IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Request for *Ex Parte* Reexamination of:	)	Group Art Unit: Not Yet Assigned
U.S. Patent No. 7,834,586	)	Examiner: Not Yet Assigned
Inventor: Fischer, *et al.*	)	Customer No. 34313
Assignee: Fundamental Innovation Systems International LLC	)	Confirmation No.: Not Yet Assigned
Filed: February 26, 2010	)	
Issued: November 16, 2010	)	
For: **MULTIFUNCTIONAL CHARGER SYSTEM AND METHOD**	)	

REQUEST FOR *EX PARTE* REEXAMINATION OF UNITED STATES PATENT NO. 7,834,586

EFS Web
Commissioner for Patents

Dear Sir:

Pursuant to 35 U.S.C. §§ 302 *et seq.* and 37 C.F.R. § 1.510, Requestors hereby request *ex parte* reexamination of United States Patent No. 7,834,586 (the "'586 Patent"). The undersigned is counsel of record and represents that he is authorized to act in a representative capacity for Requestors under 37 C.F.R. § 1.34.

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TABLE OF EXHIBITS

List of Exhibits

The Exhibits to the present Request are arranged in four groups: prior art ("PA"), relevant patent prosecution file history (including patents) ("PAT"), claim charts ("CC"), and other documents ("OTH").

A. PRIOR ART (PA)

PA-SB/08A	USPTO Form SB/08A
PA-A	U.S. Patent No. 6,904,488 ("Matsumoto")
PA-B	China Patent No. CN2410806Y ("Yang") and Certified Translation
PA-C	U.S. Patent No. 7,766,698 ("De Iuliis")
PA-D	U.S. Patent Application Publication No. 2003/0135766 ("Zyskowski")
PA-E	U.S. Patent No. 6,531,845 ("Kerai")
PA-F	U.S. Patent No. 6,625,790 ("Casebolt")
PA-G	U.S. Patent No. 6,357,011 ("Gilbert")
PA-H	U.S. Provisional Application No. 60/345,252 ("De Iuliis Provisional")
PA-I	Universal Serial Bus Specification 2.0
PA-J	U.S. Patent No. 6,184,652 ("Yang '652")
PA-K	USB Serial Bus Specification 1.1

B. RELEVANT PATENT MATERIALS (PAT)

PAT-A	U.S. Patent No. 7,834,586 ("'586 Patent")
PAT-B	File History for the '586 Patent
PAT-C	U.S. Provisional Patent Application No. 60/273,021 ("'021 Provisional")
PAT-D	U.S. Provisional Patent Application No. 60/330,486 ("'486 Provisional")

C. CLAIM CHARTS (CC)

CC-A	Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Matsumoto.

CC-B Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Matsumoto in view of Yang.

CC-C Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Matsumoto in view of De Iuliis.

CC-D Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Kerai in view of Zyskowski.

CC-E Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Kerai in view of Casebolt.

CC-F Claim Chart demonstrating a substantial new question of patentability for Claims 1 and 8 based on Kerai in view of Gilbert.

D. OTHER DOCUMENTS (OTH)

OTH-A Declaration of Jacob Baker, Ph. D.

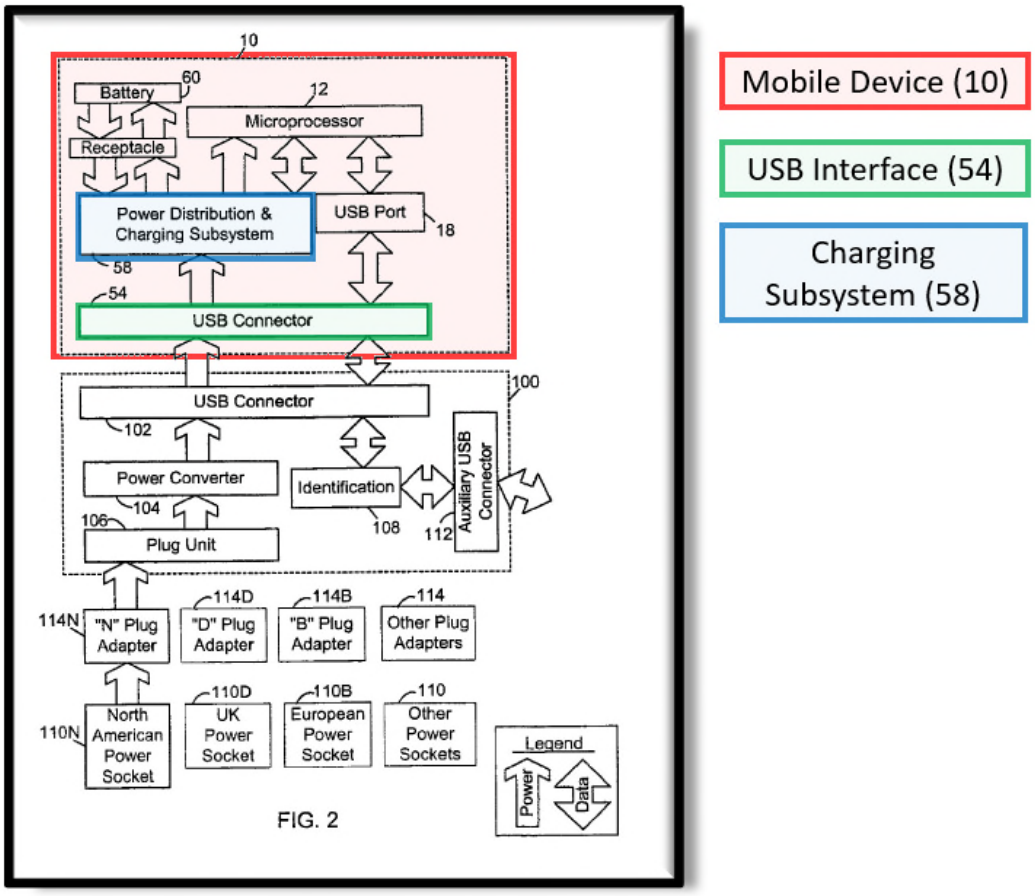
OTH-B *Fundamental Innovation Systems International LLC v. LG Electronics, Inc., et al.*, Case No. 2:16-cv-01425 (E.D. Texas), Dkt. No. 123 (Plaintiff FISI's Opening Claim Construction Brief).

OTH-C *Fundamental Innovation Systems International LLC v. LG Electronics, Inc., et al.*, Case No. 2:16-cv-01425 (E.D. Texas), Dkt. No. 146 (Claim Construction Memorandum and Order).

OTH-D *Fundamental Innovation Systems International, LLC v. Samsung Electronics Co., Ltd., et al.*, Case No. 2:17-cv -00145 (E.D. Tex.) at Dkt. No. 140 (Claim Construction Order)

I. INTRODUCTION

Requestor seeks reexamination of Claims 1 and 8 of the '586 Patent (the "Challenged Claims"). The Challenged Claims are directed to a "mobile device" that can draw power through a USB connection in order to charge the mobile device's battery. Ex. PAT-A ('586 Patent) at Claims 1 and 8. To this end, the mobile device comprises a "charging subsystem" that is operably connected between the USB interface and the battery. The charging subsystem draws power from the USB interface (and specifically the VBUS line) and uses the power to charge the battery. Figure 2 of the '586 Patent, reproduced below, illustrates the claimed structural components of the mobile device:

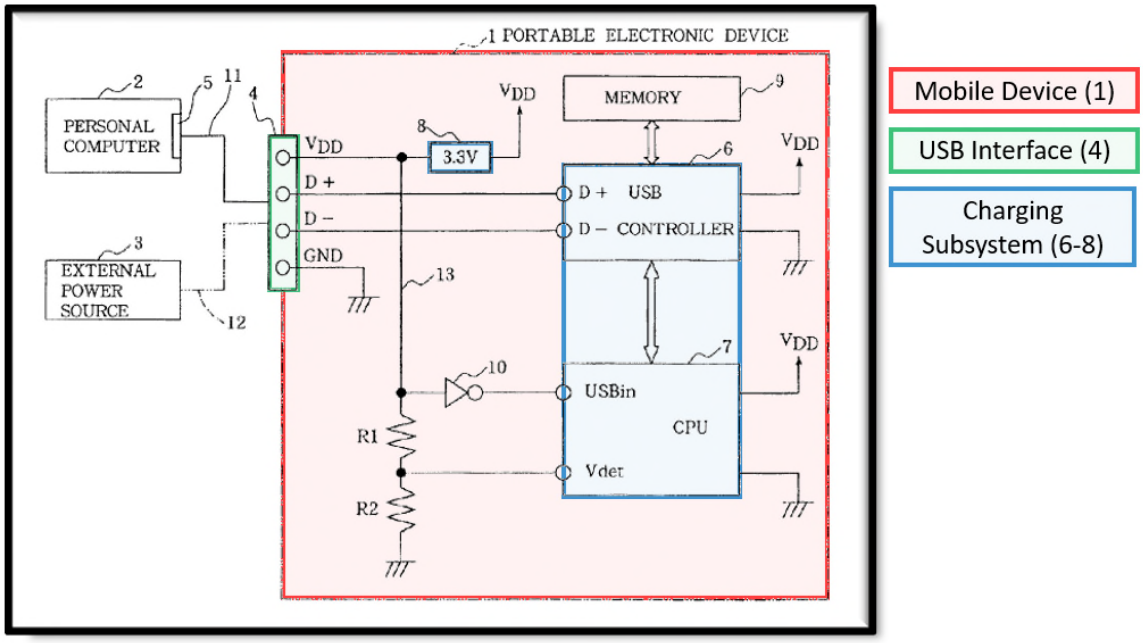


'586 Patent at Figure 2 (annotated).

In addition to these structural limitations described above, the Challenged Claims require that the mobile device be "configured to detect an identification signal at a D+ and D- data line of the USB interface, the identification signal being different than USB enumeration." *Id.*, Claims 1 and 8. Patentee has admitted in parallel litigation that the term "identification signal" simply means a "signal that identifies a power source type."

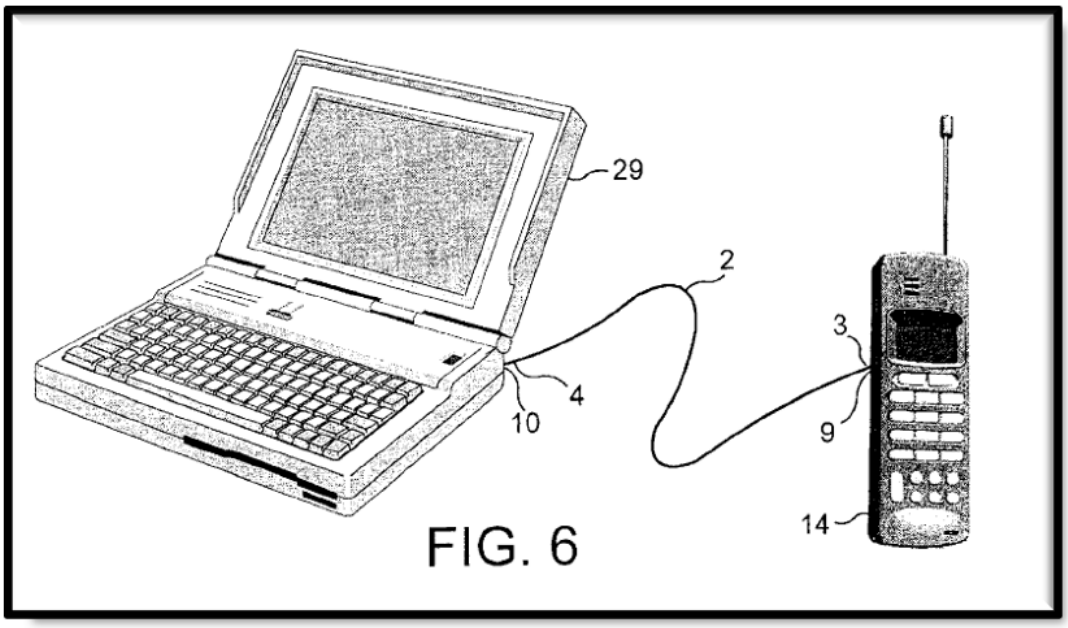
There is no dispute that the structural components of the claimed "mobile device" (*i.e.*, a USB interface, a charging subsystem, and a battery) were well-known and widely disclosed in the prior art. Indeed, one of the touted benefits of the USB standard was that USB connectors were capable of exchanging both data and power across a USB connection so that USB devices are able to use said power. Accordingly, most prior art USB devices with rechargeable batteries included the claimed structural components.

U.S. Patent No. 6,904,488 (Matsumoto), for example, discloses a system and method for implementing "portable electronic devices" (mobile devices) with rechargeable batteries. Matsumoto discloses that the mobile devices can be connected (through a USB interface) to either (1) a computer or (2) an external power source (*e.g.*, a wall adapter) for purposes of charging the device. Ex. PA-A (Matsumoto), Abstract. To this end, Matsumoto discloses that the mobile devices comprise, among other things, a USB port, a battery, and a charging subsystem:

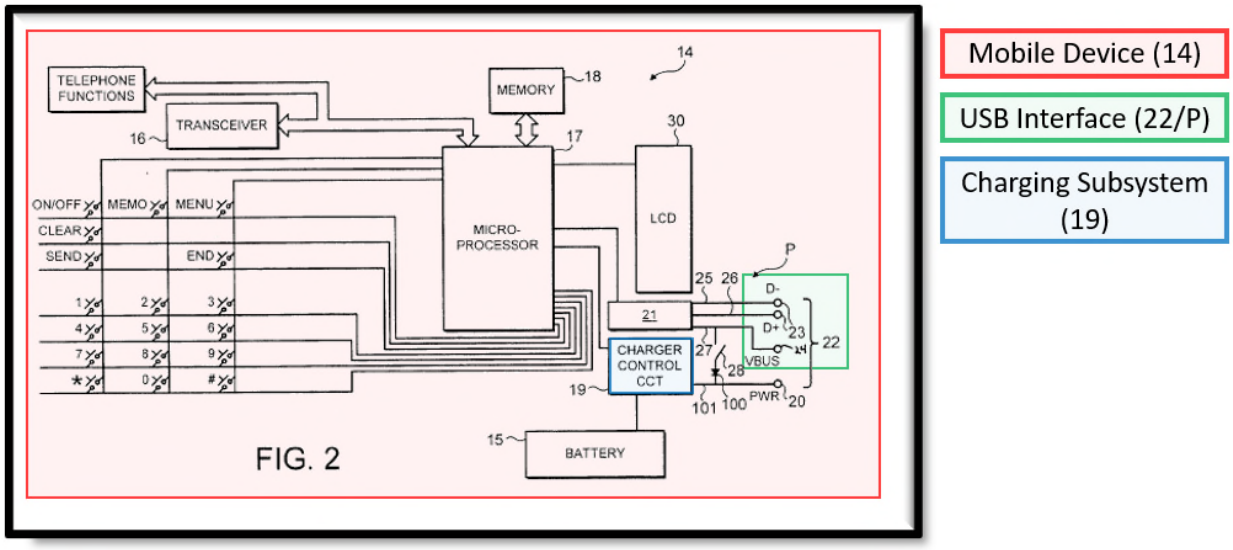


Id., Figure 1 (annotated); *id.* at 4:44-45 ("CPU 7 controls charging of the *built-in secondary cell [Battery](not shown)* . . . .") (emphasis added); *id*, Abstract ("A portable electronic device according to the invention comprises a USB connector 4, a USB controller 6 . . ., and a main CPU 7 . . . . , and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."); *id.* at 3:61-64 ("The power source voltage obtained from power source terminal V_{DD} [V_{BUS}] of the USB connector 4 is adjsuted to 3.3V by a voltage regulator and then supplied to the USB controller 6 and the main CPU 7).

U.S. Patent No. 6,351,845 ("Kerai") similarly discloses systems and methods for charging mobile devices (such as mobile phones) from a laptop computer using a USB connection and a "charging circuit." Ex. PA-E (Kerai) at Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device."). Kerai discloses that the mobile phone comprises a USB interface, a rechargeable battery, and a charging subsystem (comprising at least the charging circuit) connecting the two.



Kerai, Figure 6 (showing mobile device (14) connected to computer (29)).



Kerai, Figure 2 (annotated) (showing mobile device (14) comprising, among other things, USB interface (22) and charging control circuit (19)). Accordingly, all of the structural limitations of the Challenged Claims were well-known and disclosed in at least these references.

There is also no genuine dispute that functional limitation of the Challenged Claims (detecting an identification signal on the data lines that is different from enumeration) was also well known in the prior art. Indeed, the limitation doesn't require anything more than

"detecting" an identification signal (whether that signal is used for any specific purpose or not). Accordingly, any prior art prior art USB device would meet this limitation because the USB standard requires that such device detect signals on the data lines (even if the device doesn't know how to use the signal).

Moreover, as disclosed herein, numerous references disclose detecting and using such signals for various purposes, including, *e.g.*, (1) detecting an identification signal to determine whether the power source is a wall-adapter or a computer (*see* Matsumoto); (2) detecting an identification signal to determine whether the power source is a computer's primary power source or standby power source (*see* Zyskowski); (3) detecting an identification signal to determine whether the power source is a USB port or PS/2 port (connected through a USB adapter) (*see* Casebolt); or (4) detecting an identification signal to determine whether the power source is the devices battery or the USB connection to a computer (*see* Gilbert).

As noted above, for example, Matsumoto discloses a system and method for implementing "portable electronic devices" (mobile devices) that can be charged through a USB port by connecting the device to either (1) a computer or (2) a wall adapter. Matsumoto, Abstract. Like the '586 Patent, Matsumoto further teaches using an identification signal to distinguish between the two power sources. Specifically, Matsumoto teaches that the mobile device should be able to use "discriminating means" to determine whether it is connected to the adapter (which does not require enumeration) or to the computer (which does require enumeration). *Id.*, at 2:58-59 ("The discriminating means identifies the source of supply of power . . . ."). As described in Matsumoto, the "discriminating means" may be a data condition on the USB data lines (*i.e.*, D+ and D-) that is different from the typical USB enumeration process. *Id.*, 2:60-63 and 3:2-12 ("if data communication [enumeration] has not been started . . . the external power source is found to be the supply source."). Moreover, CN2410806Y (Yang)

and U.S. Patent No. 7,766,698 (De Iuliis) each discloses an adapter that provides a different identification signal and that can be used with the USB devices of Matsumoto. Yang, for example, teaches a USB phone charger that pulls each of the USB data lines high when connected to the mobile phone, which results in a high/high or "SE1" signal on the data lines. Ex. PA-B (Yang), Figure 2. This is different from USB enumeration and indicates that the power source is a wall adapter (not a computer). Similarly, De Iuliis discloses a wall adapter that maintains an SE0 signal (low/low signal) on the data lines for an extended period of time even after it has been connected to the mobile device. Ex. PA-C (De Iuliis) at 6:31-34 (charger uses "dummy lines" that do not apply any voltage). This extended SE0 signal is also different from enumeration and also indicates to the mobile device that power is being supplied from a wall adapter (instead of a computer). Accordingly, a person of ordinary skill in the art would have understood that Matsumoto (Ground 1), Matsumoto in view of Yang (Ground 2), or Matsumoto in view of De Iuliis (Ground 3) discloses and renders obvious the claimed mobile device.

Kerai combined with each of Zyskowski (Ground 4), Casebolt (Ground 5), and Gilbert (Ground 6) also renders the Challenged Claims obvious. Each of Zyskowski, Casebolt, and Gilbert (1) teaches improvements to a system like Kerai (i.e., a portable USB device (mobile device) connected to a computer), and (2) teaches that, as part of that improvement, the mobile device should be configured to detect an identification signal that is different from enumeration.

