SKIERMONT DERBY LLP
Dallas Los Angeles

GRAVES & SHAW LLP

PATENT OWNER'S DEMONSTRATIVE EXHIBITS

OCTOBER 24, 2023

ORAL ARGUMENT

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC., and APPLE INC.

v.

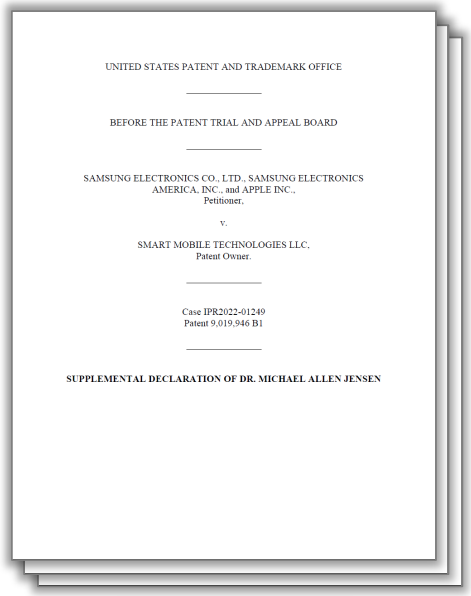
SMART MOBILE TECHNOLOGIES LLC

U.S. PATENT NO. 9,019,946 B1

IPR2022-01249

PHILIP J. GRAVES, COUNSEL FOR PATENT OWNER

Petitioner Has Inundated The Board and Patent Owner with New Evidence and Arguments



UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., and APPLE INC.,
Petitioner,

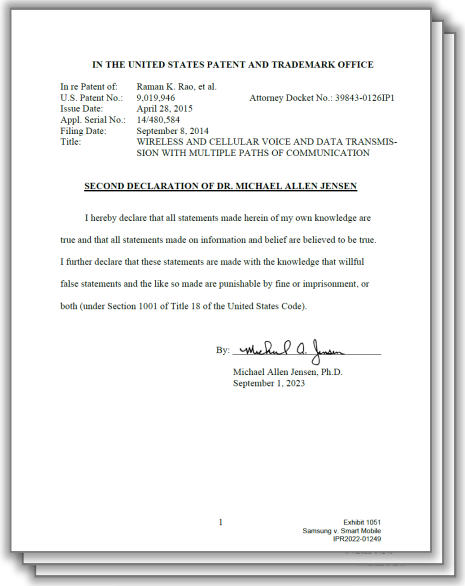
v.

SMART MOBILE TECHNOLOGIES LLC,
Patent Owner.

Case IPR2022-01249
Patent 9,019,946 B1

SUPPLEMENTAL DECLARATION OF DR. MICHAEL ALLEN JENSEN

41 pages of "supplemental" expert testimony



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Raman K. Rao, et al.
U.S. Patent No.: 9,019,946 Attorney Docket No.: 39843-0126IP1
Issue Date: April 28, 2015
Appl. Serial No.: 14/480,584
Filing Date: September 8, 2014
Title: WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

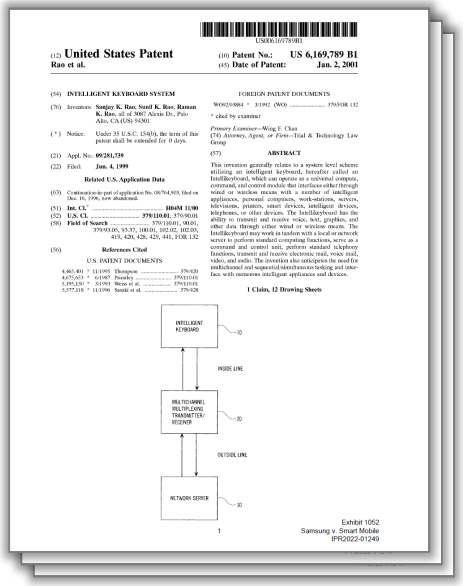
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or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

By: _____
Michael Allen Jensen, Ph.D.
September 1, 2023

1

Exhibit 1051
Samsung v. Smart Mobile
IPR2022-01249

56 pages of reply expert testimony



(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 6,169,789 B1**
(45) **Date of Patent: Jan. 2, 2001**

(54) **INTELLIGENT KEYBOARD SYSTEM**

(76) Inventors: **Sanjay K. Rao, Sunil K. Rao, Raman K. Rao**, all of 3087 Alexis Dr., Palo Alto, CA (US) 94301

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **09/281,739**

(22) Filed: **Jan. 4, 1999**

Related U.S. Application Data

(63) Continuation-in-part of application No. 08/764,503, filed on Dec. 16, 1996, now abandoned.

(51) **Int. Cl.** **H04M 11/00**
(52) **U.S. Cl.** **379/110.01**; 379/90.01
(58) **Field of Search** ..... 379/93.05, 93.37, 100.01, 102.02, 102.05, 415, 420, 426, 429, 441, FOR 132

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,465,401 * 11/1995 Thompson 379/420
4,675,653 * 6/1987 Frawley 379/111.01
5,195,130 * 3/1993 Weiss et al. 379/111.01
5,577,118 * 11/1996 Smith et al. 379/428

FOREIGN PATENT DOCUMENTS

WO92/05884 * 3/1992 (WO) 379/FOR 132

* cited by examiner

Primary Examiner—Wing F. Chan
(74) *Attorney, Agent, or Firm*—Trial & Technology Law Group

(57) **ABSTRACT**

This invention generally relates to a system level scheme utilizing an intelligent keyboard, hereafter called an IntelliKeyboard, which can operate as a universal computer, command, and control module that interfaces either through wired or wireless means with a number of intelligent appliances, personal computers, work-stations, servers, televisions, printers, smart devices, intelligent devices, telephones, or other devices. The IntelliKeyboard has the ability to transmit and receive voice, text, graphics, and other data through either wired or wireless means. The IntelliKeyboard may work in tandem with a local or network server to perform standard computing functions, serve as a command and control unit, perform standard telephony functions, transmit and receive electronic mail, voice mail, video, and audio. The invention also anticipates the need for multichannel and sequential simultaneous tasking and interface with numerous intelligent appliances and devices.

1 Claim, 12 Drawing Sheets

1

Exhibit 1052
Samsung v. Smart Mobile
IPR2022-01249

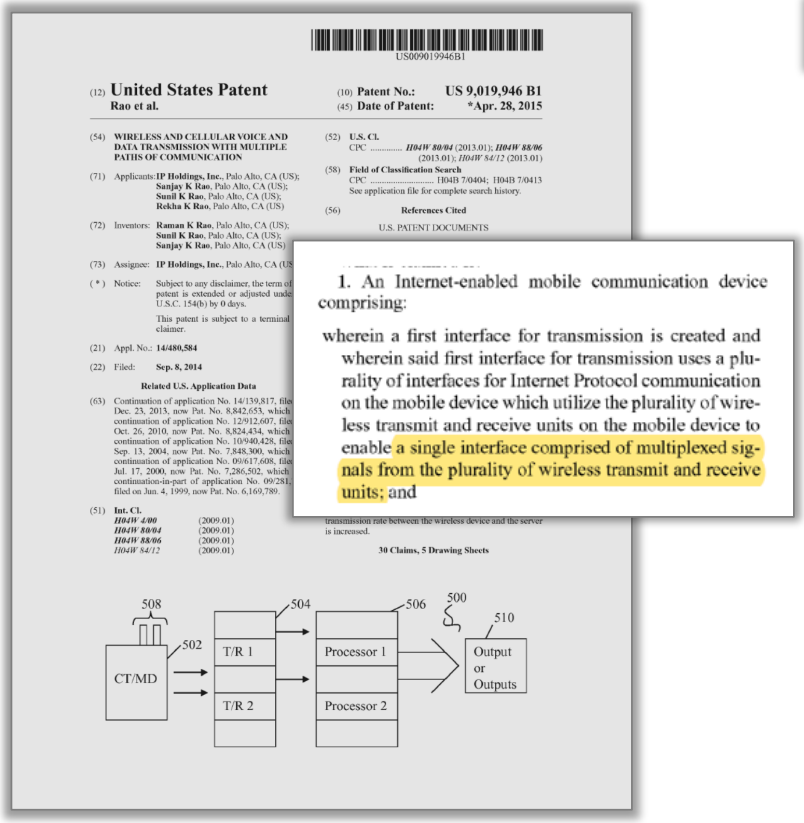
21 new exhibits

EX-1050; EX-1051; EX-1052-1071.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Table of Contents

Claim 1:
"A Single Interface Comprised of Multiplexed Signals"



US009019946B1

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

(54) **WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION**

(71) Applicants: **IP Holdings, Inc.**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Rekha K Rao**, Palo Alto, CA (US)

(72) Inventors: **Raman K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US)

(73) Assignee: **IP Holdings, Inc.**, Palo Alto, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/480,584**

(22) Filed: **Sep. 8, 2014**

Related U.S. Application Data

(63) Continuation of application No. 14/139,817, filed on Dec. 23, 2013, now Pat. No. 8,842,653, which is a continuation of application No. 12/912,607, filed on Oct. 26, 2010, now Pat. No. 8,824,434, which is a continuation of application No. 10/940,428, filed on Sep. 13, 2004, now Pat. No. 7,848,300, which is a continuation of application No. 09/617,608, filed on Jul. 17, 2000, now Pat. No. 7,286,502, which is a continuation-in-part of application No. 09/281,860, filed on Jun. 4, 1999, now Pat. No. 6,169,789.

(51) **Int. Cl.**

H04W 4/00	(2009.01)
H04W 80/04	(2009.01)
H04W 88/06	(2009.01)
H04W 84/12	(2009.01)

(52) **U.S. Cl.**
CPC ***H04W 80/04*** (2013.01); ***H04W 88/06*** (2013.01); *H04W 84/12* (2013.01)

(58) **Field of Classification Search**
CPC H04B 7/0404; H04B 7/0413
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1. An Internet-enabled mobile communication device comprising:

wherein a first interface for transmission is created and wherein said first interface for transmission uses a plurality of interfaces for Internet Protocol communication on the mobile device which utilize the plurality of wireless transmit and receive units on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive units; and

transmission rate between the wireless device and the server is increased.

30 Claims, 5 Drawing Sheets

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

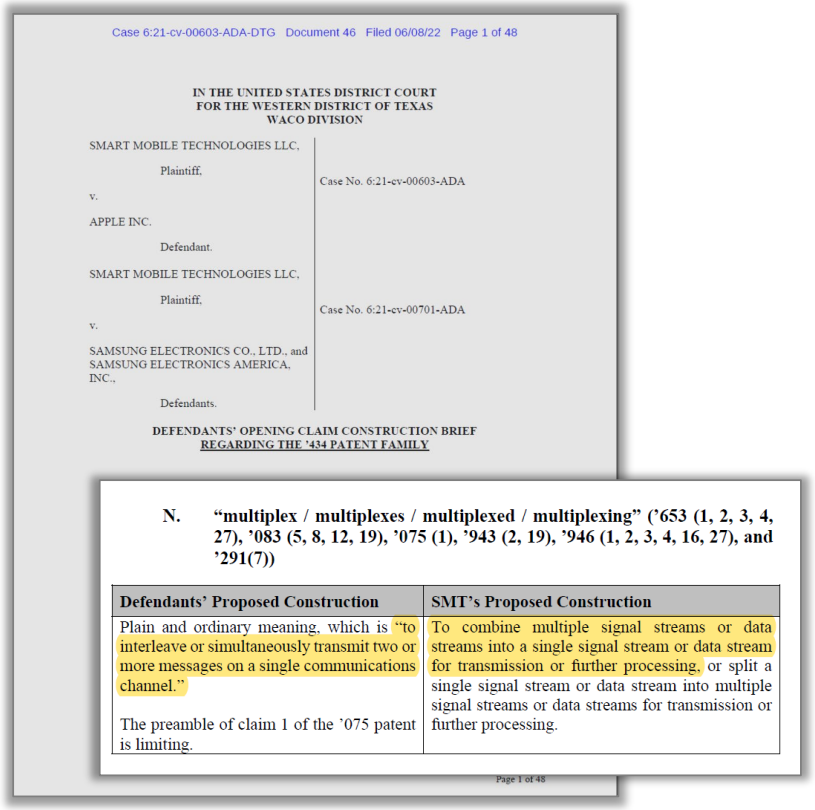
Moreover, Yegoshin's phone ***enables a single interface comprised of multiplexed signals*** from its first and second communication interfaces for cellular and WLAN (***first and second wireless transmit and receive units***). EX-1003, ¶126. For example, Yegoshin's phone switches between cellular and IP-LAN modes, and is "capable of taking some calls via cellular path while receiving other calls via IP path." EX-1004, 5:33-65. Further, Yegoshin's phone includes "microphone and speaker apparatus including converters for rendering audio data as audible speech, and for rendering audible speech as audio data." *Id.*, 3:18-22. It would have been obvious that Yegoshin's phone selectively or simultaneously uses its first/cellular and second/WLAN communication interfaces to receive signals for calls and output the signals through a ***single interface*** that includes or is coupled to the "speaker apparatus." EX-1003, ¶126; EX-1004, 3:18-22.

Again, Yegoshin-Johnston-Billström's phone communicates on cellular and WLAN selectively or simultaneously (as taught by Yegoshin) using IP-enabled cellular and WLAN communication interfaces (as taught by Yegoshin and Billström). EX-1003, ¶127; EX-1004, 5:33-65; EX-1006, 1:6:12, 1:54-60, 3:53-61. A POSITA would have found it obvious that, to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths. EX-1003, ¶127.

Pet., 33-34; EX-1001, cl. 1.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

What is the Definition of "Multiplexed" Signals?



Case 6:21-cv-00603-ADA-DTG Document 46 Filed 06/08/22 Page 1 of 48

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

APPLE INC.

Defendant.

Case No. 6:21-cv-00603-ADA

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.,

Defendants.

Case No. 6:21-cv-00701-ADA

DEFENDANTS' OPENING CLAIM CONSTRUCTION BRIEF
REGARDING THE '434 PATENT FAMILY

N. "multiplex / multiplexes / multiplexed / multiplexing" ('653 (1, 2, 3, 4, 27), '083 (5, 8, 12, 19), '075 (1), '943 (2, 19), '946 (1, 2, 3, 4, 16, 27), and '291(7))

Defendants' Proposed Construction	SMT's Proposed Construction
Plain and ordinary meaning, which is "to interleave or simultaneously transmit two or more messages on a single communications channel." The preamble of claim 1 of the '075 patent is limiting.	To combine multiple signal streams or data streams into a single signal stream or data stream for transmission or further processing, or split a single signal stream or data stream into multiple signal streams or data streams for transmission or further processing.

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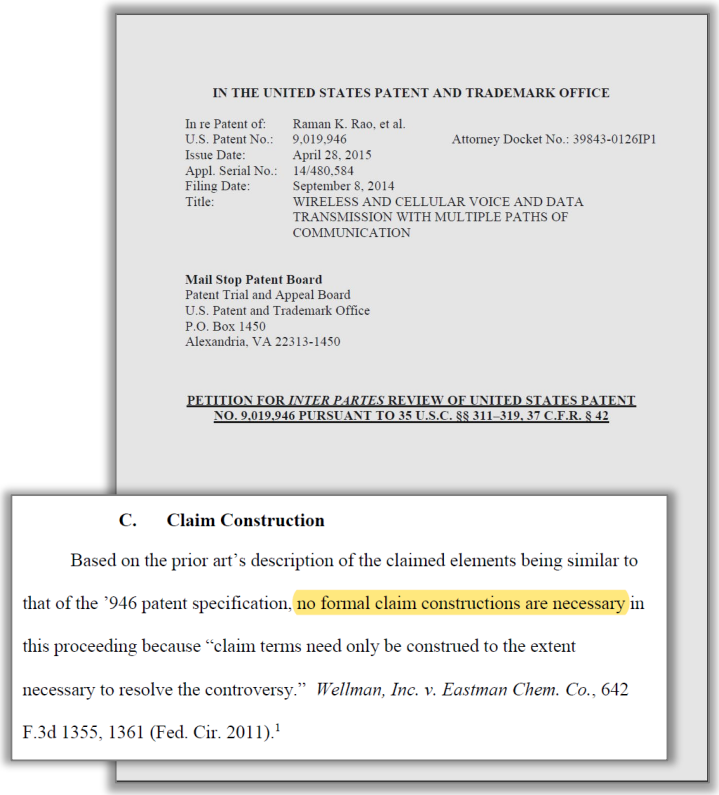

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Raman K. Rao, et al.
U.S. Patent No.: 9,019,946 Attorney Docket No.: 39843-0126IP1
Issue Date: April 28, 2015
Appl. Serial No.: 14/480,584
Filing Date: September 8, 2014
Title: WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION

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

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

C. Claim Construction

Based on the prior art's description of the claimed elements being similar to that of the '946 patent specification, no formal claim constructions are necessary in this proceeding because "claim terms need only be construed to the extent necessary to resolve the controversy." *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011).[1]

Pet., 2; EX-2003, 37.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

The Petition Argues Yegoshin's Phone Communicates On Cellular and WLAN "Selectively or Simultaneously"

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

A client software suite **19** enables a user to select a type of network for communication, to select a protocol for voice communication, and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network. Client software **19** may be provided by a plug-in smart card, or may be pre-loaded into a suitable built-in memory provided and adapted for the purpose. A series of selection buttons such as **15** and **17** allow a user to switch modes from cellular to IP communication, and perhaps to switch from differing types of networks using known protocols that are made available via client software **19**. One such protocol is the recently-developed H323 IP protocol allowing different hardware-based devices to communicate with each other over separate networks. There may be more than 2 selection buttons such as buttons **15** and **17** without departing from the spirit and scope of the present invention. Alternatively, the program may be given a series of preferences by the user, and then may negotiate the best possible connection accordingly. It may use such protocols as DHCP etc. to set up IP addresses and so forth. Selection of the network could be according to an order of preference, by availability.

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Moreover, Yegoshin's phone ***enables a single interface comprised of multiplexed signals*** from its first and second communication interfaces for cellular and WLAN (***first and second wireless transmit and receive units***). EX-1003, ¶126. For example, Yegoshin's phone switches between cellular and IP-LAN modes, and is "capable of taking some calls via cellular path while receiving other calls via IP path." EX-1004, 5:33-65. Further, Yegoshin's phone includes

Again, Yegoshin-Johnston-Billström's phone communicates on cellular and WLAN selectively or simultaneously (as taught by Yegoshin) using IP-enabled cellular and WLAN communication interfaces (as taught by Yegoshin and Billström). EX-1003, ¶127; EX-1004, 5:33-65; EX-1006, 1:6:12, 1:54-60, 3:53-61. A POSITA would have found it obvious that, to receive calls on both cellular and WLAN simultaneously or to switch between two networks, the phone multiplexes the signals communicated on two network paths. EX-1003, ¶127.

POR, 6; Pet., 34; EX-1004, 5:33-65.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Yegoshin Does Not Disclose Simultaneous Calls Over Cellular and WLAN

(12) **United States Patent** (10) **Patent No.: US 6,711,146 B2**
Yegoshin (45) **Date of Patent: *Mar. 23, 2004**

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.

If Yegoshin's phone is engaged with an IP (WLAN) call, an incoming cellular call gets a busy signal or is redirected to the WLAN path. It is **not** connected over the cellular path.

Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
Purdue University Fort Wayne, Indiana
- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
- Courses:
  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

54. Petitioner is fundamentally wrong that Yegoshin discloses using cellular and WLAN calls "simultaneously." Pet., 33-34. In my opinion, Yegoshin makes clear that the user can use ***either*** the cellular or WLAN networks for a given call, but ***not*** both simultaneously. When Yegoshin states its cell phone "is capable of taking some calls via cellular path ***while*** receiving other calls via IP path" (Ex. 1004 [Yegoshin] 5:55-65), the word "while" is not used in the simultaneous sense. Instead, Yegoshin simply teaches that some calls may be taken via the cellular path and other calls may be taken via the WLAN path. This understanding is confirmed two sentences later, when Yegoshin states "[f]or example, ***if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call***." *Id.*, 5:59-62. From this, a POSITA would understand that Yegoshin teaches the precise opposite of simultaneously using cellular and WLAN. Instead, Yegoshin teaches that the second incoming call is not connected and gets "a busy signal" or is "redirected" rather than simultaneously received.

POR, 7; Ex-1004, 5:55-65; EX-2019, ¶54.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
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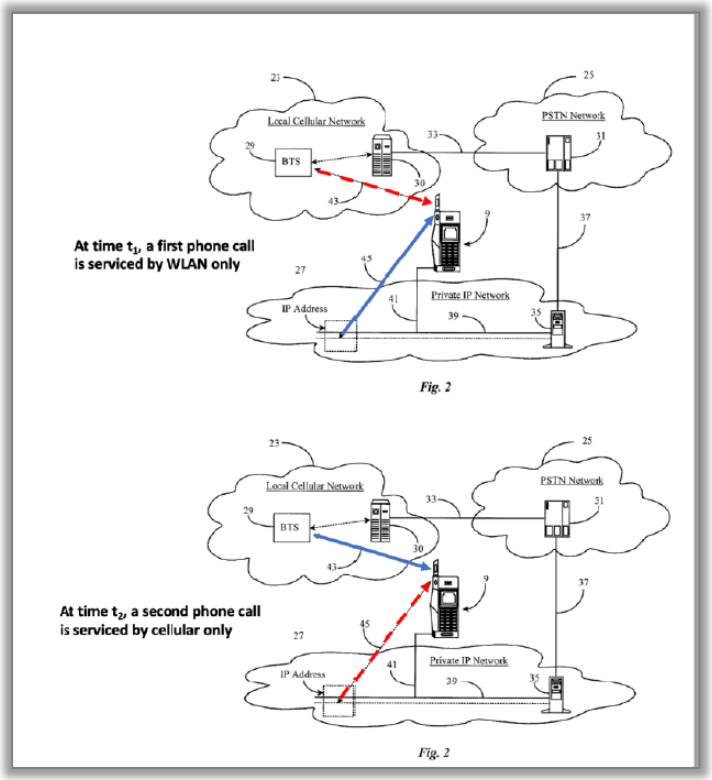
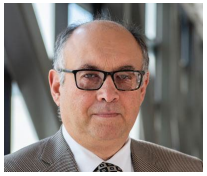
Yegoshin's Calls are Serviced Over Either the Cellular or WLAN Networks, But Never Both





Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
Purdue University Fort Wayne, Indiana
- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
- Courses:
  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

55. In Yegoshin, a "client software suite 19" enables a user to "select a protocol for voice communication," *i.e.*, whether to use cellular or WLAN. Ex. 1004 [Yegoshin] 5:33-35; *see also id.*, 5:40-42 ("A series of selection buttons such as 15 and 17 allow a user to switch modes from cellular to IP communication …"). When a call arrives at the cellular provider, the provider determines whether the user is within range of the local service area, in which case, the call would be routed to the user through the cellular network. *Id.*, 8:15-20. If the user is outside of the range of the local service area (*i.e.*, is roaming), the call would be routed to the user through the WLAN network. *Id.*, 8:20-27. Yegoshin explains that a user can specify certain calls to be routed through the cellular network even if the user is outside of the local network area. *Id.*, 8:47-56. In either case, a given call is serviced in its entirety either via the cellular or WLAN networks, but never both. This is shown schematically in Yegoshin's annotated Figure 2 below:

POR, 7-9; EX-2019, ¶55.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Calls are Redirected at the Network Level, Not on the Phone

(12) **United States Patent** Yegoshin
(10) Patent No.: US 6,711,146 B2
(45) Date of Patent: *Mar. 23, 2004

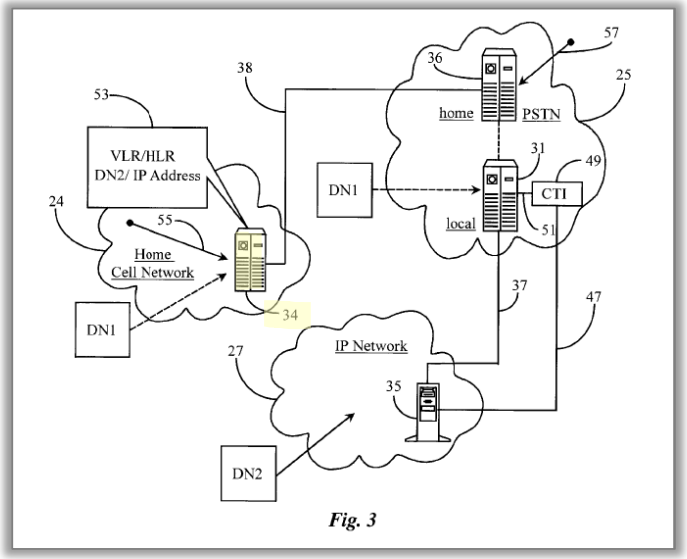


Fig. 3

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

Sur-Reply, 2-3; EX-1004, 8:16-27, Fig. 3.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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None of Dr. Jensen's Cites Support His Claim that Yegoshin Suggests Routing Calls Through Cellular and WLAN Networks Simultaneously

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.

The example described above of an instance of a cellular call **55** placed to cell phone **9** assumes that the user is taking all cellular calls in IP format while logged-on to IP network **27**. All such calls would then be routed via PSTN **25** to IP network **27**. However, it may be that certain cellular calls will be exempt from IP delivery at the user's discretion. In this case, callers from known origination numbers will be routed to local cell network **23**, local to the visited IP network, and therefore may be received by the user of telephone **9** in normal cell-phone mode.

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

55. Although Yegoshin's example operations of the phone appear to be limited to selective use of two paths (which still satisfies the "multiplexed" limitations in the Challenged Claims), a POSITA would have understood and found obvious that Yegoshin's phone would also be used for simultaneous use of cellular and WLAN paths. EX-1050, ¶¶34-35. Notably, Yegoshin's "cell phone 9 is capable of taking some calls via cellular path ***while*** receiving other calls via IP path." EX-1004, 5:55-57. Several portions of Yegoshin's disclosure inform this "while" disclosure to suggest to a POSITA the obviousness of having simultaneous cellular and WLAN calls as an alternative, equally plausible example. For example, Yegoshin describes that, when its phone is located at a place where IP calls are available, certain calls can be routed through the cellular network per a user preference. EX-1004, 8:47-56 ("However, it may be that certain cellular calls will be exempt from IP delivery at the user's discretion."); EX-1050, ¶¶35-36. Although not express, it suggests the phone's capability of having calls routed through both cellular and IP networks at the same location. Therefore, this would have informed a POSITA to understand Yegoshin's disclosure (e.g., Yegoshin's phone "is capable of taking some calls via cellular path while receiving other calls via IP path." EX-1004, 5:55-57) as obviously suggesting the capability to have simultaneous calls over the different networks. Indeed, the simultaneous use of two different networks was well known, as evidenced by Gillig's discussion of three-way linking of calls

Sur-Reply, 2-3; EX-1004, 8:47-56; EX-1051, ¶55.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Petitioner's "Three-Way Linking" Argument is Meritless and Undeveloped

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

over the different networks. Indeed, the simultaneous use of two different networks was well known, as evidenced by Gillig's discussion of three-way linking of calls over two different networks. EX-1003, ¶158 (citing EX-1045, 6:35-7:16 (describing three-way linking of two calls over different protocols such as cellular and cordless telephone calls)); EX-1003, ¶140 (citing EX-1007, 26:56-65 (describing simultaneous use of multiple different communication circuits such as cellular and land-line calls)).

What's missing?

No explanation of the modifications that would have been necessary to implement "three-way linking" of cellular and WLAN networks on Yegoshin's phone.

No testimony showing a motivation to combine.

No testimony showing a reasonable expectation of success.

No knowledge: Dr. Jensen does not even know whether the "well known" "three-way linking" was implemented on a phone or at the network level, in which case it could not even arguably indicate "simultaneous" multiplexing.

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q I recall that three-way calling was an added service that I would have to buy from the provider like AT&T or Cingular at the time. Do you recall that?

A You're talking about back around the priority date of the '653 patent, back around --

Q In the 2000s, right.

A Yeah. Early 2000s, 19- -- yeah. That's my recollection. I didn't -- I didn't have it on my cell phone, but that is my recollection.

Q Now, architecturally, do you recall how three-way calling was implemented on the network?

A I don't have detailed knowledge of that.

Q Do you know if a local server or somewhere in the backbone, wherever those two calls were joined together?

A No, sir. I don't have detailed knowledge, no.

Q So sitting here now, you don't have a recollection of how the different calls and three-way calling around the time of the invention were -- or where or which part of network they were joined together around the time of the invention; correct?

A That's correct. I don't have -- I don't have that recollection or knowledge.

Sur-Reply, 20; EX-1051, ¶55; EX-2035, 61:21-62:21.

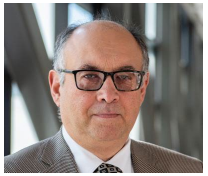
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Yegoshin's "Selective" Use of Cellular or WLAN Networks Does Not Teach Interleaving

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.



Todor Cooklev, PhD.

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- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
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  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

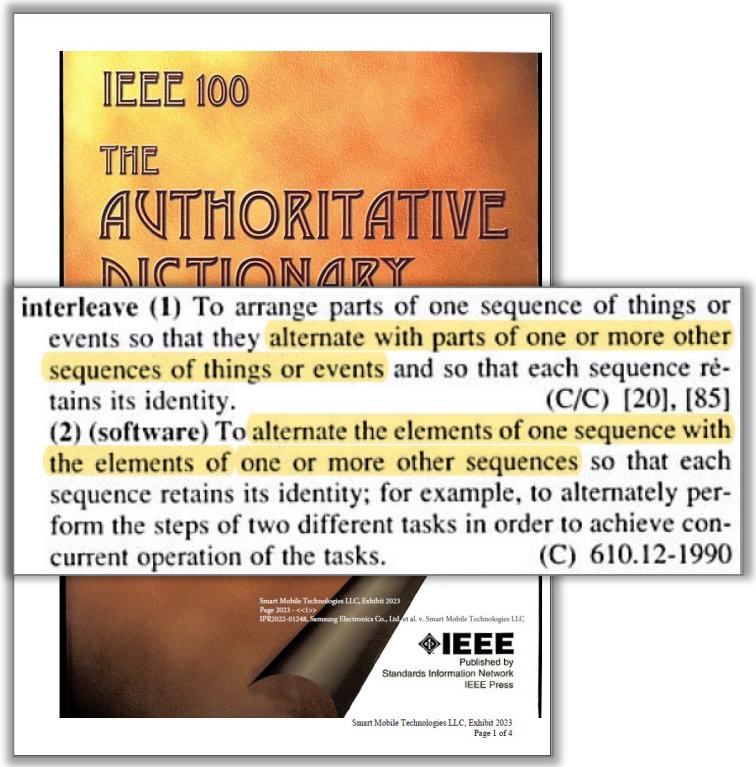
58. A POSITA would not understand Yegoshin's alleged teaching of "selectively" "switch[ing] between" cellular and WLAN (Pet., 33-34) to be "interleaving" or "simultaneously transmitting" messages per Petitioner's district court construction. Ex. 2003 [Defendants'-Opening-Claim-Construction-Brief] 37. Yegoshin teaches that its device can only receive one call at a time. Ex. 1004 [Yegoshin] 5:59-62 ("if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call"). Only after the device ends the first call could the device switch to the other network and receive the second call. Thus, it is important to note that this is not a case where Yegoshin within a single call utilizes both cellular and WLAN networks by switching between them; rather, Yegoshin uses ***either*** cellular or WLAN for any given call.

POR, 11-12; EX-2019, ¶58; EX-1004, 5:55-65.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 12 of 141

Yegoshin's "Selective" Use of Cellular or WLAN Networks Does Not Teach Interleaving



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59. A POSITA would understand that this disclosure does not result in multiplexing under Petitioner's district court construction. Given that Yegoshin does not use cellular and WLAN simultaneously, and terminates one call before servicing another, the cellular and WLAN are not "simultaneously" transferred. They simply service different calls. Furthermore, cellular and WLAN packets are not interleaved with each other. *See, e.g.*, Ex. 2023 [IEEE-Dictionary] 577 ("To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity."). Rather, all cellular packets are sent during the cellular phone call and, once that call is terminated, and when a separate WLAN call is initiated, all WLAN packets are sent for the WLAN call. There is simply no interleaving.

