara, at p. 143 ("The

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

189. **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

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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, ...").)

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 data files from a server.

190. 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 media files over a 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.

191. 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.

192. 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 data 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.

193. 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 1Mbps and 2Mbps for the original IEEE 802.11-1997,[14] or 11 Mbps for IEEE 802.11b), the 802.11a variant would have provided enormous advantages in terms

[14] In addition to 802.11a and 802.11b, the original 802.11-1997 defined two variants of the IEEE 802.11 standard, one having a data rate of 1 Mbps and one having a data rate of 2 Mbps.

of speed, 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 54 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.)

194. Furthermore, 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 cellular network, to achieve the dual and interrelated benefits of increased speed and decreased cost, and by using 802.11 access point cells that provide a wider geographical range to exploit these speed and cost

benefits and avoid the disadvantages of more traditional cellular networks. (*See* O'Hara, 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.").)

VI. ENABLEMENT OF THE PRIOR ART

195. 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, Fritsch, Frodigh, Gatherer, Hacker, Bell, O'Hara, Tagg and Pinard 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, Fritsch, Frodigh, Tagg and Pinard) are presumed enabling, and that this presumption extends to claimed and unclaimed material.

196. Nevertheless, the disclosures in these references are enabling regardless of whether they are issued patents. As I have explained in **Part III** above, the technological underpinnings of the challenged '870 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.)

197. The '870 patent itself acknowledges that "[t]he cellular telephone **202** may be any commercially available cellular phone." ('870, 14:27-28.) As I discussed above, commercially available cell phones were also capable of transmitting and receiving non-voice data. For example, it was also well-known that cell phones could be used to download and playback digital media.

198. Orthogonal frequency-division multiplexing (OFDM) was also a well-known transmission technology. (*See* **Part III.C**.) As I explained in **Part III.C** above, the use of OFDM in cellular systems was well known before the '870 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.

199. Rolf, Fritsch, Frodigh, Gatherer, Hacker, and Bell all pre-date the '870 patent, and those references themselves treat cell phones, digital signal processors, MP3 data files, and OFDM as firmly in the prior art. As I explained 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. Additionally, IEEE 802.11 wireless networking described in O'Hara, Tagg and

Pinard was well-known and well-documented by the late 1990s, and by June 2001, a person of ordinary skill in the art would have been able to implement an IEEE 802.11-compliant network without undue experimentation. (O'Hara, at p.viii ("By the time you read this, you will be able to purchase an IEEE 802.11-compliant, 11 Mbps consumer WLAN adapter for $99 or less.").) Pinard confirms, in fact, that IEEE 802.11 was available in draft form no later than 1995. (Pinard, 2:50-53.)

200. 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 '870 patent by more than six months and claims priority to the Rolf Provisional, which in turn predates the '870 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.

201. The prior art, including Hacker and the other references I address in the background section above, also reflects that file identifier techniques such as MP3 ID3 tags were well-known in the prior art before the '870 patent was filed

and would have presented no significant difficulty for a person of ordinary skill in the art to incorporate into MP3 music files in systems such as Rolf and Fritsch.

202. In short, by June 2001, each aspect of the disclosures that I have cited from Rolf, Fritsch, Frodigh, Gatherer, Hacker, Bell, O'Hara, Tagg and Pinard 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.

VII. CONCLUSION

203. 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 '870 patent claims at issue and/or offer testimony in support of this Declaration

204. 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

204. 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 13, 2017

Respectfully submitted,

Tal Lavian
Jan 13, 2017

Tal Lavian, Ph.D.
Sunnyvale, California

EXHIBIT A

Tal Lavian, Ph.D.