Zyskowski, for example, teaches an improvement that allows the laptop computer of Kerai to charge the mobile device even when it is in a "reduced power" (sleep) mode. Specifically, Zyskowksi teaches that the laptop may power devices from a primary power source (when the computer is active) or from a standby power source (when the comptuer is a "reduced-power" or sleep mode). Zyskowski, ¶ 0006 ("The host may have two sources of power for components, a primary power source and a standby power source."); *id.*, ¶ 0005 ("In some

environments the host device may enter a reduced power state in which the host consumes less power than in a fully-powered stated. In this low power state, power consumption by certain components of the computer system may be curtailed in order to reduce overall power consumption."). Zyskowksi further teaches that the mobile USB device connected to the computer may monitor the data lines of the USB connection for a signal that identifies whether the mobile device is charging from the primary power source or the standby power source. *Id.*, ¶ 0019 ("device 106 may detect that the host 104 is in a reduced power state by monitoring the state of one or both of the data paths D1 and D2."). For example, the host computer may send (and the USB device may detect) a high/high (SE1) signal when the host computer transitions from an inactive state to an active state (*i.e.*, from standby power to primary power). *Id.* ("When the host 104 is in a full power state, data lines D1 and D2 may be raised to a predefined DC voltage level, for example, 5 volts."). A person of ordinary skill in the art would have understood this signal to be an identification signal and, therefore, understood that Kerai in view of Zyskowski (Ground 4) discloses a mobile device that is configured to detect an identification signal as required by the Challenged Claims.

Casebolt teaches an improvement to Kerai that allows the USB mobile device of Kerai to be charged from a computer with a USB port or a PS/2 port. Specifically, Casebolt teaches that some computers may not have a USB port and, instead, may only have a PS/2 port. Casebolt, 1:38-40 ("[A] conventional computer is typically provided with only one interface (such as a PS2 or USB interface)."). In order to connect USB devices to computers with PS/2 ports, Casebolt discloses (1) using an adapter that converts the USB connection from the mobile device to a PS/2 connection for the computer and (2) configuring the mobile device to determine when it is connected to a USB connection and when it is connected to a PS/2 connection (through the USB to PS/2 adapter). Casebolt, Figure 3 and 2:43-59 ("The peripheral device includes an interface

detection component configured to detect which of the first and second interfaces [USB and PS/2] the peripheral device is connected to."). When the mobile device's USB port is connected to a computer through the USB-to-PS/2 adapter, the adapter will pull the data lines to a high/high (SE1) signal. *Id.*, 6:42-45 ("When adapter 154 is coupled to peripheral device 142, pull-up resistor 164 pulls the PS2 clock/USB D+ signal line to VCC. Resistor 166 pulls the PS2 data/USB D— signal line to VCC as well.") This signal indicates that the power source is a PS/2 port (which has different voltage and current specifications than a USB port). Accordingly, a person of ordinary skill in the art would have understood the signal to be an "identification signal" and, accordingly, understood that Kerai in view of Casebolt (Ground 5) discloses a mobile device that is configured to detect an identification signal as required by the Challenged Claims.

Finally, Gilbert discloses that, in some circumstances, the USB mobile device of Kerai may need more power than is typically provided from a USB connection. Gilbert, 1:41-42 ("One problem with the USB and other serial bus specifications are the power limits they impose on bus-powered peripherals"). For that reason, Gilbert (like Kerai) discloses that peripheral devices may include a rechargeable battery and a charging subsystem. *Id.*, Abstract ("[O]ne embodiment of the present invention provides a bus-powered peripheral that includes a controller a rechargeable battery, and a voltage regulator recharge circuit."). Gilbert teaches that, when connected to each other, the computer system and connected peripheral device may be used in two modes: (1) a mode in which the mobile device draws power form the USB port in order to charge the battery and (2) a mode in which the device draws power from the battery for purposes of powering device operations. Gilbert, 1:61-67. Gilbert discloses that the mobile device distinguishes between these two modes using a signal on the data lines. *Id.* ("In operation, the controller switches the battery between a charge mode and a supply mode according to signals

received through the bus data lines."); *id.*, 3:21-29 ("In operation, interface-controller module 44 monitors and decodes data received at data terminals 423 and 424. If it receives data indicating or invoking an inactive period, for example, data instructing that the peripheral be turned off, it sends a control signal to voltage regulator 46. The control signal invokes a charge mode in voltage regulator 46. In the charge mode, voltage regulator 46 diverts power away from primary-function module 49 to battery 48, thereby charging battery 48.") (emphasis added). A person of ordinary skill in the art would have understood this signal to be an "identification signal" and, accordingly, understood that Kerai in view of Gilbert (Ground 6) discloses a mobile device that is configured to detect an identification signal as required by the Challenged Claims.

As discussed in more detail herein, these references raise substantial new questions of patentability as to Claims 1 and 8 of the '586 Patent. Accordingly, Requestor requests that the examiner institute reexamination of those claims.

II. REQUIREMENTS FOR *EX PARTE* REEXAMINATION UNDER 37 C.F.R. § 1.510

Pursuant to 37 C.F.R. § 1.510, this request satisfies each requirement for *ex parte* reexamination of the '586 Patent.

A. Payment of Fees (37 C.F.R. § 1.510(a))

Requestor authorizes the Patent Office to charge Deposit Account No. 15-0665 for the fee set forth in 37 CFR § 1.20(c)(1) for reexamination. The fee for reexamination is **$12,600**. Requestor further authorizes the Patent Office to charge Deposit Account No. 15-0665 for any other fees necessary in connection with this request for reexamination.

B. Statement Pointing out Each Substantial New Question of Patentability (37 C.F.R. § 1.510(b)(1))

The Application that matured into the '586 Patent was filed on February 26, 2010. It indirectly claims priority to two provisional applications: (1) Provisional Application No.

60/273,021, filed on March 1, 2001, and (2) Provisional Application No. 60/330,486, filed on October 23, 2001. As explained herein, however, the challenged claims are entitled only to a priority date of October 23, 2001, because the substance of the challenged claims is not disclosed in the March 2, 2001, provisional application. Pre-AIA 35 U.S.C. section 102 applies to the '586 Patent.

As set forth below, substantial new questions of patentability exist as to Claims 1 and 8 in view of the following references.

1. **Exhibit PA-A**: U.S. Patent No. 6,904,488 ("Matsumoto") is titled "Portable Electronic Device Comprising Common Serial Bus Connector." The Matsumoto application was filed on December 21, 2000, and published on June 28, 2001. The Matsumoto patent issued on June 7, 2005. Matsumoto constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

2. **Exhibit PA-B**: China Patent No. CN2410806Y ("Yang") is titled "Mobile Phone Charger with Multiple Power Supply Inputs." The Yang application was filed on December 2, 1999, and issued on December 13, 2000. Yang constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C. § 102(a).

3. **Exhibit PA-C**: U.S. Patent No. 7,766,698 ("De Iuliis") is titled "Power Adapters for Powering and/or Charging Peripheral Devices." The De Iuliis application was filed on January 26, 2007, and claims priority to U.S. Provisional Application No. 60/345,252, which was filed on October 22, 2001. De Iuliis constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C §§ 102(a) and (e).

4. **Exhibit PA-D**: U.S. Patent Application Publication No. 20003/0135766 ("Zyskowski") is titled "Method and Apparatus to Control Computer System Power." The

Zyskowski application was filed on December 3, 1999, and published on July 17, 2003. Zyskowski constitutes prior art to the '586 Patent under pre-AIA 35 U.S.C. §§ 102(a) and (e).

5. **Exhibit PA-E**: U.S. Patent No. 6,351,845 ("Kerai") titled "Battery Charging." The Kerai application was filed on May 25, 2001, and issued on March 11, 2003. Kerai constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

6. **Exhibit PA-F**: U.S. Patent No. 6,625,790 ("Casebolt") titled "Method and Apparatus for Detecting the Type of Interface to which a Peripheral Device is Connected." The Casebolt application was filed on October 1, 1999. It claimed priority to an application filed on July 8, 1998. Casebolt issued as a patent on September 23, 2003. Casebolt constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

7. **Exhibit PA-G**: U.S. Patent No. 6,357,011 ("Gilbert") titled "Bus-Powered Computer Peripheral With Supplement Battery Power to Overcome Bus-Power Limit." The Gilbert application was filed on July 15, 1998, and Gilbert issued as a patent on March 12, 2002. Gilbert constitutes prior art to the '586 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

8. **Exhibits PA-H** through **PA-K** are various patent documents and publications that were all filed or published prior to the priority date of the '586 Patent and thus constitute prior art under at least 35 U.S.C. §§ 102(a).

C. Identification of Claims for Reexamination and Detailed Explanation of the Pertinency and Manner of Applying The Prior Art to Each Challenged Claim (37 C.F.R. § 1.510(b)(2))

Requestor requests reexamination of Claims 1 and 8 of the '586 Patent on the following grounds:

1. Matsumoto, when in considered in view of a person of ordinary skill in the art, anticipates Claims 1 and 8 under 35 U.S.C. § 102. A claim chart demonstrating the pertinency and manner Matsumoto anticipates Claims 1 and 8 is attached hereto as **Exhibit CC-A**.

2. Matsumoto in view of Yang and the knowledge of those skilled in the art renders obvious Claims 1 and 8 under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Matsumoto in view of Yang to Claims 1 and 8 is attached hereto as **Exhibit CC-B**.

3. Matsumoto in view of De Iuliis and the knowledge of those skilled in the art renders Claims 1 and 8 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Matsumoto in view of De Iuliis to Claims 1 and 8 is attached hereto as **Exhibit CC-C**.

4. Kerai in view of Zyskowski and the knowledge of those skilled in the art renders Claims 1 and 8 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Kerai in view of Zyskowski to Claims 1 and 8 is attached hereto as **Exhibit CC-D**.

5. Kerai in view of Casebolt and the knowledge of those skilled in the art renders Claims 1 and 8 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Kerai in view of Casebolt to Claims 1 and 8 is attached hereto as **Exhibit CC-E.**

6. Kerai in view of Gilbert and the knowledge of those skilled in the art renders Claims 1 and 8 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Kerai in view of Gilbert to Claims 1 and 8 is attached hereto as **Exhibit CC-F**.

In addition to the disclosures in Exhibits **CC-A** through **CC-F**, a detailed explanation of the pertinency and manner of applying the prior art cited above to the claims for which reexamination is requested is provided in **Section IV** below.

D. Copies of Prior Art and Translations (37 C.F.R. § 1.510(b)(3))

Requestor submits herewith a copy of each prior art patent and printed publication, including translation of foreign patents and publications, relied upon in this Request as **Exhibits PA-A** through **PA-K**.

E. Copy of U.S. Patent No. 9,451,161 (37 C.F.R. § 1.510(b)(4))

Requestor has attached a copy of the '586 Patent as **Exhibit PAT-A** and a copy of the file history of the '586 Patent as **Exhibit PAT-B**.

F. Certification of Service on Patent Owner (37 C.F.R. § 1.510(b)(5))

The undersigned certifies that a complete and entire copy of this request for *ex parte* reexamination and all supporting documents have been provided to the Patent Owner by serving the attorneys of record at the Patent Office for the '586 Patent as set forth in 37 C.F.R. § 1.33(c):

Richard Botos
Botos Churchill IP Law LLP
FISI
430 Mountain Avenue, Suite 401
New Providence, NJ 07974

G. Certification That Estoppel Does Not Apply (37 C.F.R. § 1.510(b)(6))

The undersigned certifies that the statutory estoppel provisions of 35 U.S.C. § 315(e)(1) and 35 U.S.C. § 325(e)(1) do not prohibit Requestor from filing this *ex parte* reexamination request.

H. Representative Capacity (37 C.F.R. § 1.510(f))

The undersigned is counsel of record and represents that he is authorized to act in a representative capacity for Requestor under 37 C.F.R. § 1.34.

III. OVERVIEW OF THE '586 PATENT AND RELEVANT PRIOR ART

A. USB Specification

The Universal Serial Bus (USB) Specification defines a standardized data and power connection for connecting electronic devices. Baker Decl., ¶ 47. Revision 1.1 of the USB Specification was published by the USB Implementers Forum, Inc. on September 23, 1998. Ex. PA-K; Baker Decl., ¶ 47. It is prior art to the '586 Patent under at least 35 U.S.C. §§ 102(a) and (b). Revision 2.0 of the Specification ("USB 2.0") was published on April 27, 2000. Ex. PA-I; Baker Decl., ¶ 48. It is prior art to the challenged claims of the '586 Patent under at least 35 U.S.C. §§ 102(a) and (b).

Moreover, because the '586 Patent incorporates the conditions and limitations of the USB Specification, a person of ordinary skill in the art to which the '586 Patent claims are directed would have been knowledgeable about the USB Specifications. Baker Decl., ¶ 48.

1. Configuration of a USB Network

Figure 4-1, below, shows the bus topology for a USB system. Generally, each USB network requires a "host" with a "root hub" for purposes of communication. USB 2.0 at 16. Without such a hub, there will be no communication among the devices. Baker Decl., ¶ 50. For example, connecting, Hub 1 to a node (a node is a connected device, also called a "function") or Hub 2 without connecting Hub 1 to the Host via the Root Hub will not result in a functioning/communicating, USB system. Baker Decl., ¶ 50.

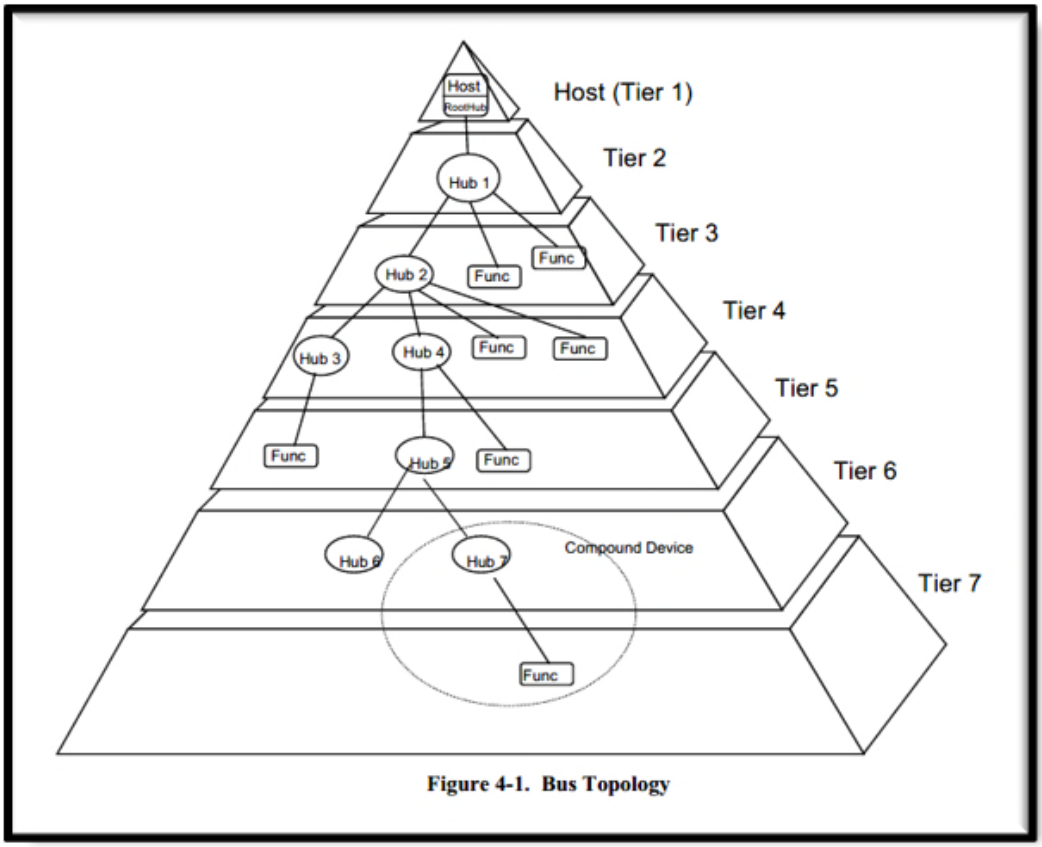


Figure 4-1. Bus Topology

USB 2.0 at 16.

The device acting as the host generally has certain functionality. Baker Decl., ¶ 51. The specification states, for example, that the host device has a CPU and a USB Controller for managing the connection(s) with other USB devices. USB 2.0 at 6 ("Host" means "The host computer system where the USB Host Controller is installed. This includes the host hardware platform (CPU, bus, etc.) and the operating system in use.") (emphasis added); USB 2.0 at 27 (Section 5.2.1 USB Host) ("The USB host occupies a unique position as the coordinating entity for the USB. In addition to its special physical position, the host has specific responsibilities with regard to the USB and its attached devices. The host controls all access to the USB. A USB device gains access to the bus only by being granted access by the host. The host is also responsible for monitoring the topology of the USB.") (emphasis added).

Generally, the USB Specification instructs that USB devices (*i.e.*, node or function) are connected to hubs using a cable. The cable is connected between a USB connector on a USB device and a USB connector on a host or hub.

Figure 4-4 illustrates how hubs provide connectivity in a typical computer environment.

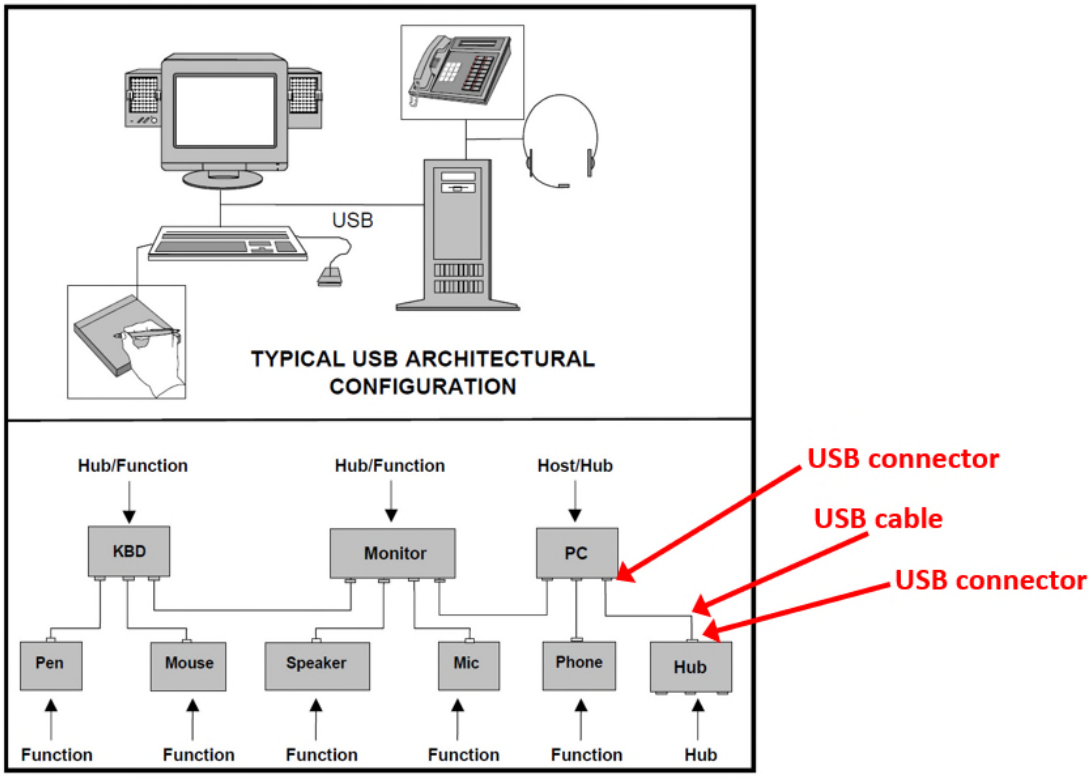


Figure 4-4. Hubs in a Desktop Computer Environment

USB 2.0 at 23 (annotated).

2. Configuration of USB Connectors

The USB Specification teaches a person of ordinary skill in the art how to implement USB Connectors, which require four contacts: A power contact (V_{BUS}), a Ground contact (Gnd), and two data lines (D+ and D-):

Table 6-1. USB Connector Termination Assignment

Contact Number	Signal Name	Typical Wiring Assignment
1	VBUS	Red
2	D-	White
3	D+	Green
4	GND	Black
Shell	Shield	Drain Wire

USB 2.0 at 94.