POR, 11-12; EX-2019, ¶59; EX-2023, 577.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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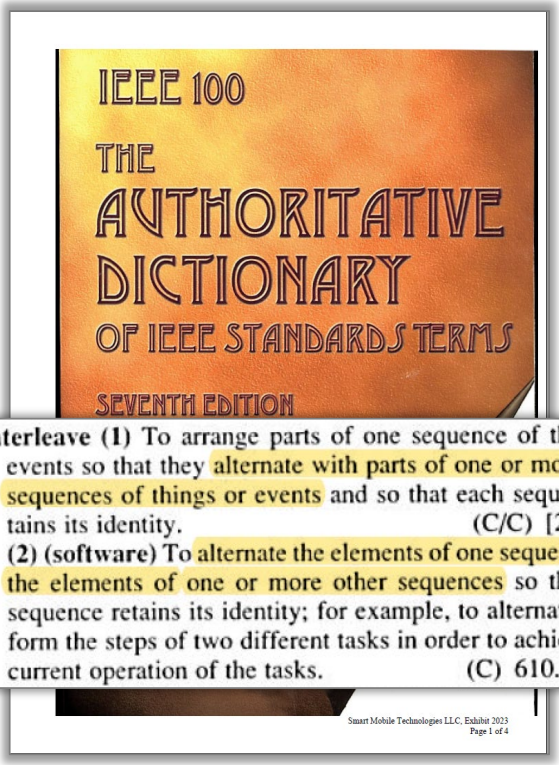
Dr. Jensen's Testimony in His First Deposition Eviscerates Petitioner's "Selective" Use Argument



Transcript of Michael Allen Jensen, Ph.D.

Date: May 11, 2023
Case: Samsung Electronics Co., Ltd., et al. -v- Smart Mobile Technologies, LLC (PTAB)

19 Q. Okay. What does "interleave" mean, as
20 you're using it here?
21 A. Yeah. In this context, it is the packets
22 received via, in this case, these two networks --
23 the cellular network and the wireless local area
24 network -- are mixed together in time. So
25 interleaving would be one or a few packets from
1 one, and then one or a few packets from another if
2 they were, sort of, simultaneously in
3 communication and transferring data. That would
4 be interleaving in that instance.

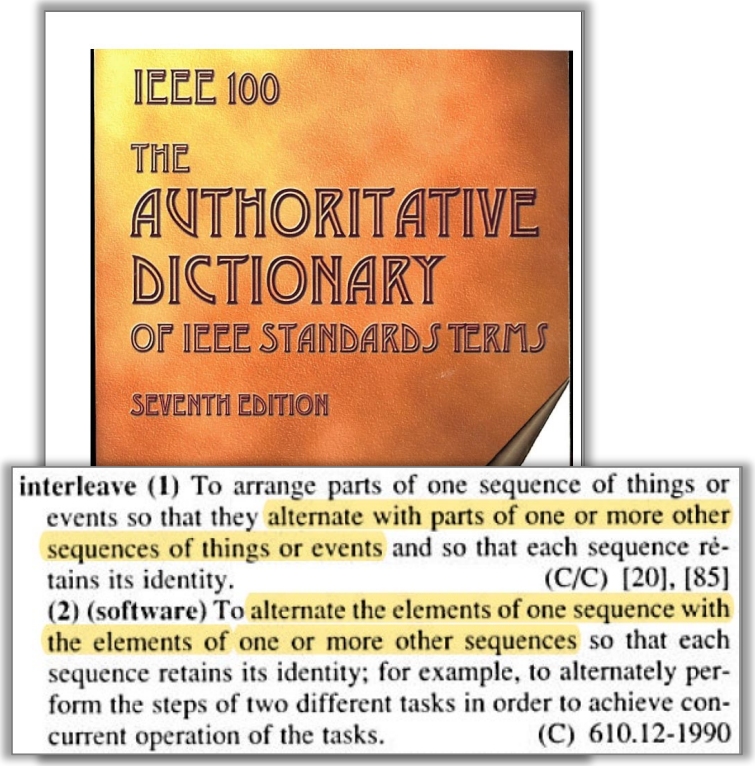
Dr. Jensen: "Interleaving" is "one or a few packets from one, and then one or a few packets from another if they were, sort of, simultaneously in communication and transferring data." Yegoshin's purported "selective" use to make one completed call, and then another unrelated completed call, does not "interleave."

POR, 12; Sur-Reply, 19; EX-2020, 65:19-66:4; EX-2023, 577.

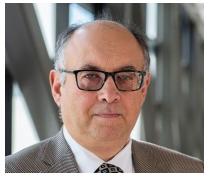
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 14 of 141

Yegoshin's "Selective" Use of Cellular or WLAN Networks Does Not Teach Multiplexing



interleave (1) To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity. (C/C) [20], [85]
(2) (software) To alternate the elements of one sequence with the elements of one or more other sequences so that each sequence retains its identity; for example, to alternately perform the steps of two different tasks in order to achieve concurrent operation of the tasks. (C) 610.12-1990



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61. I note that Dr. Jensen did not directly answer the question whether "interleaving" occurs "if a complete message from a first source is transmitted across an interface followed by a complete second message from a second source and so on." The answer is no, such a communication flow would not constitute "interleaving" as a POSITA would understand the term. Ex. 2023 [IEEE-Dictionary] 577 ("**interleave** (1) To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity. . . . (2) (**software**) To alternate the elements of one sequence with the elements of one or more other sequences so that each sequence retains its identity; for example, to alternately perform the steps of two different tasks in order to achieve concurrent operation of the tasks.").

62. So, a POSITA would understand that neither "multiplexing" nor "interleaving" occurs in Yegoshin's system.

POR, 12; EX-2019, ¶61; EX-2023, 577.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
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Yegoshin's "Selective" Use of Cellular or WLAN Networks Does Not Teach Multiplexing

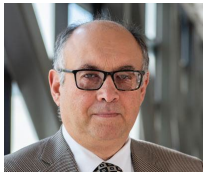
IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SMART MOBILE TECHNOLOGIES LLC, Plaintiff, v. APPLE INC., Defendant.	Case No. 6:21-cv-00603-ADA-DTG
SMART MOBILE TECHNOLOGIES LLC, Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 6:21-cv-00701-ADA-DTG

PLAINTIFF'S RESPONSIVE CLAIM CONSTRUCTION BRIEF
REGARDING THE '434 PATENT FAMILY

N. "multiplex / multiplexes / multiplexed / multiplexing" ('653 Patent, claims 1-4, 27); '946 Patent, claims 1-4, 16, 27; '291 Patent, claim 7; '083 Patent, claims 5, 8, 12, 19; '943 Patent, claims 2, 11; '075 Patent, claim 1)

Smart Mobile's Construction	Defendants' Construction
To combine multiple signal streams or data streams into a single signal stream or data stream for transmission or further processing, or split a single signal stream or data stream into multiple signal streams or data streams for transmission or further processing.	Plain and ordinary meaning, which is "to interleave or simultaneously transmit two or more messages on a single communications channel." The preamble of claim 1 of the '075 patent is limiting.



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63. In the district court, I have opined that "multiplexing" means "to combine multiple signal streams or data streams into a single signal stream or data stream." Ex. 2028 [Plaintiff's Responsive Claim Construction Brief] 40. In my opinion, a POSITA would not understand Yegoshin's alleged teaching of "selectively" "switch[ing] between" cellular and WLAN to be "combin[ing] multiple signal streams or data streams" either. Again, because Yegoshin does not service cellular and WLAN simultaneously, and terminates one call before servicing another, the cellular and WLAN streams are not combined. They are simply used for separate calls.

64. Thus, in my opinion, Petitioner and Dr. Jensen fail to prove that Yegoshin discloses or renders obvious "multiplexed signals."

POR, 12; EX-2019, ¶¶63-64; EX-2028, 40.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Dr. Jensen's Self-Impeaching Testimony on the Meaning of "Multiplexing"

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q Okay. Now, in your opinion, if I make a telephone call on my mobile phone today using the cellular network and I complete that call, and then I make another phone on my mobile phone next year using the WLAN network -- actually. That's a bad example. Let me use Yegoshin's phone so we're really on point. Because I don't want to mislead you. In your proposed combination, is it your opinion that if a phone call is made on Yegoshin's phone using the cellular network today, and that phone call is completed, and then another phone call is made next year on the WLAN network on Yegoshin's phone, is it your opinion that the signals for those two phone calls are multiplexed?

A Well, I think a year time frame between them is an extreme example. I believe nonetheless that that represents multiplexing.

Q Is there any time frame that would change your answer from being multiplex to not being multiplex?

A No.

Dr. Jensen: Two unrelated, completed calls one year apart are "multiplexed."

Dr. Jensen: Two unrelated, completed calls 50 years apart are "multiplexed."

Dr. Jensen: I don't have an opinion on the plain meaning of "multiplex."

Dr. Jensen: There is no time frame that would change the calls to being not "multiplexed."

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q Okay. So in your opinion, if on Yegoshin's phone, a phone call is made using the cellular network today and another phone call is made 50 years from now on the WLAN network, in your opinion, those two signals are multiplexed?

A Again, these are extreme examples. But -- but yes.

Q Have you formed an opinion on what the plain and ordinary meaning of the verb multiplex is?

A I haven't -- I haven't formed an opinion or opined on that in my declaration.

Sur-Reply, 16; EX-2035, 55:5-56:11, 63:13-16.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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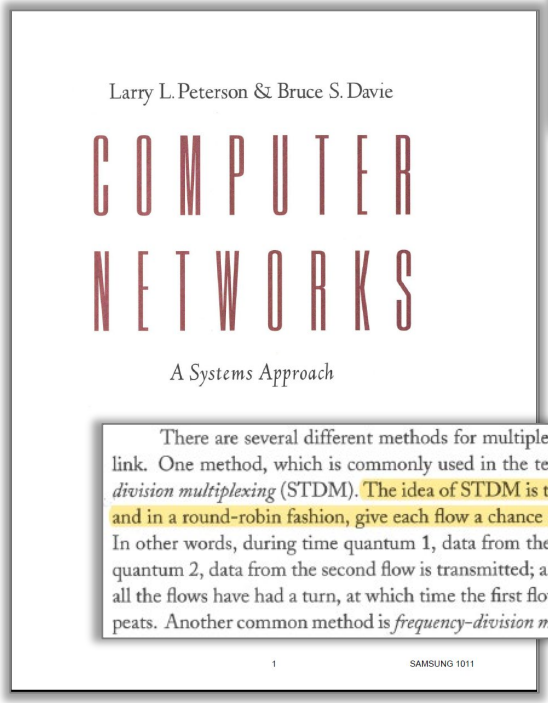
Petitioner's Treatises Do Not Support Dr. Jensen's Understanding of "Multiplexing"

Dividing time into equal preassigned time slots contradicts Dr. Jensen's "any time, any length" understanding of "multiplexing."

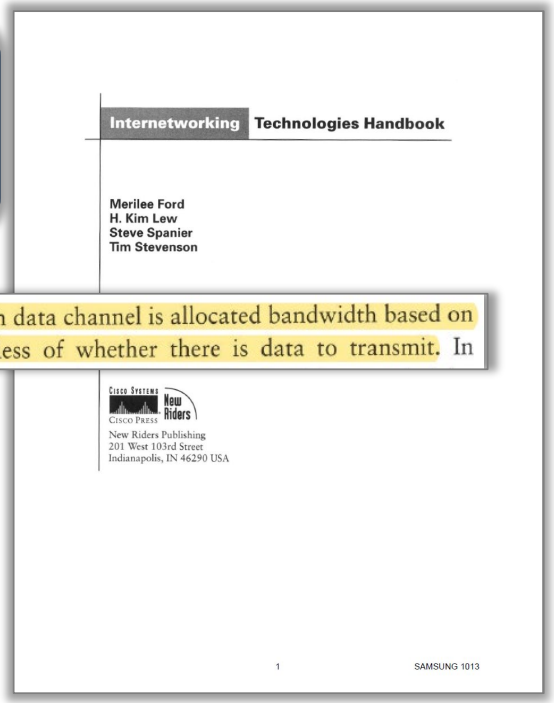

Larry L. Peterson & Bruce S. Davie

COMPUTER NETWORKS

A Systems Approach

There are several different methods for multiplexing multiple flows onto one physical link. One method, which is commonly used in the telephone network, is *synchronous time-division multiplexing* (STDM). The idea of STDM is to divide time into equal-sized quanta, and in a round-robin fashion, give each flow a chance to send its data over the physical link. In other words, during time quantum 1, data from the first flow is transmitted; during time quantum 2, data from the second flow is transmitted; and so on. This process continues until all the flows have had a turn, at which time the first flow gets to go again, and the process repeats. Another common method is *frequency-division multiplexing* (FDM). The idea of FDM

1 SAMSUNG 1011


Internetworking Technologies Handbook

Merilee Ford
H. Kim Lew
Steve Spanier
Tim Stevenson

In TDM, information from each data channel is allocated bandwidth based on preassigned time slots, regardless of whether there is data to transmit. In

Cisco Systems Cisco Press New Riders

New Riders Publishing
201 West 103rd Street
Indianapolis, IN 46290 USA

1 SAMSUNG 1013

Sur-Reply, 17; EX-1010; EX-1012.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Petitioner's Dictionaries Do Not Support Dr. Jensen's Understanding of "Multiplexing"

IEEE 100
The Authoritative Dictionary of
IEEE Standards Terms

Seventh Edition

multiplex To interleave or simultaneously transmit two or more messages on a signal channel.
(C/PE) 610.10-1994w, 599-1985w

interleave (1) To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity. (C/C) [20], [85]
(2) (software) To alternate the elements of one sequence with the elements of one or more other sequences so that each sequence retains its identity; for example, to alternately perform the steps of two different tasks in order to achieve concurrent operation of the tasks. (C) 610.12-1990

HARGRAVE'S
COMMUNICATIONS DICTIONARY

Frank Hargrave

IEEE PRESS

multiplex (MUX) To interleave or simultaneously transmit two or more messages on a single communications channel.

2

Sur-Reply, 17-18; EX-1061; EX-1062.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Table of Contents

Petition: Bernard's Packet Interface 752 Includes a Multiplexer, Which is "Decoder/Multiplexer 112"

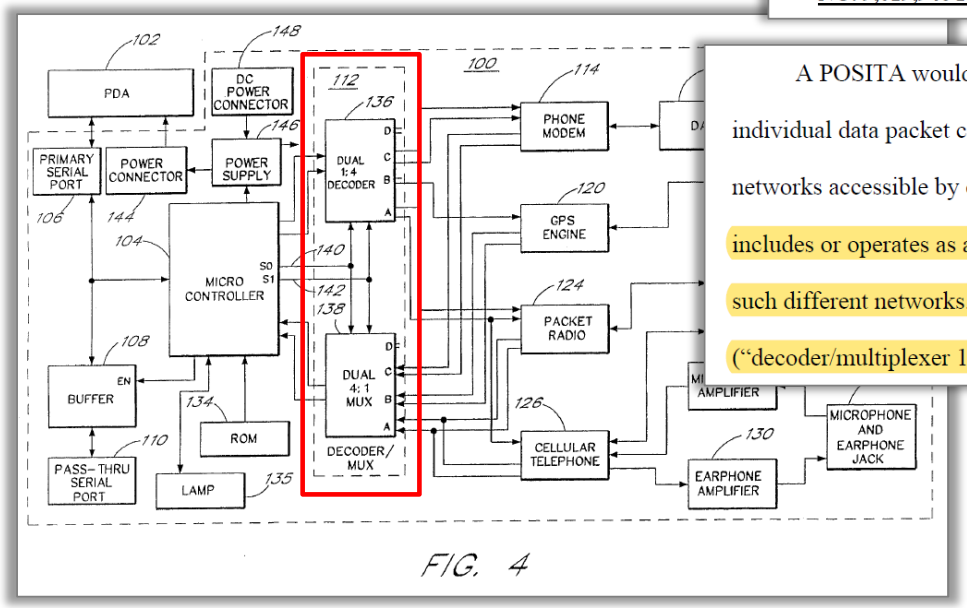

FIG. 4

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

A POSITA would have understood or found obvious that, in Bernard, each individual data packet can be communicated on any of the multiple communication networks accessible by cradle 100B, and that packet interface 752 in cradle 100B includes or operates as a multiplexer for combining the data packets coming from such different networks. EX-1003, ¶133; EX-1007, 3:59-4:15 ("decoder/multiplexer 112"), Figure 4, 17:10-25. Indeed, Bernard's teachings of

Pet., 38; POR, 15; EX-1007, Fig. 4.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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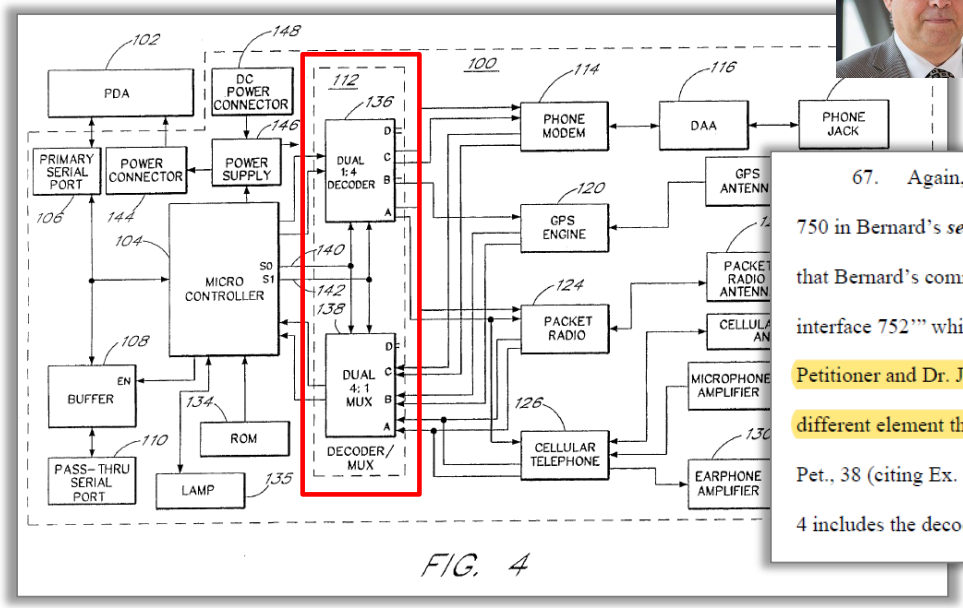
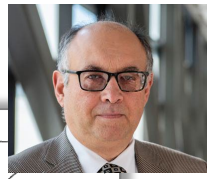
"Decoder/Multiplexer 112" is Part of Bernard's First Embodiment, Not its Second Embodiment





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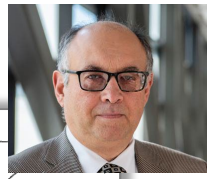
67. Again, I note that to support the contention that communication server 750 in Bernard's ***second*** embodiment multiplexes, Petitioner and Dr. Jensen argue that Bernard's communication server 750 "implements 'communication packet interface 752'" which "includes or operates as a multiplexer." Pet., 36, 38-39. Petitioner and Dr. Jensen, however, cite Bernard's "decoder/multiplexer 112," a different element that is a part of Bernard's ***first*** embodiment, but not its second. Pet., 38 (citing Ex. 1007 [Bernard] 3:59-4:15, 17:10-25, Figure 4). Bernard's Fig. 4 includes the decoder/multiplexer 112 shown in a red box:

POR, 15; EX-1004, Fig. 4; EX-2019, ¶67.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 22 of 141

"Decoder/Multiplexer 112" Does Not Multiplex Signals



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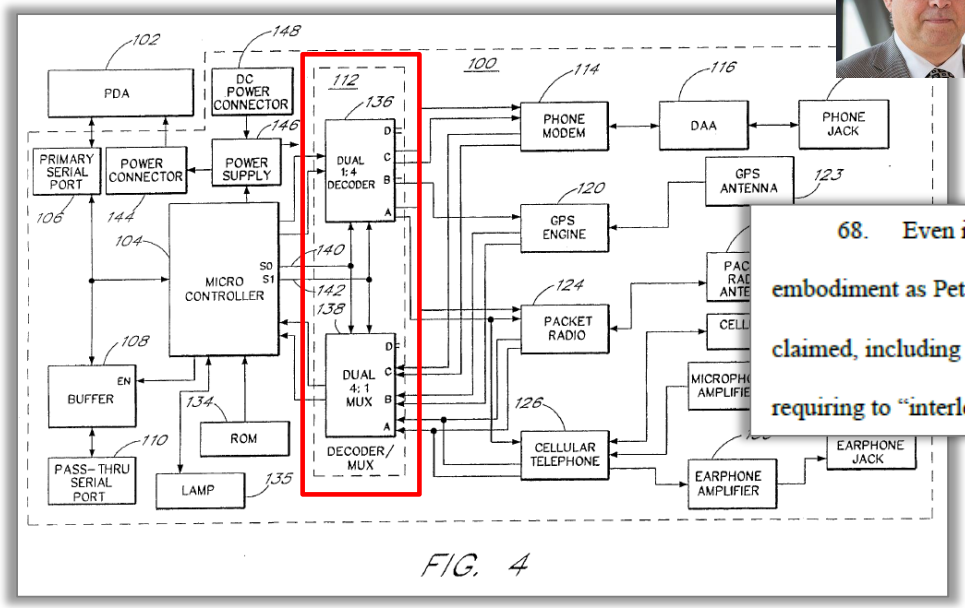

FIG. 4

68. Even if Bernard's "multiplexer 112" were a part of the second embodiment as Petitioner assumes, it does not create "multiplexed" "signals" as claimed, including under Petitioner's proposed district court claim construction requiring to "interleave" or "simultaneously transmit" two signals.

POR, 15; EX-1007, Fig. 4; EX-2019, ¶68.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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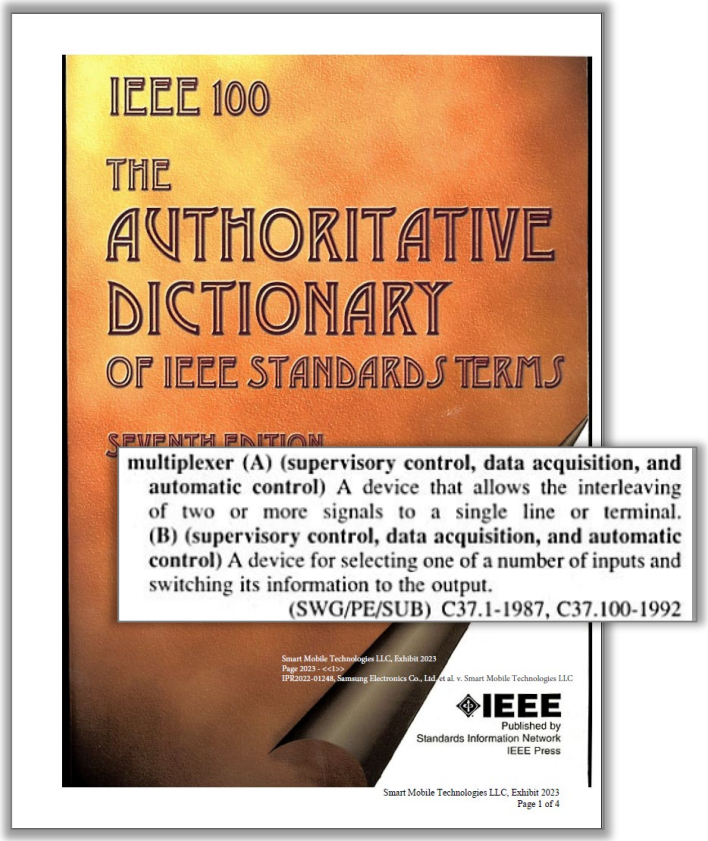
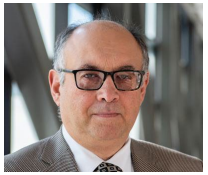
"Decoder/Multiplexer 112" Does Not Multiplex Signals





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69. While Bernard discloses a "multiplexer," Bernard's "multiplexer" is distinct from "multiplexing" as used in the claims. In the district court, Petitioner relies upon the Authoritative Dictionary of IEEE Standards Terms (7th ed. 2000) (Ex. 2003 [Defendants'-Opening-Claim-Construction-Brief] 40), which provides two distinct definitions for a "multiplexer" device. Definition (A) is "[a] device that allows the interleaving of two or more signals to a single line or terminal" while the distinct definition (B) is "[a] device for selecting one of a number of inputs and switching its information to the output." Ex. 2023 [IEEE-Dictionary] 716. Petitioner does not contend, either here or in the district court, that this second definition—"selecting one of a number of inputs and switching its information to the output"—would qualify as "multiplexing" in claim 1. Nor could it, as the same dictionary defines the verb multiplexing only as "interleav[ing] or simultaneously transmit[ting] two or more messages on the same channel," not as selecting one of a number of inputs. *Id.*

POR, 15; EX-2019, ¶69; EX-2023, 716.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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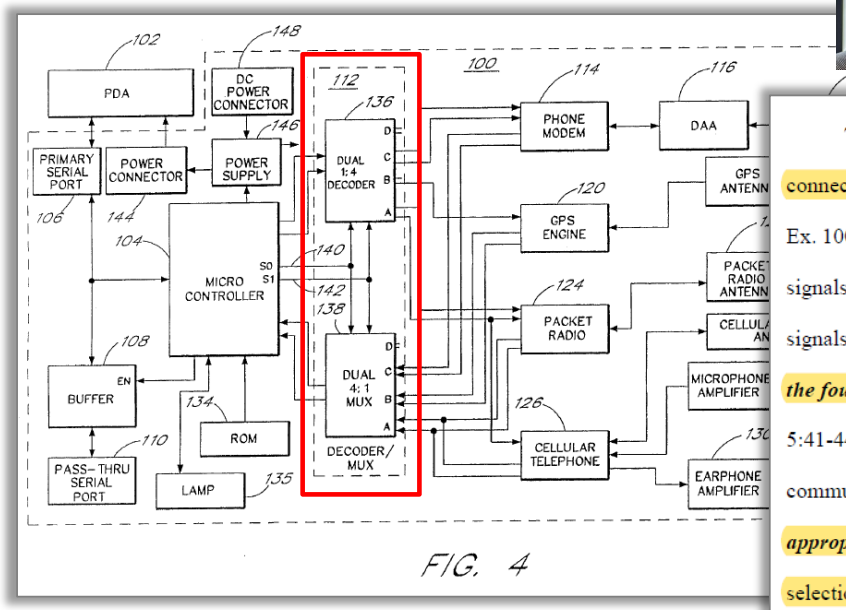
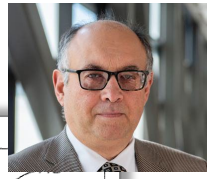
"Decoder/Multiplexer 112" is Merely a Data Selector





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70. But Bernard's "multiplexer" device is precisely such a "selector" that connects the microcontroller to the selected one of the three possible input circuits. Ex. 1007 [Bernard] 5:30-35 ("The microcontroller 104 generates a pair of select signals on a pair of select lines 140 and 142 to the decoder 136. The two select signals have logical values of 00, 01, 10, or 11 to ***control the selection of one of the four output pairs of the decoder 136 to which the input pair is connected***."); 5:41-44 ("Thus, the microcontroller 104 can send serial data to any of the installed communication circuits 114, 120 and either 124 or 126 by ***selecting the appropriate select signals***."); 5:59-62 ("The microcontroller 104 controls the selection of the multiplexer 138 using the same select signals as described above with reference to the decoder 136.").

POR, 15; EX-1007, Fig. 4; EX-2019, ¶70.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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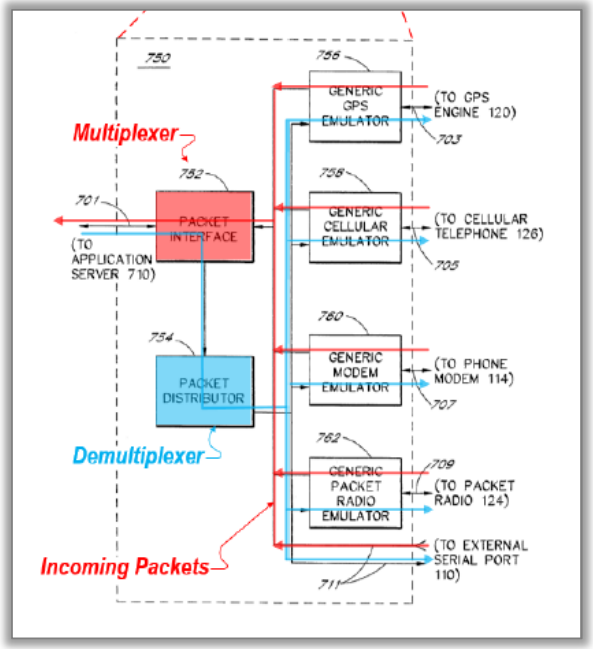
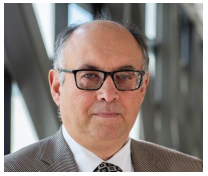
"Packet Interface 752" Does Not Multiplex

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42





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73. I also note that Petitioner cites Bernard's communication packet interface 752 in its argument that Bernard has "multiplexing features." Pet., 36-37. This communication packet interface, however, also does not perform multiplexing as the claims require.

Pet., 37; POR, 16-17; EX-2019, ¶73.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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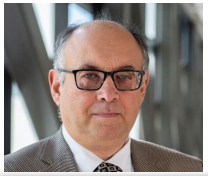
"Packet Interface 752" Services Application Requests One at a Time

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.

Ex. 1007, 26:56-66.



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2016 – **Professor of Electrical and Computer Engineering**
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- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
- Courses:
  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

74. In Bernard, communication packet interface 752 completes servicing an application request from a given network before moving to service the same or a different application's request from the same or a different network. Bernard is clear that in its second embodiment, only one of the networks can be operational to transmit data at a given time. Ex. 1007 [Bernard] 26:56-57 ("In this second embodiment, only one of the four above-described connections can be established at a time."). For example, Bernard explains that its applications can use either cellular or landline phone connections, "depending on which type of telephone has been previously selected for operation." *Id.*, 21:30-38; *see also id.*, 21:55-59; 21:61; 22:5-14. This is also confirmed by its first embodiment. There, Bernard explains that the microcontroller executes code to select only one of the available network connections for servicing. *Id.*, 5:59-62; 6:9-11. Thus, a POSITA would understand that, in Bernard, a given application using a single network is serviced before the system moves to servicing a different application using the same network or the same application using a different network.

POR, 16; EX-1007, 26:56-65; EX-2019, ¶74.

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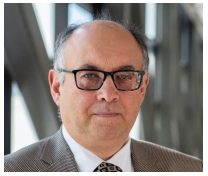
"Packet Interface 752" Services Application Requests One at a Time

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

The communication circuits **114**, **120**, **124**, **126** and devices connected to the external serial port **110** also generate data packets for transmission to one or more of the applications **702**, **704**, **706**. Each of the data packets identifies the type of data contained therein. The packet radio **124**, for example, may generate a data packet containing data that has been received from a remote source. The communication circuits **114**, **120**, **124**, **126** and the external serial port **110** transmit the data packets to the communication server **750**. The communication server **750** modifies the data packets and transmits them to the application server **710**, which also modifies the data packets. The application server **710** also determines which applications **702**,**704**, **706** have requested data of the type contained in a data packet, and sends the data packet to the appropriate applications **702**, **704**, **706**.

Ex. 1007, 18:36-51

Incoming packets are identified by type, not by address, which means that there cannot be different requests pending for different data of the same type.



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75. This is further confirmed by the fact that in Bernard, there cannot be different requests pending for different data of the same type. To illustrate, applications 1 and 2 cannot both have requests pending for different radio packet data. This is because Bernard's system determines which application a given data packet belongs to by the type of data contained in that application:

> The communication circuits 114, 120, 124, 126 and devices connected to the external serial port 110 also generate data packets for transmission to one or more of the applications 702, 704, 706. Each of the data packets identifies the type of data contained therein. … The application server 710 also determines which applications 702, 704, 706 have requested data of the type contained in a data packet, and sends the data packet to the appropriate applications 702, 704, 706.

Ex. 1007 [Bernard] 18:36-51. Therefore, Bernard is unable to distinguish between different data of the same type to send them to different applications.

POR, 16-17; EX-1007, 18:36-51; EX-2019, ¶75.

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Bernard Does Not Disclose an Application Requesting Data from Different Communication Circuits

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

Generally, the communication circuits **114**, **120**, **124**, **126**, as well as the external serial port **110** are utilized for the same purposes as in the first embodiment communication device **100**. Each application program **702**, **704**, **706** can generally utilize any of the functions of the communication circuits **114**, **120**, **124**, **126**. For example, the first application **702** may utilize the GPS engine **120** and the packet radio **124**, while the second application **704** utilizes the phone modem **114**. In the second embodiment communication

Ex. 1007, 17:61-18:2

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.

Ex. 1007, 26:56-66.

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

Bernard describes other scenarios where simultaneous connections are established, such as a single application requesting data of different types from different communication circuits. EX-1007, 17:66-18:1; EX-1051, [64].

An "example" illustrating that each application can utilize any of the communication circuits. No suggestion that the application may utilize the exemplary circuits simultaneously.

POR, 16, 36-37; Sur-Reply, 22; EX-1007, 17:61-18:2; EX-1051, ¶64.