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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.
- "Information Switching Networks." Hoang D.B.; T. Lavian;The 4th Workshop on the Internet, *Telecommunications and Signal Processing, WITSP2005*, December 19-21, 2005, Sunshine Coast, Australia.
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Presentations and Talks

(Not an exhaustive list)

- Lambda Data Grid: An Agile Optical Platform for Grid Computing and Data-intensive Applications.
- Web Services and OGSA
- WINER Workflow Integrated Network Resource Orchestration.
- Technology & Society
- Abundant Bandwidth and how it affects us?
- Active Content Networking(ACN)
- DWDM-RAM:Enabling Grid Services with Dynamic Optical Networks
- 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
- Optical Networking Services
- Business Models for Dynamically Provisioned Optical Networks
- Business Model Concepts for Dynamically Provisioned Optical Networks
- Optical Networks Infrastructure
- Research Challenges in agile optical networks
- Services and Applications' infrastructure for agile optical networks
- Impact on Society
- TeraGrid Communication and Computation
- Unified Device Management via Java-enabled Network Devices
- Active Network Node in Silicon-Based L3 Gigabit Routing Switch
- 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

- Java SNMP Oplet
- Open Distributed Networking Intelligence: A New Java Paradigm
- Open Programmability
- 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

EXHIBIT B

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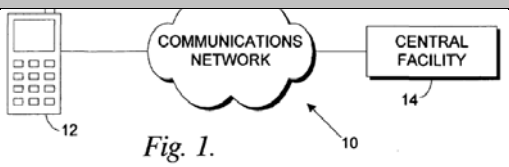
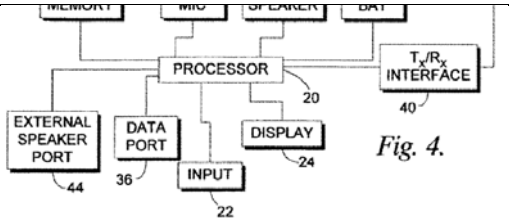
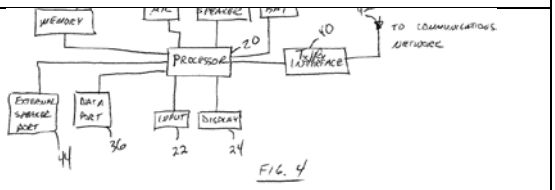
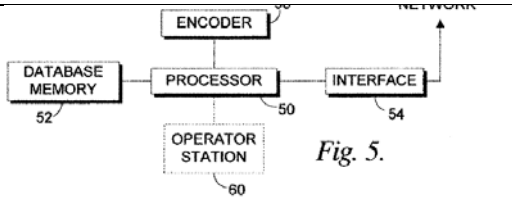
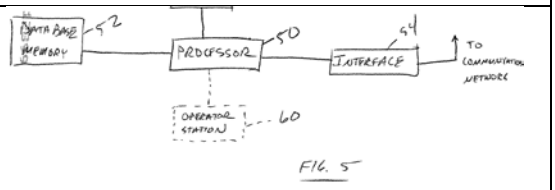
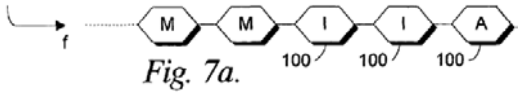
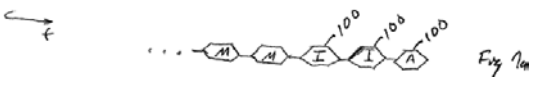
Fig. 1	 Fig. 1.	 FIG. 1
Fig. 4	 Fig. 4.	 FIG. 4
Fig. 5	 Fig. 5.	 FIG. 5
Fig. 7a	 Fig. 7a.	
1:17-21	"The present invention is generally directed to a system and method for wirelessly transmitting encoded music, via a wireless communications link, to a portable or mobile communications device which includes 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

Cite	Rolf	Rolf Provisional
	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