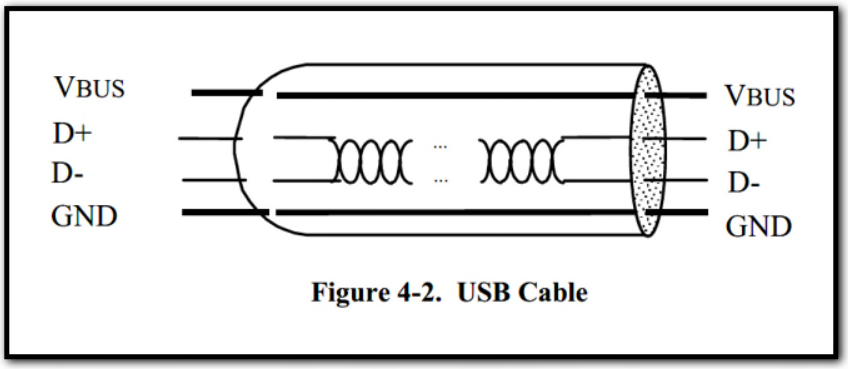


Figure 4-2. USB Cable

USB 2.0 at 17.

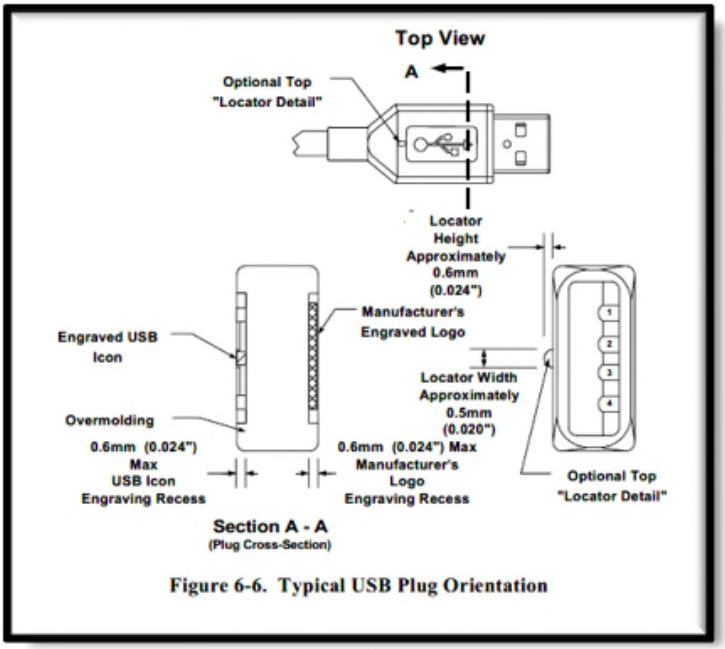


Figure 6-6. Typical USB Plug Orientation

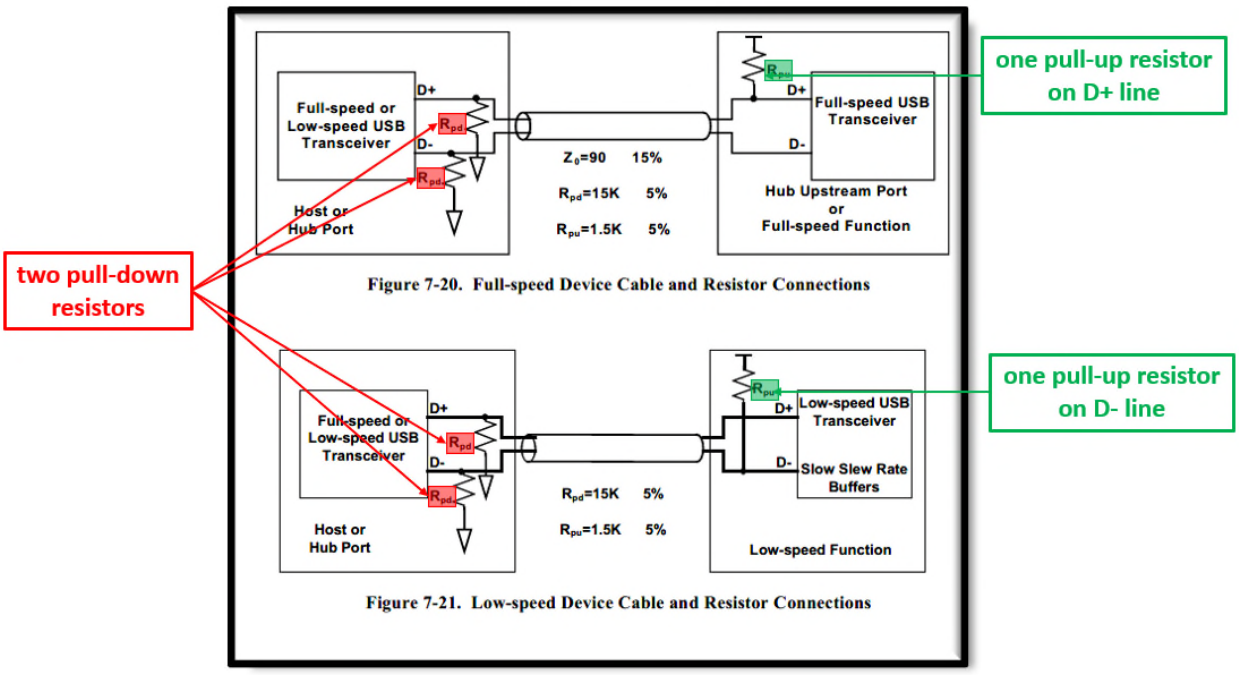
USB 2.0 at 93.

A person of ordinary skill in the art would thus have understood that a device with a USB connector comprises at least four lines: a VBUS (power/voltage line), a D+ line, a D- line, and a ground line. Baker Decl., ¶ 53.

3. USB Specification for Communicating Between Devices.

The USB Specification also dictates how USB devices in a USB network can communicate with each other. In order for a host or hub to communicate with a function (device), it must first determine whether the device is a low-speed device, a full-speed device, or a high-speed device. Baker Decl., ¶ 54. Low-speed devices communicate at 1.5 Mb/s, full-speed devices communicate at 12 Mb/s, and high-speed devices communicate at 480 Mb/s. USB 2.0 at 6-7 and 17.

A device indicates whether it is a hub, a low-speed device, or a full-/high-speed device using termination resistors within the device. USB 2.0 at 242 ("The speed selection for low- and full-speed is determined by the device termination resistors."); Baker Decl., ¶ 55. Specifically, USB hubs and hosts have two pull-down resistors attached to the data lines of a downstream port; full-speed and high-speed devices (and upstream hub ports) have one pull-up resistor attached to the D+ line; and low-speed devices have one pull-up resistor on the D- line. USB 2.0 at 141 (Section 7.1.5.1 Low-/Full-Speed Device Speed Identification) ("The USB is terminated at the hub and function ends as shown in Figure 7-20 and Figure 7-21. Full-speed and low-speed devices are differentiated by the position of the pull-up resistor on the downstream end of the cable: Full-speed devices are terminated as shown in Figure 7-20 with the pull-up resistor on the D+ line. Low-speed devices are terminated as shown in Figure 7-21 with the pull-up resistor on the D- line.").



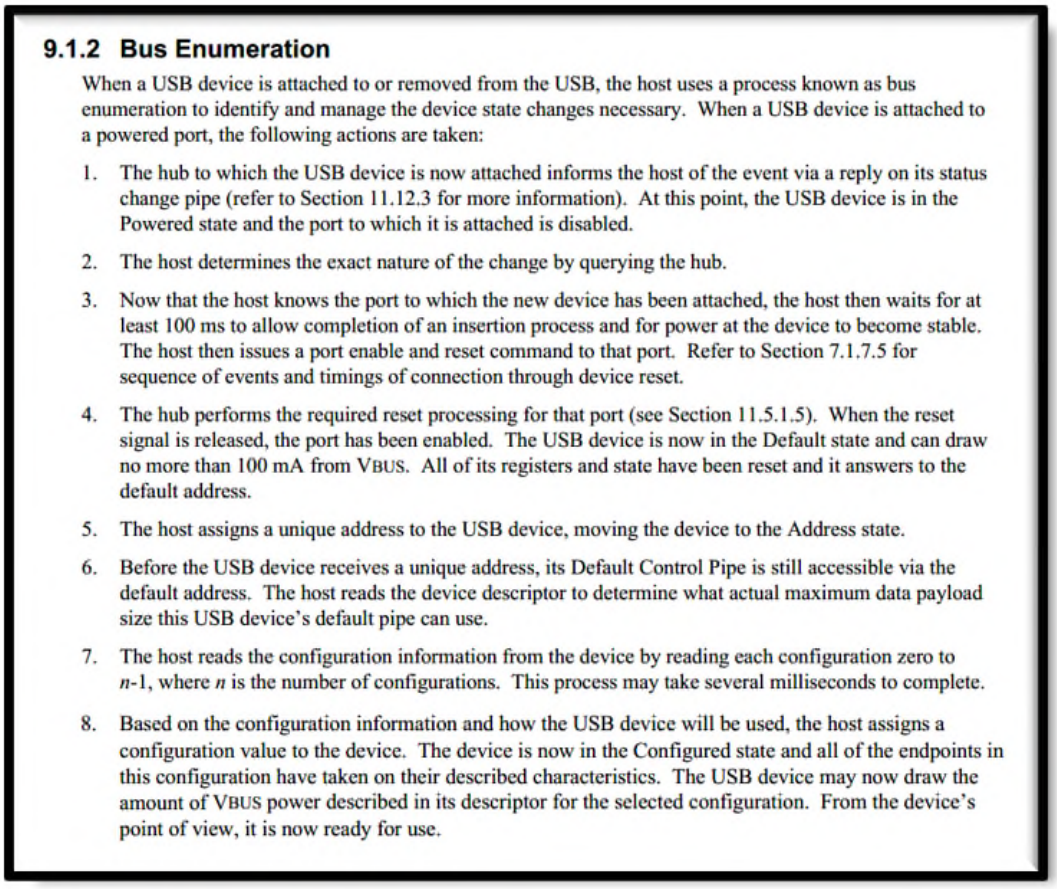
USB 2.0 at Figures 7-20 and 7-21 (annotated) (showing that typical USB hubs and hosts will have two pull down resistors and typical USB functions/devices will have one pull-up resistor to signal either low-speed or full-speed); Baker Decl., ¶ 55. Accordingly, prior to enumeration, full-speed devices and upstream hub ports will signal a default (idle) high/low on the D+/D- lines and low-speed devices will signal a default (idle) low/high signal on the D+/D- lines. Baker Decl., ¶ 56. When no pull-up resistor is present on D+ and/or D- lines and no voltage has been applied to the VBUS line, it signals that no device is connected:

D+	D-	Port configuration
Low	Low	No device connected
High	Low	Full-speed
Low	High	Low-speed

Baker Decl., ¶ 56.

Once the devices have been connected, they must undergo a process called enumeration. USB 2.0 at 243 ("When a USB device is attached to or removed from the USB, the host uses a process known as bus enumeration to identify and manage the device state changes necessary.").

Enumeration involves a number of steps and states, during which the device is configured and assigned an address. *Id.* at 243-244.



9.1.2 Bus Enumeration

When a USB device is attached to or removed from the USB, the host uses a process known as bus enumeration to identify and manage the device state changes necessary. When a USB device is attached to a powered port, the following actions are taken:

1. The hub to which the USB device is now attached informs the host of the event via a reply on its status change pipe (refer to Section 11.12.3 for more information). At this point, the USB device is in the Powered state and the port to which it is attached is disabled.
2. The host determines the exact nature of the change by querying the hub.
3. Now that the host knows the port to which the new device has been attached, the host then waits for at least 100 ms to allow completion of an insertion process and for power at the device to become stable. The host then issues a port enable and reset command to that port. Refer to Section 7.1.7.5 for sequence of events and timings of connection through device reset.
4. The hub performs the required reset processing for that port (see Section 11.5.1.5). When the reset signal is released, the port has been enabled. The USB device is now in the Default state and can draw no more than 100 mA from VBUS. All of its registers and state have been reset and it answers to the default address.
5. The host assigns a unique address to the USB device, moving the device to the Address state.
6. Before the USB device receives a unique address, its Default Control Pipe is still accessible via the default address. The host reads the device descriptor to determine what actual maximum data payload size this USB device's default pipe can use.
7. The host reads the configuration information from the device by reading each configuration zero to *n*-1, where *n* is the number of configurations. This process may take several milliseconds to complete.
8. Based on the configuration information and how the USB device will be used, the host assigns a configuration value to the device. The device is now in the Configured state and all of the endpoints in this configuration have taken on their described characteristics. The USB device may now draw the amount of VBUS power described in its descriptor for the selected configuration. From the device's point of view, it is now ready for use.

USB 2.0 at 243-244 (describing steps of enumeration).

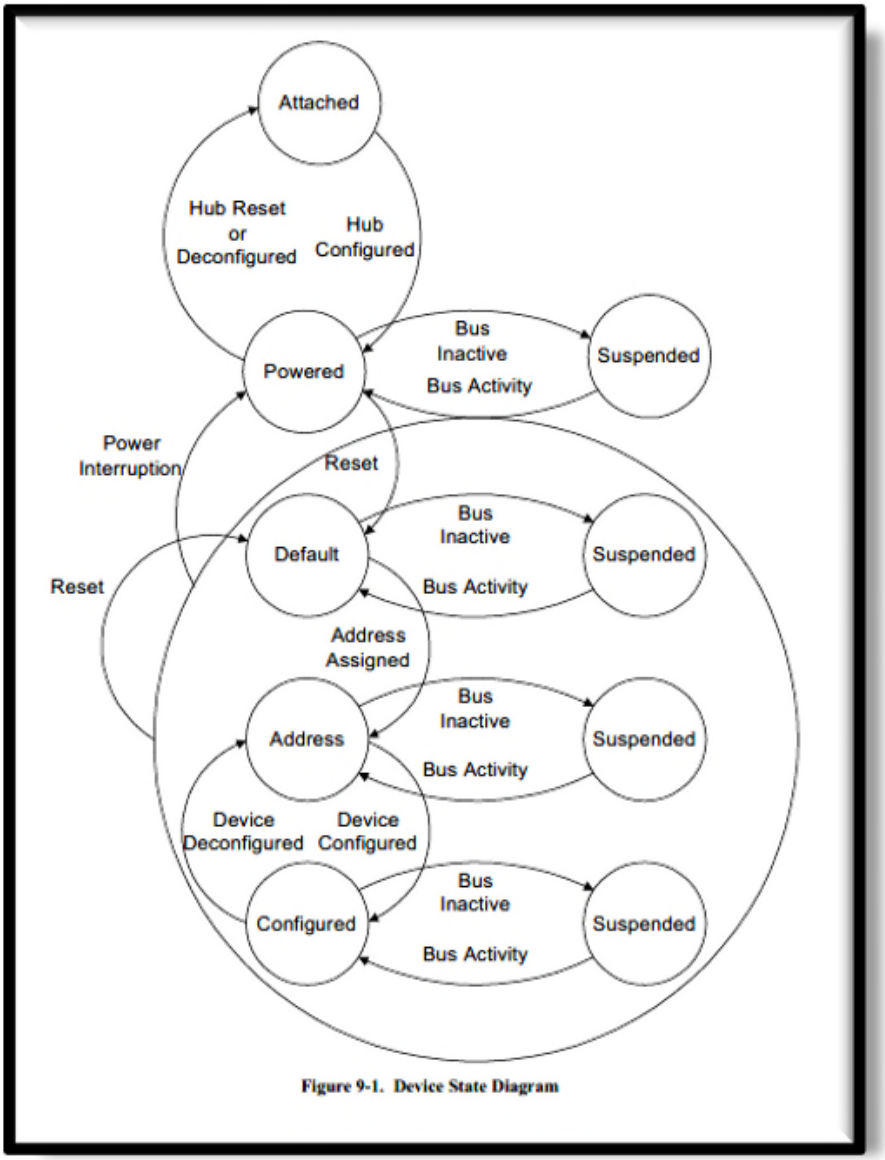


Figure 9-1. Device State Diagram

USB 2.0 at 240 (Figure 9-1) (describing states during enumeration).

In the first step, the USB devices are attached and enter the "Attached" state. Baker Decl., ¶ 59. The VBUS line is pulled up to the required voltage level and, within 100ms, the device must signal attachment with a high signal on either the D+ line or D- line (depending on the speed of the device and the state of the pull up resistor, see above); USB 2.0 at 150 (Section 7.1.7.3 Connect and Disconnect Signaling) ("Δt2 (T_{SIGATT}) This is the maximum time from when VBUS is up to valid level (4.01 V) to when a device has to signal attach. Δt2 represents the time required for the device's

internal power rail to stabilize and for D+ or D- to reach VIH (min) at the hub. Δt2 must be less than 100 ms for all hub and device implementations. (This requirement only applies if the device is drawing power from the bus.)").

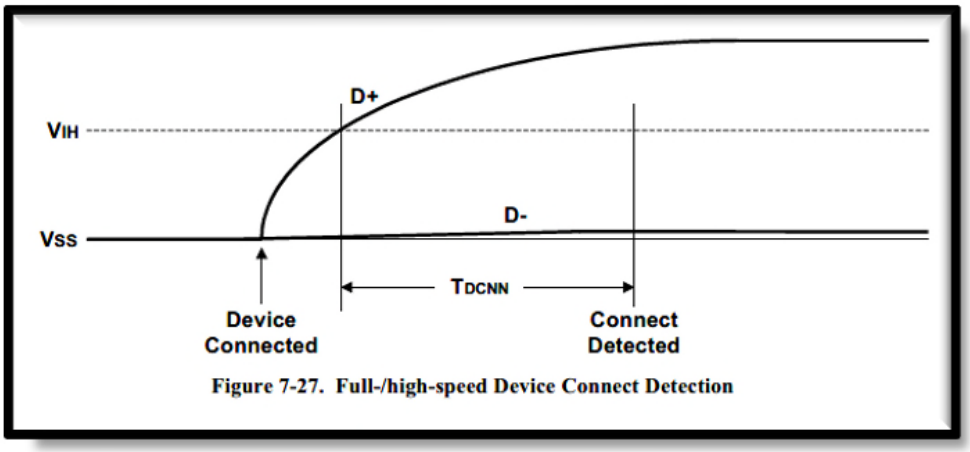


Figure 7-27. Full-/high-speed Device Connect Detection

USB 2.0 at 149 (Figure 7-27) (showing high/low on the D+/D- lines for full-speed and high-speed devices).

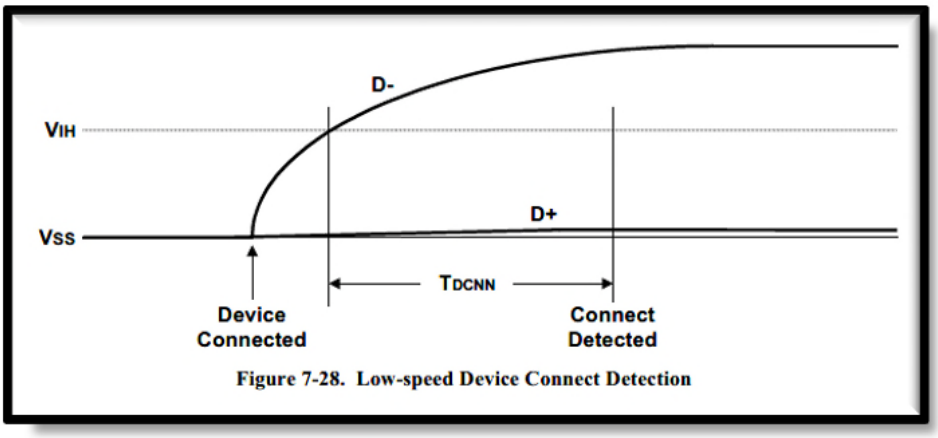


Figure 7-28. Low-speed Device Connect Detection

USB 2.0 at 50 (Figure 7-28) (showing low/high on the D+/D- lines for low-speed devices).