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"Packet Interface 752" Just Receives and Transfers Packets

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

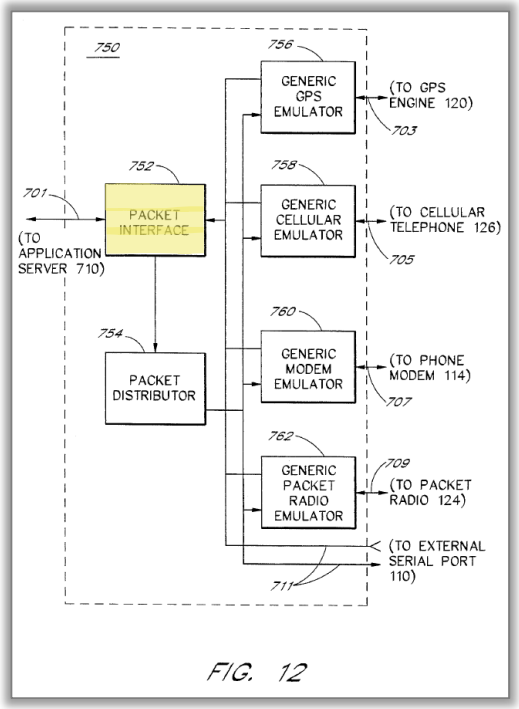

FIG. 12

Transcript of Michael Allen Jensen, Ph.D.

Date: May 11, 2023
Case: Samsung Electronics Co., Ltd., et al. -v- Smart Mobile Technologies, LLC (PTAB)

Q. I'll -- yeah, I'll ask a different question. So the packet interface, 752, in Bernard, it receives data packets from the application packet interface 740 over the serial interface 701, and transfers those packets to the communication packet distributor, 754.

That's one of the functions of the packet interface 752; correct?

A. Yes, that's correct.

Q. Okay. And the packet interface 752 also received data packets from the generic emulators and the external serial port 110 in the cradle, and transmits those packets to the application packet interface 740 over the serial interface 701; correct?

A. Yes.

Q. Okay. As disclosed in Bernard, does the packet interface 752 do anything else?

A. I don't recall that it does anything else. I don't want to say that I remember everything, but that's -- that's the function that I remember.

POR, 17; EX-1007, Fig. 12; EX-2020, 59:2-23.

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"Communication Server 750" Does Not Simultaneously Transmit Signals

United States Patent [19] | [11] **Patent Number:** 5,497,339
Bernard | [45] **Date of Patent:** Mar. 5, 1996

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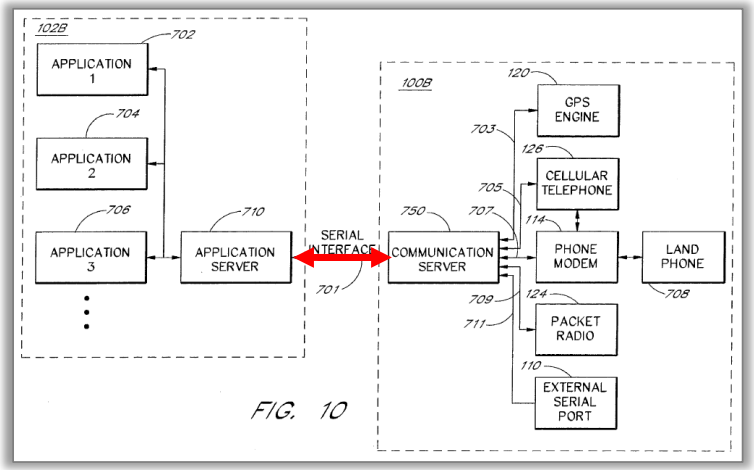

FIG. 10

76. While Petitioner and Dr. Jensen have not proffered a construction of "multiplexing," Bernard's communication server 750 does not multiplex signals under Petitioner's district court construction. The data from multiple networks are not "interleaved or simultaneously transmitted," as required by that construction.

77. First, as I explain in paragraphs 49-50, the interface 701 through which Petitioner contends multiplexed signals are transmitted after being allegedly multiplexed by communication server 750 is a serial interface that permits transmission of data one bit at a time, serially. Petitioner does not explain how serially transmitting one bit at a time can disclose "simultaneously" transmitting two or more signals.

POR, 17-18; EX-1007, Fig. 10; EX-2019, ¶¶76-77.

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"Communication Server 750" Sends Signals Over a Serial Interface

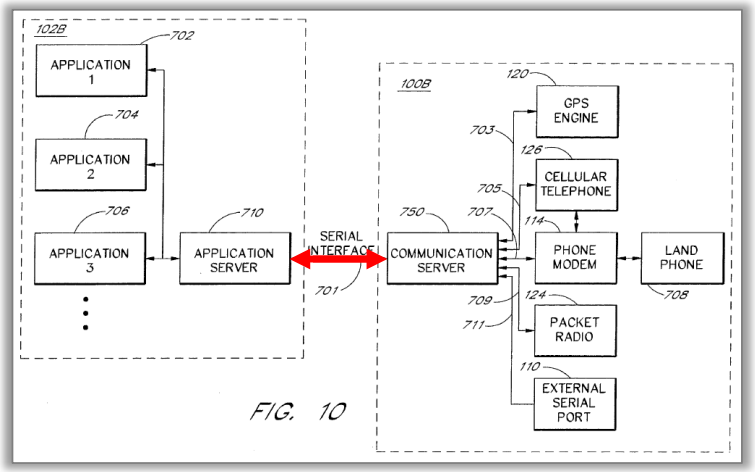

FIG. 10

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48. Bernard uses a serial interface (highlighted in **red**) between its PDA and cradle because it is the physical connection between the two devices, as illustrated in Figure 10 below:

Ex. 1007 [Bernard] Fig. 10 (annotated); 17:44-51 ("The application server 710 of the PDA 102B ***is coupled to*** the communication server 750 of the communication device 100B ***by a serial interface 701***. The serial interface 701 between the application server 710 and the communication server 750 corresponds to the serial interface between the PDA 102 and the primary serial port 106 of the first embodiment communication device 100"); see also id., 6:47-49 ("a serial port of a PDA 102 is connected to the primary serial port 106, so that the microcontroller 104 can communicate with the PDA 102 over the serial interface."). As can be seen in Figure 10 above, the serial interface 701 is the only point of connection between the PDA and the cradle. The POSITA would have known that serial interfaces were used in the computer industry as connections to external devices or to peripherals.

POPR, 43-45; EX-1007, Fig. 10; EX-2019, ¶48.

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A Serial Interface Sends Data One Bit at a Time

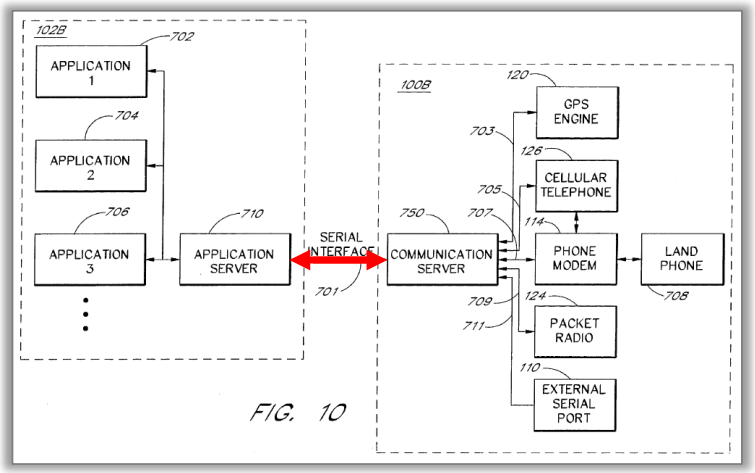
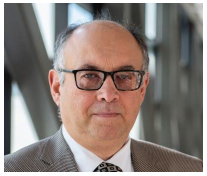


FIG. 10



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49. A serial interface is a communication interface which sends data serially, "one bit at a time." Ex. 2009 [LCD Resources] ("In serial interface ***the data is sent or received one bit at a time*** over a series of clock pulses."); Ex. 2010 [Techopedia] ("The serial interface acts as a communication interface between two digital systems that ***sends data as a series*** of voltage pulses over a wire."); Ex. 2011 [Dictionary of IEEE Standards Terms] 1029 (defining "serial interface" as "An interface that ***transmits data bit by bit*** rather than in whole bytes."). Consequently, the POSITA would understand that Bernard selects each input one-by-one at the communication server and sends the data one bit a time because the serial interface connector between the PDA and the cradle necessitates serial transmission.

POPR, 45; EX-1007, Fig. 10; EX-2019, ¶49.

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"Communication Server 750" Services Requests One at a Time

United States Patent [19] [11] **Patent Number:** 5,497,339
Bernard [45] **Date of Patent:** Mar. 5, 1996

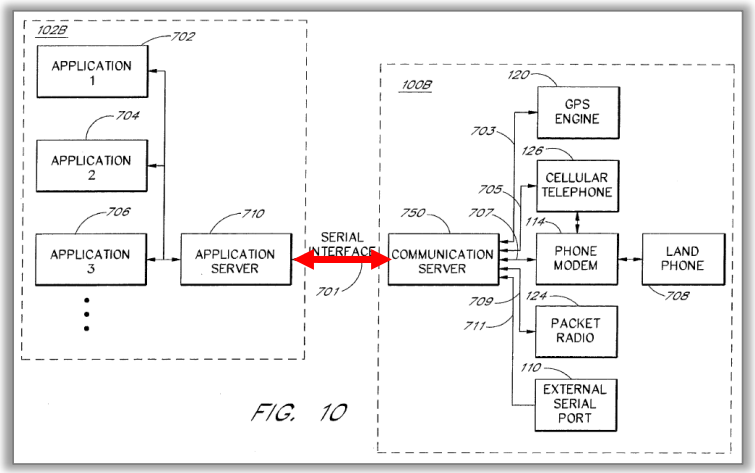

FIG. 10

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78. Nor does Petitioner show that communication server 750 interleaves two or more signals. Rather, as explained above, a request pending by a given application from a given network is serviced before servicing a different request for a different network. Thus, each request is serviced separately and before another request. There is no interleaving. *See, e.g.*, Ex. 2023 [IEEE-Dictionary] 577 ("To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity.").

POR, 18; EX-1007, Fig. 10; EX-2019, ¶78.

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Smart Mobile Technologies LLC, Exhibit 2038
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"Communication Server 750" Does Not Multiplex Under Patent Owner's District Court Construction

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

APPLE INC.

Defendant.

Case No. 6:21-cv-00603-ADA

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.,

Defendants.

Case No. 6:21-cv-00701-ADA

DEFENDANTS' OPENING CLAIM CONSTRUCTION BRIEF
REGARDING THE '434 PATENT FAMILY

N. "multiplex / multiplexes / multiplexed / multiplexing" ('653 (1, 2, 3, 4, 27), '083 (5, 8, 12, 19), '075 (1), '943 (2, 19), '946 (1, 2, 3, 4, 16, 27), and '291(7))

Defendants' Proposed Construction	SMT's Proposed Construction
Plain and ordinary meaning, which is "to interleave or simultaneously transmit two or more messages on a single communications channel." The preamble of claim 1 of the '075 patent is limiting.	To combine multiple signal streams or data streams into a single signal stream or data stream for transmission or further processing, or split a single signal stream or data stream into multiple signal streams or data streams for transmission or further processing.

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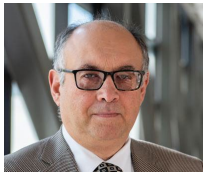
79. Nor would communication server 750 "multiplex" per my proposed district court construction. At no time are multiple streams from the different networks combined "into a single signal stream or data stream," as required by Patent Owner's district court construction.

POR, 18; EX-2019, ¶79; EX-2023, 577.

Bernard's "Alternative Interconnection" Does Not Multiplex

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.



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80. I also note that Petitioner cites to Bernard's discussion of Figure 14 to argue that "Bernard also presents an example of using two communication circuits simultaneously." Pet., 41 (citing Ex. 1003 [Jensen-Decl.] ¶ 136; Ex. 1007 [Bernard] 26:56-65). In my opinion, it does not. To be sure, the portion of

POR, 18-19; EX-1007, 26:56-65; EX-2019, ¶80.

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Smart Mobile Technologies LLC, Exhibit 2038
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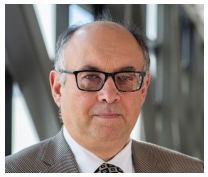
Bernard's "Alternative Interconnection" Would not Use a Serial Interface

United States Patent [19] | [11] **Patent Number:** **5,497,339**
Bernard | [45] **Date of Patent:** **Mar. 5, 1996**

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.

No testimony regarding:
- What Dr. Jensen thinks the "alternative interconnection" might be;
- Why or how it would necessarily multiplex signals; or
- Any reasonable expectation of success in doing so.



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81. Bernard, thus, makes clear that in Bernard's second embodiment, "only one" connection "can be established at a time" and that multiple simultaneous connections would need to occur via "an alternative interconnection." This does not indicate that signals are being transmitted "simultaneously" via a "single communications channel" (per Petitioner's district court construction). It indicates precisely the opposite. Specifically, even if Bernard could be modified to establish more than one network connection at a time, there is no evidence that it would still use a serial interface 701. Instead, Bernard teaches that such a modification would involve "an alternative interconnection," suggesting that the serial interface 701 between Bernard's cradle and phone would be changed to, *e.g.*, a parallel (rather than a serial) interface, which would allow each connection's signal to use its own channel, which would not even arguably multiplex under Petitioner's line of reasoning. Therefore, Petitioner has not shown why or how a POSITA would modify Bernard's second embodiment into yet another ill-defined embodiment, deploying an unspecified interface/connection, or why and how that alternative embodiment would multiplex.

POR, 19; Sur-Reply, 21; EX-1007, 26:56-65; EX-2019, ¶81.

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Table of Contents

Petitioner's Cradle (First) Scenario

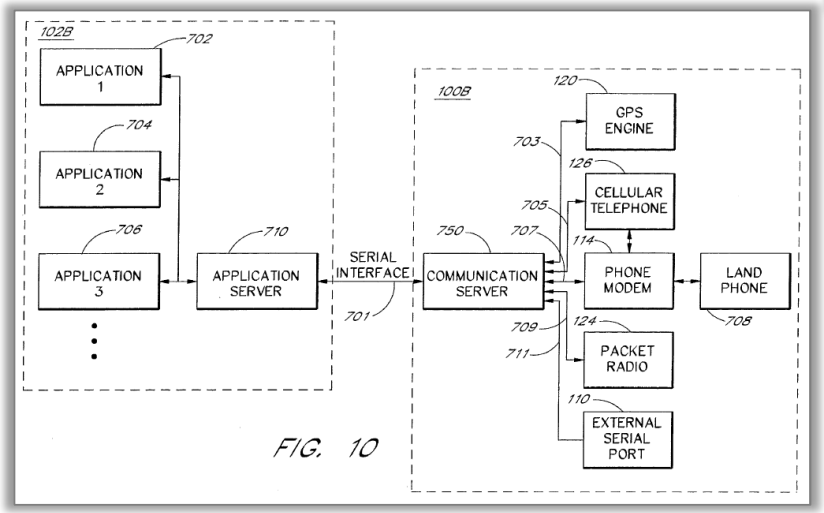

FIG. 10

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Combination of Yegoshin-Johnston-Billström and Bernard

A POSITA would have found it obvious to modify Yegoshin-Johnston-Billström's phone based on Bernard's teachings in at least two alternative ways. EX-1003, ¶136. In a first scenario, the phone in the combination would have been modified to be used with Bernard's cradle to provide multiple network connections. *Id.* Yegoshin actually suggests two alternative configurations to implement its dual-mode operation, and, in one of the alternatives, Yegoshin's phone uses the adapter port 13 for connecting a wireless network adapter to enable wireless connection to IP-LAN if the IP-LAN has "different protocols than the currently available cellular/PCS networks." *Id.*; EX-1004, 5:23-32. In this case, a POSITA would have understood or found obvious that Bernard's cradle is an example of the adapter that can be plugged into Yegoshin's phone because Bernard's cradle provides various wireless connections that are not available at the phone itself. EX-1003, ¶136; EX-1004, 5:4-8.

POR, 20-21; Pet., 39-40.

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What Would Bernard's Cradle Add to Yegoshin's Phone?

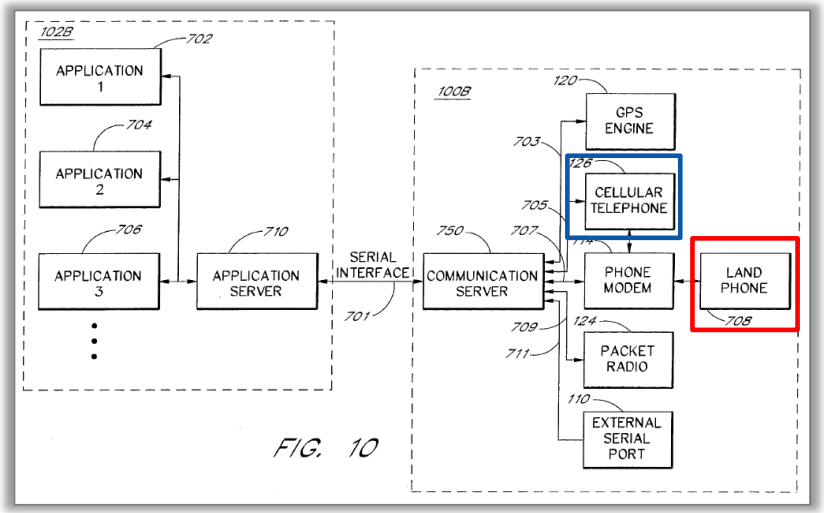

FIG. 10

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45. I do not agree that the POSITA would have been motivated to combine the references as proposed or that the resultant combination would meet the claims. Bernard's cradle includes a landline (boxed in red) and a cellular telephone (boxed in blue), as illustrated in Bernard's Figure 10 below:

Ex. 1007 [Bernard] Fig. 10 (annotated); 17:40-44 ("The communication device 100B comprises a communication server 750, the GPS engine 120, the cellular telephone 126, the phone modem 114, ***a land phone 708***, the packet radio 124, and the pass-thru or external serial port 110."); 25:29-30 ("The land phone 708 comprises the DAA 116 and the phone jack 118."). There is no explanation from Petitioner or Dr. Jensen of why the POSITA would be motivated to add both a cellular telephone and a land phone to Yegoshin's phone, which is already a cell phone.

POPR, 40-41; EX-1007, Fig. 10; EX-2019, ¶45.

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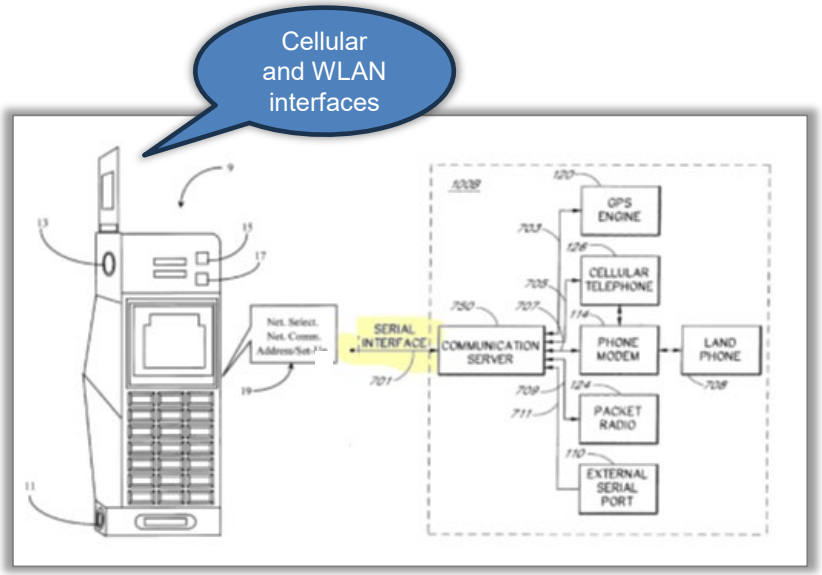
Why Would Yegoshin's Phone Use Cellular and WLAN Networks Through Bernard's Cradle?



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86. Yegoshin's own mobile device already includes cellular and WLAN interfaces. Ex. 1004 [Yegoshin] 4:63-5:3. Petitioner, in fact, relies on these interfaces for the disclosure of the claimed two transmit and receive components. Pet., 32 (limitation 1[e]). Petitioner does not explain why, even if a POSITA were to add Bernard's cradle with duplicate cellular and WLAN networks, the combined system would use the cellular and WLAN networks through the cradle interface. There does not appear to be any obvious reason to use a cellular and WLAN network through a cradle with a serial data bottleneck—permitting the transmission of only one bit at a time—that limits the number and speed of data packets that pass through it, and that likely causes increased battery power consumption.

POR, 21-22; EX-1004, Fig. 1; EX-1007, Fig. 10; EX-2019, ¶86.

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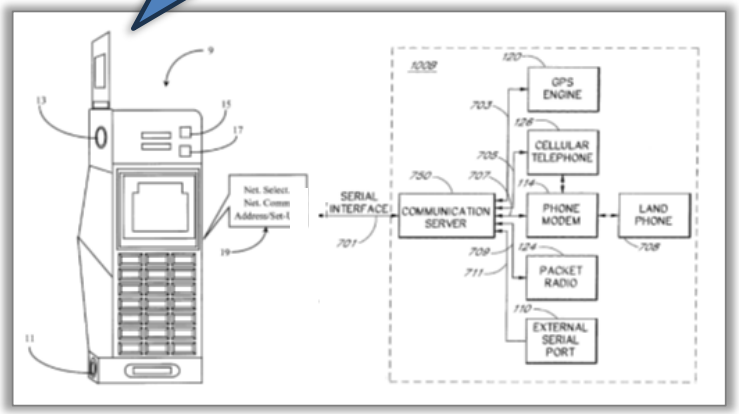
The Yegoshin-Cradle Combination Would Use Yegoshin's Internal Cellular and WLAN Connections

Cellular and WLAN signals generated and received within Yegoshin's phone



Yegoshin's Phone

Bernard's Cradle

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87. Therefore, even if Bernard's cradle were added to Yegoshin, the combined system would still use Yegoshin's internal cellular and WLAN networks. But in such a scenario, the two streams would not pass through the serial interface 701 connecting Yegoshin's phone to Bernard's cradle, because they are generated and received internally within Yegoshin's own phone. Therefore, even if Bernard's communication server 750 did multiplex signals, which it does not, it would not multiplex the cellular and WLAN signals that do not pass through it. But the Petition relied on the cellular and WLAN networks as the signals that are multiplexed. Therefore, the combination, even if made, fails to disclose the claims.

POR, 21-22; EX-1004, Fig. 1; EX-1007, Fig. 10; EX-2019, ¶87.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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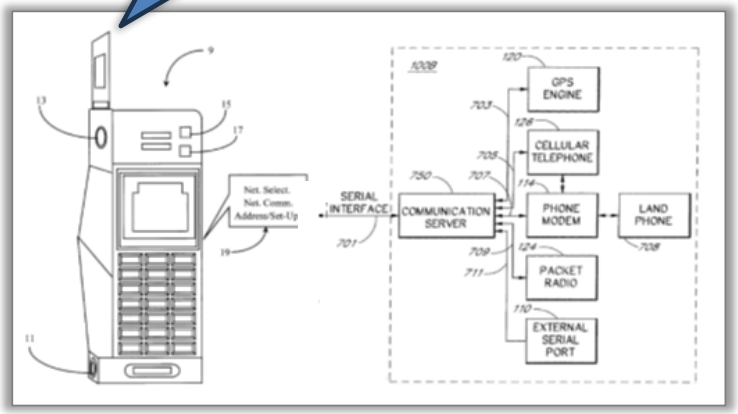
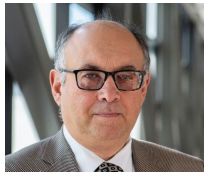
The Disadvantages Substantially Outweigh the Minimal Benefit of Combining Yegoshin's Phone with Bernard's Cradle

Cellular
and WLAN signals generated
and received within
Yegoshin's phone



Yegoshin's Phone

Bernard's Cradle



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88. Again, Yegoshin already has cellular and WLAN communication capabilities. Ex. 1004 [Yegoshin] 3:18-27. Thus, that Bernard allows a PDA to obtain cellular and WLAN capabilities is of no benefit to Yegoshin's phone. Moreover, if more were needed, Yegoshin already includes "a communication port 11 … for a user to plug-in to a wired IP network" in the event there is a need for a third network. *Id.*, 5:14-22. The only additional features that Bernard's cradle brings is a GPS, and the unusual case where Yegoshin needs to connect to a radio packet network that is different from the WLAN protocol already installed on it, and that could not otherwise be connected through Yegoshin's own communication port 11. Weighed against the cost, battery consumption, weight, size and other disadvantages of a cradle, the minimal additional benefit, if any, provided by Bernard's cradle is substantially outweighed in the context of Yegoshin's mobile phone. And, as discussed, even if a cradle could add, *e.g.*, GPS, that would not in any way demonstrate that the cellular and WLAN signals would be multiplexed.

POR, 22-23; EX-1004, Fig. 1; EX-1007, Fig. 10; EX-2019, ¶88.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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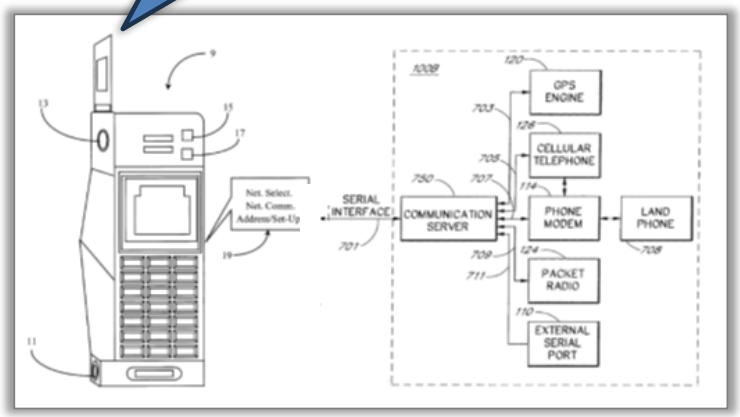
Dr. Jensen: "There'd Be Some Redundancy There"

Cellular
and WLAN signals generated
and received within
Yegoshin's phone



Yegoshin's Phone

Bernard's Cradle

REMOTE DEPOSITION OF MICHAEL JENSEN, PH.D.

PROVO, UTAH

THURSDAY, APRIL 13, 2023

Q. So in your combination of Yegoshin and Bernard, since Yegoshin already has a cellular network, do the cellular connections of Yegoshin and Bernard emerge into one or is there going to be two and then the system would use one or the other?

A. As -- as you are aware, I sort of proposed different combinations of Yegoshin and Bernard. If -- if -- if somebody combined them in a way that kept Bernard as a cradle with a cellular interface, that would probably -- there'd be some redundancy there. Whether or not that would be a good idea or not I'll leave to the product designers. There would be a redundancy there.

If it's all integrated as one, you would likely just combine Yegoshin's phone -- cellular phone and Bernard's into one device. And probably, if you're building a cradle, you would anticipate how would you use -- would you put a cellular functionality in one place if you had it in the other.

POR, 24; EX-1004, Fig. 1; EX-1007, Fig. 10; EX-2029, 72:2-21.

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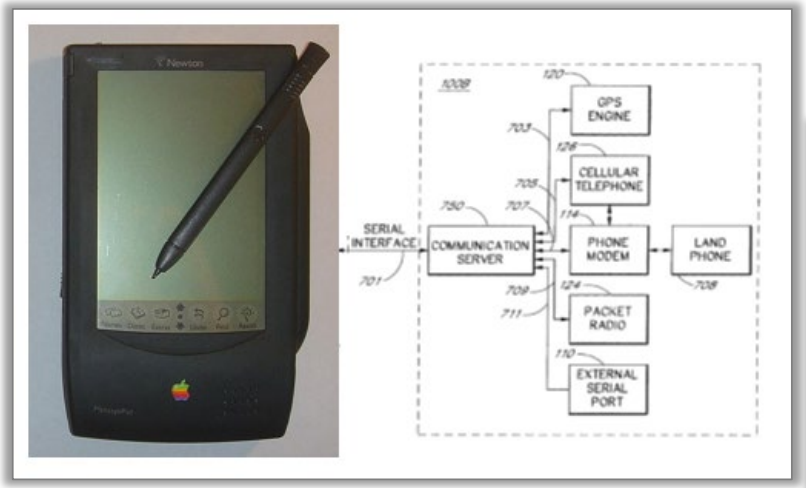
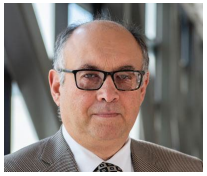
Bernard's Cradle Was Meant for PDAs, Not Phones Like Yegoshin's



Apple Newton

Bernard's Cradle



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89. That Bernard's cradle is not intended for a mobile device with already existing cellular and WLAN capabilities is further evident by the fact that Bernard states that its cradle is designed for use with PDAs which, at the time of Bernard in 1994, had limited communication capabilities. Ex. 1007 [Bernard] Fig. 10, 1:31-32 ("Examples of such PDAs include the Apple™ Newton™ and the Sharp™ Expert Pad™."); 2:65-3:4; Ex 2024 [PC-Magazine] ("Most [PDAs] included no form of built-in wireless communications functionality, though that changed around 2005."); Ex. 2025 [Ars-Technica] ("With the original [Apple] Newton, you could take notes, use the calculator, run some simple formulas, update and search contacts in an address book, and keep track of appointments in a calendar. And that was about it."). In the context of those types of devices, adding a cradle that brings in cellular and WLAN capabilities is a significant advantage. But that is not so in the context of Yegoshin's phone.

POR, 23-24; EX-1007, Fig. 10; EX-2019, ¶89.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Petitioner's New "PDA, Not Phone" Combination is Tardy and Unsupported

Reply:
Okay, use a PDA instead of Yegoshin's phone

However:

- The Petition's combination was Bernard's cradle with Yegoshin's **phone**, not some unidentified hypothetical "PDA."
- **No** testimony showing a motivation to use this unidentified PDA.
- **No** explanation supporting a reasonable likelihood of success.
- **No** support in the record.

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Combination of Yegoshin-Johnston-Billström and Bernard

A POSITA would have found it obvious to modify Yegoshin-Johnston-Billström's phone based on Bernard's teachings in at least two alternative ways. EX-1003, ¶136. In a first scenario, the phone in the combination would have been modified to be used with Bernard's cradle to provide multiple network connections. *Id.* Yegoshin actually suggests two alternative configurations to

Pet., 39; Sur-Reply, 24.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Petitioner's Integrated (Second) Scenario

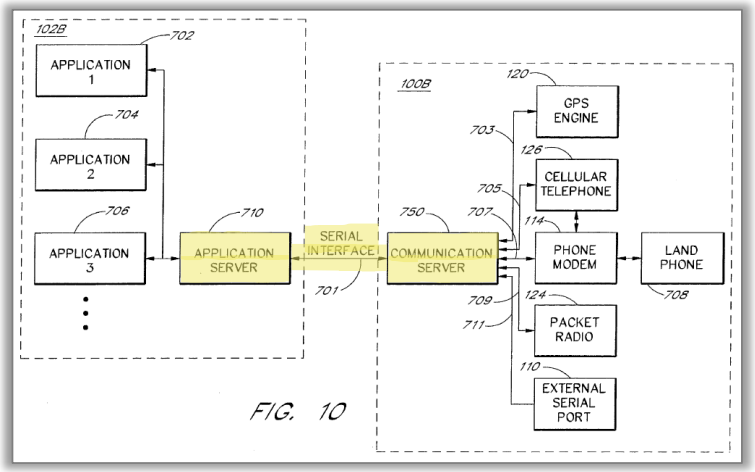

FIG. 10

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

In a second scenario, it would have been obvious to implement or modify the internal circuitry of Yegoshin-Johnston-Billström's phone to include the multiplexing features of Bernard, so that the phone integrally contains the functionality executed in Bernard's cradle. EX-1003, ¶137. In fact, Yegoshin

features. EX-1003, ¶138. Specifically, the phone in the combination would have included at least communication server 750 (including communication packet interface 752 and communication packet distributor 754), which is connected to multiple networks such as Yegoshin's cellular network and WLAN (similar to Bernard's cellular telephone and packet radio connections), and multiplexes, demultiplexes, and routes multiple data packets between one or more applications running at the phone and the respective multiple networks according to Bernard's teachings. EX-1003, ¶138. One benefit of Bernard's configuration (e.g., software

Additionally, in either of the scenarios, it would have been obvious to implement or modify Yegoshin's phone based on Bernard's teachings of the PDA that runs one or more applications and includes application server 710 connected to communication server 750 via a single interface (e.g., serial interface 701). EX-1003, ¶139.