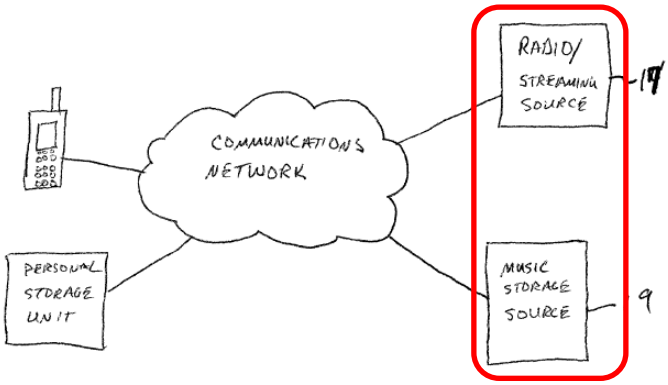
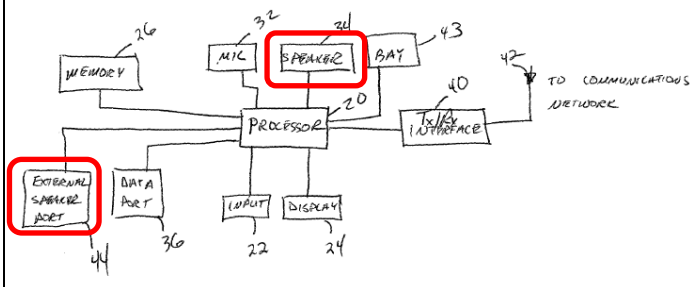
Cite	Rolf	Rolf Provisional
	recording downloaded to a remote, personal storage unit..."	recording downloaded to a remote, personal storage unit..." PP. 19-20
12:49-55	"In use, a user of communications device **12** may establish a communications link via the communications network with the remote storage 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

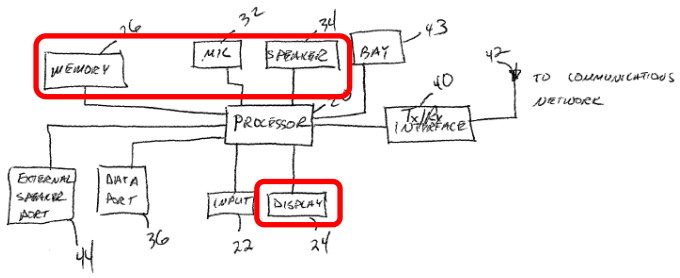
Cite	Rolf	Rolf Provisional
	recordings of other types, such as video recordings."	for decoding and play." P. 5 "In accordance with an aspect of the present invention, data indicative of a site at which the particular music recording is being played (and/or it associated album or video) can be ordered 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

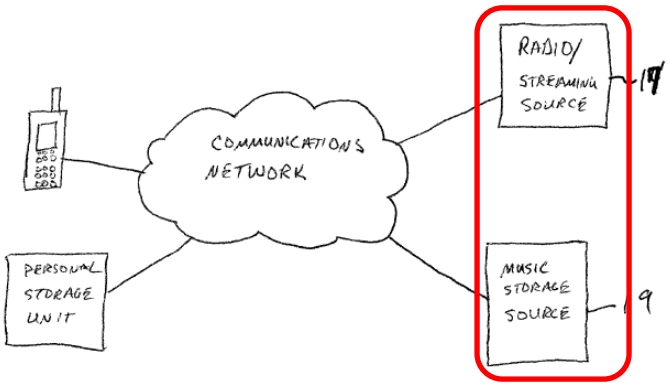
EXHIBIT C

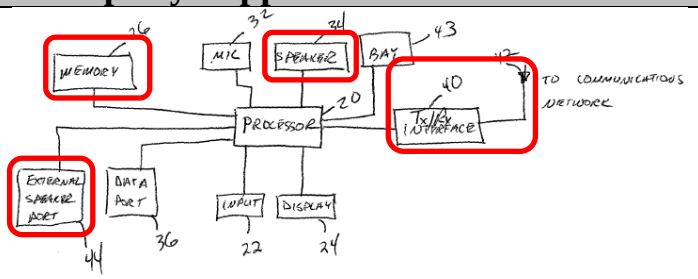
Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	Note: The entirety of the Rolf Provisional would have been understood by a person of ordinary skill to disclose the support for the issued claims in Rolf. I intend this chart simply to highlight exemplary portions, not to be an exhaustive mapping 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:

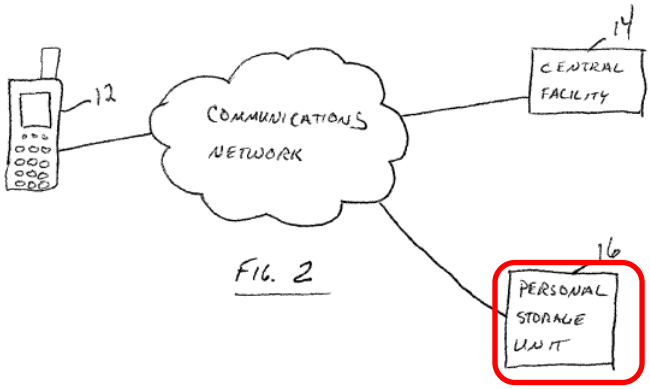
Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	"Additionally, the wireless communications device is preferably a cellular communications device and, in particular, is a **cellular voice communications device**, such as a cellular telephone." P. 9 (emphasis added). "In this regard, and in 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.*:

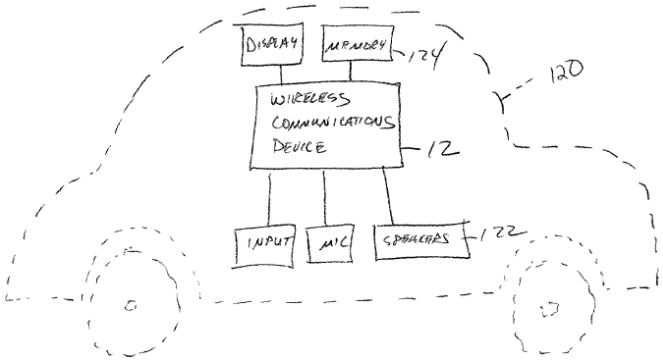
Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	 Fig. 4 (annotated). Showing the internals of the cellular telephone, including a memory where music recordings are stored, an internal speaker, an external speaker port for playback, and a wireless transciever and antenna. The cellular phone 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):

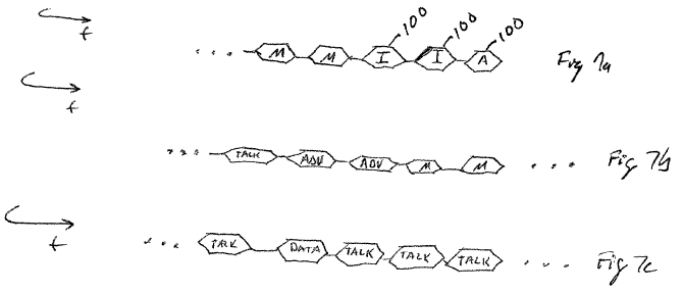
Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	"Once an encoded **music recording is stored in memory 26, or on a memory cartridge, of the wireless communications device 12**, the input 22 may be utilized to control the **player to play the recording**. In this regard, when a music recording 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

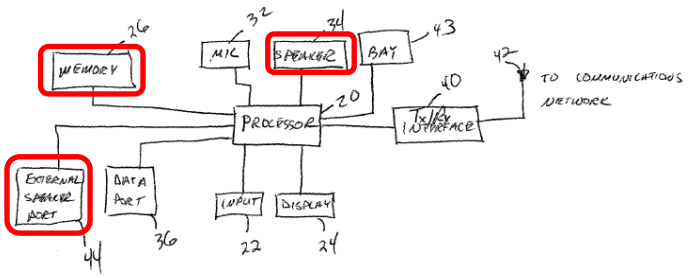
Issued Claims in Rolf	Exemplary Support in Rolf Provisional
	user of device 12 may have a personal account for storing pure based recordings, such that the account (e.g., personal storage unit 16) is accessible via device 12 and other devices (such as a personal computer).” P. 16 (emphasis added).
wherein 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).