Table 7-14. Device Event Timings

Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond VIHZ (min) (signaling attach)	TSIGATT	Figure 7-29		100	ms

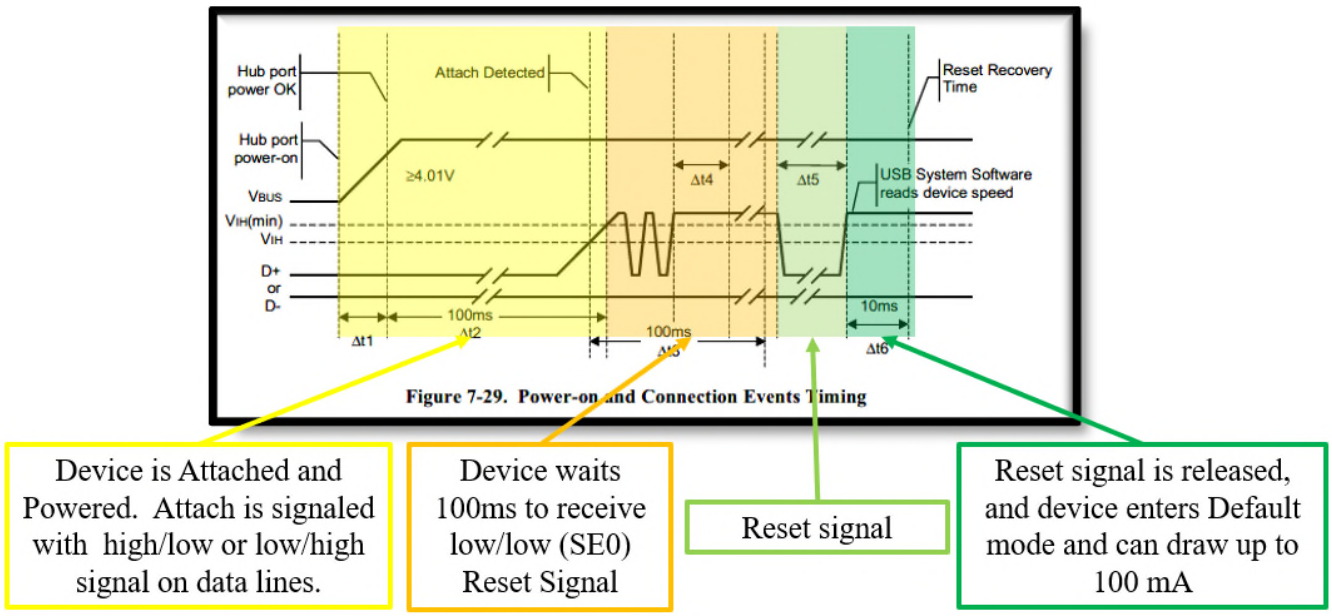
USB 2.0 at 188 (Table 7-14 Device Event Timings) (annotated).

The devices are now in the "Powered" state. Baker Decl., ¶ 59. The devices maintain an idle state (either high/low or low/high on the D+/D- lines, depending on the speed of the device) until the host or hub issues a "reset" command. Baker Decl., ¶ 59. The reset command is a low/low signal on the D+/D- line (SE0) for at 10 ms to 20 ms. Once the signal is released (*i.e.*, the data lines go back to the idle high/low or low/high state), the port is enabled, and the device is in the "Default" state. USB 2.0 at 313 (Section 11.5.1.5 Resetting) ("The hub drives SE0 on the port during this timed interval. The duration of the Resetting state is nominally 10 ms to 20 ms (10 ms is preferred)."). As discussed in the following section, the device can now draw up to 100 mA of current.

Table 9-1. Visible Device States

Attached	Powered	Default	Address	Configured	Suspended	State
No	--	--	--	--	--	Device is not attached to the USB. Other attributes are not significant.
Yes	No	--	--	--	--	Device is attached to the USB, but is not powered. Other attributes are not significant.
Yes	Yes	No	--	--	--	Device is attached to the USB and powered, but has not been reset.
Yes	Yes	Yes	No	--	--	Device is attached to the USB and powered and has been reset, but has not been assigned a unique address. Device responds at the default address.

USB 2.0 at 241.



USB 2.0 at 150 (Figure 2-29) (annotated).

B. The ’586 Patent

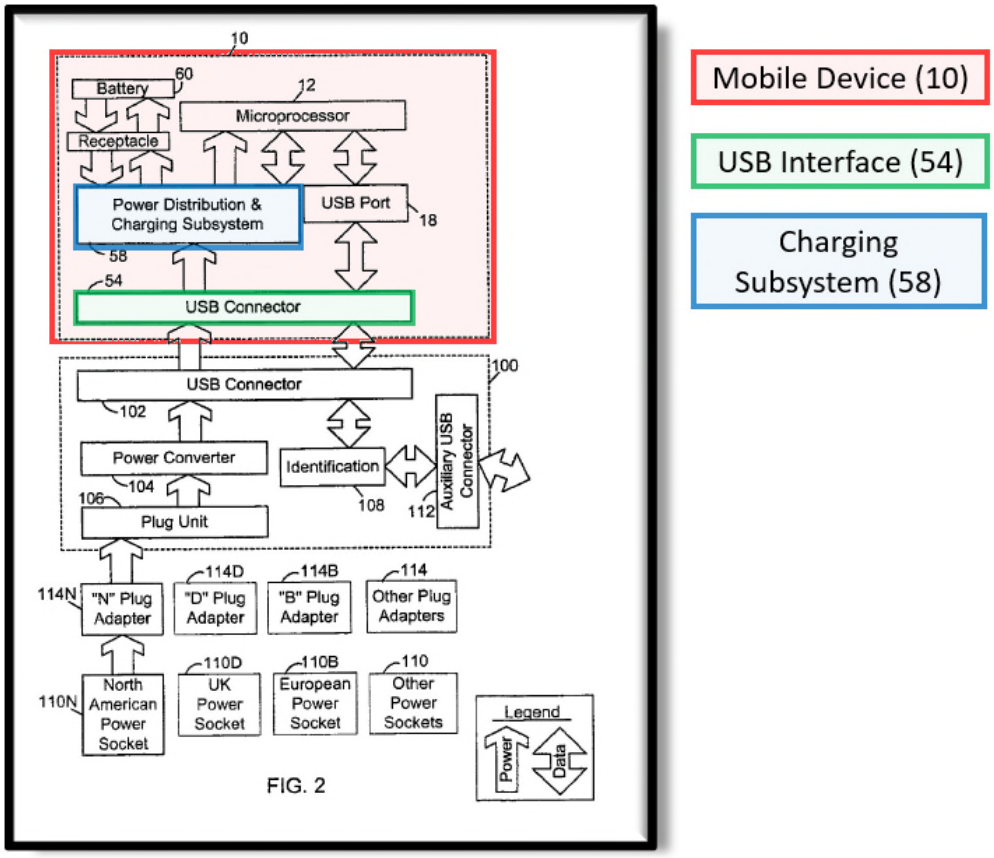
1. Disclosure and Claims of the ’586 Patent

The ’586 Patent is directed to a “Multifunctional Charger System and Method.” Ex. PAT-A (’586 Patent) at Title. It discloses “a powering system for a mobile device having a USB connector.” PAT-A (’586 Patent) at 2:66-67. The ’586 Patent explains that, in the prior art, it was common for mobile devices to include two separate interfaces, *i.e.*, one that provided power only (*e.g.*, from an adapter through a “barrel connector”) and one for communicating with other devices (*e.g.*, a USB interface). *Id.* at 1:42-58. The ’586 Patent notes that some prior art devices did include “combined power and data interfaces,” but explains that such devices typically used non-standard and sometimes proprietary interfaces.” *Id.* at 1:49-55. Accordingly, the patent proposes using the standardized USB interface for this purpose.

The ’586 Patent concedes that USB devices could already draw power and communicate with other devices through a USB connection. It notes, however, that the connection typically required a separate hub or host USB devices (*i.e.*, it could not be used with an adapter) because

the USB specification required a handshaking protocol called "enumeration" before power could be exchanged before the two devices. *Id.* at 1:58-62. ("In accordance with the USB specification, typical USB power source devices, such as hubs and hosts, require that a USB device participate in a host-initiated process called enumeration in order to be compliant with the current USB specification in drawing power from the USB interface.") The '586 Patent thus proposes using an "identification" signal in order to disclose power sources that don't require enumeration. *Id.* at 1:64-2:3 ("[I]t would be preferable in many situations, such as when a host would not be available, as often happens during normal use of a mobile device, to be able to utilize alternate power sources such as conventional AC outlets and DC car sockets that are not capable of participating in enumeration to supply power to the mobile device via a USB interface.").

The patentee drafted the claims of the '586 Patent fairly broadly. The bulk of the limitations require what was already clearly known in the prior art, *i.e.*, a charging subsystem connected to a USB interface and a battery. *Id.*, Claims 1 and 8. Figure 2 of the '586 Patent, reproduced below, shows these key features:



Ex. PAT-A ('586 Patent), Figure 2 (annotated)

The only other limitation in the Challenged claims requires that the mobile device is "configured to detect an identification signal at a D+ and D- data line of the USB interface, the identification signal being different than USB enumeration." *Id.*, Claims 1 and 8. As discussed herein, the Patentee has admitted that an "identification signal" is simply a "signal that identifies a power source type." Moreover, although the claims of the '586 Patent don't require any specific signal be used for the identification signal, the specification discloses (as an example) using a high/high signal on the data lines (also known as an SE1 signal). *Id.* at 8:21-23 ("In one embodiment, the identification subsystem 108 comprises a hard-wired connection of a single voltage level to both data lines."); *id.* at 9:23-25 ("Also, in this example, the identification subsystem 108 of the USB adapter 100 may have applied a logic high signal, such as a +5V reference, to both the D+ and D- lines to identify the attached device as a USB adapter 100.").

The claims, however, don't require that the USB device use or respond to the identification signal in any specific way. Accordingly, because any USB device would be able to detect any signal received at the data lines, any USB-enabled device would arguably meet this limitation. Moreover, as disclosed herein, numerous prior art reference disclose detecting and using such a signal to distinguish between different types of power sources.

2. Prosecution of the '586 Patent

The '586 Patent issued from U.S. Patent Application No. 12/714,204, which was filed on February 26, 2010. However, there was no substantive prosecution on the merits in the file history of the '586 Patent. There were only statutory double-patenting rejections that called for a terminal disclaimer, a filed and approved terminal disclaimer, and an allowance with no statement as to the reason of allowance. Ex. PAT-B ('586 Patent File History) at 119, 124, 135, 138-39, 177, 183, and 184.

3. Priority of the '586 Patent.

The '586 patent claims priority through a series of continuations to two provisional applications: (1) U.S. Provisional Application 60/273,021 (the "'021 Application") (Ex. PAT-C), filed March 1, 2001; and (2) U.S. Provisional Application No. 60/330,486 (the "'486 Application") (Ex. PAT-D), filed October 23, 2001.

The '021 Application was filed on March 1, 2001. Ex. PAT-C. The '021 Application omits any discussion detecting an identification signal on the data lines of the USB interface that is not enumeration. *See id.* at 20-30 (discussing various embodiments); Baker Decl., ¶ 69. To the contrary, the application indicates that the mobile device is connected to a typical USB port (*e.g.*, a standard hub that would send standard USB signals); it does not disclose connecting the mobile device to any other type of power source. *Id.* at 22 ("Typical means of providing a high-power USB port are ensuring that the invention is the only USB device to attach to the USB port

of a desktop computer, a laptop computer, or a self-powered hub."). In other words, the application does not disclose receiving any type of identification signal.

The '486 Application was filed on October 23, 2001. Ex. PAT-D ('486 Application). The application, for the first time, discussed the use of "identification information" to signal to the USB device that it is connected to a particular power source. *Id.* at 24.

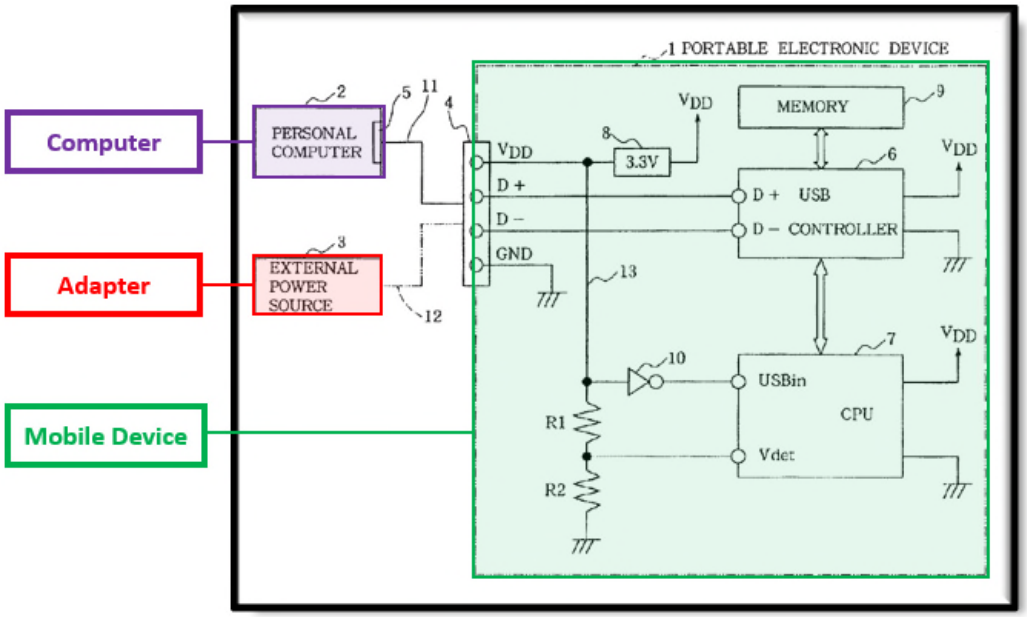
Because the '021 Application does not describe at least the identification signal in Challenged Claims 1 and 8, those claims are entitled to the October 23, 2001, priority date of the '486 Application at the earliest. Baker Decl., ¶ 67-70. Moreover, Patent Owner has asserted in litigation that the '586 Patent is entitled to an October 23, 2001, priority date only.

C. Summary of Relevant Prior Art

1. Matsumoto

Like the '586 Patent, Matsumoto discloses a system and method for implementing a mobile device that can draw power for charging from a USB connection. Baker Decl., ¶ 71.

Specifically, Matsumoto explains that the USB device can be connected to either (1) a personal computer or (2) an external power source (*e.g.*, an AC outlet) through an adapter. Baker Decl. ¶ 72; Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector . . . . and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."); *id.*, 3:41-47 ("FIG. 1 shows a portable electronic device 1 of the invention, which has a USB connector 4. A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12.").



Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)).

Matsumoto further discloses that—consistent with the USB Specification—the mobile device will typically engage in USB communication (*e.g.*, enumeration) when connected to the personal computer. Baker Decl. ¶ 73; Matsumoto, 1:54-2:1 ("When the personal computer is connected to the USB connector on the portable electronic device in this case, it is necessary for the USB controller to conduct data communication with the personal computer within a definite period as required by the USB Standard [enumeration/configuration], so that the leadership in data processing is taken over by the USB controller from the main CPU . . . . Further while the USB controller is connected to the personal computer for data communication, some kind of data is handled also between the main CPU and the USB controller.") Matsumoto notes, however, that such communication slows down the operation of the mobile device. *Id.*, 1:60-64 ("This entails the problem that even if the user gives the portable electronic device a command for data reproduction (play operation), the main CPU is unable to rapidly execute device operation processing for data reproduction."); *id.* at 2:1-4 ("This gives rise to the problem that the main

CPU must execute very complicated processing since there is a need for the main CPU to execute device processing for data reproduction in this state.").

Because such communication (and the slowdown that occurs therewith) is not necessary when the mobile device is connected to the adapter (which only needs to charge the portable electronic device, not communicate), Matsumoto discloses using "discriminating means" to identify when the mobile device is connected to the adapter (as opposed to a typical USB device). Baker Decl., ¶ 74; Matsumoto, 2:58-63 ("The discriminating means identifies the source of supply of power based on the voltage value of the power supply terminal of the common Serial bus connector, or identifies the source of supply of power depending on whether the common serial bus controller has started data communication via the common serial bus connector") (emphasis added); *id.* at 2:46-50 ("Stated more specifically, the control circuit comprises discriminating means for judging which of the information processing device [computer] and the external power source [adapter/charger] is connected to the common serial bus connector . . . ."); *id.* at 2:13-27 ("The present invention provides a portable electronic device comprising . . . a control circuit connected to the common serial bus controller . . . . The control circuit discriminates among the sources of supply of power.") (emphasis added).

When the mobile device is connected to the adapter (instead of a typical USB device like the computer), the "discriminating means" cause the device to avoid the costly communication process (including enumeration/configuration) and simply move forward with charging and usual device operation/processing. Baker Decl., ¶ 75; Matsumoto, 2:36-42 ("[T]he control circuit causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] when the information processing device [computer] is the power source, or executes the usual device operation processing [*i.e.*, no enumeration], such as data reproduction control, when the external power source [adapter] or the internal power source

is the source of supply of power.") This allows the device to use the power from the adapter and still engage in faster processing. *Id.*, 2:42-46 ("Thus, the control circuit and the common serial bus controller perform processing as distinctly dividedly assigned thereto according to the source of supply of power. This ensures simplified processing at a higher speed.").

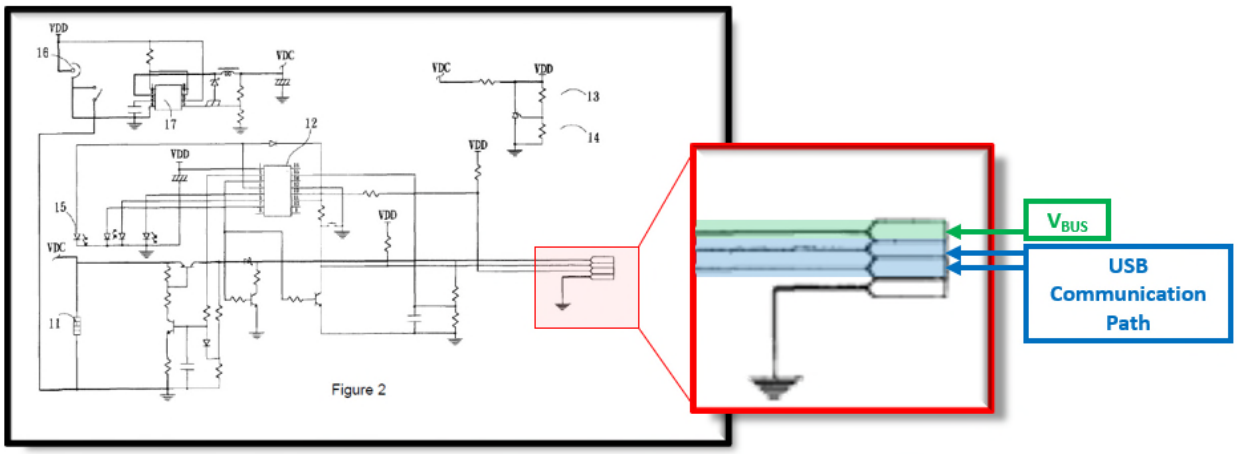
The examiner did not consider Matsumoto during prosecution of the '586 Patent.