POR, 25; Pet., 40-42; EX-1007, Fig. 10.

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Bernard's Serial Interface is a Bottleneck

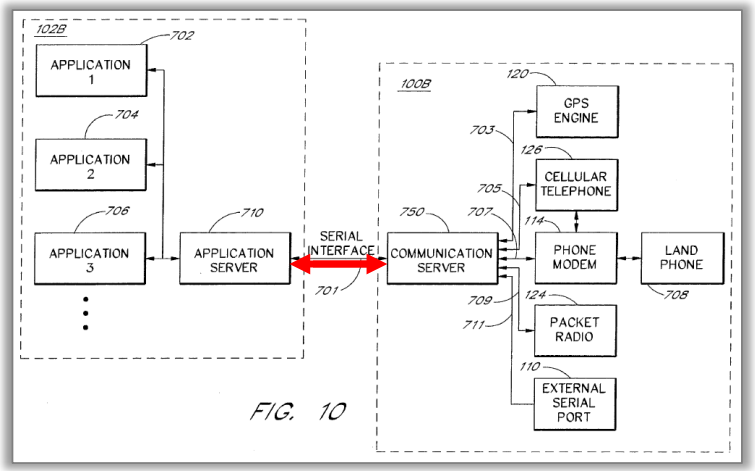

FIG. 10

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48. Bernard uses a serial interface (highlighted in red) between its PDA and cradle because it is the physical connection between the two devices, as illustrated in Figure 10 below:

Ex. 1007 [Bernard] Fig. 10 (annotated); 17:44-51 ("The application server 710 of the PDA 102B ***is coupled to*** the communication server 750 of the communication device 100B ***by a serial interface 701***. The serial interface 701 between the application server 710 and the communication server 750 corresponds to the serial interface between the PDA 102 and the primary serial port 106 of the first embodiment communication device 100"); see also id., 6:47-49 ("a serial port of a PDA 102 is connected to the primary serial port 106, so that the microcontroller 104 can communicate with the PDA 102 over the serial interface."). As can be seen in Figure 10 above, the serial interface 701 is the only point of connection between the PDA and the cradle. The POSITA would have known that serial interfaces were used in the computer industry as connections to external devices or to peripherals.

POR, 25-26; EX-1007, Fig. 10; EX-2019, ¶48.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Bernard's Serial Interface Sends Data One Bit at a Time

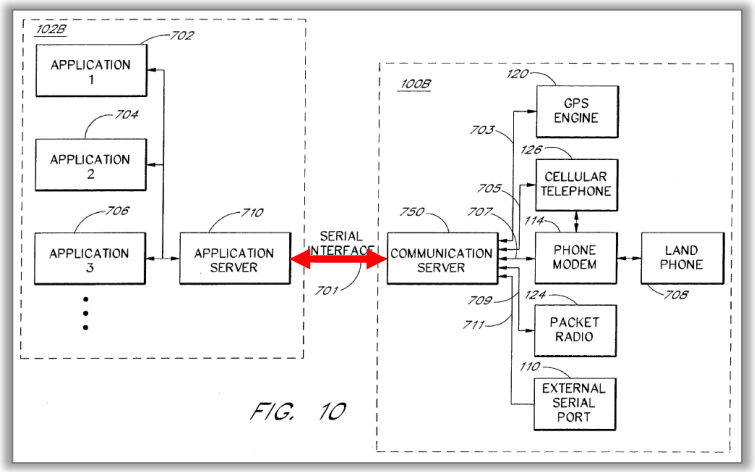
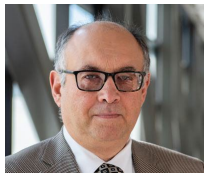


FIG. 10



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49. A serial interface is a communication interface which sends data serially, "one bit at a time." Ex. 2009 [LCD Resources] ("In serial interface *the data is sent or received one bit at a time* over a series of clock pulses."); Ex. 2010 [Techopedia] ("The serial interface acts as a communication interface between two digital systems that *sends data as a series* of voltage pulses over a wire."); Ex. 2011 [Dictionary of IEEE Standards Terms] 1029 (defining "serial interface" as "An interface that *transmits data bit by bit* rather than in whole bytes."). Consequently, the POSITA would understand that Bernard selects each input one-by-one at the communication server and sends the data one bit a time because the serial interface connector between the PDA and the cradle necessitates serial transmission.

POR, 27; EX-1007, Fig. 10; EX-2019, ¶49.

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A POSITA Would Recognize that Using Bernard's Serial Interface Would be Detrimental and Unnecessary

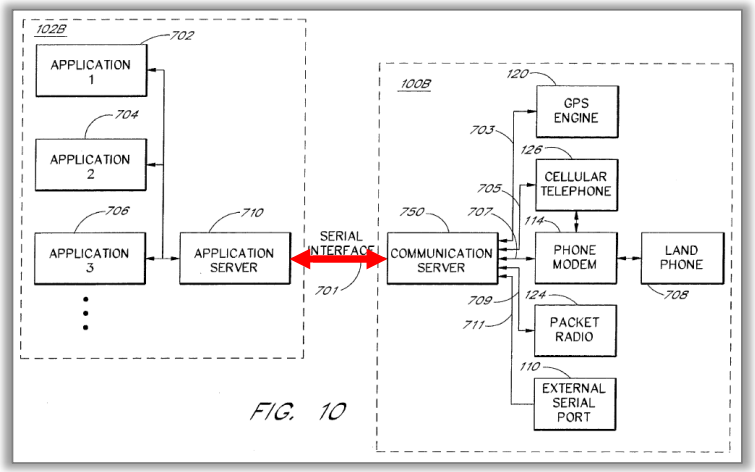
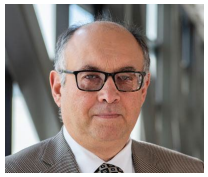


FIG. 10



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50. Even if Bernard's cradle were to be integrated in Yegoshin's phone, however, the POSITA would recognize that there would no longer be an external device or peripheral necessitating a serial interface. Rather, the POSITA would have recognized that other interfacing techniques, including, *inter alia*, Direct Memory Access (DMA), memory-mapped interface, shared memory interface, or even a parallel interface would be far more efficient, and a serial interface would be comparatively very disadvantageous. *See* Ex. 2012 [Valvano] (serial

transmission lines."). The POSITA would thus recognize that using a serial interface to transmit data between a communication server and application server that are within the same device would introduce an unnecessary and detrimental bottleneck in Yegoshin's phone.

POR, 27-28; EX-1007, Fig. 10; EX-2019, ¶50.

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A Serial Interface is "Very Disadvantageous" Compared to Other Interfacing Techniques

Chapter 11: Serial Interfacing
Embedded Systems - Shape The World
Jonathan Valvano and Ramesh Yerraballi

This chapter provides an introduction to serial interfacing, which means we send one bit at time. Serial communication is prevalent in both the computer industry in general and the embedded industry in specific. There are many serial protocols, but in this course we will show you one of the first and simplest protocols that transmit one bit at a time. We will show the theory and details of the universal asynchronous receiver/transmitter (UART) and then use it as an example for developing an I/O driver. We will use busy-wait to synchronize the software with the hardware.

DMA, or direct memory access, is an interfacing approach that transfers data directly to/from memory. With an input device, the hardware will request a DMA transfer when the input device has new data. Without the software's knowledge or permission the DMA controller will read data from the input device and save it in memory. With an output device, the hardware will request a DMA transfer when the output device is idle. The DMA controller will get data from memory, and then write it to the device. Sometimes we configure the hardware timer to request DMA transfers on a periodic basis. DMA can be used to implement a high-speed data acquisition system. DMA synchronization will be used in situations where high bandwidth and low latency are important. DMA will not be covered in this introductory class. For details on how to implement DMA on the LM4F120/TM4C123, see Embedded Systems: Real-Time Operating Systems for ARM Cortex-M Microcontrollers, ISBN: 978-1466468863.

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POR, 27-28; EX-2012; EX-2019, ¶50.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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A Serial Interface is "Very Disadvantageous" Compared to Other Interfacing Techniques

Input and output for microprocessors

STEVE GOLDBAND
State University of New York, Buffalo, New York 14226

In the hardware aspect of I/O, parallel interfaces are often the least costly, least complex electronically, and have adequate speed and flexibility for most applications. They are commonly found on plug-in modules such as analog/digital converters, real-time clocks, relay

require moderate speed.

Serial I/O methods are typically slower than parallel, and require somewhat more complex and expensive hardware. Their primary advantage is that they require

DMA interfaces are electronically complex. However, they are extremely fast and require no management from the CPU. They must be tailored to the specific

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used to implement a high-speed data acquisition system."); Ex 2013 [Goldband] 252-253 ("Serial I/O methods are typically slower than parallel, and require somewhat more complex and expensive hardware" while "parallel interfaces are often the least costly, least complex electronically, and have adequate speed and flexibility for most applications" and DMA interfaces "are extremely fast and require no management from the CPU."); Ex. 2010 [Techopedia] ("In contrast [to a

POR, 27-28; EX-2013; EX-2019, ¶50.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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A Serial Interface is "Very Disadvantageous" Compared to Other Interfacing Techniques

techopedia

A serial interface is a communication interface that transmits data as a single stream of bits, typically using a wire-plus-ground cable, a single wireless channel or a wire-pair.

The serial interface acts as a communication interface between two digital systems that sends data as a series of voltage pulses over a wire. In contrast, a parallel interface transmits multiple bits simultaneously using different wires.

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require no management from the CPU."); Ex. 2010 [Techopedia] ("In contrast [to a serial interface], a parallel interface transmits multiple bits simultaneously using different wires."); Ex. 2009 [LCD Resources] ("In serial interface the data is sent

POR, 27-28; EX-2010; EX-2019, ¶50.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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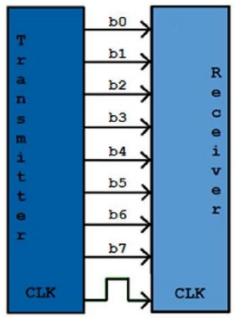
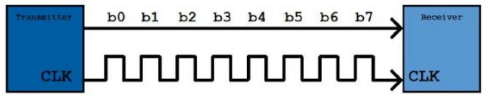
A Serial Interface is "Very Disadvantageous" Compared to Other Interfacing Techniques

LCD Resources

The main difference between the serial and parallel interfaces is how they transmit data. In serial interface the data is sent or received one bit at a time over a series of clock pulses. In parallel mode the interface sends and receives 4 bits, 8 bits, or 16 bits of data at a time over multiple transmission lines. These two interface modes will be explained in further detail below.



8-bit Parallel Interface



8-bit Serial Interface

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different wires."); Ex. 2009 [LCD Resources] ("In serial interface the data is sent or received one bit at a time over a series of clock pulses. In parallel mode the interface sends and receives ***4 bits, 8 bits, or 16 bits of data at a time*** over multiple transmission lines."). The POSITA would thus recognize that using a serial

POR, 27-28; EX-2009; EX-2019, ¶50.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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A Serial Interface is "Very Disadvantageous" Compared to Other Interfacing Techniques

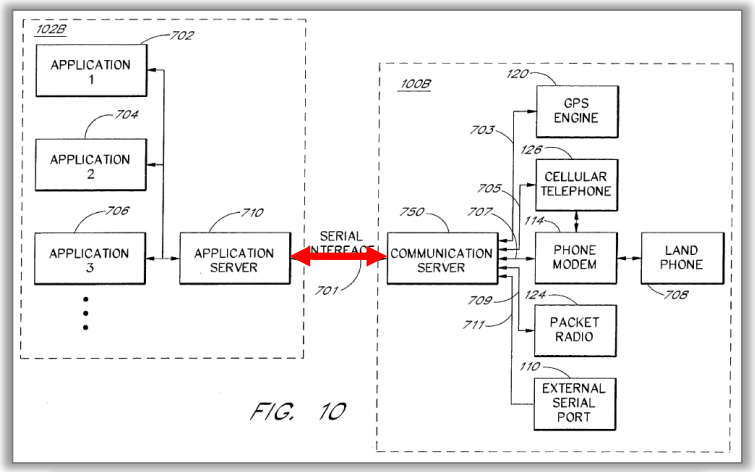
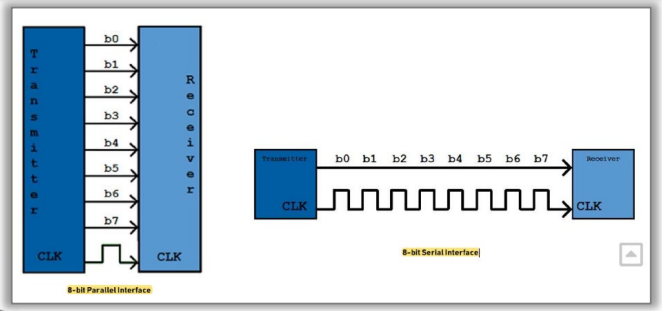
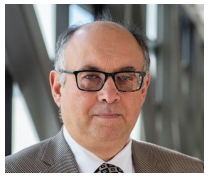


FIG. 10





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51. Consequently, the POSITA would not be motivated to integrate Bernard's serial interface within Yegoshin's phone, thereby eliminating the need for Bernard's communication server to serially transmit data over a serial interface. Rather, the POSITA would recognize that it would be far more efficient to use DMA, a memory-mapped interface or the like as described above.

POR, 28; EX-2009; EX-2019, ¶51.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Petitioner's "Advantages" Don't Result From the Serial Interface or "Multiplexing"

Purported "advantages:"

- Avoids the need for a separate cradle device and thus makes the device compact and easy to carry, improving the mobility of the device.
- Would achieve the benefits of Bernard's multi-network connectivity without requiring the mobile device to be connected to the cradle (same as above).
- The communication server 750 (including the packet interface 752 and packet distributor 754) provides an interface that masks from particular applications the complexity of communicating directly with the cellular and WLAN communication components.
- Connect to one or more different available network services.

None of these result from incorporating Bernard's serial interface into Yegoshin's phone, or from incorporating any purported "multiplexing" functionality into Yegoshin's phone.

Sur-Reply, 26; EX-1003, ¶¶137-38, 144.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Petitioner's "Advantages" Lack a Rational Connection to the Claimed Invention

Reversing the Board's decision holding all challenged claims unpatentable because the petitioner's expert declaration "'**fails to explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does***.'" *TQ Delta, LLC v. CISCO Systems, Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (citing *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (emphasis in original).

Reversing the examiner's rejection of claims in an application. **"[T]he Examiner cites a motivation to combine that is expressly tied to a teaching not used in the combination; thus the rejection lacks a rational underpinning to support the legal conclusion of obviousness**. '[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *Ex Parte Foster*, Appeal No. 2019-002355, 2020 WL 2731806, *2 (PTAB May 20, 2020) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Sur-Reply, 26.

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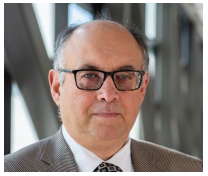
Claims 6 and 17 Require a Processor Configured to Combine the Data Paths Into a Single Transmission Interface to One or More Applications

6. The device of claim 1, wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.

17. A portable wireless communication device, comprising:

a memory;

wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the device is configured to combine the data paths into a single transmission interface to one or more applications on the device;



Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
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- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
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93. Claims 6 and 17 require that the two data paths be combined into a single transmission interface to one or more applications on the mobile device. Therefore, from a given application's perspective, it should receive a combination of the two data paths from a single interface.

POR, 9; EX-1001, cls. 6, 17; EX-2019, ¶93.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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The Specification Provides Examples

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

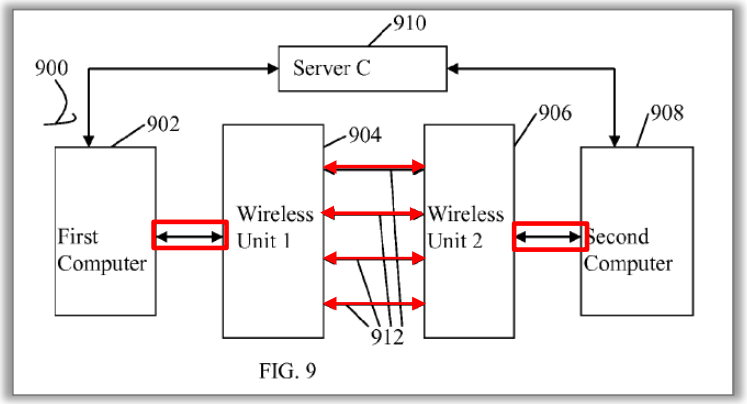

FIG. 9

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94. For example, the '946 explains that in an embodiment, "computer 902 and computer 908 need to exchange data streams at very fast rates." Ex. 1001 ['946] 6:65-67. To improve the data rate, "multiple channels 912 are provided." *Id.*, 7:1-2. The data are "partitioned" into multiple channels, with each channel transmitting a portion of the partitioned data. *Id.*, 7:16-20. Figure 9, relating to this embodiment, shows the partitioned signals being combined into a single interface (boxed) going into the computers 902 and 908:

POR, 29-30; EX-1001, Fig. 9; EX-2019, ¶94.

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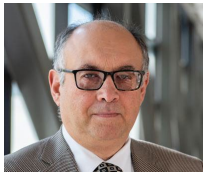
The Petition's Combinations Fail to Disclose Combining the Data Paths into a Single Transmission Interface

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Further, as described in 1[i], the phone in the combination multiplexes (***combines***) the signals received over cellular and WLAN into the single interface (e.g., serial interface) (***single transmission interface***) connected/integral to the phone, which routes the received signals to "appropriate ***applications***" running on the phone as taught in Bernard. EX-1003, ¶190; EX-1007, 17:33-19:2, 19:37-21:54, 23:60-25:25. Further, Bernard's multiplexing is performed by microcontroller 772 (***processor***). EX-1007, 17:33-22:4, 24:12-25:24; EX-1003, ¶190; *see* claim 10.



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96. I understand that the Petition argues that "as described in 1[i], the phone in the combination multiplexes (*combines*) the signals received over cellular and WLAN into the single interface (e.g., serial interface) (*single transmission interface*) . . . ." Pet., 58 (emphasis original). In my opinion, for at least the same reasons the Petition fails to demonstrate that its Grounds 1B and 1D combinations disclose or render obvious "multiplexed" "signals," the Petition also fails to demonstrate that its combinations disclose or render obvious "combin[ing] the data paths into a single transmission interface." *See* Section VI.A.

Pet., 58; POR, 30-31; EX-2019, ¶96.

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Yegoshin's Phone Does Not Combine the Cellular and WLAN Paths

(12) **United States Patent**
Yegoshin

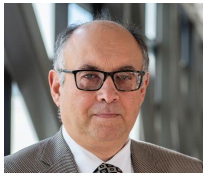
(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

A client software suite **19** enables a user to select a type of network for communication, to select a protocol for voice communication, and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network. Client software **19** may be provided by a plug-in smart card, or may be pre-loaded into a suitable built-in memory provided and adapted for the purpose. A series of selection buttons such as **15** and **17** allow a user to switch modes from cellular to IP communication, and perhaps to switch from differing types of networks using known protocols that are made available via client software **19**. One such protocol is the recently-

Ex. 1004, 5:33-44

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

Ex. 1004, 8:15-27



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97. Petitioner relies on Yegoshin's cellular network as the claimed "first network path," and on Yegoshin's WLAN network as the claimed "second network path." Pet., 56-57. Yegoshin, however, never combines its cellular and WLAN paths. Specifically, a given phone call in Yegoshin utilizes either cellular or WLAN, but never both. In Yegoshin, a "client software suite 19" enables a user to "select a protocol for voice communication," *i.e.*, whether to use cellular or WLAN. Ex. 1004 [Yegoshin] 5:33-35; *see also id.*, 5:40-41 ("A series of selection buttons such as 15 and 17 allow a user to switch modes from cellular to IP communication …"). When a call arrives at the cellular provider, the provider determines whether the user is within range of the local service area, in which case, the call would be routed to the user through the cellular network. *Id.*, 8:15-20. If the user is outside of the range of the local service area (*i.e.*, is roaming), the call would be routed to the user through the WLAN network. *Id.*, 8:20-27. Yegoshin explains that a user can specify certain calls to be routed through the cellular network even if the user is outside of the local network area. *Id.*, 8:47-56. In either case, a given call is serviced in its entirety either via the cellular or WLAN networks, but never both.

POR, 31-33; EX-1004, 5:33-44, 8:15-27; EX-2019, ¶97.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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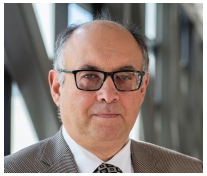
Yegoshin's Phone Does Not Combine the Cellular and WLAN Paths

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

In one embodiment of the present invention cell phone **9** is capable of taking some calls via cellular path while receiving other calls via IP path. In such a situation, integrating software is provided to coordinate activity between the two paths. For example, if engaged with an IP call, an incoming cell call would get a busy signal and so on, or it would be redirected to the IP call point, where it would then be presented as a call-waiting call, if that feature set is available and enabled. In a preferred embodiment, phone **9** may be switched from one network capability to another at the user's discretion.

Ex. 1004, 5:55-65



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98. In fact, Yegoshin expressly explains that it "coordinate[s] activity between the two paths" by rejecting one or the other of the two paths, which is the direct opposite of the claimed invention requiring "combining" the two paths:

Ex. 1004 [Yegoshin] 5:55-65. Thus, the data paths are never combined into a "single transmission interface" to one or more applications. They are always separate and distinct. This is shown schematically below. In the first annotated version of Yegoshin's Figure 2, for a first phone call, the cellular path is not selected, and the phone application only uses the WLAN path. In the second annotation, for a different call, the WLAN path is not selected, and the phone application only uses the cellular path. Thus, the two paths are never combined for any call, as Yegoshin also expressly explains (*id.*):

POR, 31-33; EX-1004, 5:55-56; EX-2019, ¶98.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Yegoshin's Phone Does Not Combine the Cellular and WLAN Paths

(12) **United States Patent**
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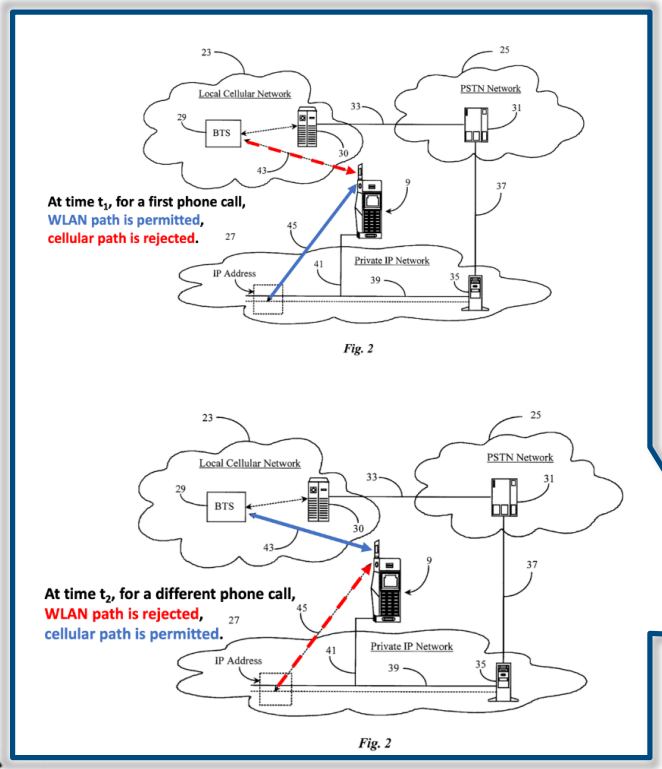
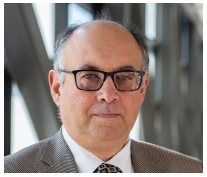
(45) **Date of Patent: *Mar. 23, 2004**





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Ex. 1004 [Yegoshin] 5:55-65. Thus, the data paths are never combined into a "single transmission interface" to one or more applications. They are always separate and distinct. This is shown schematically below. In the first annotated version of Yegoshin's Figure 2, for a first phone call, the cellular path is not selected, and the phone application only uses the WLAN path. In the second annotation, for a different call, the WLAN path is not selected, and the phone application only uses the cellular path. Thus, the two paths are never combined for any call, as Yegoshin also expressly explains (*id.*):

POR, 31-33; EX-1004, Fig. 2; EX-2019, ¶98.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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The Board Should Not Consider Petitioner's New "Virtual Path" Theory

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Further, as described in 1[i], the phone in the combination multiplexes (***combines***) the signals received over cellular and WLAN into the single interface (e.g., serial interface) (***single transmission interface***) connected/integral to the phone, which routes the received signals to "appropriate ***applications***" running on the phone as taught in Bernard. EX-1003, ¶190; EX-1007, 17:33-19:2, 19:37-21:54, 23:60-25:25. Further, Bernard's multiplexing is performed by microcontroller 772 (***processor***). EX-1007, 17:33-22:4, 24:12-25:24; EX-1003, ¶190; *see* claim 10.

What is "combined?" "The signals received over cellular and WLAN." **Not** abstract "data paths" that exist independent of the signals sent or received by the phone.

Pet., 58; Sur-Reply, 12.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Petitioner's New "Virtual Path" Theory is Meritless

6. The device of claim 1, wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.

17. A portable wireless communication device, comprising:

[illegible];

wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the device is configured to combine the data paths into a single transmission interface to one or more applications on the device;

How can "the processor" be configured to combine the data paths into a single transmission interface unless the data paths comprise actual data?

Sur-Reply, 12; EX-1001, cls. 6, 17.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 66 of 141

Dr. Jensen Conflates the "Single Transmission Interface" with "One or More Applications"

6. The device of claim 1, wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.

17. A portable wireless communication device, comprising:

wherein the first wireless transmit and receive unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the device is configured to combine the data paths into a single transmission interface to one or more applications on the device;

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q Okay. So you have mapped the claim single transmission interface to the phone app on Yegoshin's phone; is that correct?

A Yes, sir. That's -- that's -- at least as an example, that's one that I identified, yes, sir.

Q And you haven't identified any other examples as far as I could tell; correct?

A I -- no, I don't recall identifying another example.

The "single transmission interface" is a separate element from the "applications." The processor combines the data paths into a single transmission interface "**to**" the applications, so the applications receive the already combined data paths and cannot themselves be the "transmission interface." *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010). Dr. Jensen's mapping makes a hash of the claims

Sur-Reply, 12; EX-1001, cls. 6, 17; EX-2035, 64:9-17.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Neither of Yegoshin's Networks is a "Virtual Path"

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q Understood. And can you maybe provide a brief explanation -- and the reason I ask you these questions is you submitted an expert declaration. So I rely on what you explain to me so I can explain to the board this is what these terms mean. So can you provide a brief understanding of what a packet-switched network is and what that architecture entails?

A Well, I'm not prepared to give you a long explanation of packet-switched architectures. But in -- but in general, I can say this much: Packet-switched architectures look at each individual packet. And each individual packet can be routed through the network independently of the other packets that are routed through the network, even if they belong to the same message.

Packet-switched (WLAN) network: the "path" does not exist until the packets are sent.

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q And you also mentioned circuit-switched architecture; correct?

A Yes, sir.

Q Okay. Can you maybe provide a short explanation of what that entails?

A Again, in contrast to packet-switched, circuit-switched is an architecture where the network provides a dedicated path between the two ends of the link for the duration or at least some duration of the communication that is happening.

Circuit-switched (Yegoshin's cellular) network: the network provides a dedicated "path."

Sur-Reply, 12; EX-2035, 14:14-15:4, 15:12-21.

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Dr. Jensen's Effort to Defend His New "Virtual Path" Theory Ties Him In Knots

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q So if an application on a mobile phone is able to use either cellular or WLAN, but not simultaneously, are the data path for the cellular and WLAN necessarily combined into a single interface at the mobile phone?

A Yes, it's my opinion that if an application on that device can -- can use both of those networks sequentially or simultaneously, that we have that single interface.

Q So if I make a phone call today on the cellular network, and then I make another phone call next year on the WLAN network, what is the basis of your opinion that the data paths for these two phone calls are merged, are combined?

A Again, the data paths are the paths available for the data to take. That's their -- that's the plain meaning of a data path. So the fact that those two data paths come into a single point, which in your case is the application of the phone call, then those data paths are merged.

The phone uses only one network for the entire duration of a call. Dr. Jensen: "that is a form of combining."

Two separate calls one year apart. Dr. Jensen: "those data paths are merged."

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q So if -- so let me make sure that I understand your opinion. So it is your opinion that, for example, in Yegoshin's phone, if the processor determines to use the cellular connection for the entirety of the phone conversation, phone call, in your opinion, that is combining the cellular and the WLAN path?

A The fact that it can select between them, and even if it maintains one of those connections for an extended period, it still has the ability to combine those two paths. So yes, that is a form of combining the two data paths.

Q Okay. So you keep going back to the ability to combine. So I am not asking whether the processor has the ability to combine, even if it doesn't actually combine. That is really not my question. My question is if the fact of combining has happened. So let me ask the question again. Is it your opinion that in Yegoshin's phone, if the processor selects the cellular path for the entire duration of a phone call, has that processor actually combined the cellular and WLAN data paths?

A Yes.

Sur-Reply, 12; EX-2035, 35:23-36:6, 38:3-13, 45:9-46:6.

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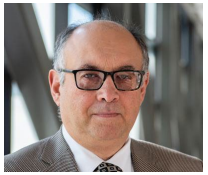
Bernard Does Not Combine Data Paths Into a Single Transmission Interface to One or More Applications



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99. Petitioner also points to Bernard's serial interface to supply the required "combining." But, in my opinion, Bernard does not disclose this limitation to begin with. Petitioner and Dr. Jensen rely on Bernard's routing mechanism, arguing that because in Bernard data packets from multiple networks all pass through the serial interface, and are then distributed to their respective applications, the "combining" limitation is allegedly met. Pet., 56 ("the phone multiplexes (combines) the signals received over cellular and WLAN into the single interface (e.g., the serial interface) (single transmission interface) connected/integral to the phone, which routes the received signals to 'appropriate *applications*' running on the phone as taught in Bernard."); *see also id.*, 37 ("Indeed, Bernard's teachings of routing data packets are consistent with well-known packet switched networking technology."). Packet routing, however, has nothing to do with the claimed invention.

100. The concept of combining two data paths into a single transmission interface to one or more applications is absent from Bernard, and Petitioner does not point to anything to the contrary. At a conceptual level, Bernard does not disclose the concept of combining two data paths such as cellular and Wi-Fi, nor does it disclose any use for such a combination, for example to increase the data rate by servicing a data request through two networks instead of one. *Contra* Ex. 1001 ['946] 6:64-7:10, Fig. 9. That in Bernard, because of connection to an external cradle, a serial connection happens to be used, and therefore, the data that is transmitted at different times all happen to pass through the same connection, albeit never at the same time, has no relevance to the claimed invention.

POR, 33-36; EX-2019, ¶¶99-100.

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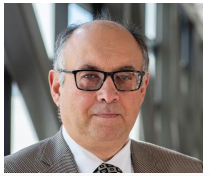
Bernard Does Not Combine Data Paths Into a Single Transmission Interface to One or More Applications

United States Patent [19] | [11] **Patent Number:** **5,497,339**
Bernard | [45] **Date of Patent:** **Mar. 5, 1996**

in a functional manner for the convenience of the user. For example, a user can select a function to dial a phone number from the telephone server **730**, and the telephone server **730** either causes the cellular telephone interface **720** to generate a data packet for the cellular telephone **126**, or it causes the land phone interface **724** to generate a data packet for the land telephone **708**, depending on which type of telephone has been previously selected for operation.

The telephone server **730** can be used to process incoming and outgoing phone calls using either the cellular telephone interface **720** or the land phone interface **724**, depending on which type of telephone interface has been previously selected. The telephone server **730** provides various func-

Similarly, the fax server **732** can be used to send and receive data using the phone modem interface **722** and either the cellular telephone interface **720** or the land phone interface **724**. The fax server **732** also provides functions



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101. But Bernard does not even incidentally disclose the claimed limitation. For example, as with Yegoshin, Bernard explains that a user can utilize the phone application with only one of the landline or cellular networks, "depending on which type of telephone has been previously selected for operation," thus never "combining" the two paths to an application:

Ex. 1007 [Bernard] 21:30-38; *see also id.*, 21:55-59 ("The telephone server 730 can be used to process incoming and outgoing phone calls using either the cellular telephone interface 720 or the land phone interface 724, depending on which type of telephone interface has been previously selected."); 21:61 ("allowing for the selection of a type of telephone interface"). Bernard explains that "[s]imilarly, the fax server 732 can be used to send and receive data using the phone modem interface 722 and ***either the cellular telephone interface 720 or the land phone interface 724.***" *Id.*, 22:5-14.

POR, 34-35; EX-1007, 21:30-38, 55-59, 22:5-8; EX-2019, ¶101.