2. Yang

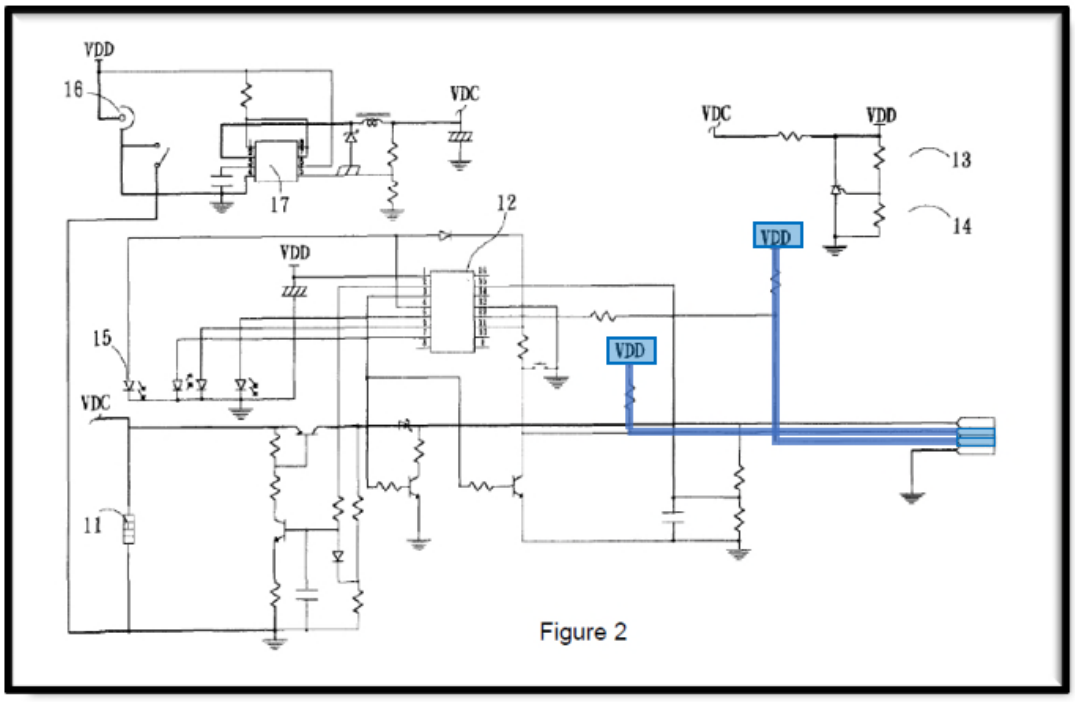
Yang is directed to a "Mobile Phone Charger with Multiple Power Supply Inputs." PA-B (Yang) at [54]. Yang teaches an adapter that can draw power from multiple power sources (including a wall outlet, a car socket, or a USB connection) and convert the power to be used by a mobile device. *Id.*, Abstract ("The utility model can achieve the purpose of adapting multiple power supply inputs."); *id.* at Specification Page 1 ("The second purpose of this utility model is to provide a mobile phone charger with multiple power supply inputs so that the dock charger can use the regular household AC 110V/220V power supply for charging mobile phone batteries."); Baker Dec. ¶ 76.

If the power is drawn from a wall socket, it is (1) converted into the same voltage as the automobile power supply using an AC transformer then (2) converted to the same voltage as the USB interface using a DC voltage conversion circuit. *Id.*, Claim 1. If the power is drawn from the automobile power supply, it is simply converted to the USB voltage using the DC conversion circuit. The voltage can then be converted into the voltage required by a particular mobile device battery and provided to that mobile device through a connection such as a USB connection. *Id.*

Figure 2 of Yang discloses a schematic for the mobile device charger. Like the USB connector of Matsumoto, the connector includes four connections: power, ground, and two data lines.



Yang, Figure 2 (annotated); Baker Decl., ¶ 78. The schematic shows that the charger comprises two pull-up resistors attached to the data lines of the connection with the mobile device. In other words, the default signal on the data lines is a high/high signal or "SE1" signal on the data lines which can be used to distinguish the adapter of Yang from typical USB devices. Baker Decl., ¶ 79.



Yang, Figure 2 (annotated).

The examiner did not consider Yang during prosecution of the '586 Patent.[1]

3. De Iuliis[2]

De Iuliis is directed to various "Power Adapters for Powering and/or Charging Peripheral Devices." Ex. PA-C ("De Iuliis"). It discloses an adapter that can (1) connect directly between a wall outlet and a mobile device and (2) that can provide power over a standardized data port such as a USB port. *Id.*, Abstract ("The power adapter includes a housing that contains electrical components associated with the power adapter" and "a data port . . . configured to provide external power to the peripheral device."); *id.* at 4:40-57 ("The data port 56 is arranged to receive one end of a data transmission line 58 . . . . By way of example, the data transmission line 58 may be a universal serial bus (USB) . . . ."); Baker Decl., ¶ 80.

[1] The '586 Patent lists U.S. Patent No. 6,184,652 to Yang ("'652 Patent") on the face of the patent. That patent, however, is different from the Yang reference identified here, which is a Chinese Patent. Unlike the Yang reference relied on here, the '652 Patent does not disclose an "adapter" that can convert power from a wall-socket to be used by a mobile device. PA-J ('652 Patent). Instead, the charger disclosed in the '652 Patent can only draw power from a USB port. And, in any event, the examiner does not appear to have discussed or considered the '652 Patent during prosecution. Accordingly, the examiner does not appear to have considered Yang during prosecution.

[2] De Iuliis claims priority to U.S. Provisional Application No. 60/345,252, which is attached hereto as Exhibit PA-H. All of the substantive disclosures of De Iuliis relied on herein are also disclosed in the provisional application. *Id.*; *see also* CC-B (claim chart references De Iuliis and De Iuliis Provisional).

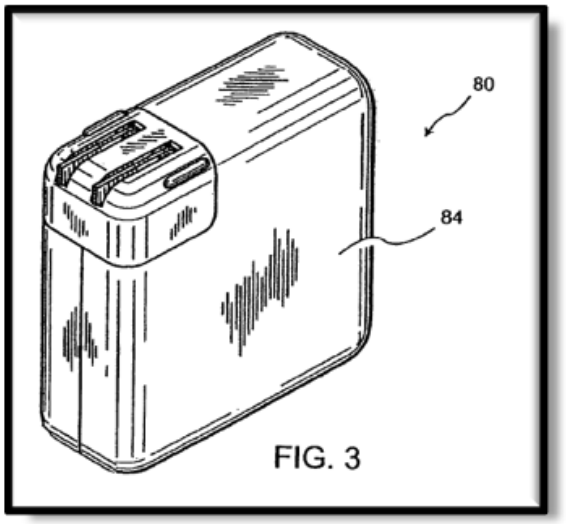


FIG. 3

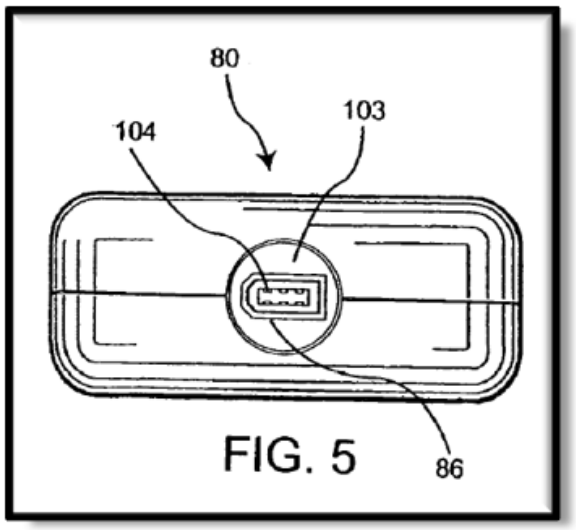


FIG. 5

De Iuliis at Figures 3 and 5 (showing adapter with connection for wall-socket and data port connection to power mobile device). De Iuliis discloses that while the charger comprises all of the connections/lines for the data port (*e.g.*, VBUS and data lines), "the power adapter 80 generally does not use the data contacts of the port 86 for transmitting data (*e.g.*, they act as dummy contacts)." In other words, unlike typcial USB devices, the charger of De Iuliis will not provide any signals on the D+ or D- lines or otherwise communicate with the mobile device once it is connected.

The examiner did not consider De Iuliis during prosecution of the '586 Patent.

4. Kerai

Kerai discloses a system and method for charging a "mobile radio telephone" device by connecting it to a laptop computer through a USB connection when no wall socket is available. *See* Kerai, 1:32-34 ("It is still a further object of the invention to permit the charging of a device in the absence of a locally available electrical supply."); Baker Decl., ¶ 81. Specifically, Kerai discloses that the mobile phone includes a charging circuit that can draw power from either (1) a conventional adapter connected to a power jack or (2) the USB connection with the laptop computer. Baker Decl., ¶ 81; Kerai, Abstract ("A battery charging circuit is described in which

power is derived from a communications port Such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone.").

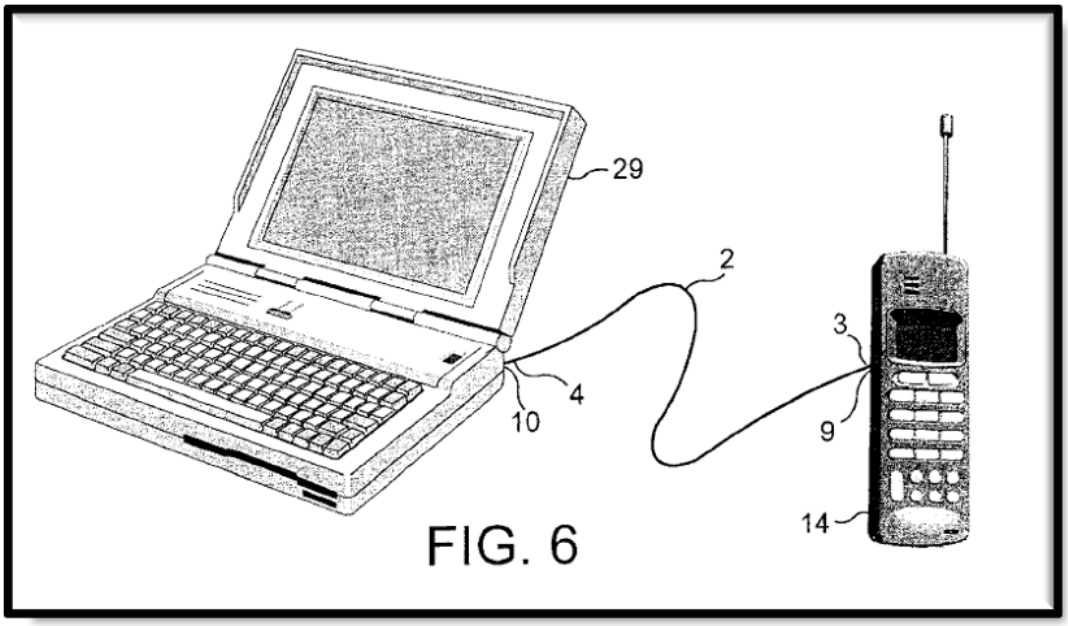


FIG. 6

Kerai, Figure 6 (showing mobile device (14) connected to computer (29)).

Kerai discloses that the mobile phone comprises, among other things, a USB interface, a rechargeable battery, and a charging subsystem (comprising at least the charging circuit) connecting the two. Kerai, 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port [USB] and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port where in the port, in use, provides power to the charging circuit.").

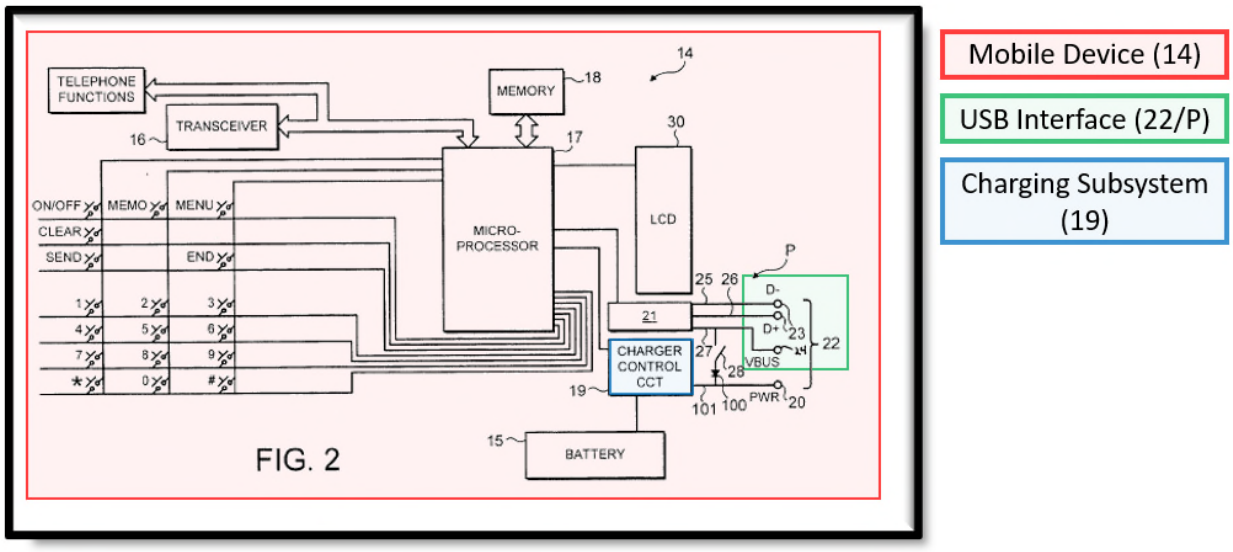


FIG. 2

Kerai, Figure 2 (annotated) (showing mobile device (14) comprising, among other things, USB interface (22) and charging control circuit (19)); Baker Decl., ¶ 82.

The examiner did not consider Kerai during prosecution of the '586 Patent.

5. Zyskowski

Zyskowski, like Kerai, discloses a "host" computer system (*e.g.*, laptop) that is connected to a "bus device" (*e.g.*, mobile phone) through a USB connection. Zyskowski, ¶ 0017 ("Host 104 is coupled to a bus device 106 by way of a bus 108"); Baker Decl.; ¶ 83. Zyskowski makes clear that the "host" computer system may be "a personal computer (PC), laptop computer, or handheld computer" and that the "bus device" can be "virtually any electronic device." *Id.*

Zyskowski further discloses that the laptop computer may power devices from a primary power source (when the computer is active) or from a standby power source (when the comptuer is a "reduced-power" or sleep mode). Zyskowski, ¶ 0006 ("The host may have two sources of power for components, a primary power source and a standby power source.") Typically, certain non-essential devices (*e.g.*, USB-connected devices) may stop receiving power when the laptop transitions from an active/awake mode (primary power) to an inactive/asleep mode (standby power).

> In some environments the host device may enter a reduced power state in which the host consumes less power than in a fully-powered stated. In this low power state, power consumption by certain components of the computer system may be curtailed in order to reduce overall power consumption . . . . Essential components may derive power from the standby power source. Non-essential components, e.g. components to whom power may be discontinued to place the host in a reduced power state, may derive power from the primary power source. Placing the host in a reduced power consumption state may thus involve cutting off the primary power source. The standby power source may remain available while the host is in the reduced power state. Restoring the primary power source may cause the host to enter the fully power state again.

Id., ¶ 0005-0006.

In order to determine whether it is being powered by primary power or standby power, the USB-connected device of Zyskowski my monitor the data lines of the USB connection. *Id.*, ¶ 0019 ("[D]evice 106 may detect that the host 104 is in a reduced power state by monitoring the state of one or both of the data paths D1 and D2.) The host may, for example, send a high/high (SE1) signal when transitioning to from an inactive state to an active state (i.e., from standby power to primary power). *Id.*; Baker Decl., 85. Alternatively, when the host in an inactive/asleep state, it may draw the data lines to a "floating" signal or a ground signal:

> [D]evice 106 may detect that the host 104 is in a reduced power state by monitoring the state of one or both of the data paths D1 and D2. <u>When the host 104 is in a full power state, data lines D1 and D2 may be raised to a predefined DC voltage level, for example, 5 volts (systems operating at lower voltages might raise the data paths to 3 volts, 2 volts, or even less).</u> When the host 104 is operating in a reduced power state, the data paths D1 and D2 may be "floating (an electrical characteristic well known in the art) or grounded, or in some other state wherein the predefined DC voltage level is not present on the paths. The device 106 may detect the power state of host 104 by detecting the presence or absence of the predefined DC voltage level on the data paths D1 and D2.

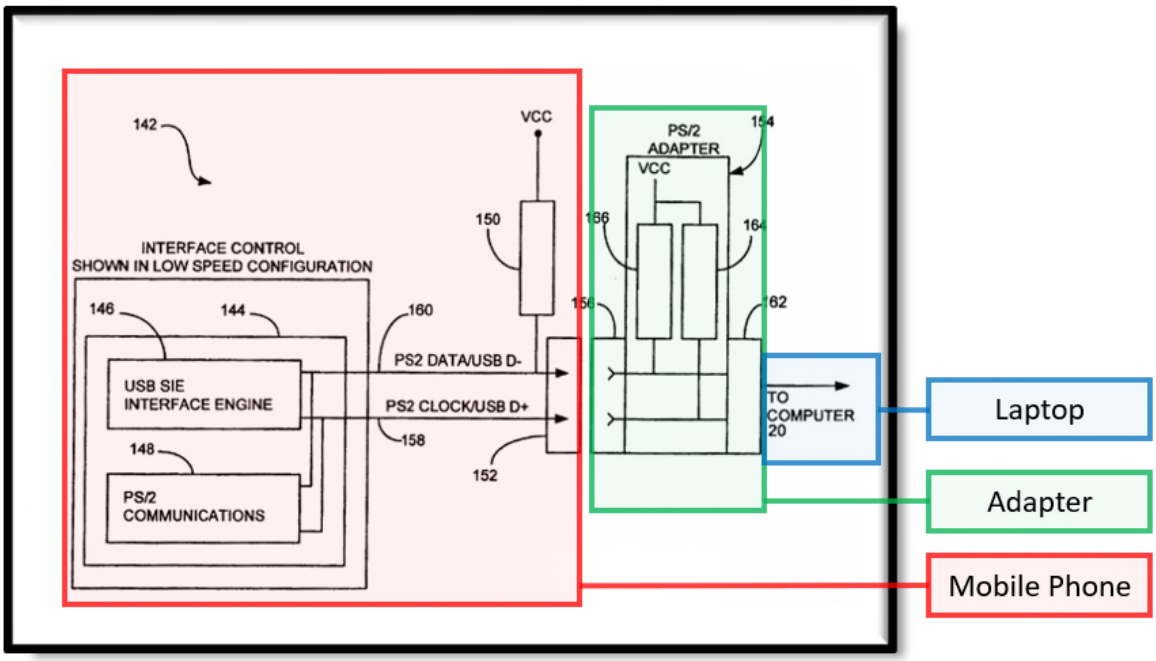
Id., ¶ 0019 (emphasis added).

The examiner did not consider Zyskowski during prosecution of the '586 Patent.

6. <u>Casebolt</u>

Casebolt, like Kerai and Zyskowski, is also directed to a system and method for connecting a computer system (*e.g.*, a laptop) to a peripheral device (*e.g.*, a mobile phone). PA-F

(Casebolt), Abstract. Casebolt discloses, however, that some computer systems may not have a USB port and, instead, may only have other ports such as PS/2 port. Casebolt, 1:38-40 ("[A] conventional computer is typically provided with only one interface (such as a PS2 or USB interface)."). In order to connect a device—such as the mobile device disclosed by Kerai—that comprises a USB connection only (and not a PS/2 connection), Casebolt discloses (1) using an adapter for connecting a USB connection to a PS/2 port and (2) configuring the mobile device to distinguish between a USB connection and a PS/2 connection (through the USB to PS/2 adapter). *Id.*, 2:43-59 ("The peripheral device includes an interface detection component configured to detect which of the first and second interfaces [USB and PS/2] the peripheral device is connected to."); Baker Decl., ¶ 86. The adapter is connected to the USB connection of the mobile device on the one hand, and connected to the PS/2 port of the computer on the other:



Casebolt, Figure 3 (annotated) (showing mobile device (142) connected to adapter (154) which connects to the PS/2 port of computer (20)); Baker Decl., ¶ 86.