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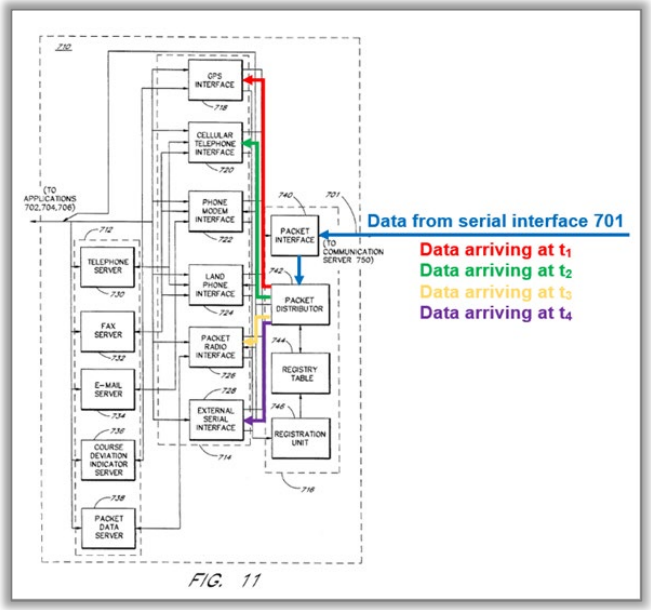
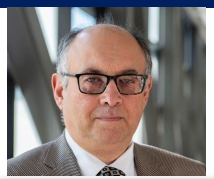
Bernard's Data Paths are Separated Upon Arrival at the Mobile Device

United States Patent [19] | [11] **Patent Number:** 5,497,339
Bernard | [45] **Date of Patent:** Mar. 5, 1996





Todor Cooklev, PhD.

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  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

102. Even if Petitioner were to argue that Bernard combines data paths in the serial interface 701, it still fails. Even if Bernard's servicing of one application at a time, through one network at a time, were "combining" the data paths as claimed because the data being transmitted at different times happen to pass through a single serial connection, the different data paths are separated upon arrival at the mobile device, and thus Bernard does not "combine the data paths into a single interface to one or more applications." Specifically, Bernard explains that when the cradle transmits signals through the serial interface 701 to a PDA, the packets are received at the PDA by the application packet interface 740. Ex. cellular, land phone, packet radio or from an external connection, the packet distributor causes the packets to be distributed for processing to each packet type's respective interface, 718, 720, 722, 724, 726, and 714. *Id.*, 28:35-29:6; Fig. 15C. The processed packet is then transmitted to the application that has a request pending for that packet type. *Id.*, 29:7-10. Thus, as shown in Bernard's annotated Fig. 11, even if different data paths were "combined" by virtue of having to be transmitted through the serial interface 701 at different times, they are separated again before they are sent to any application:

POR, 35-36; EX-1007, Fig. 11; EX-2019, ¶102.

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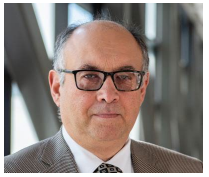
Bernard Teaches that Only One Connection May Be Established at a Time

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.



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104. I note that Petitioner also argues that "Bernard also presents an example of using two communication circuits simultaneously," relying on Ex. 1007 [Bernard] 26:56-65. Pet., 42. First, that section of Bernard expressly states that "[i]n this embodiment, only one of the four above described connections can be established at a time." Ex. 1007 [Bernard] 26:56-58. Thus, in the second embodiment of Bernard relied upon by the Petition, Bernard is clear that two connections cannot be established—let alone being combined into a single interface to one or more applications. Significantly, I do not see a proposal from Petitioner or Dr. Jensen to modify Bernard's system, nor do they argue any motivation to do so.

POR, 37; EX-1007, 26:56-65; EX-2019, ¶104.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
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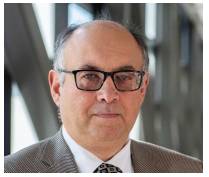
Bernard's "Alternative Embodiment" Does Not Combine Data Paths into a Single Interface to an Application

United States Patent [19] [11] **Patent Number:** **5,497,339**
Bernard [45] **Date of Patent:** **Mar. 5, 1996**

In this second embodiment, only one of the four above-described connections can be established at a time. However, a person of skill in the art will understand that an alternative interconnection could be used that would allow multiple connections to be established simultaneously. For example, an alternative embodiment can allow data to be transferred over a cellular system using the phone modem **114** and the cellular telephone **126**, while a user talks over a land-based telephone line using an attached microphone and earphone and the land phone **708**.



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105. Even if Bernard were modified to permit establishing two simultaneous connections, that would still not disclose the "combining" limitation. Such a modification would not change Bernard's principle of operation, discussed above, that each application is still serviced through a single data path. *See, e.g.*, Ex. 1007 [Bernard] 21:30-38; 21:55-63; 22:5-14. Thus, even in the example of a modification to Bernard Petitioner relies upon, the user would use only the landline to talk, and the cellular would separately transmit data packets to a different application, *e.g.*, for a fax or email receipt. *Id.*, 26:60-65. Thus, two data paths are not combined into a single interface to an application.

POR, 37; EX-1007, 26:56-65; EX-2019, ¶105.

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Smart Mobile Technologies LLC, Exhibit 2038
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Petitioner Fails to Provide a Reason to Modify Yegoshin to Combine Cellular and WLAN Data Paths

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

Typically, such individuals would carry cellular telephones or equivalent devices for communication with, for example, callers from a home office, or other business calls. Depending on where such an individual lives or works, he or she may be required to extend the mobile communication range of a cellular device. This is termed roaming in the art. If the organization is significantly large or distributed over a large geographic region, he may have to roam over more than one service area. The cost of communication on a cellular phone increases has he roams further from a primary service area.

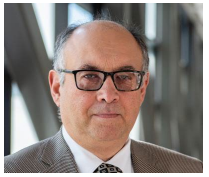
Ex. 1004, 2:55-65

What is clearly needed is a method and apparatus that would allow a visitor to an IP LAN-connected site to plug in or otherwise connect his or her mobile telephone device to the local IP LAN, so that calls coming from any source network may be routed to the user's device on the LAN.

Ex. 1004, 3:11-15

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

Ex. 1004, 8:15-27



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107. Yegoshin sets out a well-defined problem to solve, and a well-defined principle of operation as the solution. It sets out to address the problem of roaming charges when an organization has many users that travel outside of their home cellular network. Ex. 1004 [Yegoshin] 2:55-65, 6:15-22. As the solution, the mobile user may select, in advance, a WLAN network as a substitute for the cellular network, and designate calls to be routed to the mobile device through the WLAN network instead of the cellular network. Id., 5:33-41, 8:15-56. A telephone call uses one or the other, but never both.

108. Therefore, even if the concept of "combining" two data paths "into a single transmission interface to one or more applications" were known in the art in the abstract in another context for a different system, Petitioner has not explained why or how to implement that in Yegoshin, particularly as Yegoshin's principle of operation does not work in this fashion.

POR, 37-38; EX-1004, 2:55-65, 3:11-15, 8:15-27; EX-2019, ¶¶107-108.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Table of Contents

Multiple IP Addresses or Interfaces

1. An Internet-enabled mobile communication device comprising:

wherein a first interface for transmission is created and wherein said first interface for transmission uses a plurality of interfaces for Internet Protocol communication on the mobile device which utilize the plurality of wireless transmit and receive units on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive units; and

14. An Internet-enabled mobile communication device comprising:

wherein the mobile device maintains multiple IP addresses, wherein the first wireless unit is accessible on a first IP address and the second wireless transmit and receive unit is accessible on a second IP address and wherein the mobile device operates using a plurality of ports;

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Additionally, Yegoshin's phone uses IP for cellular communication because it is capable of "taking all cellular calls in IP format." EX-1004, 8:47-56. Therefore, it would have been obvious to assign another IP address to Yegoshin's phone for cellular connection. EX-1003, ¶82. Indeed, IP was a well-known technique to communicate data with a cellular telephone, as confirmed by Billström. *Id.*

A POSITA would have been motivated to modify Yegoshin's cellular phone based on Billström's teachings to operate using IP and "provid[e] packet data communication services" in the cellular system. EX-1006, 1:6-12; EX-1003, ¶83.

15. Therefore, it would have been predictable and obvious to modify Yegoshin's phone to maintain another IP address for access to the cellular network, as taught by Billström, so that Yegoshin's "first communication interface" for cellular (***first wireless transmit and receive unit***) is accessible on that IP address (***first IP address***). EX-1003, ¶84; EX-1030; EX-1031; EX-1032; EX-1033.

Pet., 18-19; EX-1001, cls. 1, 14.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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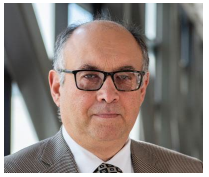
Yegoshin and Billström's Phones Have Only One IP Address

(12) **United States Patent**
Yegoshin

(10) **Patent No.:** **US 6,711,146 B2**
(45) **Date of Patent:** ***Mar. 23, 2004**

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

An appropriate signal-conversion bridge is used to convert signal as previously described. Such conversion may be performed in IP switch **35** or a trunk-connected bridge. The converted digital call is then routed over the LAN to DN **2**, which in this case is the assigned IP address of cell phone **9**. LAN communication may be wireless or wired as previously described.



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113. Yegoshin and Billström each teach a device with only a single IP address. Because each reference only has a device with a single IP address, each reference only teaches how to route using one IP address, not two. I do not see any recognition from Petitioner or Dr. Jensen of this disconnect, much less any explanation of how a POSITA could resolve it such that Yegoshin's phone decides and enforces which IP address to use to route each data packet.

United States Patent [19]
Billström et al.

[11] **Patent Number:** **5,590,133**
[45] **Date of Patent:** **Dec. 31, 1996**

formed between MT and MSC. An MS is identified, on layer **3** with an IP address, and on layer **2** with standard GSM identities, International Mobile Subscriber Identity (IMSI) or, normally, Temporary Mobile Subscriber Identity (TMSI).

POR, 39; EX-1004, 8:15-34; EX-1006, 8:18-21; EX-2019, ¶113.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Yegoshin's Phone Does Not Select Between Multiple IP Addresses

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

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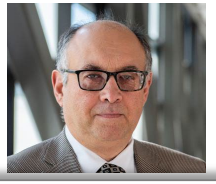
Ex. 1004, 8:15-34

The example described above of an instance of a cellular call **55** placed to cell phone **9** assumes that the user is taking all cellular calls in IP format while logged-on to IP network **27**. All such calls would then be routed via PSTN **25** to IP network **27**. However, it may be that certain cellular calls will be exempt from IP delivery at the user's discretion. In this case, callers from known origination numbers will be routed to local cell network **23**, local to the visited IP network, and therefore may be received by the user of telephone **9** in normal cell-phone mode.

Ex. 1004, 8:47-56



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114. Yegoshin does not need to select between a first IP address or a second IP address. Yegoshin teaches that calls can be routed via cellular or LAN on a call-by-call basis rather than a packet-by-packet basis because the user has specified the proper route for specific phone numbers in advance. Ex. 1004 [Yegoshin] 8:51-56 ("it may be that certain cellular calls will be exempt from IP delivery at the user's discretion. In this case, callers from known origination numbers will be routed to local cell network 23, local to the visited IP network, and therefore may be received by the user of telephone 9 in normal cell-phone mode."). When a phone call is routed through IP, there is only a single IP address, and therefore all packets for the phone call are transmitted using that IP address. *Id.*, 8:16-26 ("Call 55 is then routed on through to IP switch 35 (via local switch 31) in network 27 via trunk 37 from switch 31 ***based on the IP address***."); 8:30-32 ("The converted digital call is then routed over the LAN to DN 2, which in this case is ***the assigned IP address of cell phone 9***.").

POR, 39-40; EX-1004, 8:15-34; 47-56; EX-2019, ¶114.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Petitioner's Yegoshin-Billström Phone Cannot Determine Which IP Address to Use Based on Telephone Number

United States Patent [19] [11] **Patent Number:** **5,590,133**
Billström et al. [45] **Date of Patent:** **Dec. 31, 1996**

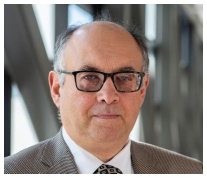
Providing the packet data services on a cellular system platform offers potential advantages in terms of widespread availability, possibility of combined voice/data services, and comparatively low additional investments by capitalizing on the cellular infrastructure. Of particular interest are current 1:54-58

Two different embodiments of the invention are described, both applied to a digital TDMA cellular system with a GSM type of architecture. Although this type of 6:11-13

The packet data services subscribed to are available to an MS after a procedure that brings the MS from an initial GSM idle mode to a new "PD mode". This procedure may be 8:47-49

is allocated or is allocatable on user demand. The signalling sequence (1)–(13) in the figure is based on standard GSM signalling and authentication procedures used for setting up regular GSM voice/circuit data calls. A new type of service request (signal (3)) is used to request PD mode establishment. The optional sequence (8)–(13) is employed to allo- 9:38-43

A PD mode establishment procedure may also be initiated when a PD router in an MSC, currently serving an MS in idle mode, receives a packet addressed to the MS. The PD router 10:62-64



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115. In the combined Yegoshin-Billström system, however, the system cannot merely determine which IP address to use for any given data packet based on the telephone number. This is because, as I explain below, in Billström, the IP address is not linked to the user's telephone number, which only receives phone calls through the GSM cellular network. Billström adds a data packet layer to the existing, otherwise non-packet-data cellular networks such as a GSM cellular system. Ex. 1006 [Billström] 6:11-13; 9:41 ("regular GSM voice/circuit data calls"). Its goal is to add data services to a voice system. *Id.*, 1:54-58 ("[p]roviding the packet data services on a cellular system platform" and "possibility of combined voice/data services."). Thus, Billström's system defines two separate modes, a GSM mode and a packet data mode. *Id.*, 8:47-49. Billström does not associate packet addresses with the device's phone number, but, instead, each packet designates the IP address of the recipient device. *Id.*, 10:62-64. When a call is received by the device, the packet data mode is kept "pending" during the call. *Id.*, 14:26-31.

POR, 40-41; EX-1006, 1:54-58, 6:11-13, 8:47-49, 9:38-43, 10:62-64; EX-2019, ¶115.

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Petitioner's Yegoshin-Billström Phone Cannot Determine Which IP Address to Use Based on Telephone Number

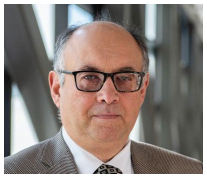
United States Patent [19] [11] **Patent Number: 5,590,133**
Billström et al. [45] **Date of Patent: Dec. 31, 1996**

14

For a combined MS, supporting both packet data and ordinary GSM services (but not simultaneously), a number of mixed traffic situations are possible. An MS in PD mode may make or receive a regular GSM (voice/circuit data/ point-to-point short message) call with the PD mode maintained as "pending" during the call and returned to "active" when the call is completed. To make a call, the MS, if it was using "PDCH procedures", first changes to "GSM procedures" (transition (3) in FIG. 4). When using "GSM procedures", the MS initiates a call in a regular GSM manner and, when the call is set up, changes to call-connected mode (transition (6)). Via the circuit mode MSC (FIG. 1), the PD mode is marked as "pending" in VLR and in the data base portion of the PD controller (FIG. 1). When the call is completed, the MS returns to "active" PD mode (transition (7) in FIG. 4) and is marked accordingly in VLR and the PD controller.

If an ordinary GSM call to an MS in PD mode is received by a circuit mode MSC, the circuit mode MSC, after finding from VLR that the MS is in PD mode, requests the PD controller to initiate paging of the MS. If the PD controller has information on the procedures used by the MS, paging is initiated accordingly using either MPDCH, for which special paging types are provided to convey GSM calls, or ordinary GSM paging channel (via the circuit mode MSC). Should such information not be available in the PD controller, paging may involve both types of channels in different cells. If the MS indicates "accept" in its paging response, the call, after the MS having changed to "GSM procedures" as required, is set up and PD mode is kept "pending" during the call in a similar way as discribed above for a mobile initiated call.

14:1-30



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POR, 40-41; EX-1006, 14:1-30; EX-2019, ¶115.

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Multiple IP Addresses or Interfaces

(12) **United States Patent**
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(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

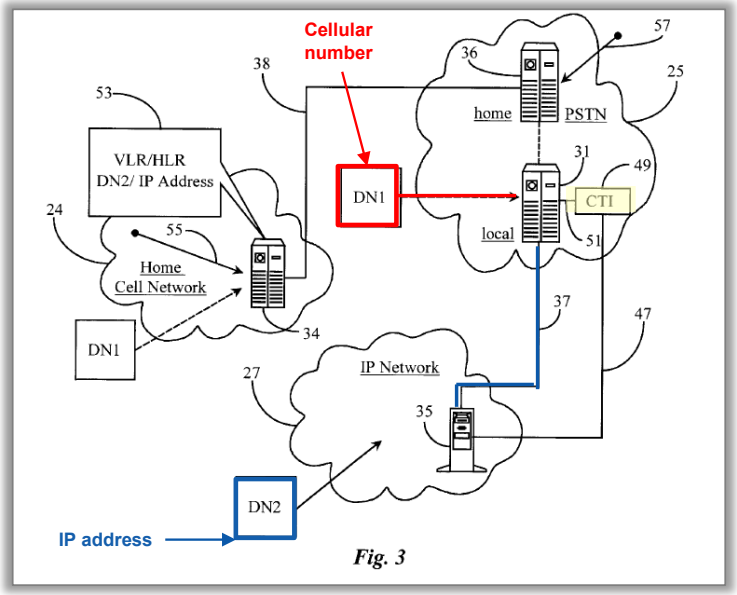
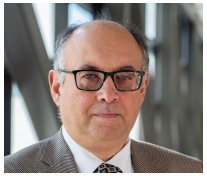


Fig. 3



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117. In contrast, in Yegoshin, "CTI processor 49" is added to the standard switch and provides "intelligent routing capability." Ex. 1004 [Yegoshin] 7:26-30; 9:1-13. When a call addressed at a user's phone number arrives, CTI processor 49 determines, based on the user's selection for that phone number, whether to route the call through the user's home cellular (roaming) system or through the WLAN system. *Id.*, 6:5-9:12. Such a corresponding structure is not provided, or even envisioned, in Billström's fundamentally different architecture, which uses the GSM cellular system for telephone calls, and the add-on data capability for data transfers, such as emails.

POR, 41; EX-1004, Fig. 3; EX-2019, ¶117.

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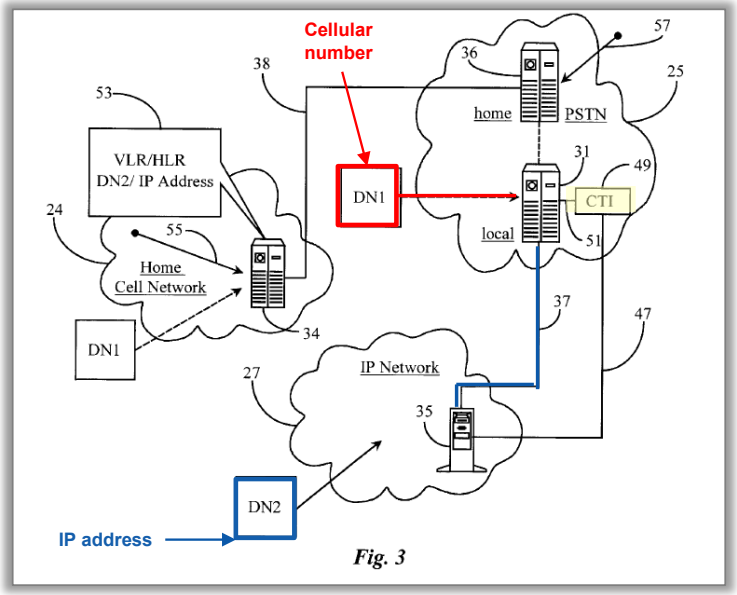
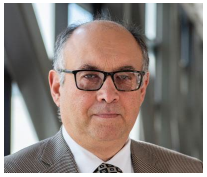


Fig. 3



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  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

118. Thus, the system in Petitioner's proposed combination needs to decide, for data packets, which IP address should be used to transmit each and every data packet. I do not see any suggestion in Yegoshin of how its device would choose between a first IP address and a second IP address when determining how to route a data packet. Nor is any such suggestion in any other reference in Petitioner's combinations. Moreover, I do not see any suggestion from Petitioner or Dr. Jensen of how a POSITA would modify Yegoshin or its Yegoshin-Billström combination to do so.

POR, 41; EX-1004, Fig. 3; EX-2019, ¶118.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Petitioner Fails to Explain How its Yegoshin-Billström Combination Would Work

Petitioner failed "to explain sufficiently how a POSA would have implemented Hieda's source/drain contact areas in Inaba's device," **where compatibility of references was neither "self-evident" nor explained.** *Samsung Elecs. Co. Ltd. v. KAIST IP US LLC*, IPR2017-01046, Papers 12 at 18-20 (Oct. 2, 2017) and 14 at 7 (Jan. 22, 2018).

"[T]he evidence supports that it would have been no[t] simple or well-understood or obvious matter to make the combination" where, *inter alia*, "**Petitioner never satisfactorily explains just how the combination would work** . . . ." *Alcon Inc. v. AMO Dev., LLC*, IPR2021-00853, Paper 48, 50-56 (Dec. 2, 2022).

POR, 42.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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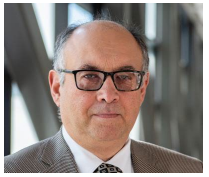
Third, a POSITA would have been prompted to apply Billström's technology because it "provide[s] a 'separated' system concept that provides the new packet data services with minimum impact on the current TDMA cellular infrastructure, by primarily utilizing the base station portion of the cellular system and for the remaining network parts relying on a separate mobile packet data infrastructure." EX-1006, 4:5-4:20; EX-1003, ¶89.

A POSITA would have understood how to implement Billström's cellular network employing IP with a reasonable expectation of success because significant overlap exists across the teachings of Yegoshin-Johnston and Billström in the same technical field of cellular communication technology. EX-1003, ¶91. The modification would require only routine knowledge of wireless technologies, which were well within the POSITA's skill. *Id.* The telephone would have been easily modified to implement Billström's techniques because such modification would only change the cellular part of the system to enable the combined system for IP-based cellular communication, while only routine modifications would be required for the telephone to implement Billström's techniques. *Id.*



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119. In my opinion, a POSITA as defined by Petitioner and Dr. Jensen would also not have been able to combine Yegoshin and Billström with a reasonable expectation of success because the unspecified modifications required to implement Billström's IP address on a traditional cellular network (as Petitioner's combination requires) would be beyond their skills.

Pet., 20-22; POR, 42-43; EX-2019, ¶119.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Dr. Jensen: It Would Take "A Fairly Extraordinary Person" To Implement Billström's System

DECLARATION OF DR. MICHAEL ALLEN JENSEN

27. Based on my knowledge and experience in the field and my review of the '946 patent and its file history, I believe that a person of ordinary skill in the art at the time of alleged invention ("POSITA") would have had a Bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience related to the design or development of wireless communication systems, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

28. Based on my experiences, I have a good understanding of the capabilities of one of ordinary skill. Indeed, I have taught and worked closely with many such persons over the course of my career. Based on my knowledge, skill, and experience, I have an understanding of the capabilities of one of ordinary skill. For example, from teaching and supervising my students, I have an understanding of the knowledge that a person with this academic experience possesses. Furthermore, I possess those capabilities myself.

REMOTE DEPOSITION OF MICHAEL JENSEN, PH.D.
PROVO, UTAH
THURSDAY, APRIL 13, 2023

Q. So let me ask the question more precisely. Do you believe an average person with a bachelor degree in electrical engineering, computer engineering, computer science or related field, and only two years of experience related to the design and development of wireless communication systems, would be able to modify an existing GSM type architecture system with the necessary additional hardware and software to implement Billstrom's first embodiment?

A. I believe that -- so to be -- to be fair, I believe it would take a fairly extraordinary person to have enough knowledge to single-handedly do that in that education and time horizon. A little more experience might be necessary in order to implement this.

POR, 43; EX-1003, ¶¶27-28; EX-2029, 102:12-103:2.

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Petitioner's Yegoshin-Billström Combination Requires Billström's "Apparatus"

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Third, a POSITA would have been prompted to apply Billström's technology because it "provide[s] a 'separated' system concept that provides the new packet data services with minimum impact on the current TDMA cellular infrastructure, by primarily utilizing the base station portion of the cellular system and for the remaining network parts relying on a separate mobile packet data infrastructure." EX-1006, 4:5-4:20; EX-1003, ¶89.

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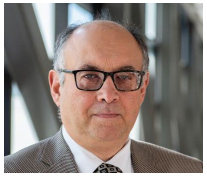

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123. Petitioner's proposed combination involves "implement[ing] Billström's cellular network employing IP." Pet., 20-21. Although Petitioner alleges that the modifications to Yegoshin's phone would have been within a POSITA's skillset, *id.*, 20-22, these are not the only modifications that would have to be made to Yegoshin's system. Petitioner's argument that only the phone would need modification seems to be premised on Billström's alleged teaching of "mobile stations (e.g., cellular phones) [that] are designed 'for providing packet data communications services in current TDMA cellular systems." Pet., 18 (citing Ex. 1006 [Billström] 1:6-12. Petitioner, however, critically omits the first portion of the cited sentence which states: "the present invention is directed towards ***apparatuses and*** mobile stations for providing packet data communications services in current TDMA cellular systems." Billström makes clear that its invention requires not only modification of the mobile stations, but also requires modification of the TDMA cellular system with an "apparatus."

POR, 44-45; Pet., 20-22; EX-2019, ¶123.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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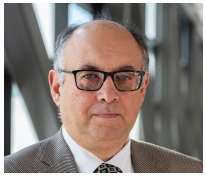
Petitioner's Yegoshin-Billström Combination Requires Billström's "Apparatus"

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

A POSITA would have been motivated to modify Yegoshin's cellular phone based on Billström's teachings to operate using IP and "provid[e] packet data communication services" in the cellular system. EX-1006, 1:6-12; EX-1003, ¶83.



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United States Patent [19] [11] **Patent Number: 5,590,133**
Billström et al. [45] **Date of Patent: Dec. 31, 1996**

This invention relates to digital TDMA (Time Division Multiple Access) cellular radio mobile telecommunications systems. More specifically, the present invention is directed towards apparatuses and mobile stations for providing packet data communications services in current TDMA cellular systems.

1:6-12

Pet., 18; POR, 44-45; EX-1006, 1:7-12; EX-2019, ¶123.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Petitioner's Yegoshin-Billström Combination Requires Billström's "Apparatus"

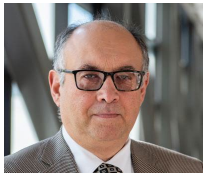
United States Patent [19] [11] **Patent Number: 5,590,133**
Billström et al. [45] **Date of Patent: Dec. 31, 1996**

For example, Applicants' invention provides an apparatus for providing packet data communication to and from mobile stations in a digital TDMA cellular system having a plurality of base stations providing regular cellular control channels; one or more mobile services switching centers, each being associated with a visitor location register and being coupled to a subordinated plurality of the base stations; and home location register means for storing information on subscribers. The apparatus comprises a channel providing device for providing, in at least some of the base stations, on a per cell basis, one or more shared packet data channels for packet transfer to and from the mobile stations, and a packet transfer controlling device for controlling the packet transfer.

The apparatus further comprises a channel defining device for defining, on a per cell basis, the packet data channel to be used for initiating packet transfer; a first packet data mode establishing device for establishing packet data mode for a mobile station to enable the mobile station to send and receive packets over the packet data channels; and a first packet transferring device for transferring packets between the mobile stations and a base station; a second packet transferring device for transferring packets between the base stations and their respective superior mobile services switching centers.

The apparatus further comprises a packet routing device for routing packets to and from a service area of a mobile services switching center; a first device for performing cell selection for a mobile station in packet data mode; a first device for performing location updating for the mobile station in packet data mode; a first packet data mode maintaining device for maintaining the packet data mode for a roaming mobile station; and a first packet data mode terminating device for terminating the established packet data mode for the mobile station.

4:23-58



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124. Billström's apparatus performs the following functions:

[illegible] Ex. 1006 [Billström] 4:23-58. From these disclosures, a POSITA would understand that Billström's apparatus is necessary to "provid[e] packet data communication" in the TDMA system which otherwise does not send or receive packet data communication.

125. Indeed, Billström's invention would make little sense without the inventive "apparatus." Modifying the mobile stations to receive packet data communication would be pointless unless the TDMA system were also altered to send packet data communication. Consequently, a POSITA would understand that to implement Petitioner's proposed combination, it would be necessary to modify the TDMA system with Billström's apparatus. I do not see any explanation from Petitioner or Dr. Jensen of how or why a POSITA would be able to do such a thing.

POR, 45-47; EX-1006, 4:23-58; EX-2019, ¶¶124-25.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Petitioner's Yegoshin-Billström Combination Requires Implementing Billström's Cellular IP Network

Reply: "Petitioner's combination simply modifies Yegoshin's ***phone*** to use Billström's ***IP address*** for IP-based cellular communication."

Third, a POSITA would have been prompted to apply Billström's technology because it "provide[s] a 'separated' system concept that provides the new packet data services with minimum impact on the current TDMA cellular infrastructure, by primarily utilizing the base station portion of the cellular system and for the remaining network parts relying on a separate mobile packet data infrastructure." EX-1006, 4:5-4:20; EX-1003, ¶89.

A POSITA would have understood how to implement Billström's cellular network employing IP with a reasonable expectation of success because significant overlap exists across the teachings of Yegoshin-Johnston and Billström in the same ...hnical field of cellular communication technology. EX-1003, ¶91. The ...n would require only routine knowledge of wireless technologies, ...within the POSITA's skill. *Id.* The telephone would have been ...mplement Billström's techniques because such modification ...cellular part of the system to enable the combined system ...mmunication, while only routine modifications would be ...one to implement Billström's techniques. *Id.*

But the Petition proposed to "implement Billström's cellular network employing IP" and "rel[ied] on a separate mobile packet data infrastructure" described in Billström.

Dr. Jensen: The phone uses "Billström's network."

VIDEOCONFERENCED DEPOSITION OF
DR. MICHAEL A. JENSEN
SEPTEMBER 29, 2023

Q Is the combination of the Yegoshin and Billstrom that you propose -- actually, strike that. That was wrong grammar.

That is the combination of the Yegoshin and Billstrom proposed only modify the Yegoshin's phone and does not make any modification to another part of the network?

A Well, to the extent that the combination is Yegoshin's phone, that needs to be modified to communicate on Billstrom's network. So the modification is to the phone.

Q So was a yes to my question?

A I -- well, I -- I -- I put that in my words. So --

Q Because it might be that I maybe not clearly understood it. But let me ask again because I didn't understand that you provided a yes or a clear answer. If you did, I apologize for repeating the question. But the question is, does the combination of Yegoshin and Billstrom that you propose only modify Yegoshin's phone and not any other part of the network?

A The reason I answered it in my own words is -- so the answer is yes, it modifies Yegoshin's phone. And that's the modification that needs to be done. Obviously, in that case, Yegoshin's phone would be able to function in Billstrom's network. But the modification the petitioner needs to do is to the phone in order to communicate in that network.

Sur-Reply, 1; Pet., 20-22; EX-2035, 33:23-34:24.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

No Reasonable Expectation of Success

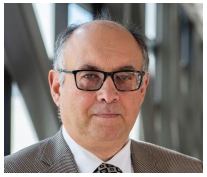
REMOTE DEPOSITION OF MICHAEL JENSEN, PH.D.

PROVO, UTAH

THURSDAY, APRIL 13, 2023

Q. So let me ask the question more precisely. Do you believe an average person with a bachelor degree in electrical engineering, computer engineering, computer science or related field, and only two years of experience related to the design and development of wireless communication systems, would be able to modify an existing GSM type architecture system with the necessary additional hardware and software to implement Billstrom's first embodiment?

A. I believe that -- so to be -- to be fair, I believe it would take a fairly extraordinary person to have enough knowledge to single-handedly do that in that education and time horizon. A little more experience might be necessary in order to implement this.



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126. In my opinion, a POSITA as defined by Petitioner and Dr. Jensen would have encountered challenges that would have been far beyond their skill level. Indeed, I agree with Dr. Jensen that Billström's apparatus "was relatively complicated" and that "it would take a fairly extraordinary person to have enough knowledge to single-handedly [implement Billström's apparatus] in that education and time horizon." Ex. 2029 [Jensen-Depo. IPR2022-01248] 100:4-9, 102:12-103:2. The person implementing Billström's apparatus would need at least a thorough understanding of the GSM system in order to add Billström's "relatively complicated" apparatus. I believe each of these requirements is far beyond the level of skill of a POSITA as defined by Petitioner and Dr. Jensen because they involve at least complex technical and system design aspects that well exceed the knowledge and experience of a POSITA.

POR, 47; EX-2019, ¶126; EX-2029, 102:12-103:2.

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Simultaneous Use of Multiple Network Paths

14. An Internet-enabled mobile communication device comprising:

and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

17. A portable wireless communication device, comprising:

and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

14[j]

To the extent that the *data* requires data transferred by the first and second transmit and receive units (e.g., Yegoshin's cellular and WLAN interfaces, 14[e]), and that ***the simultaneous use of multiple network paths*** requires communication using simultaneous use of these units, Yegoshin's phone uses both cellular and WLAN connections (***simultaneous use of multiple network paths***). EX-1003, ¶97; EX-1004, 5:55-57. Such calls are routed through "IP telephony server"

Pet., 25

17[j]

See 14[j]; EX-1003, ¶191.

Pet., 58

Pet., 25, 58; POR, 48; EX-1001, cls. 14, 17.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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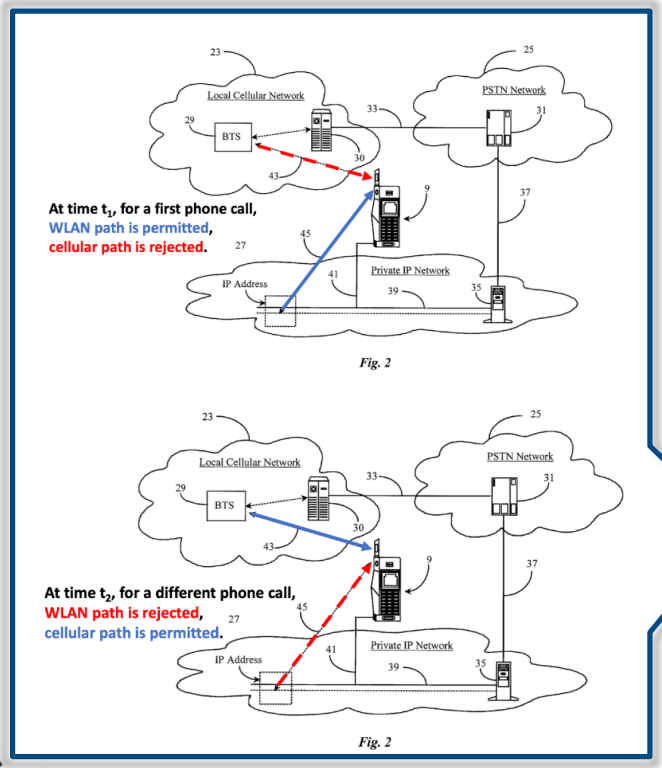
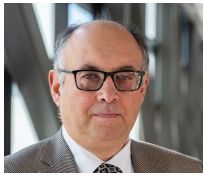
Yegoshin's Phone May Use Either Cellular or WLAN Connections for a Given Call, But Not Both

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**





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131. Yegoshin, however, teaches that the mobile device may use the cellular and LAN connections ***consecutively***, not ***simultaneously***. As I discussed above at ¶¶54-55, Petitioner is fundamentally wrong that Yegoshin discloses using cellular and WLAN calls "simultaneously." In my opinion, Yegoshin makes clear that the user can use ***either*** the cellular or WLAN networks for a given call, but ***not*** both simultaneously:

Ex-1004, 5:55-57, Fig. 2 (annotations added).

POR, 48-49; EX-2019, ¶131.

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Call Redirection is Implemented at the MSC, Not on the Phone

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

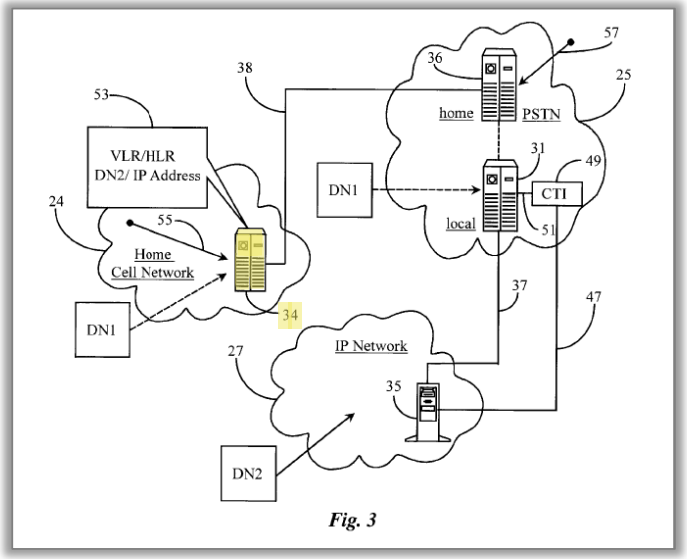

Fig. 3

According to one embodiment of the present invention, call **55** may arrive at MSC **34** from within cellular network **24**. A look-up of the HLR indicates that the owner of the device called is not within range of the local service area. If no current cellular service area where the user is currently operating is indicated in MSC **34** at the time of call **55**, then the system looks for forwarding information and finds an IP address associated with the user's cell phone number. MSC **34** then routes call **55** via a trunk **38** to switch **36**. Call **55** is then routed on through to IP switch **35** (via local switch **31**) in network **27** via trunk **37** from switch **31** based on the IP address.

Sur-Reply, 2-3; EX-1004, 8:16-27, Fig. 3.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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The Reply's Out-of-Context Snippets Do Not Suggest Simultaneous Use of the Cellular and WLAN Networks

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

In this exemplary embodiment, cell phone **9** may communicate via cellular network in normal fashion as illustrated via dotted double-arrow **43**. In addition to normal cellular communication, cell phone **9** may communicate in wireless mode on wireless IP LAN **38** as illustrated via dotted double-arrow **45**. In some embodiments wherein

Once logged on to the LAN, cell phone **9** operates as any other LAN-connected telecommunications device facilitating two-way voice communication. Forwarded calls to cell phone **9** will arrive via PSTN **25** over trunk **37** to IP switch **35** where they are distributed accordingly. It is important to

Only WLAN
EX-1004, 6:65-7:3, 7:15-19

The example described above of an instance of a cellular call **55** placed to cell phone **9** assumes that the user is taking all cellular calls in IP format while logged-on to IP network **27**. All such calls would then be routed via PSTN **25** to IP network **27**. However, it may be that certain cellular calls will be exempt from IP delivery at the user's discretion. In this case, callers from known origination numbers will be routed to local cell network **23**, local to the visited IP network, and therefore may be received by the user of telephone **9** in normal cell-phone mode.

Only cellular
EX-1004, 8:47-56

Sur-Reply, 3; EX-1004, 6:65-7:3, 15-19, 8:47-56.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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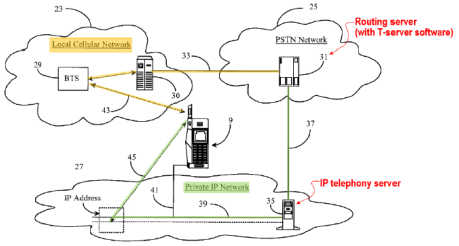
Petitioner Cited to Johnston for "Improv[ing] . . . Data," Not for Simultaneous Use of Multiple Network Paths

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

14[j]

Yegoshin's phone is in communication with ***networked servers*** such as "PSTN-connected routing server" and "IP telephony server." EX-1004, 3:35-4:34, 5:66-6:4, 6:38-64, 7:15-37, Figure 2; EX-1003, ¶94. Therefore, Yegoshin's first and second communication interfaces (***transmit and receive units***, 14[e]) communicate with these ***networked servers*** in cellular and WLAN paths (***multiple network paths***). EX-1003, ¶94; EX-1004, 1:31-67, 2:21-4:14, 4:65-5:8, 5:23-32, 6:62-7:14, 8:28-34.



EX-1004, Figure 2 (annotated)

Further, Johnston's antenna diversity, as applied to Yegoshin-Billström, enables multipath communications using multiple antennas and thus improves various communication attributes of data, such as signal quality, signal reliability, bandwidth, data rate, etc., allowing for more favorable tradeoff between these parameters. EX-1003, ¶95; EX-1005, 1:10-30, 6:48-7:32, 8:33-43, 9:35-41, 10:15-31, 11:9-23, 12:8-30. Johnston's technique "improv[es] radio communication in a multipath fading environment." EX-1005, 1:10-12, 12:21-30. For example, antenna diversity avoids signal degradation or loss by combining multipath signals over multiple antennas or switching to another channel having no deep signal fade. EX-1003, ¶95; EX-1005, 6:55-67, 11:9-23; EX-1028, 313-323. Therefore, antenna diversity improves signal reliability for a given transmit power level, thereby increasing data throughput. EX-1003, ¶95; EX-1005, 1:10-30. Alternatively, for a given transmit power level, the data rate may increase, while maintaining the same signal reliability as no antenna diversity. *Id.*; EX-1005, 1:10-30, 6:48-54, 12:8-13. Indeed, Johnston offers several example antenna configurations where the bandwidth is improved. EX-1005, 7:5-32, 8:33-43, 9:35-41, 10:15-31.

To the extent that the ***data*** requires data transferred by the first and second transmit and receive units (e.g., Yegoshin's cellular and WLAN interfaces, 14[e]), and that ***the simultaneous use of multiple network paths*** requires communication using simultaneous use of these units, Yegoshin's phone uses both cellular and WLAN connections (***simultaneous use of multiple network paths***). EX-1003, ¶97; EX-1004, 5:55-57. Such calls are routed through "IP telephony server" and/or "PSTN-connected routing server," thereby ***including at least one connection to a networked server***. *Id.*; EX-1004, 3:35-51.

Yegoshin's phone uses multiple network paths

Johnston's antenna diversity improves data

Yegoshin's phone uses multiple network paths

Pet., 23-25; POR, 50-51.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Petitioner May Not Point to Johnston for "Simultaneous Use of Multiple Network Paths"

"**It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim**.' 35 U.S.C. § 312(a)(3). . . . [T]he expedited nature of IPRs bring with it an obligation for petitioner to make their case in their petition. . . .'" *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

"**Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability**.

* * *

Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief. 37 C.F.R. § 42.23, except as noted above. **"Respond," in the context of 37 C.F.R. § 42.23(b), does not mean proceed in a new direction with a new approach as compared to the positions taken in a prior filing**. While replies and sur-replies can help crystalize issues for decision, a reply or sur-reply that raises a new issue or belatedly presents evidence may not be considered. The Board is not required to attempt to sort proper from improper portions of the reply or sur-reply." PTAB Consolidated Patent Trial Practice Guide at 73 (Nov. 21, 2019).

POR, 42.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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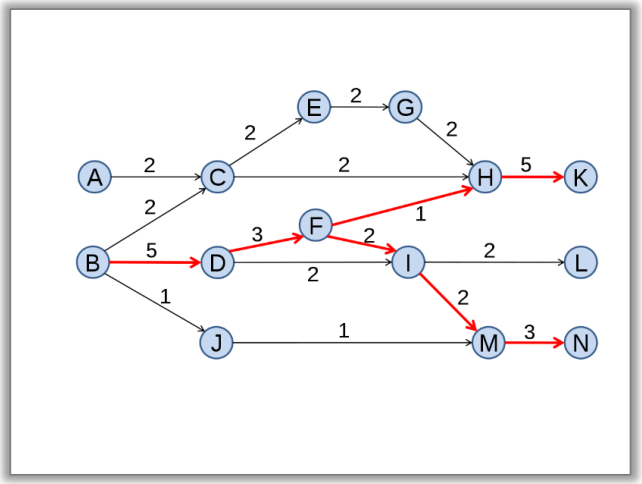
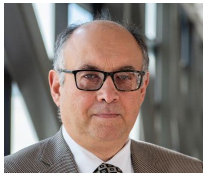
Network Paths are Traced Node to Node

Network Path





Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
Purdue University Fort Wayne, Indiana

- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
- Courses:
  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

132. I understand that a question has been raised as to whether the Johnston reference, Ex-1005, discloses simultaneous use of multiple network paths as a result of the use of a diversity antenna array in a multipath environment. It does not. A "network path" is typically understood as a path through a network or from one network to another, and, depending on the type of network, is typically traced via nodes. The path will go from one node to another, from the start of the path to the end. For this purpose, it is immaterial whether one electromagnetic signal travels directly from the transmitter to the receiver and another or the same electromagnetic signal is reflected from an environmental obstruction prior to arriving at the receiver; both signals are part of the same network path.

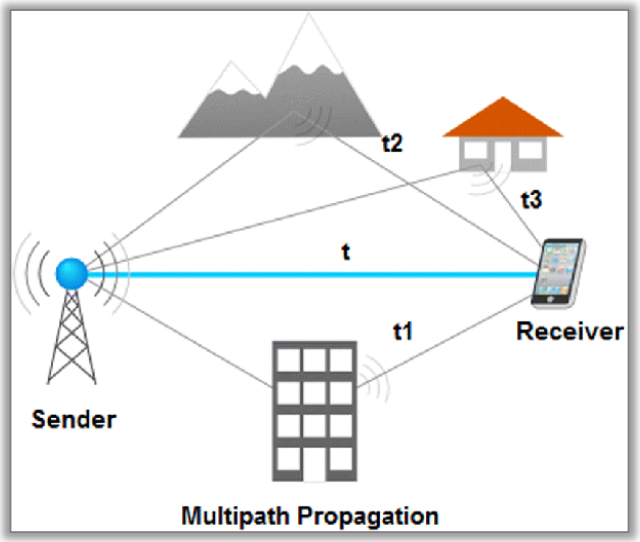
POR, 51-52; EX-2019, ¶132.

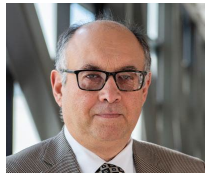
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 100 of 141

Multipath Effects Are Not Network Paths

Multipath Effects





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133. The "multipath effects" of Johnston are a propagation phenomenon and a result of the laws of physics. They are a natural phenomenon. Using multiple network paths is not a natural phenomenon, but the result of using a specific network architecture. The two concepts are very different. So it is not correct to say that a particular reflected signal in a multipath environment travels a particular "network path," and that a different reflection of the same signal travels a different "network path." Assuming that the node to node path is the same for both, they would both be travelling the same network path.

POR, 51-52; EX-2019, ¶133.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 101 of 141

Johnston's "Multipath Effects" Are Not Network Paths

No response in the Reply.

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133. The "multipath effects" of Johnston are a propagation phenomenon and a result of the laws of physics. They are a natural phenomenon. Using multiple network paths is not a natural phenomenon, but the result of using a specific network architecture. The two concepts are very different. So it is not correct to say that a particular reflected signal in a multipath environment travels a particular "network path," and that a different reflection of the same signal travels a different "network path." Assuming that the node to node path is the same for both, they would both be travelling the same network path.

POR, 51-52; EX-2019, ¶¶132-133.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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"Network Path" Does Not Generically Cover Any Path of a Signal in a Network

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

1. An Internet-enabled mobile communication device comprising:

[illegible]
and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple communication paths including at least one connection to a networked server; and wherein at least

14. An Internet-enabled mobile communication device comprising:

[illegible]
and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

- Petitioner's argument would read "network" out of "network paths."
- Claim 1 recites "communication paths," whereas claims 14 and 17 recite "network paths," in otherwise identical limitations. The terms have different meanings. *Chicago Bd. Options Exch., Inc. v. Int'l Securities Exch., LLC*, 677 F.3d 1361, 1369 (Fed. Cir. 2012) ("The general presumption that different terms have different meanings remains.").

17. A portable wireless communication device, comprising:

[illegible]
and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

Sur-Reply, 4; EX-1001, cls. 1, 14, 17.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
Page 103 of 141

Petitioner Did Not Make an Obviousness Argument in the Petition for Simultaneous Use of Multiple Network Paths

Reply

The Petition offered an alternative rationale to preempt the POR's argument. Pet., 25; POR, 52-55. Particularly, the Petition explained why it would have been obvious to transmit data simultaneously using Yegoshin's cellular and WLAN interfaces. Pet., 25. Yegoshin's cellular and WLAN interfaces are separate,

Petition

To the extent that the *data* requires data transferred by the first and second transmit and receive units (e.g., Yegoshin's cellular and WLAN interfaces, 14[e]), and that *the simultaneous use of multiple network paths* requires communication using simultaneous use of these units, Yegoshin's phone uses both cellular and WLAN connections (*simultaneous use of multiple network paths*). EX-1003, ¶97; EX-1004, 5:55-57. Such calls are routed through "IP telephony server" and/or "PSTN-connected routing server," thereby *including at least one*

Petition page 25: "Yegoshin's phone uses both cellular and WLAN connections (***simultaneous use of multiple network paths***)."

No obviousness argument.

- No reference to modifying Yegoshin.
- No motivation to modify Yegoshin.
- No explanation supporting a reasonable likelihood of success.

Pet., 25; Reply, 9; Sur-Reply, 5.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Dr. Jensen Says He Proffered an Obviousness Theory, But He Did Not

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

21. In my Original Declaration, I offered an alternative argument to preempt the argument that Patent Owner offers in the POR. EX-1003, ¶¶97-98; POR, 52-55. Particularly, I explained why it would have been obvious to transmit data simultaneously using Yegoshin's cellular and WLAN interfaces. EX-1003, ¶¶97-98. Yegoshin's cellular and WLAN interfaces are separate, independent modes of communication and a POSITA would have found it obvious to use them simultaneously. In fact, a POSITA would have considered only two options for the simultaneity of Yegoshin's cellular and WLAN interfaces—simultaneous or non-simultaneous—and viewed the simultaneous option as an obvious option to consider, particularly in the combination with Billström where two IP addresses are maintained. Dr. Cooklev admitted that using two different networks simultaneously was well-known in various scenarios before the Critical Date. EX-1053, 64:2-15; EX-1007, 26:60-65; EX-1045, 6:35-7:16

DECLARATION OF DR. MICHAEL ALLEN JENSEN

97. To the extent that the term *data* in this element requires data transferred by the first and second transmit and receive units (14[e]), and that *the simultaneous use of multiple network paths* requires communication using simultaneous use of these units (e.g., Yegoshin's cellular and WLAN interfaces), Yegoshin's phone is configured to use both cellular and WLAN connections by "taking some calls via cellular path while receiving other calls via IP path." EX-1004, 5:55-57. Such calls are routed through the "IP telephony server" and/or "PSTN-connected routing server." EX-1004, 3:35-51. Therefore, Yegoshin's phone implements *the simultaneous use of multiple network paths including at least one connection to a networked server* in this element.

Dr. Jensen, ¶97: "Yegoshin's phone implements ***the simultaneous use of multiple network paths including at least one connection to a networked server*** in this element.

No obviousness argument.

- No reference to modifying Yegoshin.
- No motivation to modify Yegoshin.
- No explanation supporting a reasonable likelihood of success.

Sur-Reply, 5; EX-1051, ¶21; EX-1003, ¶97.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

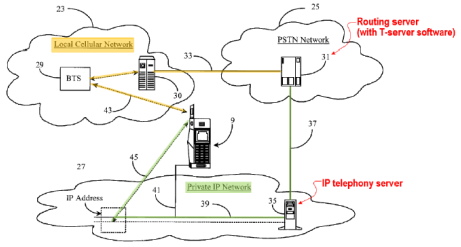
Smart Mobile Technologies LLC, Exhibit 2038
Page 105 of 141

Petitioner Cited to Gillig for "Improv[ing] . . . Data," Not for Simultaneous Use of Multiple Network Paths

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

14[j]

Yegoshin's phone is in communication with ***networked servers*** such as "PSTN-connected routing server" and "IP telephony server." EX-1004, 3:35-4:34, 5:66-6:4, 6:38-64, 7:15-37, Figure 2; EX-1003, ¶94. Therefore, Yegoshin's first and second communication interfaces (***transmit and receive units***, 14[e]) communicate with these ***networked servers*** in cellular and WLAN paths (***multiple network paths***). EX-1003, ¶94; EX-1004, 1:31-67, 2:21-4:14, 4:65-5:8, 5:23-32, 6:62-7:14, 8:28-34.



EX-1004, Figure 2 (annotated)

To the extent that the ***data*** requires data transferred by the first and second transmit and receive units (e.g., Yegoshin's cellular and WLAN interfaces, 14[e]), and that ***the simultaneous use of multiple network paths*** requires communication using simultaneous use of these units, Yegoshin's phone uses both cellular and WLAN connections (***simultaneous use of multiple network paths***). EX-1003, ¶97; EX-1004, 5:55-57. Such calls are routed through "IP telephony server" and/or "PSTN-connected routing server," thereby ***including at least one connection to a networked server***. *Id.*; EX-1004, 3:35-51.

It would have been obvious that the data for telephone calls, which are transferred using both cellular and WLAN paths, is improved, compared to the same data being transferred using only conventional telephony communication such as PSTN. EX-1004, 1:17-2:41; EX-1003, ¶98; EX-1013, 33. For example, the use of both cellular and WLAN paths would allow three-way linking of different calls, thereby improving data communication. EX-1003, ¶98; EX-1045, 6:35-7:16.

Yegoshin's phone uses multiple network paths

Yegoshin's phone uses multiple network paths

Three-way linking improves data

Sur-Reply, 5; POR, 52-53; Pet., 23, 25.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Dr. Jensen Says He Proffered an Obviousness Theory, But He Did Not (2)

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

22. As an example, I referred to three-way calling and explained how a POSITA would have found it obvious to employ three-way calling in Yegoshin. EX-1003, ¶98. Patent Owner's sole argument against the obviousness of three-way calling is to attack Gillig, which is the reference cited for corroboration. Patent Owner contends that the term "data" should be limited to "digital" data and Gillig is an analog system. POR, 53-55. But this misses the point of the obviousness argument advanced in my Original Declaration column 5, which contemplated adding three-way calling, not Gillig's analog calling. Even if "data" is limited to digital, the Yegoshin-Billström combination teaches digital data communication over both of the WLAN and cellular networks because both WLAN uses IP (which is digital) and Billström's GSM is digital, whether the communication is routed over the standard GSM communication or over the added packet data capability. With this, a POSITA would have employed three-way calling using these digital technologies, rather than turning back to Gillig's older, analog functionality. As acknowledged by Dr. Cooklev, it was well-known for calls to be simultaneously connected over two different networks. EX-1053, 64:2-15; EX-1045, 6:35-7:16 ("three-way linking" simultaneously connecting to cellular and cordless calls).

Paragraph 98 directed to the "data . . . Is improved" element of the claims. "Three-way linking" mentioned in one sentence directed to "improving data communication. "

DECLARATION OF DR. MICHAEL ALLEN JENSEN

98. Further, it would have been obvious that the data for telephone calls, which are transferred using both cellular and WLAN paths, is improved, compared to the same data being transferred using only a conventional telephony communication that "[c]onventionally and historically ... has been practiced by use of networks that provide dedicated connections and guaranteed bandwidth, such as in Publicly Switched Telephony Networks (PSTN)." EX-1004, 1:17-2:41; EX-1013, 33 ("A multiplexer is a physical-layer device that combines multiple data streams into one or more output channels at the source. Multiplexers demultiplex the channels into multiple data streams at the remote end and thus maximize the use of the bandwidth of the physical medium by enabling it to be shared by multiple traffic sources."). For example, the use of both cellular and WLAN paths would allow three-way linking of different calls, thereby improving data communication. *See* EX-1045, 6:35-7:16 (describing three-way linking of two calls over different protocols such as cellular and cordless telephone calls).

Sur-Reply, 5; EX-1051, ¶22; EX-1003, ¶98.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 107 of 141

Therefore, Petitioner May Not Point to Gillig's "Three-Way Linking" for "Simultaneous Use of Multiple Network Paths"

"**It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim**.' 35 U.S.C. § 312(a)(3). . . . [T]he expedited nature of IPRs bring with it an obligation for petitioner to make their case in their petition. . . .'" *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

"**Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability**.

* * *

Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief. 37 C.F.R. § 42.23, except as noted above. **"Respond," in the context of 37 C.F.R. § 42.23(b), does not mean proceed in a new direction with a new approach as compared to the positions taken in a prior filing**. While replies and sur-replies can help crystalize issues for decision, a reply or sur-reply that raises a new issue or belatedly presents evidence may not be considered. The Board is not required to attempt to sort proper from improper portions of the reply or sur-reply." PTAB Consolidated Patent Trial Practice Guide at 73 (Nov. 21, 2019).

Petitioner Fails to Proffer Necessary Evidence and Argument to Support its New, Untimely Obviousness Ground

SECOND DECLARATION OF DR. MICHAEL ALLEN JENSEN

21. In my Original Declaration, I offered an alternative argument to preempt the argument that Patent Owner offers in the POR. EX-1003, ¶¶97-98; POR, 52-55. Particularly, I explained why it would have been obvious to transmit data simultaneously using Yegoshin's cellular and WLAN interfaces. EX-1003, ¶¶97-98. Yegoshin's cellular and WLAN interfaces are separate, independent modes of communication and a POSITA would have found it obvious to use them simultaneously. In fact, a POSITA would have considered only two options for the simultaneity of Yegoshin's cellular and WLAN interfaces—simultaneous or non-simultaneous—and viewed the simultaneous option as an obvious option to consider, particularly in the combination with Billström where two IP addresses are maintained. Dr. Cooklev admitted that using two different networks simultaneously was well-known in various scenarios before the Critical Date. EX-1053, 64:2-15; EX-1007, 26:60-65; EX-1045, 6:35-7:16

No explanation of the modifications that would have been necessary to implement "three-way linking" of cellular and WLAN networks on Yegoshin's phone.

No testimony showing a reasonable expectation of success.

22. As an example, I referred to three-way calling and explained how a POSITA would have found it obvious to employ three-way calling in Yegoshin. EX-1003, ¶98. Patent Owner's sole argument against the obviousness of three-way calling is to attack Gillig, which is the reference cited for corroboration. Patent Owner contends that the term "data" should be limited to "digital" data and Gillig is an analog system. POR, 53-55. But this misses the point of the obviousness argument advanced in my Original Declaration column 5, which contemplated adding three-way calling, not Gillig's analog calling. Even if "data" is limited to digital, the Yegoshin-Billström combination teaches digital data communication over both of the WLAN and cellular networks because both WLAN uses IP (which is digital) and Billström's GSM is digital, whether the communication is routed over the standard GSM communication or over the added packet data capability. With this, a POSITA would have employed three-way calling using these digital technologies, rather than turning back to Gillig's older, analog functionality. As acknowledged by Dr. Cooklev, it was well-known for calls to be simultaneously connected over two different networks. EX-1053, 64:2-15; EX-1045, 6:35-7:16 ("three-way linking" simultaneously connecting to cellular and cordless calls).

Sur-Reply, 6; EX-1051, ¶¶21-22.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 109 of 141

"Data" Means Digital Information

14. An Internet-enabled mobile communication device comprising:

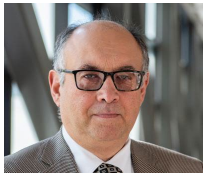
[illegible]

and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

17. A portable wireless communication device, comprising:

[illegible]

and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;



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  ECE 543 Wireless Communications and Networks

134. I understand that a question has been raised as to whether the Gillig reference, Ex-1045, discloses simultaneous use of multiple network paths as a result of Gillig's disclosure of "three-way calling." It does not.

135. In my opinion, a POSITA would have understood "data," in the context of the '946 patent, to mean "***digital information***."

136. In the context of computer science or telecommunications, a reference to "data" that is communicated to or from a "server" or other computer, or between computers, would be understood by a POSITA to refer to digital information.

137. A POSITA would note that each of the independent claims of the '946 patent (claims 1, 14, 17 and 26) recite "data" that is "transferred" or otherwise communicated to or with a server. This is indicative that the recited "data" is digital information, not analog information.

POR, 53-54; EX-1001, cls. 14, 17; EX-2019, ¶¶134-137.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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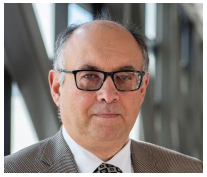
"Data" Means Digital Information

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

It is an object of the present invention to provide wireless enhancements to IP based cellular telephones/mobile wireless devices (CT/MD). The same enhancements are applied to IP based and locally based network switch boxes.



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138. The specification also informs a POSITA that "data" as used in the claims means digital information. The Summary of the Invention states that an object of the invention is to "provide wireless enhancements to IP based cellular telephones/mobile wireless devices." Ex-1001, 1:43-45. "IP based" here refers to enhancements to Internet Protocol-based communications, which points to digital information.

POR, 53; EX-1001, 1:43-46; EX-2019, ¶138.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

"Data" Means Digital Information

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

In the present invention, one or more antennas and T/R units in a CT/MD will provide better tuning and greater bandwidth for a given frequency/application. For example, consider an embodiment of a cell phone, CB radio, and wireless phone, all in a single CT/MD for improving the data rates of a wireless device/network:

It is seen that the data rate of the CT/MD is increased. Currently the CT/MD data rates are very low and pose a severe limitation for high speed wireless data networking. 14.4 KBPS (kilobits per second) is probably the best reliable speed for a wireless network that is commercially available.

Data transferred to a CT/MD over a wireless network comes in encoded form and must be decoded at the CT/MD after the data is received, such as by a receiver. The ability to

FIG. **2** illustrates an embodiment of the present invention for a communication system **200** with data being transferred from computer **202** to computer **204**. In FIG. **2**, computer **202**

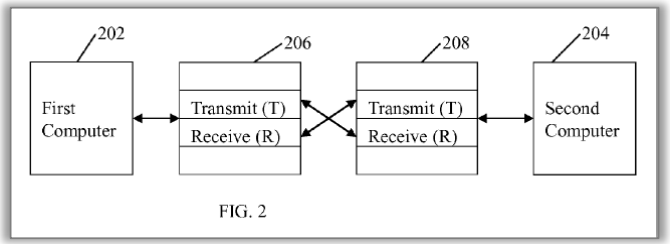
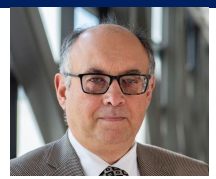


FIG. 2



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  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

139. Additional portions of the specification underscore that "data" as used in the patent refers to digital information. One of the disclosed benefits of the invention is "for improving the data rates of a wireless/device network" and indicates that "[c]urrently the CT/MD data rates are very low and pose a severe limitation for high speed wireless data networking. 14.4KBPS (kilobits per second) is probably the best reliable speed for a wireless network that is commercially available." Ex-1001, 2:55-65. KBPS is a known unit of measure of bits-digitized information. Analog signals carrying analog information have no "data rate." The specification also states that "[d]ata transferred to a CT/MD over a wireless network comes in encoded form and must be decoded at the CT/MD after the data is received." Ex-1001, 3:10-12. Encoding and decoding would not be necessary for analog signals carrying analog information. In another example, the specification describes Figure 2 as illustrat[ing] an embodiment of the present invention for a communication system 200 with data being transferred from computer 202 to computer 204." Ex-1001, 3:35-37. Data transferred from one computer to another will necessarily consist of digital information. The specification repeatedly refers to data and in each case is clear that it is referring to digital information.

POR, 53-54; EX-1001, 2:55-65, 3:10-12, 35-37, Fig. 2; EX-2019, ¶139.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 112 of 141

"Data" Means Digital Information

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

4:10-14 As an example, the design considerations for receiving cellular telephone frequencies may be totally different from those for streaming video or data signals, and with the present invention both can be combined into the CT/MD.

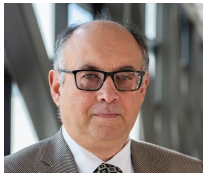
4:23-28 cessors. Alternately, the single processor may have multiple channels for parallel processing of each data stream to process accurately two distinct signals **408** that were more optimally received by two dedicated antennas and two separate T/R units contained within the CT/MD to improve performance and quality of output. An example is a CT/MD **402**

4:51-53 CT/MD **502**. The multiple processors **506** allow for parallel and custom processing of each signal or data stream to achieve higher speed and better quality of output. This can

Parallel processing of signals and data streams at a system level using hardware and software on a server such as Server C **706**.

FIG. **9** is an embodiment of the present invention showing a multiple processing system **900**. In FIG. **9**, computer **902** and computer **908** need to exchange data streams at very fast rates. Having a single channel for T/R with a single antenna or

6:61-67



Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
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- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
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  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

140. In addition, it is also indicative that "data" refers to digital information (and not analog information) that the specification repeatedly refers to "data" within the context of "data streams" and the like. Ex-1001, 4:12 ("streaming video

810. Consequently having the data partitioned by the Server C **910** and assigned to multiple channels **912** enables parallel processing of the communications, and having parallel processing of wireless data streams where the data streams coexist, as in the present invention, increases the data transfer rate.