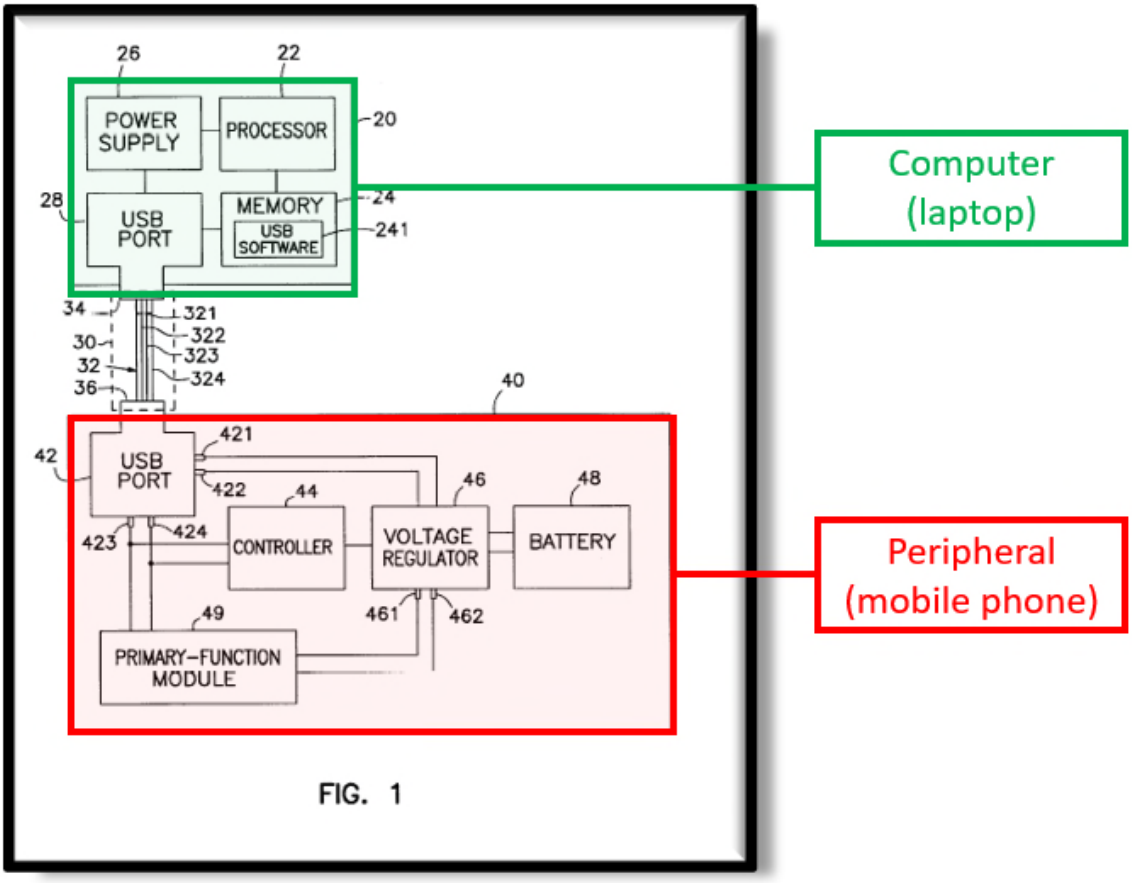
Casebolt discloses that when the mobile devices USB connector is connected to a computer through the USB-to-PS/2 adapter, the adapter will pull the data lines to a high/high (SE1) signal through pull-up resistors 156 and 164. *Id.*, 6:42-45 ("When adapter 154 is coupled to peripheral device 142, pull-up resistor 164 pulls the PS2 clock/USB D+ signal line to VCC. Resistor 166 pulls the PS2 data/USB D— signal line to VCC as well."). This is very similar to certain embodiments in the '586 Patent in which the "identification signal" is comprises a "hardwired connection" of a high voltage to both data lines. *See e.g.*, Ex. PAT-A ('586 Patent) at 8:21-23 ("In one embodiment, the identification subsystem 108 comprises a hard-wired connection of a single voltage level to both data lines."); Baker Decl., ¶ 87.

This signal—which Casebolt notes is an SE1 signal—indicates that the mobile device is charging from a PS/2 port (which has different voltage and current specifications). Casebolt, 7:40-45 ("[I]f the SE1 condition is maintained for the necessary time period, and the terminal count is reached, controller 144 determines that it has detected a PS2 interface and moves to state 180. This causes USB functions to be terminated, and PS2 communications controller 148 takes over communication between peripheral device 142 and computer 20."); Baker Decl., ¶ 88.

The examiner did not consider Casebolt during prosecution of the '586 Patent.

7. Gilbert

Gilbert, like Kerai, Zyskowski, and Casebolt, is directed to a system and method for connecting a peripheral device (*e.g.*, mobile device) to a computer system through a USB cable and thereby supplying power to the peripheral device. PA-G (Gilbert), Abstract; Baker Decl. ¶ 89. Gilbert does not limit the system to any specific type of peripheral device but notes that the system can be used with "high-power peripherals that require more than available through [a typical USB connection]." *Id.* at 3:18-20.



Gilbert, Figure 1 (annotated).

91. Gilbert discloses that the mobile device switches between two modes: (1) a mode in which the mobile device draws power form the USB port in order to charge the battery and (2) a mode in which the device draws power from the battery for purposes of powering device operations. Baker Decl., ¶ 90. Gilbert further discloses that the peripheral device determines which mode to operate in by monitoring signals on the data lines. Gilbert, 1:61-67 ("In operation, the controller switches the battery between a charge mode and a supply mode according to signals received through the bus data lines. The charged battery supplements the power available through the bus power lines, thereby providing more power for operating the peripheral than otherwise available over the bus power lines alone") (emphasis added); *id.* at 3:21-29 ("In operation, interface-controller module 44 monitors and decodes data received at data terminals

423 and 424. If it receives data indicating or invoking an inactive period, for example, data instructing that the peripheral be turned off, it sends a control signal to voltage regulator 46. The control signal invokes a charge mode in voltage regulator 46. In the charge mode, voltage regulator 46 diverts power away from primary-function module 49 to battery 48, thereby charging battery 48") (emphasis added); *id.* at 3:65-4:12 ("More precisely, port 42 and controller 44 of power extension peripheral 50 decode and monitor data on bus 30. If controller 44 detects data indicating or invoking an inactive period for peripheral 70, it directs regulator 46 to divert power away from connector 64 and thus away from peripheral 70 to charge battery 48. On the other hand, if controller 44 detects data indicating or invoking an active period for peripheral 70, it allows battery 48 to provide supplemental power through connector 64, cable 66, and connector 68 to peripheral 70, thereby overcoming the 2.5-watt power limit of bus 30. Furthermore, two or more substantially similar power-extension peripherals can be connected in parallel to provide even more supplemental power to a given high-power peripheral."); Baker Decl., ¶ 90.

In order to determime the difference between these two modes, the "interface-controller module 44 [of the peripheral] monitors and decodes data received at data terminals 423 and 423 [of the USB interface]." *Id.* at 1:21-22. Based on the data signals received on the data lines, "the controller switches the battery between a charge mode and a supply mode according to signals received through the bus data lines." *Id.* at 1:61-63.

The examiner did not consider Gilbert during prosecution of the '586 Patent.

D. Claim Construction

The '586 Patent has expired. "[W]hen an expired patent is subject to reexamination, the traditional *Phillips* construction standard attaches." *In re CSB-Sys. Int'l, Inc.*, 832 F.3d 1335,

1341 (Fed. Cir. 2016). This standard "emphasizes considering the plain meaning of the claim terms themselves in light of the intrinsic record." *Id.*

1. "identification signal"

In prior proceedings, Patent owner argued that "identification signal" meant a "signal that identifies a power source type." OTH-B (*Fundamental Innovation Systems International, LLC v. LG Electronics, Inc. et al*, Case No. 2:16-cv-01425 (E.D. Tex.) at Dkt. No. 123 (FISI Opening Claim Construction Brief)) at 13. The court subsequently adopted patentee's construction. OTH-C ((*Fundamental Innovation Systems International, LLC v. LG Electronics, Inc. et al*, Case No. 2:16-cv-01425 (E.D. Tex.) at Dkt. No. 146 (Claim Construction Order)) at 34. The court had previously adopted the same construction as well. OTH-D ((*Fundamental Innovation Systems International, LLC v. Samsung Electronics Co., Ltd., et al.*, Case No. 2:17-cv -00145 (E.D. Tex.) at Dkt. No. 140 (Claim Construction Order)) at 41.

For purposes of this request for reexamination, Requestor adopts this construction.

E. Prior Requests for Review

The grounds and reasoning asserted in this request for *ex parte* reexamination are unique. As noted above, the examiner did not consider any of the references cited herein during prosecution.

Moreover, although there have been three prior requests for *inter partes* review of the '586 Patent (IPR2021-00599, IPR2018-00274, IPR2018-00493, and IPR2018-00485), the PTAB did not consider the grounds articulated herein. Specifically, the PTAB has not considered any specific invalidity grounds based on Matsumoto, Yang, De Iuliis, Zyskowski, Kerai, or Gilbert, either alone or in combination, in any prior proceedings regarding the '586 Patent. And while the PTAB did consider one of the prior art references discussed herein during prior *inter partes*

review proceedings (Casebolt), it did not consider the combination and reasoning discussed herein.

IV. DETAILED STATEMENT OF SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY

A. Matsumoto Anticipates or Renders Obvious Claims 1 and 8 of the '586 Patent

For the reasons stated below, Matsumoto anticipates Claims 1 and 8 or, at a minimum, renders Claims 1 and 8 obvious. OTH-A ("Baker Decl."), ¶¶ 91-121.

1. Claim 1

Matsumoto anticipates Claim 1 under 25 U.S.C. § 102 or, at a minimum, renders Claim 1 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 91-114. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 1 based on Matsumoto under 35 U.S.C. §§ 102 and 103.

Please see attached Exhibit CC-A for a claim chart comparing Matsumoto with Claim 1 of the '586 Patent under 35 U.S.C. §§ 102 and 103

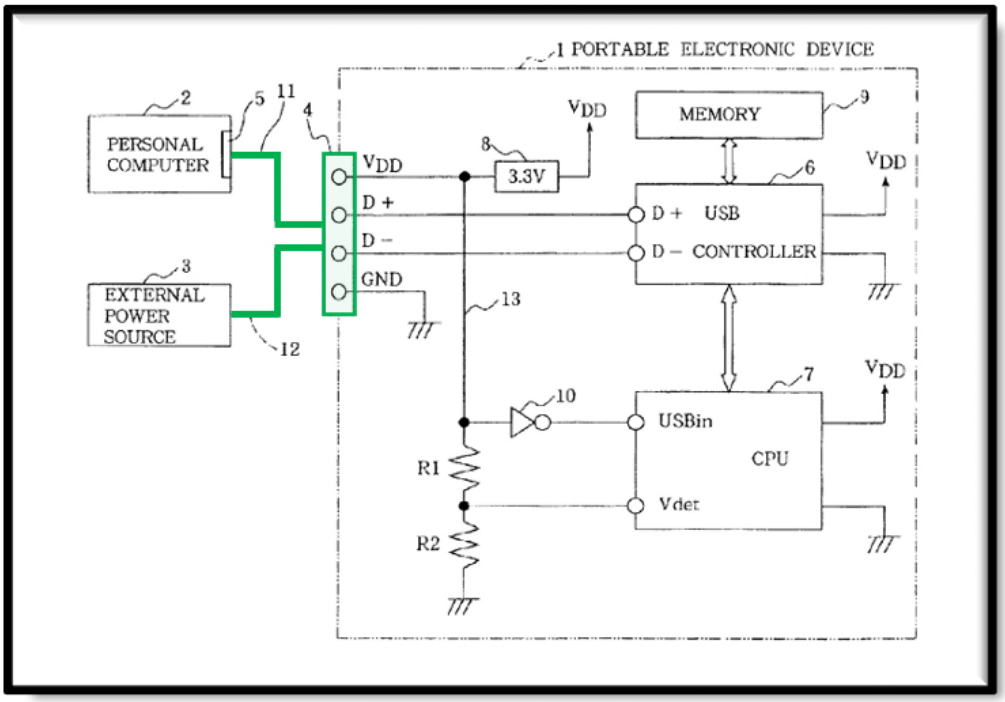
a. *Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising*

The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto. Baker Decl., ¶¶ 92-93 Specifically, Matsumoto discloses a "portable electronic device" that comprises a USB connection for connecting to a personal computer or an adapter. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector 4, a USB controller 6 for executing predetermined data communication processing attendant on data communication with a personal computer 2 connected to the USB connector 4,

and a main CPU 7 for executing device operation processing for the usual operation of the device, and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4.") (emphasis added). A person of ordinary skill in the art would have understood—or at a minimum found it obvious—that this could include mobile USB devices configurable for use in a wireless telecommunications network. Baker Decl., ¶ 93.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Matsumoto discloses this element. Baker Decl., ¶¶ 94-95. Specifically, Matsumoto teaches that the mobile device has a USB interface that can connect to another device through a USB cable, *e.g.*, to personal computer (2) or to external power source (3).



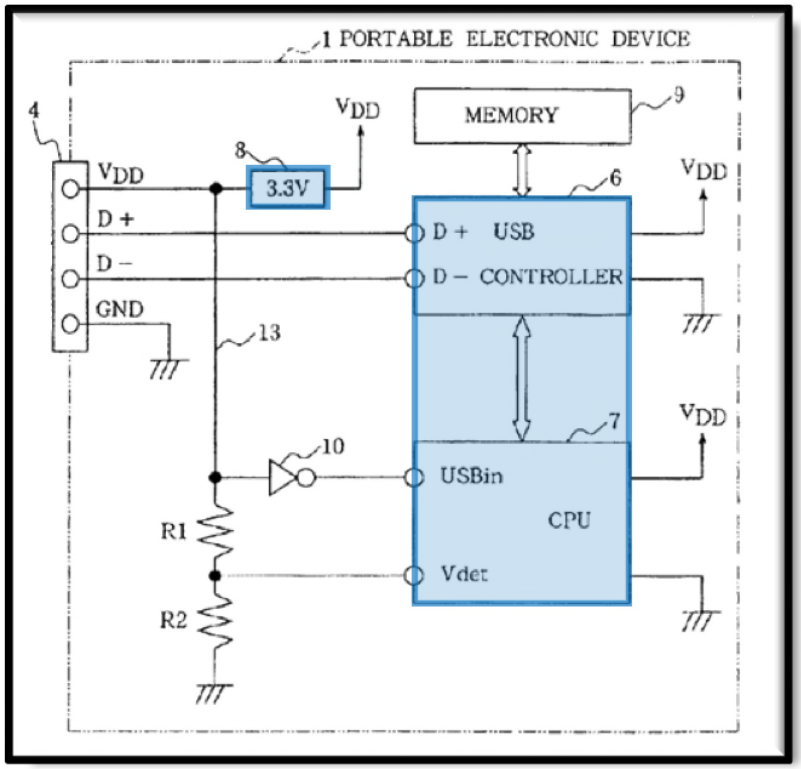
Matsumoto, Figure 1 (annotated) (showing USB interface (4) configured to allow reception of a USB Cable (11 or 12)); *id.* at Abstract ("A portable electronic device according to the invention comprises a USB connector 4 . . . and is adapted to receive a power supply from . . . an external power source 3 as connected to the USB connector 4.") (emphasis added); *id.* at 3:40-50 ("An embodiment of the present invention will be described below in detail with reference to the drawings. FIG. 1 shows a portable electronic device 1 of the invention, which has a USB connector 4. A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12. The USB connector 4 has a pair of data terminals D+ and D−, a power source terminal VDD and a ground terminal GND.")**;** *id.*, at 1:28-36 ("In recent years, USB has attracted attention as a universal interface for connecting a plurality of peripheral devices in common to a host personal computer, and studies are underway for providing USB connectors, which are compliant with the USB standard, on various portable electronic devices. The USB connector has a pair of data terminals D+ and D-, power source terminal [VBUS line] and ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal.") (emphasis added); Baker Decl., ¶ 94.

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto included "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 95.

c. *1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line*

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Matsumoto discloses this element. Baker Decl., ¶¶ 96-98. Specifically, Matsumoto discloses that the mobile device comprises a voltage regulator (8) a USB controller (6) and a CPU (7), and that each of these

components are operably connected to the V_{BUS} line (which Matsumoto refers to as V_{DD}) of the mobile device's USB interface.



Matsumoto, Figure 1 (annotated); *id.* at 3:59-65 ("The pair of data terminals D+ and D- of the USB connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal VDD of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added); Baker Decl., ¶ 96-97.

Matsumoto further discloses that at mobile device has a "charging subsystem" comprised at least of the CPU. Baker Decl., ¶¶ 97. Specifically, Matsumoto discloses that the CPU controls charging of the mobile device's battery and that power is supplied from the USB connection for that purpose. Matsumoto at 1:17-21 ("Portable electronic devices . . . conventionally have incorporated therein a dry cell or secondary sell [battery] serving as the power source to realize the portability of the device."); *id.* at 1:28-36 ("The USB connector has a

pair of data terminals D+ and D-, a power source terminal [USB V_{BUS} line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line].") (emphasis added); *id.* at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Matsumoto comprise a charging subsystem comprised of at least the mobile device's CPU, which is operably connected to the USB interface V_{BUS} power line. Baker Decl., ¶¶ 96-97. A person of ordinary skill in the art would have thus understood that Matsumoto discloses a mobile device with "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Baker Decl., ¶ 98.

d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Matsumoto discloses this element. Baker Decl., ¶¶ 99-101.

Specifically, as noted above, Matsumoto discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU. *See* Claim 1[c]. Matsumoto further discloses that the CPU is operably connected to the battery (through the power line, V_{DD}/V_{BUS}) and that it controls charging of the battery. Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector has a pair of data

terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); *id.* at 3:59-65 ("The pair of data terminals D+ and D- of the USB connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal V_{DD} of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Matsumoto (which is comprised at least of the CPU) is "operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 143.

e. *1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery*

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Matsumoto discloses this element. Baker Decl., ¶¶ 144-147.

Specifically, as noted above, Matsumoto discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU that is operably connected to (1) the V_{BUS} line of the USB Connector and (2) the mobile device's battery. *See* Claim 1[c]-[d]. Matsumoto further discloses that portions of the charging subsystem (specifically the CPU) controls the charging of the mobile device's battery and that the power for such charging comes from the V_{DD} (V_{BUS}) line of the USB connection. *See* Claim 1[d]; Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector

has a pair of data terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); Baker Decl., ¶ 100.

Accordingly, a person of ordinary skill in the art would have understood that Matsumoto discloses that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 101.

f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Matsumoto discloses this element. Baker Decl., ¶¶ 105-113. Specifically, Matsumoto discloses "discriminating means" that identify the type of power source connected to the mobile device (*e.g.*, by discriminating between a personal computer and a wall adapter). Moreover, Matsumoto discloses—and a POSITA would have understood—that such "discriminating means" can comprise an identification signal at a D+ and D- data line of the USB interface that is different from USB enumeration. Baker Decl., ¶ 105.

Matsumoto discloses a portable electronic device (*e.g.*, a mobile phone) with a USB port that can be connected to (1) a computer that supplies power and performs certain communications (*e.g.*, enumeration) over the USB connection or (2) an external power supply (*e.g.*, an adapter/charger) that only supplies power. Baker Decl., ¶ 106; Matsumoto, Abstract ("A portable electronic device according to the invention . . . is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."); *id.* at 1:17-27 ("Portable electronic devices Such as audio players or digital cameras of the portable type conventionally have incorporated therein a dry cell or secondary

cell serving as the power source to realize the portability of the device. In some cases, however, it is desired to connect a commercial a.c. power source or like external power source to such a device and operate the device therewith. This nevertheless entails the problem that the provision of a connector for connecting the external power Source to the portable electronic device renders the device greater in size."); *id.* at 1:37-45 ("Accordingly, it appears feasible to provide the USB connector on a portable electronic device for use with an a.c. adaptor (external power source) connectable to the power source terminal of the USB connector, and to connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device, the USB connector thus serving also as a connector for the connection of the external power source, whereby an increase in the size of the electronic device is avoidable."); *id.* at 3:44-48 ("A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 Such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12.").

Matsumoto further discloses that when portable devices are connected to other USB devices, they will typically (per the USB specification) engage in communication with that device (including, for example, for enumeration), which slows down performance of the portable device.

> However, it is usual practice with the portable electronic device (compliant with the USB standard) having the USB connector to provide a main CPU for executing predetermined device operation processing for various operations of the device including reproduction of data, and a USB controller separate from the main CPU and adapted to execute predetermined data processing for carrying out data communication with the personal computer through the USB connector so as to ensure simplified processing. When the personal computer is connected to the USB connector on the portable electronic device in this case, it is necessary for the USB controller to conduct data communication with the personal computer with a definite period as required by the USB Standard [*e.g.*, enumeration/configuration], so that the leadership in data processing is taken over by the USB controller from the main CPU. This entails the problem that even if the user gives the portable electronic

> device a command for data reproduction (play operation), the main CPU is unable to rapidly execute device operation processing for data reproduction.
>
> Further while the USB controller is connected to the personal computer for data communication, some kind of data is handled also between the main CPU and the USB controller. This gives rise to the problem that the main CPU must execute very complicated processing since there is a need for the main CPU to execute device processing for data reproduction in this state."