FIG. **10** is an embodiment of the present invention showing a data system **1000** with three data streams DS1 **1002**, DS2 **1004** and DS3 **1006**. In FIG. **10**, three wireless T/R units **1008**, **1010**, and **1012** are shown. The three data streams **1002**, **1004**, and **1006** are processed by the three T/R units **1008**, **1010** and **1012**, converted by converters **1014**, **1016**, and **1018**, and presented to processors **1020**, **1022**, and **1024** under the control of controller **1026**. The data streams may be interfaced separately with server C **1030** or combined into data stream **1028** and interfaced to Server C **1030**. The pro-

7:16-29

is avoided. Each channel may be sampled and clocked individually as necessary to optimally process each data stream and combine the individual data packets.

FIG. **11** is an embodiment of the present invention showing a data system **1100** with three data streams DS1 **1102**, DS2 **1104** and DS3 **1106**. In FIG. **11**, three fibre optic channel units **1108**, **1110**, and **1112** are shown. The three data streams **1102**, **1104**, and **1106** are processed by the three fibre optic channel units **1108**, **1110** and **1112**, converted by converters **1114**, **1116**, and **1118**, and presented to processors **1120**, **1122**, and **1124** under the control of controller **1126**. The data streams are combined into data stream **1128** and interfaced to Server C **1130**. The processor or CPU speed is seldom a

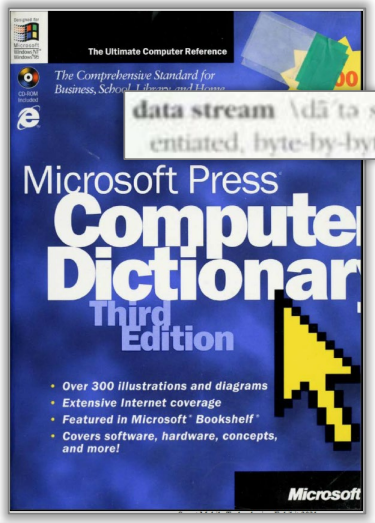
7:45-57

POR, 54; EX-1001, 4:10-14, 23-28, 51-53, 6:61-67, 7:16-29, 45-57; EX-2019, ¶140.

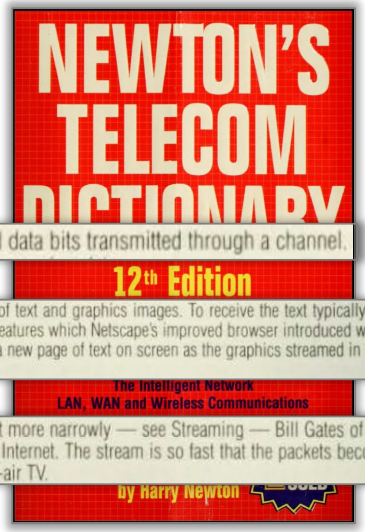
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 113 of 141

"Data" Means Digital Information



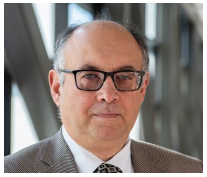
data stream \dā´tə strēm´, dat´ə\ *n.* An undifferentiated, byte-by-byte flow of data.



Data Stream 1. Collection of characters and data bits transmitted through a channel.

Streaming An Internet term. A Web page typically consists of text and graphics images. To receive the text typically takes much less time than receiving the graphics images. One of the features which Netscape's improved browser introduced was the streaming of graphical image. This allowed the user to look at a new page of text on screen as the graphics streamed in (came in over the phone lines). See INTERNET and HOME PAGE.

Streaming Media After Netscape defined the concept more narrowly — see Streaming — Bill Gates of Microsoft defined more broadly to video coming to you in packets over the Internet. The stream is so fast that the packets become full-blown 30 frames per second video, similar to commercial, over-the-air TV.



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141. The description of "data" in the context of a "stream" informs a POSITA that the data is digital information, because that terminology was (and is) typically used to refer to data transmitted between computers. Ex-2032, 184, 616 [Newton's Telecom Dictionary, p. 616 (12th ed., 1997)] ("data stream" is "Collection of characters and data bits transmitted through a channel") ("Streaming" is "[a]n Internet term" that typically refers to delivery of content for a webpage. "Streaming Media" refers to "video coming to you in packets over the Internet."); see also Ex-2031, 88 [Microsoft Computer Dictionary 3rd Ed. (1997)] ("data stream" is "An undifferentiated, byte-by-byte flow of data").

POR, 54; EX-2019, ¶141; EX-2031, 88; EX-2032, 184, 616.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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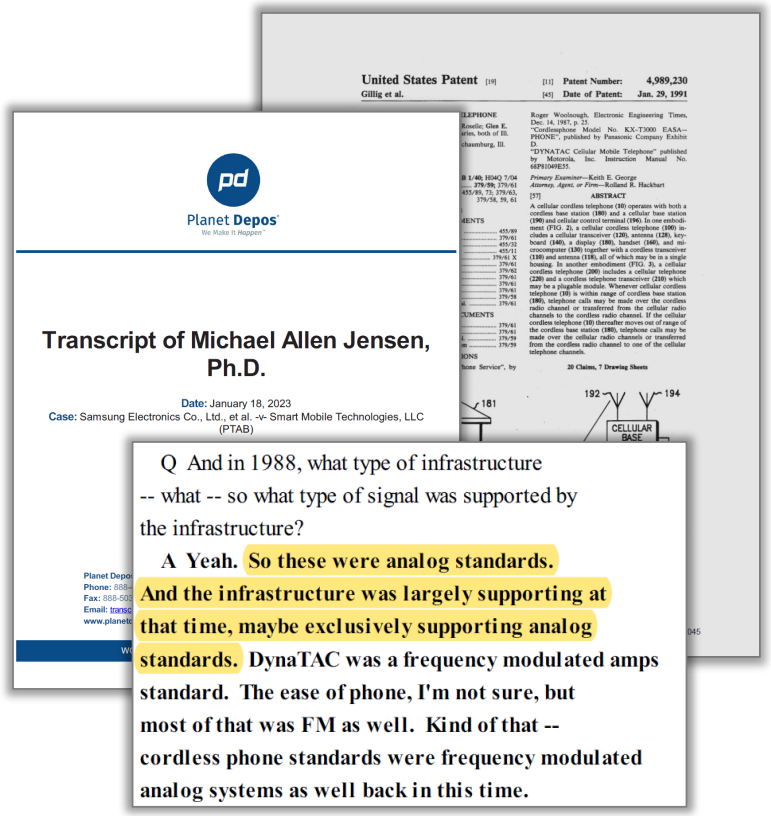
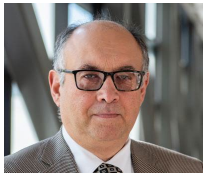
Gillig Discloses an Analog System





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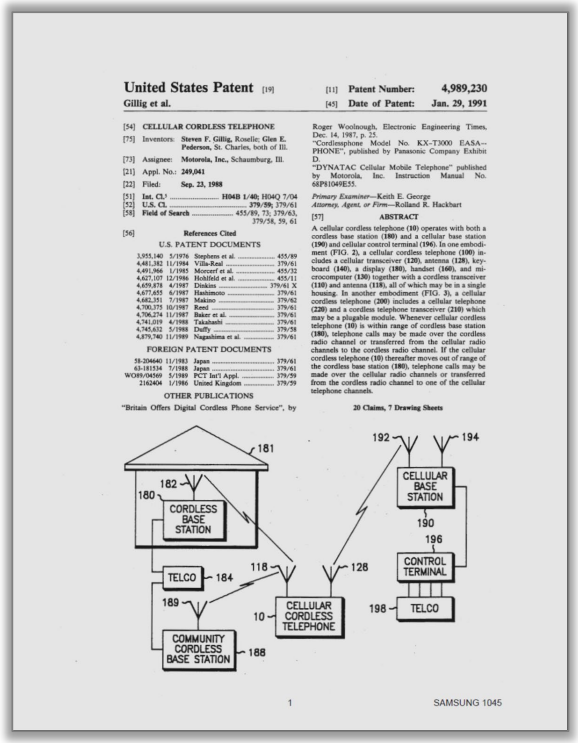
147. Gillig describes an analog phone with cordless and cellular capability. Gillig's phone has the ability to accept an incoming call while already on an existing call and link the two by "coupling the combined receive audio signals from summing amplifier 159 via analog gate 155 to the speaker, and enabling both transmit audio switches . . . ." Ex-1045, 6:62 – 7:1. However, the linked calls are clearly analog calls carrying analog voice information. Gillig's cellular and cordless calls do not carry digital information. A POSITA would have understood that "data" excludes the analog voice signals of Gillig.

POR, 54; EX-2019, ¶147; EX-2030, 83:10-20.

Gillig's "Three-Way Linking" Does Not Disclose Simultaneous Use of Multiple Network Paths to Transfer Data



United States Patent [19]
Gillig et al.

[11] **Patent Number: 4,989,230**
[45] **Date of Patent: Jan. 29, 1991**

[54] **CELLULAR CORDLESS TELEPHONE**

[75] Inventors: **Steven F. Gillig**, Roselle; **Glen E. Pedersen**, St. Charles, both of Ill.

[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **249,041**

[22] Filed: **Sep. 23, 1988**

[51] **Int. Cl.**[5] **H04B 1/40**; H04Q 7/04
[52] **U.S. Cl.** **379/59**; 379/61
[58] **Field of Search** 455/89, 73, 379/63, 379/58, 59, 61

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,955,140	5/1976	Stephens et al.	455/89
4,481,382	11/1984	Villa-Real	379/61
4,491,966	1/1985	Mozeref et al.	455/32
4,627,107	12/1986	Hohlfeld et al.	455/11
4,659,878	4/1987	Dinkins	379/61 X
4,677,655	6/1987	Hashimoto	379/61
4,682,351	7/1987	Makino	379/62
4,700,375	10/1987	Reed	379/61
4,706,274	11/1987	Baker et al.	379/61
4,741,019	4/1988	Takahashi	379/61
4,745,632	5/1988	Duffy	379/58
4,879,740	11/1989	Nagashima et al.	379/61

FOREIGN PATENT DOCUMENTS

58-204640	11/1983	Japan	379/61
63-181534	7/1988	Japan	379/61
WO89/04569	5/1989	PCT Int'l Appl.	379/59
2162404	1/1986	United Kingdom	379/59

OTHER PUBLICATIONS

"Britain Offers Digital Cordless Phone Service", by Roger Woolnough, Electronic Engineering Times, Dec. 14, 1987, p. 25.
"Cordlessphone Model No. KX-T3000 EASA--PHONE", published by Panasonic Company Exhibit D.
"DYNATAC Cellular Mobile Telephone" published by Motorola, Inc. Instruction Manual No. 68P81049E55.

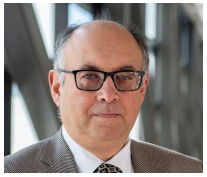
Primary Examiner—Keith E. George
Attorney, Agent, or Firm—Rolland R. Hackbart

[57] **ABSTRACT**

A cellular cordless telephone (**10**) operates with both a cordless base station (**180**) and a cellular base station (**190**) and cellular control terminal (**196**). In one embodiment (FIG. 2), a cellular cordless telephone (**100**) includes a cellular transceiver (**120**), antenna (**128**), keyboard (**140**), a display (**180**), handset (**160**), and microcomputer (**130**) together with a cordless transceiver (**110**) and antenna (**118**), all of which may be in a single housing. In another embodiment (FIG. 3), a cellular cordless telephone (**200**) includes a cellular telephone (**220**) and a cordless telephone transceiver (**210**) which may be a plugable module. Whenever cellular cordless telephone (**10**) is within range of cordless base station (**180**), telephone calls may be made over the cordless radio channel or transferred from the cellular radio channels to the cordless radio channel. If the cellular cordless telephone (**10**) thereafter moves out of range of the cordless base station (**180**), telephone calls may be made over the cellular radio channels or transferred from the cordless radio channel to one of the cellular telephone channels.

20 Claims, 7 Drawing Sheets

1 SAMSUNG 1045



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149. As discussed above, a POSITA would understand "data" as used in the '946 patent to refer to "digital information." Thus, while Gillig's phone may have been transmitting and receiving analog signals carrying analog information, it was not transmitting or receiving data. Gillig's disclosure of "three way linking" of analog voice calls does not, therefore, disclose simultaneous use of multiple network paths to transfer data within the meaning of claims 14 and 17 of the '946 patent.

POR, 55; EX-2019, ¶149.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
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Table of Contents

Petitioner Reads the "Remote Server" of Claim 27 Onto PSTN Switch 31

27. An IP-enabled communication device comprising:

wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit; and wherein video or audio can be accessed simultaneously with performance optimized for each through dedicated or multiplexed paths.

Claim 27 requires that the first **and** second transmit and receive units operate and communicate to "**the**" remote server on the first **and** second network paths.

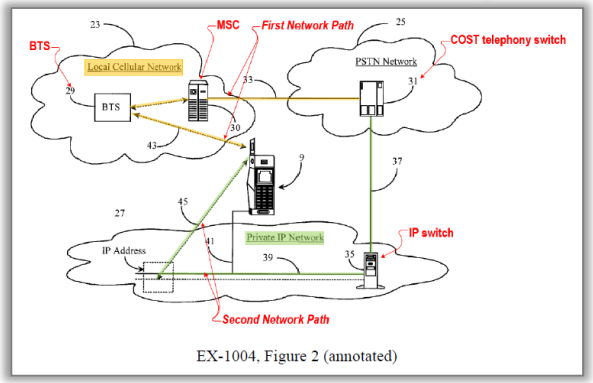
PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Pet., 80-81

27[h]

As described in 17[i], Yegoshin's first and second communication interfaces (*first and second wireless transmit and receive units*) in the phone communicate with the PSTN switch (*remote server*) on cellular and WLAN networks (*first and second network paths*). EX-1003, ¶249; EX-1004, 5:33-54, 5:66-7:25, 7:48-58, 8:47-56, 3:35-4:42.

17[i]



EX-1004, Figure 2 (annotated)

Pet., 56, 58

Pet., 56, 58, 80-81; POR, 55; EX-1001, cl. 27.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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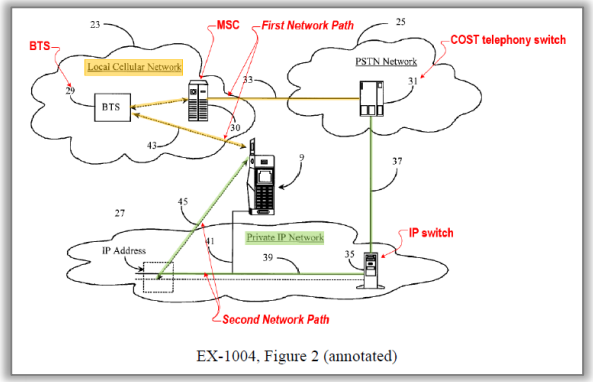
PSTN Switch 31 is Not a Server

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

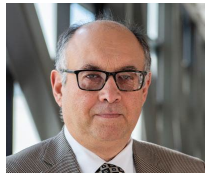
27[h]

As described in 17[i], Yegoshin's first and second communication interfaces (*first and second wireless transmit and receive units*) in the phone communicate with the PSTN switch (*remote server*) on cellular and WLAN networks (*first and second network paths*). EX-1003, ¶249; EX-1004, 5:33-54, 5:66-7:25, 7:48-58, 8:47-56, 3:35-4:42.

17[i]



EX-1004, Figure 2 (annotated)



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152. In my opinion, Petitioner's mapping of the first and second network paths to Yegoshin's cellular and WLAN connections and the "remote server" to Yegoshin's "PSTN switch" does not teach limitation 27[i], because PSTN switch 31 (or COST telephony switch, in Petitioner's illustration) is not a server.

Pet., 56, 58, 80-81; POR, 56; EX-2019, ¶152.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
Page 119 of 141

Yegoshin Does Not Describe PSTN Switch 31 as a Server

(12) **United States Patent** (10) **Patent No.: US 6,711,146 B2**
Yegoshin (45) **Date of Patent: *Mar. 23, 2004**

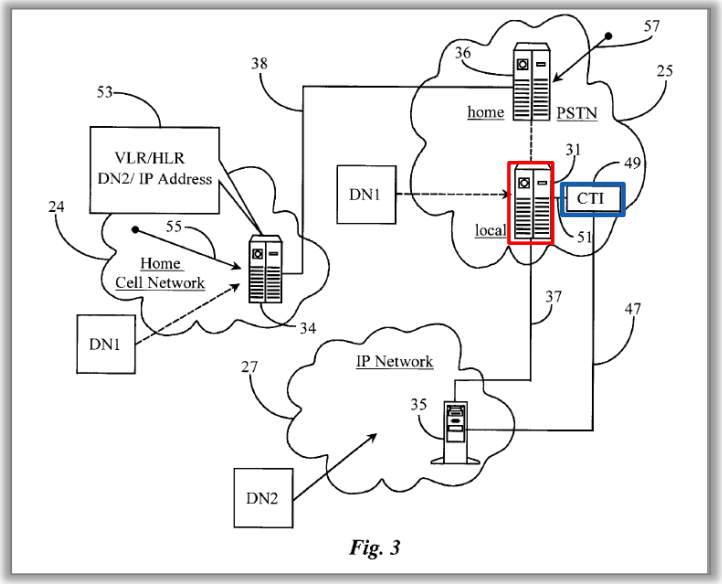

Fig. 3

Yegoshin's cellular and WLAN components do **not** operate or communicate to the CTI processor. They communicate to PSTN switch 31, which is not a server.

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153. Yegoshin never describes PSTN switch 31 as a server. Rather, it explains that switch 31 is connected to a "routing server." Ex. 1004 [Yegoshin] 3:43 ("a PSTN-connected routing server"); 4:6-10 (same). Switch 31 is connected to CTI processor 49 which "provides intelligent routing capability to switch 31 by virtue of added software known as T-server software to the inventor." *Id.*, 7:30-32. Switch 31 is connected to CTI processor 49 "via a CTI connection 51." *Id.*, 7:29-30. But switch 31 (boxed in red) is a distinct element from CTI 49 (boxed in blue):

Id., Fig. 3 (annotated).

POR, 57; EX-1004, Fig. 3; EX-2019, ¶153.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Dr. Jensen Agrees that PSTN Switch 31 is Not a Server

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

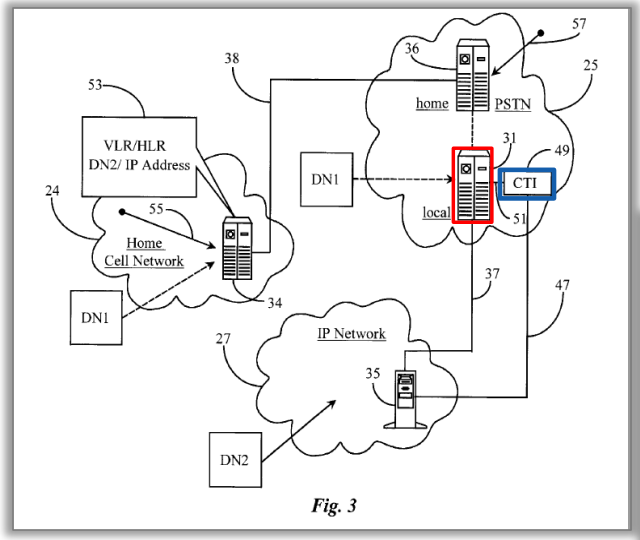


Fig. 3

Transcript of Michael Allen Jensen, Ph.D.

Date: May 11, 2023
Case: Samsung Electronics Co., Ltd., et al. -v- Smart Mobile Technologies, LLC (PTAB)

Q. And I guess I'll preface it by pointing you to paragraph 6, lines 38 to 40, if you can take a look at that. This describes the telephony switch 31 in a little bit more detail. It refers to it as a PSTN switch 31 and a COST, C-O-S-T, all caps, telephony switch 31. And COST, C-O-S-T, as earlier defined in column 1 lines -- looks like 27 and 29, "As a connection oriented/switched telephony COST."

Do you see that?

A. Yes, sir.

Q. Okay. So does this tell you anything about the functionality of the switch 31?

A. Well, yes -- I mean, I don't know that -- yes. I mean, this is a standard circuit switched network, so switch 31 is -- is part of the PSTN, which is a circuit switch network.

Q. Okay. So in order to have intelligent routing capability, that switch 31 is -- strike that.

So does CTI processor 49 provide the intelligent routing capability to switch 31?

A. That's what Yegoshin discloses about the CTI processor, is it has intelligent routing functionality.

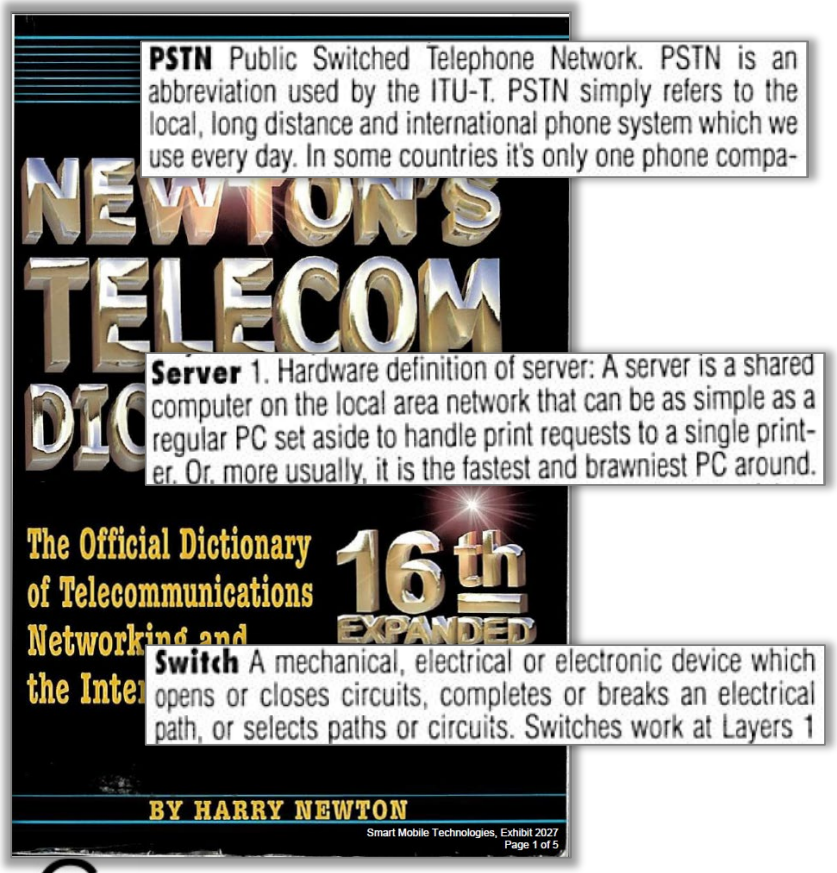
Q. Okay. Does switch 31, independent of CTI processor 49, have intelligent routing functionality?

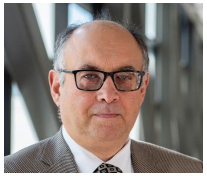
A. The only place Yegoshin talks about intelligent routing is in the CTI, at least my recollection of the -- of the disclosure that the -- that the PSTN switch would be standard equipment, which does not -- would not provide the Yegoshin intelligent routing functionality.

POR, 57-58; EX-2020, 41:13-42:21.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Dictionaries Do Not Define PSTN Switch 31 as a Server





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155. Furthermore, there is no reason to believe that switch 31 is a "server" as claimed. Per Newton's Telecom Dictionary, "PSTN" refers to a "Public Switched Telephone Network" and "PSTN simply refers to the local, long distance and international phone system which we use every day." Ex. 2027 [Newton's-Telecom-Dictionary] 683. A "switch" is a "mechanical, electrical or electronic device which opens or closes circuits, completes or breaks an electrical path, or selects paths or circuits." *Id.*, 815. The "hardware definition of server," by contrast, is "a shared computer," or "more usually, … the fastest and brawniest PC around." *Id.*, 757. It further explains that the "software definition of server" is "a program which provides some service to other (client) programs." *Id.* It is not apparent how a PSTN *switch* would qualify as a server. Certainly, there is no mention of switch 31 being, *e.g.*, a shared computer. It is consistently only described as a switch.

POR, 58-59; EX-2019, ¶155; EX-2027.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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The Parties' District Court Constructions of "Server" Do Not Cover PSTN Switch 31

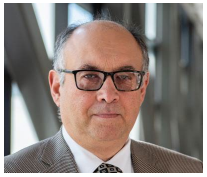
Case 6:21-cv-00603-ADA-DTG Document 66 Filed 08/17/22 Page 1 of 54

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SMART MOBILE TECHNOLOGIES LLC, Plaintiff, v. APPLE INC., Defendant.	Case No. 6:21-cv-00603-ADA-DTG
SMART MOBILE TECHNOLOGIES LLC, Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 6:21-cv-00701-ADA-DTG

PLAINTIFF'S RESPONSIVE CLAIM CONSTRUCTION BRIEF
REGARDING THE '434 PATENT FAMILY

Smart Mobile's Construction
a computing device or program or collection of computing devices or programs that provides resources, data, services, or programs to other computing devices or programs over a network, or that enables access to a network or network resources



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  ECE 543 Wireless Communications and Networks

156. Switch 31 is also not a "server" under the construction I have proposed in the district court. There, I have proposed that a server is "a computing device or program or collection of computing devices or programs that provides resources, data, services, or programs to other computing devices or programs over a network, or that enables access to a network or network resources." Switch 31 is not a "computing device or program or collection of computing devices or programs" and is not a server as claimed.

POR, 59; EX-2019, ¶156.

Petitioners' District Court Expert's Description of a "Server" Does Not Cover PSTN Switch 31

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

APPLE INC.

Defendant.

Case No. 6:21-cv-00603-ADA

SMART MOBILE TECHNOLOGIES LLC,

Plaintiff,

v.

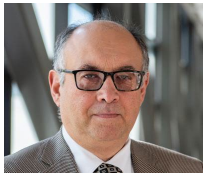
SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.,

Defendants.

Case No. 6:21-cv-00701-ADA

DECLARATION OF HARRY BIMS IN SUPPORT OF DEFENDANTS' OPENING CLAIM CONSTRUCTION BRIEFS

24. In this field, the word "server" generally refers to a computer that "serves" client devices through a network.[1] It generally connotes to persons of skill in the art a particularly powerful computer capable of storing lots of data and providing that data to many client devices. Both now and at the time of the asserted patents, servers form the backbone of the Internet, in that servers store websites, enabling client devices to access those websites from anywhere in the world.



Todor Cooklev, PhD.

2016 – **Professor of Electrical and Computer Engineering**
Purdue University Fort Wayne, Indiana
- Research on most aspects of wireless systems, including hardware, signal processing, and software techniques, in particular for software-defined radios.
- Courses:
  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

157. Moreover, I note that in the District Court Action, Petitioner's expert there testified that:

> In this field, the word "server" generally refers to *a computer* that "serves" client devices through a network. It generally connotes to persons of skill in the art *a particularly powerful computer capable of storing lots of data and providing that data to many client devices.* Both now and at the time of the asserted patents, servers form the backbone of the Internet, in that servers store websites, enabling client devices to access those websites from anywhere in the world.

Ex. 2026 [Bims-Decl.] ¶ 24. Consequently, in my opinion, a switch would not be a "server" under Petitioner's own district court analysis.

POR, 59; EX-2019, ¶157; EX-2026, ¶24.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

The '946 Specification Does Not Suggest that PSTN Switch 31 is a Server

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

Server C controls the communication protocols in conjunction with the network switching box or other devices, such as CT/MD **502**. The multiple processors **506** allow for parallel and custom processing of each signal or data stream to achieve higher speed and better quality of output. This can also be done with a single processor that has the parallelism and pipeline capability built in for handling one or more data streams simultaneously. Processor **506** is the complete elec-

cation path. Server C **910** oversees the allocation of data to the different channels and keeps the process under control. In

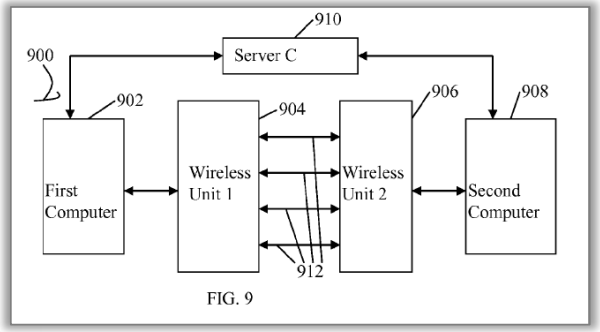
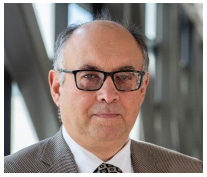


FIG. 9



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158. Nor does the '946's specification suggest or teach that switch 31 discloses the claimed "server." The remote server in the '946 provides a variety of services, including "control[ling] the communication protocols" (Ex. 1001 ['946] 4:49-51) and "oversee[ing] the allocation of data to the different channels and keep[ing] the process under control" (*id.*, 7:9-10). There is no indication that a "mechanical, electrical or electronic device which opens or closes circuits, completes or breaks an electrical path, or selects paths or circuits" (Ex. 2027 [Newton's-Telecom-Dictionary] 815) would be capable of providing these services.

POR, 59; EX-1001, 4:48-56, 7:9-10. Fig. 9; EX-2019, ¶158.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
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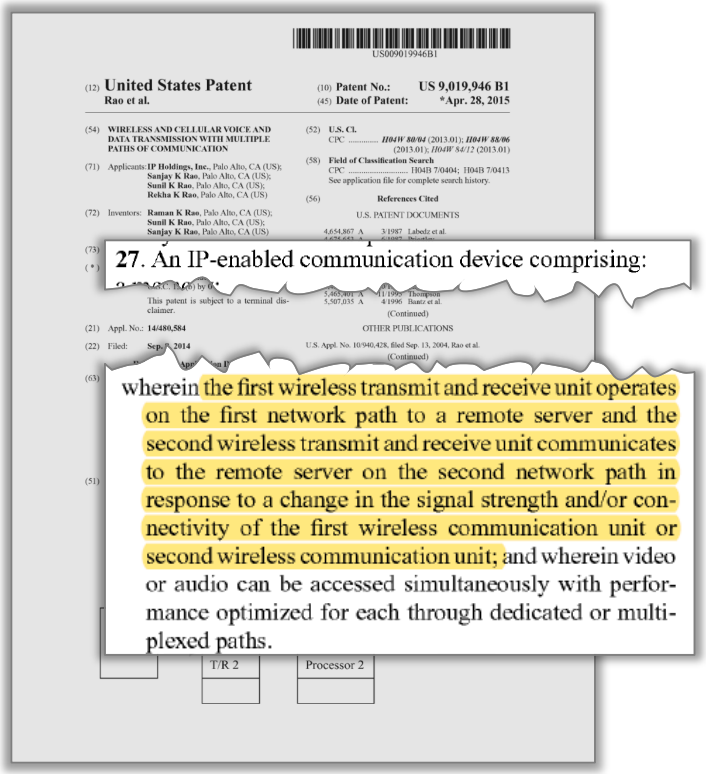
Yegoshin's Phone Does Not Communicate to Any Server In Response to a Change in Signal Strength or Connectivity



US009019946B1

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

(54) **WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION**

(71) Applicants: **IP Holdings, Inc.**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Rekha K Rao**, Palo Alto, CA (US)

(72) Inventors: **Raman K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US)

(52) **U.S. Cl.**
CPC *H04W 80/04* (2013.01); *H04W 88/06* (2013.01); *H04W 84/12* (2013.01)

(58) **Field of Classification Search**
CPC H04B 7/0404; H04B 7/0413
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,654,867 A 3/1987 Labedz et al.
5,465,401 A 11/1995 Thompson
5,507,035 A 4/1996 Bantz et al.
(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 10/940,428, filed Sep. 13, 2004, Rao et al.
(Continued)

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/480,584**

(22) Filed: **Sep. 8, 2014**

27. An IP-enabled communication device comprising:

wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit; and wherein video or audio can be accessed simultaneously with performance optimized for each through dedicated or multiplexed paths.

T/R 2 | Processor 2

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

27[h]

As described in 17[i], Yegoshin's first and second communication interfaces (***first and second wireless transmit and receive units***) in the phone communicate with the PSTN switch (***remote server***) on cellular and WLAN networks (***first and second network paths***). EX-1003, ¶249; EX-1004, 5:33-54, 5:66-7:25, 7:48-58, 8:47-56, 3:35-4:42.