Matsumoto, 1:46-2:4 (emphasis added); Baker Decl., ¶ 107.

To resolve this issue, Matsumoto discloses "discriminating means" for determining whether the portable device is connected to a computer or an external power supply for charging purposes. Baker Decl., ¶ 108. If the portable device is connected to an adapter/charger, the portable device will avoid the costly communication process (including enumeration/configuration). *Id*. Accordingly, Matsumoto discloses that power is supplied "without enumeration" when connected to an adapter. Baker Decl., ¶ 108; Matsumoto at Abstract ("Discriminating between the sources of supply of power, the main CPU 7 causes the USB controller 6 to execute the predetermined data communication processing [enumeration] while power is supplied from the personal computer 2, or executes the usual device operation processing [no enumeration] while power is supplied from the external power source 3. This assures more rapid and simplified processing even when the USB connector is used also as a connector for the external power source."); *id.* at 2:26-32 ("The control circuit discriminates among the sources of supply of power and causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] while power is supplied from the information processing device [the computer], or executes the usual device [*e.g.*, phone] operation processing [no enumeration] while power is supplied from the external power source [adapter].") (emphasis added); *id.*at 2:33-46 ("With the portable electronic device of the present invention, processing is assigned according to the source of supply of power; the control circuit causes the common serial bus controller to execute the predetermined data

communication processing [including enumeration] when the information processing device [computer] is the power source, or executes the usual device operation processing [i.e., no enumeration], such as data reproduction control, when the external power source [adapter] or the internal power source is the source of supply of power. Thus, the control circuit and the common serial bus controller perform processing as distinctly dividedly assigned thereto according to the source of supply of power. This ensures simplified processing at a higher speed.") (emphasis added); *id.* at 2:47-57 ("Stated more specifically, the control circuit comprises discriminating means for judging which of the information processing device [computer] and the external power source [adapter/charger] is connected to the common serial bus connector [*e.g.*, USB connector], and control means for causing the common serial bus controller [USB connector] to execute the predetermined data communication processing [including enumeration] when the connection of the information processing device [computer] to the common serial bus connector [USB connector] is recognized, or executes the usual device operation processing [no enumeration/communication] when the connection of the external power source to the common serial bus connector is recognized.") (emphasis added).

A POSITA would have understood that there are various ways to implement "discriminating means" to inform the mobile device that it is charging from an A/C adapter, including through a signal on the data lines (D+ and D-) of the USB interface. Baker Decl., ¶ 109. For example, Matsumoto discloses that the discriminating means may comprise determining whether "the common serial bus controller has started communication via the common serial bus connector withing a predetermined period of time" (i.e., within the time required by the USB Specification). Baker Decl., ¶ 109; Matsumoto, 3:2-5. "[I]f data communication has not been started within the predetermined period of time, the external power source is found to be the supply source." *Id.*, 3:6-9. In other words, as one option, Matsumoto

proposes that after attaching the mobile device to the adapter, neither device will send any signals on the data lines to signal the attachment, *i.e.*, they will maintain a low voltage on both data lines for an extended (indefinite) period of time. *Id.* In the USB Specification this is referred to as an extended "SE0" (low/low) signal. Baker Decl., ¶ 110; Matsumoto at 2:26-27 ("The control circuit discriminates among the sources of supply of power . . . ."); *id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power depending on whether the common serial bus controller has started data communication via the common serial bus connector.") (emphasis added); *id.* at 3:2-9 ("[W]ith the latter method, when the common serial bus controller started data communication via the common serial bus connector within a predetermined period of time, the information processing device is found to be the source of supply of power, whereas if data communication has not been started within the predetermined period of time, the external power Source is found to be the supply source.") (emphasis added).

A POSITA would have understood this extended SE0 signal to be "an identification signal." The USB Specification routinely treats SE0 as a signal. Baker Decl., ¶ 110; *see also, e.g.*, PA-I (USB 2.0) at 151 (Section 7.1.7.4.1 (Low-/Full-Speed Signaling) (noting that in certain circumstances "[t]he SE0 State is used to signal an end-of-packet (EOP)); *id.* at 153 ("A hub signals reset to a downstream port by driving an extended SE0 at the port. . . . A device operating in low-/full-speed mode that sees an SE0 signal on its upstream facing port for more than 2.5 us (TDETRST) may treat that signal as a reset."). And, in this case, the SE0 signal identifies the wall adapter as the power source (instead of a personal computer). Baker Decl., ¶ 111; *e.g., id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power . . . .").

Moreover, a POSITA would have understood that the extended SE0 signal is different than enumeration because enumeration requires specific communication protocol that does not

involve an extended SE0 signal. Baker Decl., ¶ 112. Indeed, the typical idle status for a USB device is either high/low or low/high (depending on the speed of the device) and USB enumeration requires pulling either the D+ line high or the D- line high within 100ms to signal an "attach." *Id.* Maintaining an SE0 signal after connecting a device specifically avoids USB enumeration. Ex. PA-I (USB 2.0) at 150 (Section 7.1.7.3 Connect and Disconnect Signaling) ("Δt2 (TSIGATT) This is the maximum time from when VBUS is up to valid level (4.01 V) to when a device has to signal attach. Δt2 represents the time required for the device's internal power rail to stabilize and for D+ or D- to reach VIH (min) at the hub. Δt2 must be less than 100 ms for all hub and device implementations. (This requirement only applies if the device is drawing power from the bus.)"

Table 7-14. Device Event Timings

Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond VIHZ (min) (signaling attach)	TSIGATT	Figure 7-29		100	ms

Id. at 188 (Table 7-14 Device Event Timings); *id.*at 242 ("A USB device must be able to be addressed within a specified period of time from when power is initially applied (refer to Chapter 7). After an attachment to a port has been detected, the host may enable the port, which will also reset the device attached to the port.").

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto are "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Baker Decl., ¶ 113.

2. Claim 8

Matsumoto anticipates Claim 8 under 25 U.S.C. § 102 or, at a minimum, renders Claim 8 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 114-121. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 1 based on Matsumoto under 35 U.S.C. §§ 102 and 103.

Please see attached Exhibit CC-A for a claim chart comparing Matsumoto with Claim 8 of the '586 Patent under 35 U.S.C. §§ 102 and 103

a. ***Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto. Specifically, Matsumoto discloses a "portable electronic device" that comprises a USB connection for connecting to a personal computer or an adapter and is adapted to charge a battery of a mobile device by receiving power through a USB connector. *See* Claim 1[a] and 1[e].

b. ***8[b]: providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface." Matsumoto discloses this element. Specifically, Matsumoto teaches that the mobile device has a USB interface and connects through a USB connector and a USB cable to a USB connector of another device. *See* Claim 1[b]. Matsumoto also teaches that

the mobile device receives power on a V-bus power line at the USB interface. *See* Claim 1[c] and 1[e].

c. ***8[c]: providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem***

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Matsumoto discloses this element. Specifically, Matsumoto discloses that the mobile USB device comprises a charging subsystem that charges the battery of the USB device and is operably connected to the V_{BUS} line of the USB interface. *See* Claim 1[c].

d. ***8[d]: having a battery in operable connection to the charging subsystem;***

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Matsumoto discloses this element. *See* Claim 1[d].

e. ***8[e]: providing power to the battery using the charger subsystem***

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Matsumoto discloses this element. *See* Claim 1[d].

f. ***8[f]: detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Matsumoto discloses this element. Specifically, Matsumoto discloses "discriminating means" that identifies the source of supply of power connected to the portable device (*e.g.*, discriminating between a personal computer or a wall adapter). *See* Claim 1[f]. Matsumoto further discloses that the discriminating means may be an extended SE0 signal on the

data lines (which is different from USB enumeration), and that the mobile USB device detects in order to determine that it is connected to a wall-adapter instead of a computer. *Id.*

B. Matsumoto in view of Yang Renders Obvious Claims 1 and 8

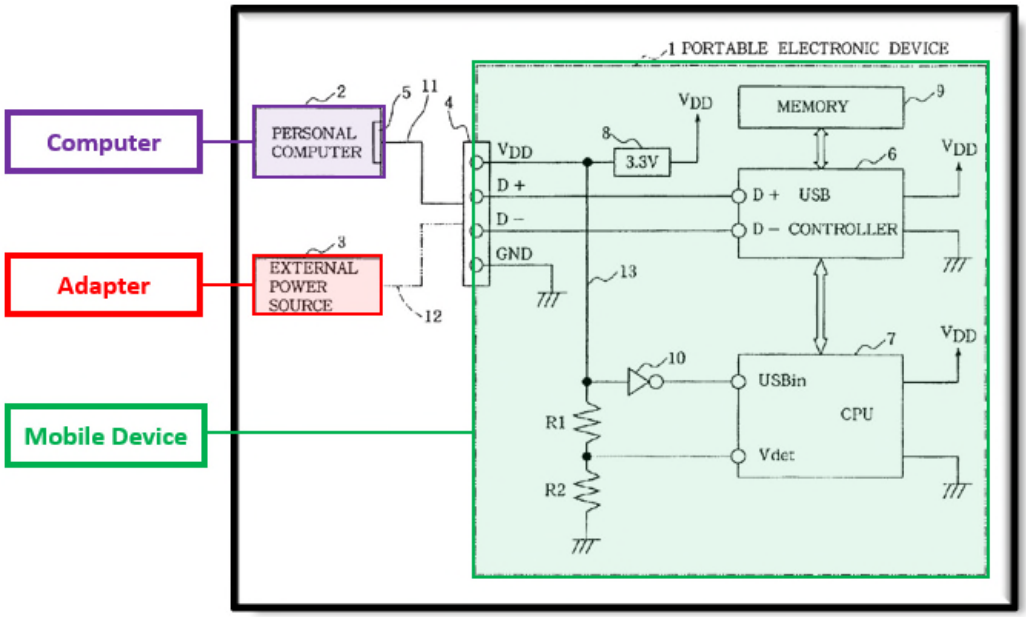
For the reasons stated below, Matsumoto in view of Yang renders obvious Claims 1 and 8. OTH-A (Baker Decl.,), ¶¶ 122-170.

1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Matsumoto with the teachings of Yang. OTH-A (Baker Decl.,), ¶ 122.

Both Matsumoto and Yang relate to systems and methods for powering portable electronic devices (*i.e.*, mobile devices). Baker Decl., ¶ 123. Specifically, each involves a system and method for powering such mobile devices using an adapter that connects directly between a wall outlet and the mobile device. Ex. PA-A (Matsumoto), Abstract ("A portable electronic device . . . is adapted to receive a power supply from . . . an external power source.") and 3:46-47 ("an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12."); Ex. PA-B (Yang) at Abstract ("A mobile phone charger with multiple power supply inputs") and Specification Page 1 ("The second purpose of this utility model is to provide a mobile phone charger with multiple power supply inputs so that the dock charger can use the regular household AC 110V/220V power supply for charging mobile phone batteries."); Baker Decl., ¶¶ 123-125.

As noted in Section III.C.1, *supra*, Matsumoto discloses that the mobile device comprises a USB connector and can be connected to either (1) a computer or (2) an adapter connected to a wall outlet. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector . . . . and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."):



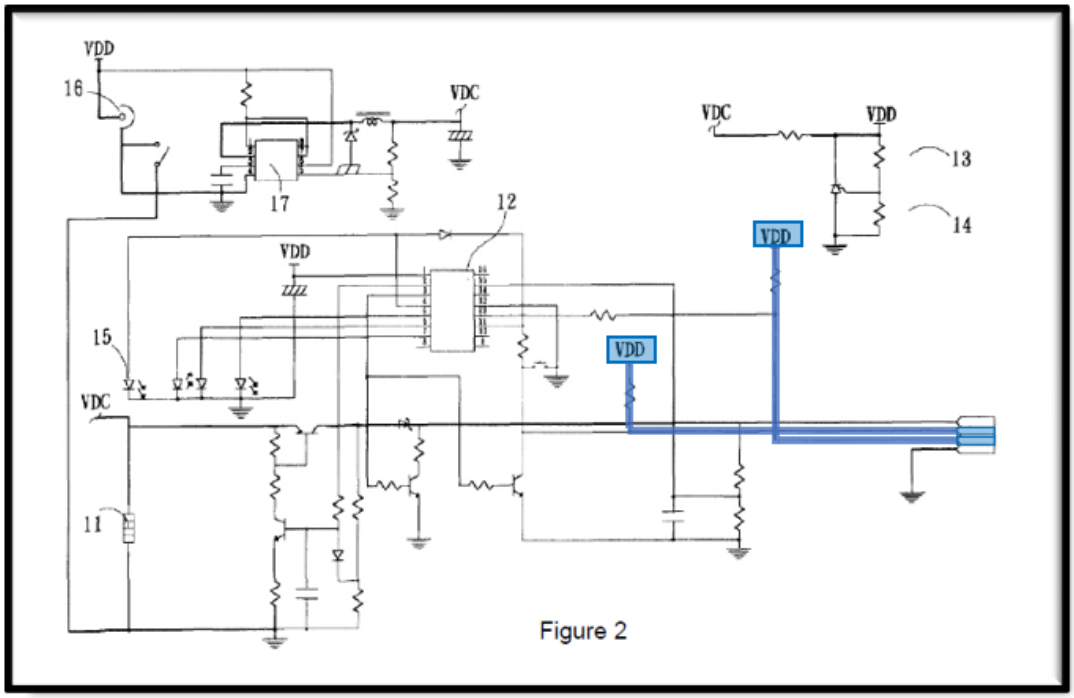
Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)).

Matsumoto further teaches that, when connected to the adapter, the mobile device need not undergo enumeration and, accordingly, it is beneficial to include "discriminating means" for determining when the mobile device is connected to an adapter (as opposed to a computer).

Accordingly, Matsumoto discloses a USB mobile device and a corresponding adapter. Baker Decl., ¶ 126. Matsumoto does not limit the adapter to any specific configuration or implementation, nor does it require a precise structure. Thus, a person of ordinary skill in the art seeking to implement a mobile device and USB wall adapter pursuant to the teachings of Matsumoto would search for references disclosing the structure of such adapters and would find Yang. Baker Decl., ¶ 127. Yang discloses precisely what is suggested by Matsumoto, an adapter that can power a mobile device from, for example, a wall outlet. Yang, Abstract and 3:46-47; Baker Decl., ¶ 127. Moreover, because Yang discloses a flexible design that can be used with various mobile devices, and a connector comprising the same four lines as a USB connection (*i.e.*, Power (VBUS), data lines (D+/D-), and ground), a person of ordinary skill in

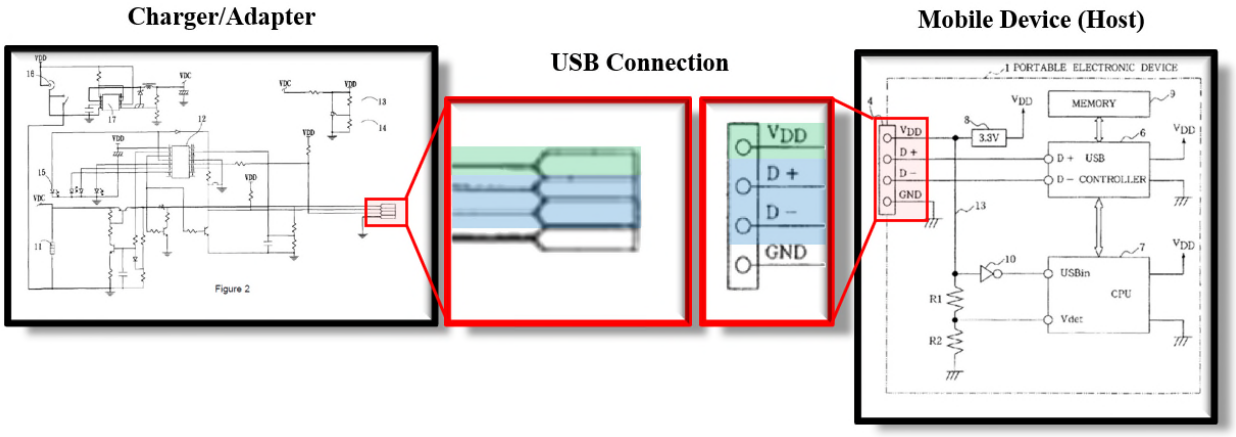
the art would immediately understand that the teachings of Yang regarding the adapter could be used in combination with the teaching of Matsumoto regarding a mobile device. Baker Decl., ¶ 127.

Additionally, Yang discloses an adapter design that would be easily distinguished from typical USB devices (like the personal computer that can be attached to the portable device of Matsumoto). Specifically, Yang discloses an adapter that comprises two pull-up resistors on the data lines, *i.e.*, a default high/high (SE1) signal.



Yang, Figure 2 (annotated); Baker Decl., ¶ 127. As discussed above, typical USB devices will have only one pull-up resistor (i.e., a high/low or low/high default signal depending on the speed of the device). *See* Section III.A.3. Accordingly, a person of ordinary skill in the art seeking to implement the USB device taught by Matsumoto would have understood that the Yang adapter would be a good and convenient design because the SE1 signal could be used as the "discriminating means" taught by Matsumoto. Baker Decl., ¶ 127.

Accordingly, a person of ordinary skill in the art would have been motivated to combine the teachings of Yang and Matsumoto in order to implement a USB Mobile device and associated wall adapter:



Yang Figure 2 and Matsumoto Figure 1 (annotated); Baker Decl., ¶ 128. Upon detecting the adapter of Yang, the mobile device of Matsumoto would, as taught by Matsumoto, simply draw current from the USB VBUS line without engaging in enumeration or otherwise following the USB Specification.

2. Claim 1

Matsumoto in view of Yang renders Claim 1 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 129-160. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Matsumoto in view of Yang under 35 U.S.C. §103.