Yegoshin's first/cellular and second/WLAN communication interfaces are selectively used depending on various criteria, such as the extent of service area, the location of a roaming device, a user's manual selection, automatic selection based on user's preferences, etc. EX-1003, ¶250; EX-1004, 3:4-15, 5:40-54, 6:12-14, 2:42-3:15, 8:15-9:12. It would have been obvious to a POSITA that Yegoshin's phone switches between cellular and WLAN connections as the phone moves between a cellular-only area and a WLAN area. *Id.*

Pet., 80-81

Pet., 80-81; POR, 61-62.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Yegoshin's Phone Does Not Communicate to Any Server In Response to a Change in Signal Strength or Connectivity

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

A client software suite **19** enables a user to select a type of network for communication, to select a protocol for voice communication, and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network. Client software **19** may be provided by a plug-in smart card, or may be pre-loaded into a suitable built-in memory provided and adapted for the purpose. A series of selection buttons such as **15** and **17** allow a user to switch modes from cellular to IP communication, and perhaps to switch from differing types of networks using known protocols that are made available via client software **19**. One such protocol is the recently-developed H323 IP protocol allowing different hardware-based devices to communicate with each other over separate networks. There may be more than 2 selection buttons such as buttons **15** and **17** without departing from the spirit and scope of the present invention. Alternatively, the program may be given a series of preferences by the user, and then may negotiate the best possible connection accordingly. It may use such protocols as DHCP etc. to set up IP addresses and so forth. Selection of the network could be according to an order of preference, by availability.

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168. Yegoshin was not directed to a means for improving signal quality or stability, but rather to means for reducing the cost of cell phone calls. Yegoshin states that individuals "roaming" away from their home or office on a visit to a site with a LAN might incur "costly cell charges," and that it "would be desirable then, to have a cell phone or equivalent device adaptable to a wireless or wired IP network at the location or site that a person may be visiting, and have incoming calls forwarded to the connected to the device." Ex-1004, 2:55-3:10. Accordingly, the phone may operate as a "normal cellular phone, and through additional circuitry and software" may operate on a wireless LAN. Ex-1004, 5:15-25. The phone includes software that "enables a user to select a type of network for communication," by selecting a physical button or "using known protocols that are made available via client software 19." Ex-1004, 5:33-43. Alternatively, "the program may be given a series of preferences by the user, and then may negotiate the best possible connection accordingly. . . . Selection of the network could be according to an order of preference, by availability." Ex-1004, 5:49-54.

POR, 62-63; EX-1004, 5:33-54; EX-2019, ¶168.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
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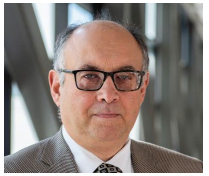
Dr. Jensen's Testimony that Yegoshin's Phone "Could be Switched" Does Not Show that the Phone "Switches"

DECLARATION OF DR. MICHAEL ALLEN JENSEN

250. Yegoshin's first/cellular and second/WLAN communication interfaces are configured to be selectively used depending on various criteria, such as the extent of service area, the location of a roaming device, a user's manual selection, automatic selection based on a series of user's preferences, etc. EX-1004, 3:4-15, 5:40-54, 6:12-14, 2:42-3:15, 8:15-9:12. For example, it would have been obvious to a POSITA that Yegoshin's cellular and WLAN connections could be switched when the phone moves out of WLAN coverage and into an area where the cellular system is only available, or when the phone moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available. *Id.*



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170. Petitioner states that "[i]t would have been obvious to a POSITA that Yegoshin's phone *switches* between cellular and WLAN connections as the phone moves between a cellular-only area and a WLAN area," Pet. 81, citing to paragraph 250 of Dr. Jensen's declaration. Dr. Jensen's declaration does not, however, support the statement that the phone "*switches*," but rather only that it passively "*could be switched*," such as by user input: "[i]t would have been obvious to a POSITA that Yegoshin's cellular and WLAN connections *could be switched* when the phone moves out of WLAN coverage and into an area where the cellular system is only available, or when the phone moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available." Pet. 81; Ex-1003, ¶250.

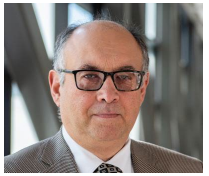
POR, 63; Sur-Reply, 10-11; EX-1003, ¶250; EX-2019, ¶170.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE
Smart Mobile Technologies LLC, Exhibit 2038
Page 129 of 141

Yegoshin's Phone Does Not Switch Between Cellular and WLAN Networks In Response to Any Criterion

DECLARATION OF DR. MICHAEL ALLEN JENSEN

250. Yegoshin's first/cellular and second/WLAN communication interfaces are configured to be selectively used depending on various criteria, such as the extent of service area, the location of a roaming device, a user's manual selection, automatic selection based on a series of user's preferences, etc. EX-1004, 3:4-15, 5:40-54, 6:12-14, 2:42-3:15, 8:15-9:12. For example, it would have been obvious to a POSITA that Yegoshin's cellular and WLAN connections could be switched when the phone moves out of WLAN coverage and into an area where the cellular system is only available, or when the phone moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available. *Id.*



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171. Regardless of whether Yegoshin's phone "could be switched" by a user when moving out of WLAN or cellular coverage, there is no disclosure in Yegoshin that the phone actively "switches" in response to any criterion. A POSITA would understand that the second wireless transmit and receive unit must be capable of communicating to the remote server on the second network path "in response to a change in the signal strength and/or connectivity of" the first or second wireless communication unit. Communicating to a remote server on the WLAN interface in response to manual user input—as in Yegoshin—would not satisfy the claimed requirement that the communication be "in response to a change in the signal strength and/or connectivity of" the first or second wireless communication unit.

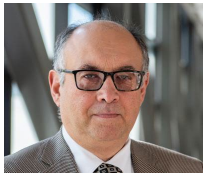
POR, 63; Sur-Reply, 10-11; EX-1003, ¶250; EX-2019, ¶171.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Yegoshin's Phone Does Not Switch Between Cellular and WLAN Networks In Response to Any Criterion

DECLARATION OF DR. MICHAEL ALLEN JENSEN

250. Yegoshin's first/cellular and second/WLAN communication interfaces are configured to be selectively used depending on various criteria, such as the extent of service area, the location of a roaming device, a user's manual selection, automatic selection based on a series of user's preferences, etc. EX-1004, 3:4-15, 5:40-54, 6:12-14, 2:42-3:15, 8:15-9:12. For example, it would have been obvious to a POSITA that Yegoshin's cellular and WLAN connections could be switched when the phone moves out of WLAN coverage and into an area where the cellular system is only available, or when the phone moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available. *Id.*



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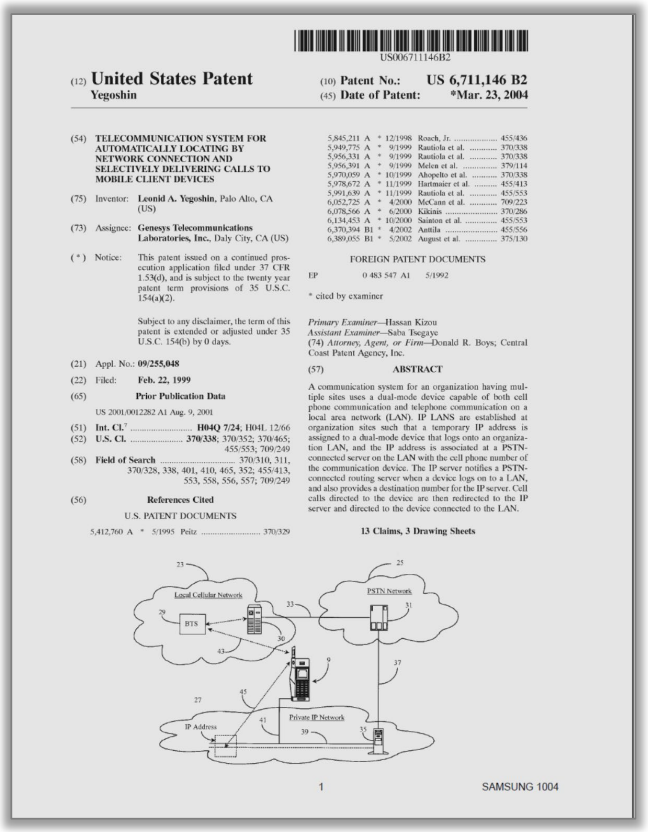
172. This distinction is further illustrated by considering what would happen in the hypothetical provided by Dr. Jensen, where "the phone moves out of WLAN coverage and into an area where the cellular system is only available, or when the phone moves from an area where only cellular service is available into an area where the more inexpensive WLAN coverage is available." If this scenario occurred during an active call, what would happen is that the call would be terminated, either involuntarily (in the first case) or by manual input by the user (in the second case). While the user might then decide to manually switch the phone to a different network in order to attempt to reconnect, communicating in response to user input is not what the claim recites.

POR, 63; Sur-Reply, 10-11; EX-1003, ¶250; EX-2019, ¶172.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Yegoshin's Phone Does Not "Switch" In Response to a Change in Signal Strength or Connectivity



US006711146B2

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

(54) **TELECOMMUNICATION SYSTEM FOR AUTOMATICALLY LOCATING BY NETWORK CONNECTION AND SELECTIVELY DELIVERING CALLS TO MOBILE CLIENT DEVICES**

(75) Inventor: **Leonid A. Yegoshin**, Palo Alto, CA (US)

(73) Assignee: **Genesys Telecommunications Laboratories, Inc.**, Daly City, CA (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/255,048**

(22) Filed: **Feb. 22, 1999**

(65) **Prior Publication Data**

US 2001/0012282 A1 Aug. 9, 2001

(51) **Int. Cl.**[7] **H04Q 7/24**; H04L 12/66

(52) **U.S. Cl.** **370/338**; 370/352; 370/465; 455/553; 709/249

(58) **Field of Search** 370/310, 311, 370/328, 338, 401, 410, 465, 352; 455/413, 553, 558, 556, 557; 709/249

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,412,760	A *	5/1995	Peitz	370/329
5,845,211	A *	12/1998	Roach, Jr.	455/436
5,949,775	A *	9/1999	Rautiola et al.	370/338
5,956,331	A *	9/1999	Rautiola et al.	370/338
5,956,391	A *	9/1999	Melen et al.	379/114
5,970,059	A *	10/1999	Ahopelto et al.	370/338
5,978,672	A *	11/1999	Hartmaier et al.	455/413
5,991,639	A *	11/1999	Rautiola et al.	455/553
6,052,725	A *	4/2000	McCann et al.	709/223
6,078,566	A *	6/2000	Kikinis	370/286
6,134,453	A *	10/2000	Sainton et al.	455/553
6,370,394	B1 *	4/2002	Anttila	455/556
6,389,055	B1 *	5/2002	August et al.	375/130

FOREIGN PATENT DOCUMENTS

EP 0 483 547 A1 5/1992

* cited by examiner

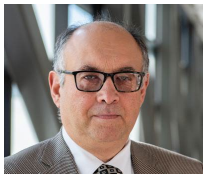
Primary Examiner—Hassan Kizou
Assistant Examiner—Sabu Tsegaye
(74) *Attorney, Agent, or Firm*—Donald R. Boys; Central Coast Patent Agency, Inc.

(57) **ABSTRACT**

A communication system for an organization having multiple sites uses a dual-mode device capable of both cell phone communication and telephone communication on a local area network (LAN). IP LANS are established at organization sites such that a temporary IP address is assigned to a dual-mode device that logs onto an organization LAN, and the IP address is associated at a PSTN-connected server on the LAN with the cell phone number of the communication device. The IP server notifies a PSTN-connected routing server when a device logs on to a LAN, and also provides a destination number for the IP server. Cell calls directed to the device are then redirected to the IP server and directed to the device connected to the LAN.

13 Claims, 3 Drawing Sheets

1 SAMSUNG 1004



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173. In addition, even if Yegoshin described an active "switching" functionality (which it does not), the criteria cited in Yegoshin for "selecting" an interface do not include a change in signal strength or connectivity. Yegoshin does not teach selecting an interface (cellular or WAN) in response to a change in signal strength or connectivity, or anything else other than a user input or setting.

POR, 63-64; Sur-Reply, 10-11; EX-2019, ¶173.

The Reply's Examples Do Not Disclose Yegoshin's Phone Communicating to Any Server In Response to a Change in Signal Strength or Connectivity

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

Typically, such individuals would carry cellular telephones or equivalent devices for communication with, for example, callers from a home office, or other business calls. Depending on where such an individual lives or works, he or she may be required to extend the mobile communication range of a cellular device. This is termed roaming in the art. If the organization is significantly large or distributed over a large geographic region, he may have to roam over more than one service area. The cost of communication on a cellular phone increases has he roams further from a primary service area.

Often individuals use telephones designated to resident individuals or workers at a visited location to avoid costly cell charges. However, such resident individuals may be inconvenienced by having to take calls for the visitors. If calls are many, the resident individuals duties may be interrupted. It would be desirable then, to have a cell phone or equivalent device adaptable to a wireless or wired IP network at the location or site that a person may be visiting, and have incoming calls forwarded to the connected to the device. Such a telephone device and a system cooperating with the device, could enable substantial cost savings for the sponsoring organization.

What is clearly needed is a method and apparatus that would allow a visitor to an IP LAN-connected site to plug in or otherwise connect his or her mobile telephone device to the local IP LAN, so that calls coming from any source network may be routed to the user's device on the LAN.

Where is the "switching?" Just discloses that calls may be routed to the user's device on a LAN.

Describes the process of initially connecting the phone to a LAN. **No** disclosure that the phone "switches" from operating over cellular to communicating over WLAN in response to any criteria.

A client software suite **19** enables a user to select a type of network for communication, to select a protocol for voice communication, and to set-up a temporary IP address on a network for the purpose of identifying and registering the device for normal operation on the network. Client software **19** may be provided by a plug-in smart card, or may be pre-loaded into a suitable built-in memory provided and adapted for the purpose. A series of selection buttons such as **15** and **17** allow a user to switch modes from cellular to IP communication, and perhaps to switch from differing types of networks using known protocols that are made available via client software **19**. One such protocol is the recently-developed H323 IP protocol allowing different hardware-based devices to communicate with each other over separate networks. There may be more than 2 selection buttons such as buttons **15** and **17** without departing from the spirit and scope of the present invention. Alternatively, the program may be given a series of preferences by the user, and then may negotiate the best possible connection accordingly. It may use such protocols as DHCP etc. to set up IP addresses and so forth. Selection of the network could be according to an order of preference, by availability.

Sur-Reply, 10; EX-1004, 2:53-3:16, 5:33-54.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Smart Mobile Technologies LLC, Exhibit 2038
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Bernard Does Not Disclose the Missing "Switching" Functionality

United States Patent [19] [11] **Patent Number: 5,497,339**
Bernard [45] **Date of Patent: Mar. 5, 1996**

The telephone server **730** can be used to process incoming and outgoing phone calls using either the cellular telephone interface **720** or the land phone interface **724**, depending on which type of telephone interface has been previously selected. The telephone server **730** provides various functions to the applications **702,704,706**, such as allowing for the selection of a type of telephone interface for subsequent operations, dialing a telephone number, answering a call, terminating a phone connection, determining the current signal strength, redialing the last dialed number, setting the volume level for an attached earphone, setting a volume level for the ringer of the selected telephone **126**, **708**, sending tones from the selected telephone **126**, **708**, determining the air time that has been consumed, determining the battery level of the communication device **100B**, determining the current roam state, and determining the current service state.

The cellular telephone interface **720** can be used for incoming and outgoing cellular phone calls. The cellular telephone interface **720** can also be used in conjunction with the phone modem interface **722** to send and receive data over a cellular link. The cellular telephone interface **720** provides functions such as determining whether a cellular telephone **126** is attached to the communication device **100B**, dialing a telephone number, answering a call, terminating a phone connection, determining the current signal strength, redialing the last dialed number, setting the volume level for an attached earphone, setting a volume level for the ringer of the cellular telephone **126**, sending tones from the cellular telephone **126**, determining the air time that has been consumed, determining the battery level of the communication device **100B**, determining the current roam state, determining the current service state.

Why? Bernard doesn't say

The packet data server **738** can be used to send and receive data using the packet radio interface **726**. The packet data server **738** also provides functions such as determining whether a packet radio **124** is attached to the communication device **100B**, powering on or off the packet radio **124**, causing the packet radio **124** to execute a cold start, determining and setting the operating mode of the packet radio **124**, determining the number of packets waiting to be read or transmitted, determining the signal strength, determining status results regarding the data packet link or regarding a specific transmission or reception, setting a channel for transmission or reception, and setting the packet radio **124** to automatically receive data packets.

The land phone interface **724** is primarily used in conjunction with the phone modem interface **722** to send and receive data, and for voice calls. The land phone interface **724** also provides functions such as determining whether a land phone **708** is attached to the communication device **100B**, dialing a telephone number, answering a call, terminating a phone connection, determining the current signal strength, redialing the last dialed number, setting the volume level for an attached earphone, setting a volume level for the ringer of the land phone **708**, sending tones from the land phone **708**, determining the air time that has been consumed, and determining the battery level of the communication device **100B**.

POR, 64; EX-1007, 21:55-22:4, 29-42, 56-23:4, 18-30; EX-2019, ¶174.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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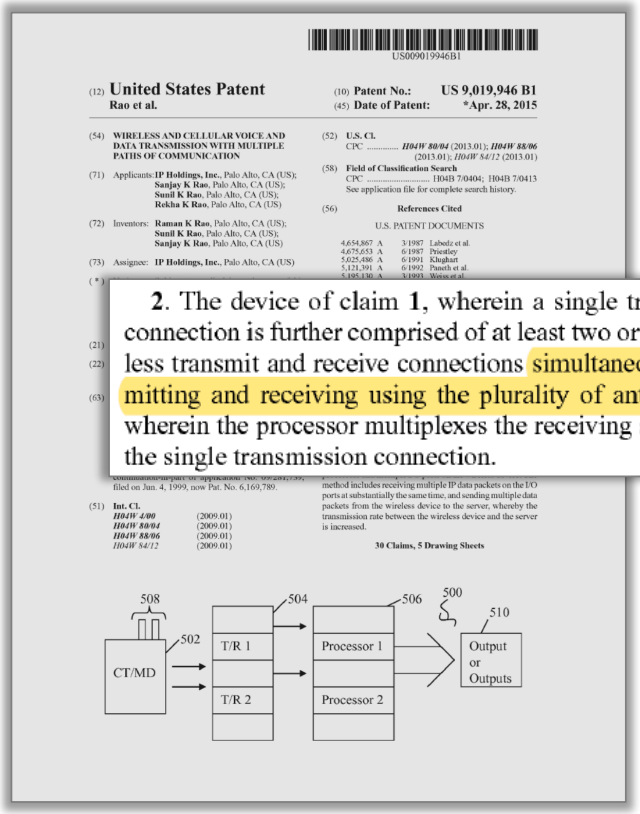
Claim 2



US009019946B1

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

(54) **WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION**

(71) Applicants: **IP Holdings, Inc.**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Rekha K Rao**, Palo Alto, CA (US)

(72) Inventors: **Raman K Rao**, Palo Alto, CA (US); **Sunil K Rao**, Palo Alto, CA (US); **Sanjay K Rao**, Palo Alto, CA (US)

(73) Assignee: **IP Holdings, Inc.**, Palo Alto, CA (US)

(52) **U.S. Cl.**
CPC *H04W 80/04* (2013.01); *H04W 88/06* (2013.01); *H04W 84/12* (2013.01)

(58) **Field of Classification Search**
CPC H04B 7/0404; H04B 7/0413
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,654,867 A 3/1987 Labedz et al.
4,675,653 A 6/1987 Priestley
5,025,486 A 6/1991 Klughart
5,121,391 A 6/1992 Paneth et al.
5,195,130 A 3/1993 Weiss et al.

filed on Jun. 4, 1999, now Pat. No. 6,169,789.

(51) **Int. Cl.**
H04W 4/00 (2009.01)
H04W 80/04 (2009.01)
H04W 88/06 (2009.01)
H04W 84/12 (2009.01)

method includes receiving multiple IP data packets on the I/O ports at substantially the same time, and sending multiple data packets from the wireless device to the server, whereby the transmission rate between the wireless device and the server is increased.

30 Claims, 5 Drawing Sheets

2. The device of claim **1**, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections simultaneously transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,019,946 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Claim 2

As described in 1[i], the combination modifies or implements Yegoshin's phone to use a single interface (e.g., serial interface 701) (***single transmission connection***) to couple to multiple wireless networks, such as cellular and WLAN. EX-1003, ¶150; EX-1007, 17:40-51, 19:31-46, 20:17-58, 21:9-15, 23:60-24:1, 24:19-25:25, 27:3-46. As also described in 1[i], Yegoshin's cellular and WLAN connections can be used to transmit/receive signals for calls over respective paths simultaneously. EX-1004, 5:55-65. Therefore, the single interface in the combination would enable both cellular and WLAN communications simultaneously, thereby rendering obvious the ***single transmission connection comprised of at least two wireless transmit and receive connections for simultaneous data transmission and reception***. EX-1003, ¶150.

Pet., 46-47; POR, 65; EX-1001, cl. 2.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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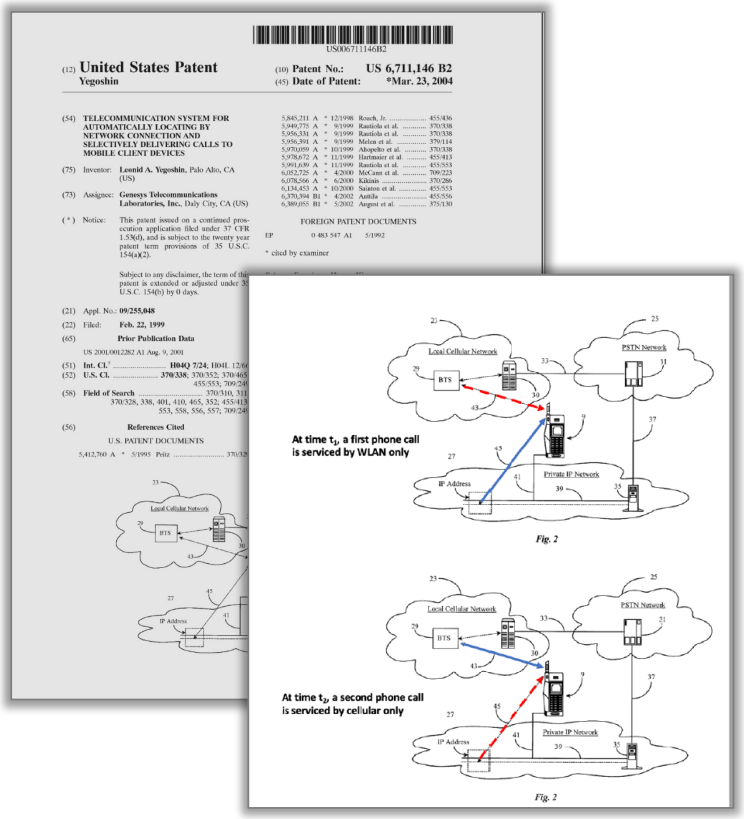
Petitioner Fails to Show that Yegoshin's Phone Simultaneously Transmits and Receives Calls



US006711146B2

(12) **United States Patent**
Yegoshin

(10) **Patent No.: US 6,711,146 B2**
(45) **Date of Patent: *Mar. 23, 2004**

(54) **TELECOMMUNICATION SYSTEM FOR AUTOMATICALLY LOCATING BY NETWORK CONNECTION AND SELECTIVELY DELIVERING CALLS TO MOBILE CLIENT DEVICES**

(75) Inventor: **Leonid A. Yegoshin**, Palo Alto, CA (US)

(73) Assignee: **Genesys Telecommunications Laboratories, Inc.**, Daly City, CA (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/255,048**

(22) Filed: **Feb. 22, 1999**

(65) **Prior Publication Data**

US 2001/0012282 A1 Aug. 9, 2001

(51) **Int. Cl.**[7] **H04Q 7/24**; H04L 12/66

(52) **U.S. Cl.** **370/338**; 370/352; 370/465; 455/553; 709/245

(58) **Field of Search** 370/310, 328, 338, 401, 410, 465, 352; 455/413, 553, 558, 556, 557; 709/245

(56) **References Cited**

U.S. PATENT DOCUMENTS

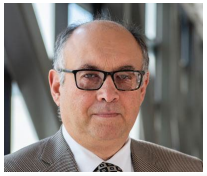
5,412,760 A * 5/1995 Peitz 370/329

5,845,211 A * 12/1998 Roach, Jr. 455/436
5,940,775 A * 8/1999 Rautiola et al. 370/338
5,956,331 A * 9/1999 Rautiola et al. 370/338
5,956,391 A * 9/1999 Melen et al. 379/114
5,970,059 A * 10/1999 Ahopelto et al. 370/338
5,978,672 A * 11/1999 Hartmaier et al. 455/413
5,991,639 A * 11/1999 Rautiola et al. 455/553
6,052,725 A * 4/2000 McCann et al. 709/223
6,078,566 A * 6/2000 Kikinis 370/286
6,134,453 A * 10/2000 Sainton et al. 455/553
6,370,394 B1 * 4/2002 Autila 455/556
6,389,055 B1 * 5/2002 August et al. 375/130

FOREIGN PATENT DOCUMENTS

EP 0 483 547 A1 5/1992

* cited by examiner



Todor Cooklev, PhD.

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  ECE 428 Communication Systems
  ECE 549 Software-Defined Radio
  ECE 543 Wireless Communications and Networks

176. Petitioner again relies on Yegoshin's alleged teaching of "transmit[ting]/receiv[ing] signals for calls over respective paths simultaneously":

> As also described in 1[i], Yegoshin's cellular and WLAN connections can be used to transmit/receive signals for calls over respective paths simultaneously. EX-1004, 5:55-65. Therefore, the single interface in the combination would enable both cellular and WLAN communications simultaneously, thereby rendering obvious the ***single transmission connection comprised of at least two wireless transmit and receive connections for simultaneous data transmission and reception***. EX-1003, ¶150.

Pet., 47. As I previously explained, however, Yegoshin's disclosures do not describe "simultaneously" receiving calls via cellular and WLAN, but rather describe diverting the second call to "call-waiting" or sending a busy signal.

177. Thus, in my opinion, Petitioner and Dr. Jensen fail to prove that its combination renders obvious a "single transmission connection comprised of at least two wireless transmit and receive connections for ***simultaneous*** data transmission and reception."

POR, 65; EX-2019, ¶¶176-177.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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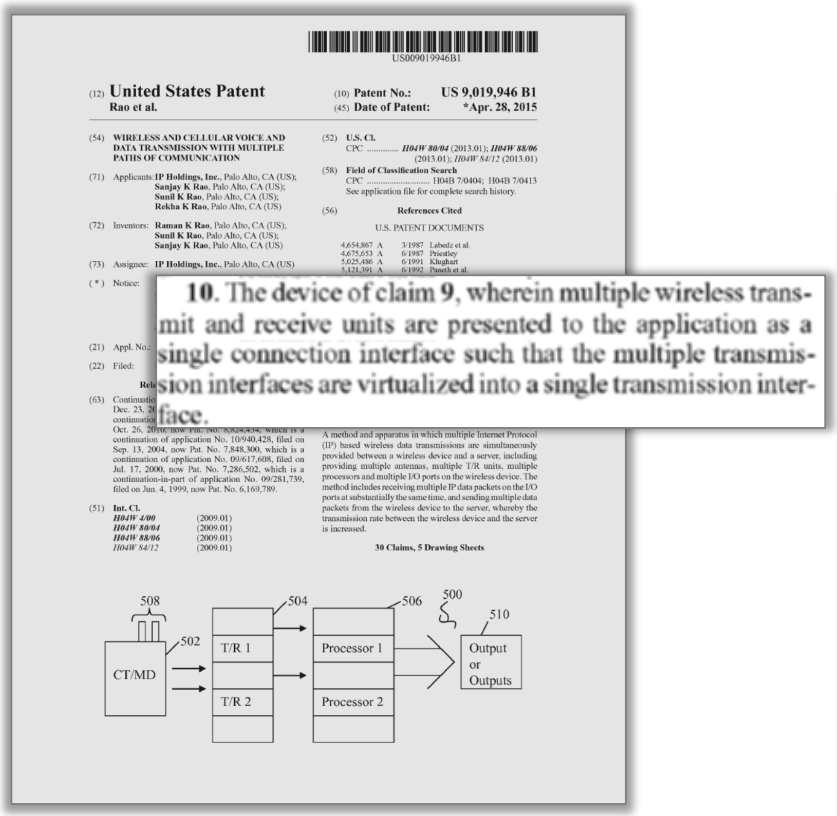
Claim 10



US009019946B1

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,019,946 B1**
(45) **Date of Patent: *Apr. 28, 2015**

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(73) Assignee: **IP Holdings, Inc.**, Palo Alto, CA (US)

(*) Notice:

(21) Appl. No.:

(22) Filed:

(63) Continuation

(51) **Int. Cl.**
H04W 4/00 (2009.01)
H04W 80/04 (2009.01)
H04W 88/06 (2009.01)
H04W 84/12 (2009.01)

(52) **U.S. Cl.**
CPC ***H04W 80/04*** (2013.01); ***H04W 88/06*** (2013.01); ***H04W 84/12*** (2013.01)

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See application file for complete search history.

(56) **References Cited**

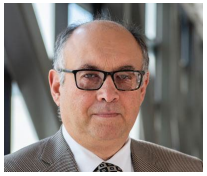
U.S. PATENT DOCUMENTS

4,654,867 A 3/1987 Labarre et al.
4,675,653 A 6/1987 Priestley
5,025,486 A 6/1991 Klughart
5,121,391 A 6/1992 Paneth et al.

10. The device of claim **9**, wherein multiple wireless transmit and receive units are presented to the application as a single connection interface such that the multiple transmission interfaces are virtualized into a single transmission interface.

A method and apparatus in which multiple Internet Protocol (IP) based wireless data transmissions are simultaneously provided between a wireless device and a server, including providing multiple antennas, multiple T/R units, multiple processors and multiple I/O ports on the wireless device. The method includes receiving multiple IP data packets on the I/O ports at substantially the same time, and sending multiple data packets from the wireless device to the server, whereby the transmission rate between the wireless device and the server is increased.

30 Claims, 5 Drawing Sheets



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  ECE 543 Wireless Communications and Networks

179. Claim 10 of the '946 Patent is materially identical, apart from its dependency from claim 9, to claim 10 of U.S. Patent No. 8,842,653 ("the '653 Patent.") Ex-2034 ['653 patent]. The Board found in its Institution Decision in IPR2022-1248, involving the '653 Patent, that "Petitioner's showing on claim 10 would ***not*** have been sufficient to establish a reasonable likelihood that Petitioner will prove this claim unpatentable" because "Petitioner argues that the cellular and WLAN interfaces would [be] virtualized into a single transmission interface 'from the perspective of the phone,' but does not explain how that relates to an 'application,' or even identify an application." Ex-2022, 33-34. In my opinion, the Board is correct.

180. I do not see any identification of an "application," let alone one that is presented with a "multiple wireless transmit and receive components … as a single connection interface." Pet., 52-53.

181. Thus, in my opinion, Petitioner's argument is facially deficient and fails to prove that claim 10 is disclosed or rendered obvious.

POR, 65-66; EX-1001, cl. 10; EX-2019, ¶¶179-181.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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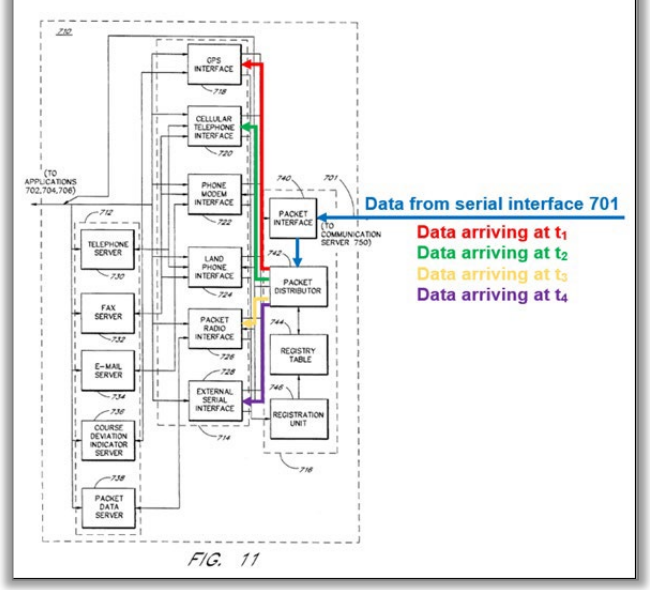
Bernard's Connection Circuits Are Not Presented to an Application as a Single Connection Interface

United States Patent [19] | [11] **Patent Number:** **5,497,339**
Bernard | [45] **Date of Patent:** **Mar. 5, 1996**



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DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

SKIERMONT DERBY LLP
Dallas Los Angeles

GRAVES & SHAW LLP

PATENT OWNER'S DEMONSTRATIVE EXHIBITS

OCTOBER 24, 2023

ORAL ARGUMENT

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC., and APPLE INC.

v.

SMART MOBILE TECHNOLOGIES LLC

U.S. PATENT NO. 9,019,946 B1

IPR2022-01249

PHILIP J. GRAVES, COUNSEL FOR PATENT OWNER