Please see attached Exhibit CC-B for a claim chart comparing Matsumoto in view of Yang with Claim 1 of the '586 Patent under 35 U.S.C. § 103

a. ***1[a] Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising***

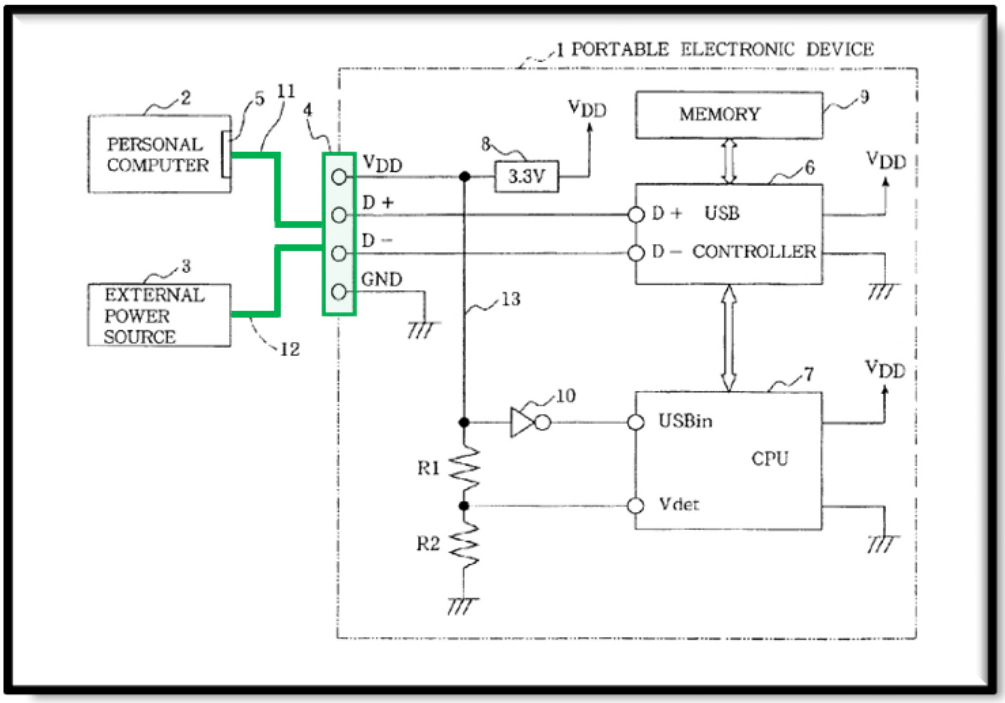
The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto in view of Yang. Baker Decl., ¶¶ 130-132. Specifically, Matsumoto discloses a "portable electronic device" that comprises a USB connection for connecting to a personal computer or an adapter. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector 4 . . . and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4.") (emphasis added). Matsumoto does not limit the "portable" USB device to any particular type of device and a person of ordinary skill in the art would have understood that it be a mobile communications device configurable for use in a wireless telecommunications network. Moreover, Yang similarly discloses an adapter that can be used connected to said portable USB device and expressly states that the device may be a mobile phone. Yang, Claim 1 ("A mobile phone charger with multiple power supply input. Its features include a power supply input device, a DC voltage conversion circuit, a universal serial bus (USB) interface socket, a power supply selection switch, and a voltage conversion IC.") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that Matsumoto in view of Yang discloses a mobile communication device configurable for use in a wireless telecommunications network. Baker Decl., ¶ 132.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Matsumoto in view of Yang discloses this element. Baker Decl., ¶¶ 133-135. Specifically, Matsumoto teaches that the mobile device has a USB interface

that can connect to another device through a USB cable, *e.g.*, to personal computer (2) or to external power source (3):



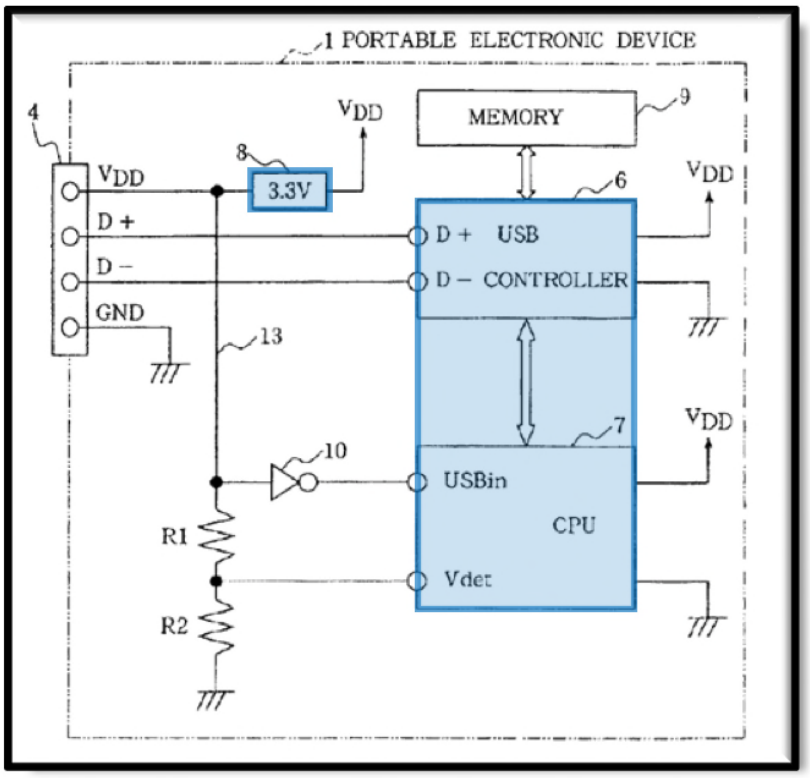
Matsumoto, Figure 1 (annotated) (showing USB interface (4) configured to allow reception of a USB Cable (11 or 12)); *id.* at Abstract ("A portable electronic device according to the invention comprises a USB connector 4 . . . and is adapted to receive a power supply from . . . an external power source 3 as connected to the USB connector 4.") (emphasis added); *id.* at 3:40-50 ("An embodiment of the present invention will be described below in detail with reference to the drawings. FIG. 1 shows a portable electronic device 1 of the invention, which has a USB connector 4. A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12. The USB connector 4 has a pair of data terminals D+ and D−, a power source terminal VDD and a ground terminal GND."); *id.*, at 1:28-36 ("In recent years, USB has attracted attention as a universal interface for connecting a plurality of peripheral devices in common to a host personal computer, and studies

are underway for providing USB connectors, which are compliant with the USB standard, on various portable electronic devices. The USB connector has a pair of data terminals D+ and D-, power source terminal [VBUS line] and ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal.") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto in view of Yang included "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 135

c. ***1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line***

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Matsumoto in view of Yang discloses this element. Baker Decl., ¶¶ 136-139. Specifically, Matsumoto discloses that the mobile device comprises a voltage regulator (8) a USB controller (6) and a CPU (7), and that each of these components are operably connected to the V_{BUS} line (which Matsumoto refers to as V_{DD}) of the mobile device's USB interface.



Matsumoto, Figure 1 (annotated); *id.* at 3:59-65 ("The pair of data terminals D+ and D- of the USB connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal VDD of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added); Baker Decl., ¶ 137.

Matsumoto further discloses that at mobile device has a "charging subsystem" comprised at least of the CPU. Specifically, Matsumoto discloses that the CPU controls charging of the mobile device's battery and that power is supplied from the USB connection for that purpose. Matsumoto at 1:17-21 ("Portable electronic devices . . . conventionally have incorporated therein a dry cell or secondary sell [battery] serving as the power source to realize the portability of the device."); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V_{BUS} line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."") (emphasis added); *id.*

at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); Baker Decl., ¶ 138.

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Matsumoto in view of Yang comprise a charging subsystem comprised of at least the mobile device's CPU, which is operably connected to the USB interface V_{BUS} power line. Baker Decl., ¶ 139. A person of ordinary skill in the art would have thus understood that Matsumoto in view of Yang discloses a mobile device with "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Baker Decl., ¶ 139.

d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Matsumoto in view of Yang discloses this element. Baker Decl., ¶¶ 140-143.

Specifically, as noted above, Matsumoto in view of Yang discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU. *See* Claim 1[c]. Matsumoto further discloses that the CPU is operably connected to the battery (through the power line, V_{DD}/V_{BUS}) and that it controls charging of the battery. Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); *id.* at 3:59-65 ("The pair of data terminals D+ and D- of the USB

connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal V_{DD} of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added); Baker Decl., ¶ 141.

Yang similarly discloses that the mobile device (mobile phone) will charge the device's battery using power from the USB connection. Yang, Specification at 1 ("The main purpose of this utility model is to provide a mobile phone charger with multiple power supply inputs, that is, a USB interface connection device and a power supply conversion device are added to the mobile phone charging dock to obtain the power of the USB interface on the computer for charging mobile phone batteries.") (emphasis added); *id.* at Claim 1 ("Firstly, the voltage of the commercial power supply transformer and the automobile power supply is . . . . converted into the voltage used by the mobile phone battery through a voltage conversion IC for charging, to achieve the purpose of adapting multiple power supply inputs.") (emphasis added); Baker Decl., ¶ 142.

Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Matsumoto in view of Yang (which is comprised at least of the CPU) is "operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 143.

e. ***1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Matsumoto in view of Yang discloses this element. Baker Decl., ¶¶ 144-147.

Specifically, as noted above, Matsumoto discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU that is operably connected to (1) the

V_{BUS} line of the USB connector and (2) the mobile device's battery. *See* Claim 1[c]-[d]. Matsumoto further discloses that portions of the charging subsystem (specifically the CPU) controls the charging of the mobile device's battery and that the power for such charging comes from the V_{DD} (V_{BUS}) line of the USB connection. *See* Claim 1[d]; Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); Baker Decl., ¶ 145.

Yang similarly discloses that the mobile device (mobile phone) will charge the device's battery using power from the USB connection. Yang, Specification at 1 ("The main purpose of this utility model is to provide a mobile phone charger with multiple power supply inputs, that is, a USB interface connection device and a power supply conversion device are added to the mobile phone charging dock to obtain the power of the USB interface on the computer for charging mobile phone batteries.") (emphasis added); *id.* at Claim 1 ("Firstly, the voltage of the commercial power supply transformer and the automobile power supply is . . . . converted into the voltage used by the mobile phone battery through a voltage conversion IC for charging, to achieve the purpose of adapting multiple power supply inputs.") (emphasis added); Baker Decl., ¶ 146.

Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Matsumoto in view of Yang (which is comprised at least of the CPU) is "configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 147.

f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Matsumoto in view of Yang discloses this element. Baker Decl., ¶¶ 148-159. Specifically, Matsumoto discloses "discriminating means" that identify the type of power source connected to the mobile device (*e.g.*, by discriminating between a personal computer and a wall adapter). *Id.* Moreover, Matsumoto in view of Yang discloses—and a POSITA would have understood—that such "discriminating means" can comprise an identification signal at a D+ and D- data line of the USB interface that is different from USB enumeration. *Id.*

Matsumoto discloses a portable electronic device (*e.g.*, a mobile phone) with a USB port that can be connected to (1) a computer that supplies power and performs certain communications (*e.g.*, enumeration) over the USB connection or (2) an external power supply (*e.g.*, an adapter/charger) that only supplies power. Matsumoto, Abstract ("A portable electronic device according to the invention . . . is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."); *id.* at 1:17-27 ("Portable electronic devices Such as audio players or digital cameras of the portable type conventionally have incorporated therein a dry cell or secondary cell serving as the power source to realize the portability of the device. In some cases, however, it is desired to connect a commercial a.c. power source or like external power source to such a device and operate the device therewith. This nevertheless entails the problem that the provision of a connector for connecting the external power Source to the portable electronic device renders the device greater in size."); *id.* at 1:37-45 ("Accordingly, it appears feasible to provide the USB connector on a

portable electronic device for use with an a.c. adaptor (external power source) connectable to the power source terminal of the USB connector, and to connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device, the USB connector thus serving also as a connector for the connection of the external power source, whereby an increase in the size of the electronic device is avoidable."); *id.* at 3:44-48 ("A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 Such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12."); Baker Decl., ¶ 149.

Matsumoto further discloses that when portable devices are connected to other USB devices, they will typically (per the USB specification) engage in communication with that device (including, for example, for enumeration), which slows down performance of the portable device.

> However, it is usual practice with the portable electronic device (compliant with the USB standard) having the USB connector to provide a main CPU for executing predetermined device operation processing for various operations of the device including reproduction of data, and a USB controller separate from the main CPU and adapted to execute predetermined data processing for carrying out data communication with the personal computer through the USB connector so as to ensure simplified processing. When the personal computer is connected to the USB connector on the portable electronic device in this case, it is necessary for the USB controller to conduct data communication with the personal computer with a definite period as required by the USB Standard [*e.g.*, enumeration/configuration], so that the leadership in data processing is taken over by the USB controller from the main CPU. This entails the problem that even if the user gives the portable electronic device a command for data reproduction (play operation), the main CPU is unable to rapidly execute device operation processing for data reproduction.
>
> Further while the USB controller is connected to the personal computer for data communication, some kind of data is handled also between the main CPU and the USB controller. This gives rise to the problem that the main CPU must execute very complicated processing since there is a need for the main CPU to execute device processing for data reproduction in this state."

Matsumoto, 1:46-2:4 (emphasis added).

To resolve this issue, Matsumoto discloses "discriminating means" for determining whether the portable device is connected to a computer or an external power supply for charging purposes. Baker Decl., ¶ 151. If the portable device is connected to an adapter/charger, the portable device will avoid the costly communication process (including enumeration/configuration). Baker Decl., ¶ 151. Accordingly, Matsumoto discloses that power is supplied "without enumeration" when connected to an adapter. *Id.*; Matsumoto at Abstract ("Discriminating between the sources of supply of power, the main CPU 7 causes the USB controller 6 to execute the predetermined data communication processing [enumeration] while power is supplied from the personal computer 2, or executes the usual device operation processing [no enumeration] while power is supplied from the external power source 3. This assures more rapid and simplified processing even when the USB connector is used also as a connector for the external power source."); *id.* at 2:26-32 ("The control circuit discriminates among the sources of supply of power and causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] while power is supplied from the information processing device [the computer], or executes the usual device [*e.g.*, phone] operation processing [no enumeration] while power is supplied from the external power source [adapter].") (emphasis added); *id.*at 2:33-46 ("With the portable electronic device of the present invention, processing is assigned according to the source of supply of power; the control circuit causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] when the information processing device [computer] is the power source, or executes the usual device operation processing [i.e., no enumeration], such as data reproduction control, when the external power source [adapter] or the internal power source is the source of supply of power. Thus, the control circuit and the common serial bus controller perform processing as distinctly dividedly assigned thereto

according to the source of supply of power. This ensures simplified processing at a higher speed.") (emphasis added); *id.* at 2:47-57 ("Stated more specifically, the control circuit comprises discriminating means for judging which of the information processing device [computer] and the external power source [adapter/charger] is connected to the common serial bus connector [*e.g.*, USB connector], and control means for causing the common serial bus controller [USB connector] to execute the predetermined data communication processing [including enumeration] when the connection of the information processing device [computer] to the common serial bus connector [USB connector] is recognized, or executes the usual device operation processing [no enumeration/communication] when the connection of the external power source to the common serial bus connector is recognized.") (emphasis added); Baker Decl., ¶ 151.

A POSITA would have understood that there are various ways to implement "discriminating means" to inform the mobile device that it is charging from an A/C adapter, including through a signal on the data lines (D+ and D-) of the USB interface. Baker Decl., ¶ 152. For example, Matsumoto discloses that the discriminating means may comprise determining whether "the common serial bus controller has started communication via the common serial bus connector withing a predetermined period of time" (i.e., within the time required by the USB Specification). Baker Decl., ¶ 152; Matsumoto, 3:2-5. "[I]f data communication has not been started within the predetermined period of time, the external power source is found to be the supply source." *Id.*, 3:6-9. In other words, as one option, Matsumoto proposes that after attaching the mobile device to the adapter, neither device will send any signals on the data lines to signal the attachment, *i.e.*, they will maintain a low voltage on both data lines for an extended (indefinite) period of time. *Id.* In the USB Specification this is referred to as an extended "SE0" (low/low) signal. Matsumoto at 2:26-27 ("The control circuit

discriminates among the sources of supply of power . . . ."); *id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power depending on whether the common serial bus controller has started data communication via the common serial bus connector.") (emphasis added); *id.* at 3:2-9 ("[W]ith the latter method, when the common serial bus controller started data communication via the common serial bus connector within a predetermined period of time, the information processing device is found to be the source of supply of power, whereas if data communication has not been started within the predetermined period of time, the external power Source is found to be the supply source.") (emphasis added).

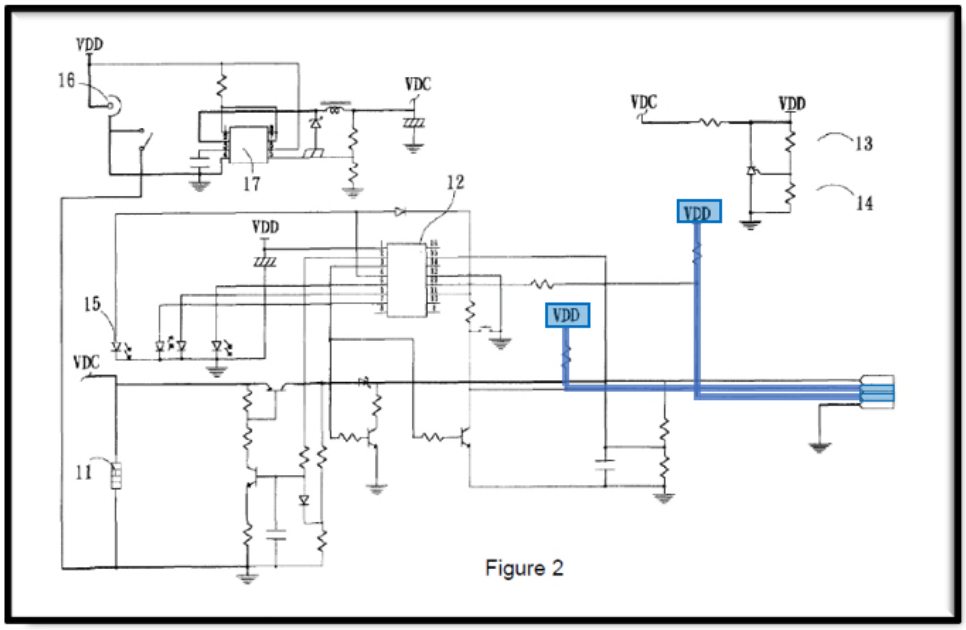
A POSITA would have understood this extended SE0 signal to be "an identification signal" because it identifies the wall adapter as the power source (instead of a personal computer). Baker Decl., ¶ 153; *e.g., id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power . . . ."). Moreover, a POSITA would have understood that the extended SE0 signal is different than enumeration because enumeration requires specific communication protocol that does not involve an extended SE0 signal. Baker Decl., ¶ 154. Indeed, the typical idle status for a USB device is either high/low or low/high (depending on the speed of the device) and USB enumeration requires pulling either the D+ line high or the D- line high within 100ms to signal an "attach." Baker Decl., ¶ 155. Maintaining an SE0 signal after connecting a device specifically avoids USB enumeration. Ex. PA-I (USB 2.0) at 150 (Section 7.1.7.3 Connect and Disconnect Signaling) ("Δt2 (TSIGATT) This is the maximum time from when VBUS is up to valid level (4.01 V) to when a device has to signal attach. Δt2 represents the time required for the device's internal power rail to stabilize and for D+ or D- to reach VIH (min) at the hub. Δt2 must be less than 100 ms for all hub and device implementations. (This requirement only applies if the device is drawing power from the bus.)"

Table 7-14. Device Event Timings

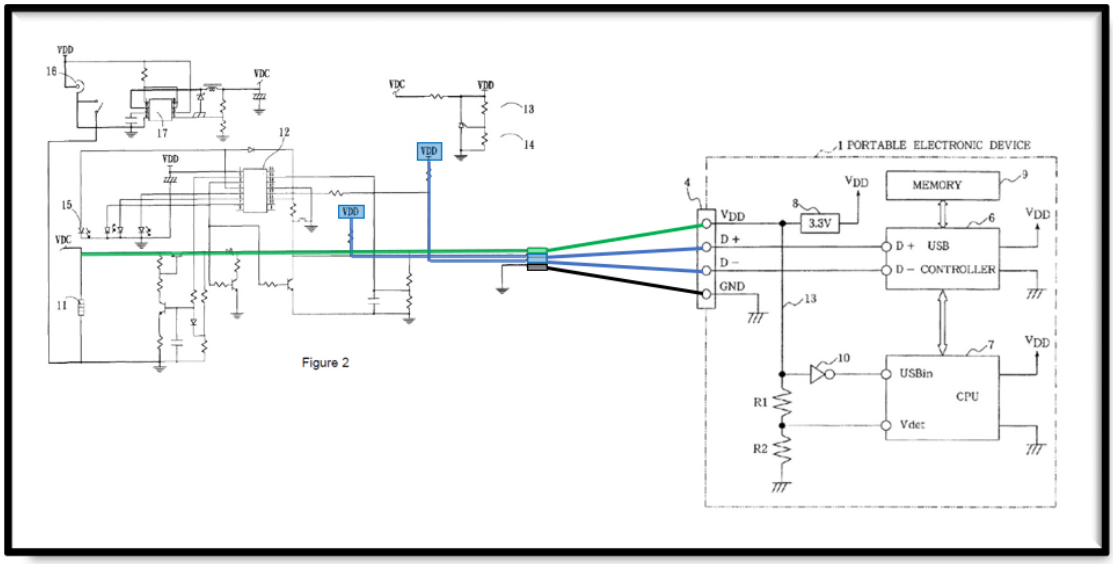
Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond VIHZ (min) (signaling attach)	TSIGATT	Figure 7-29		100	ms

Id. at 188 (Table 7-14 Device Event Timings); *id.*at 242 ("A USB device must be able to be addressed within a specified period of time from when power is initially applied (refer to Chapter 7). After an attachment to a port has been detected, the host may enable the port, which will also reset the device attached to the port."); Baker Decl., ¶ 155.

A POSITA would have also identified other obvious ways for the mobile device to "discriminate" between the computer and the A/C adapter. Baker Decl., ¶ 156. For example, Yang teaches that the data lines may be pulled high through two pull-up resistors, which would identify the charger with a HIGH signal on both the D+ line and the D- line.



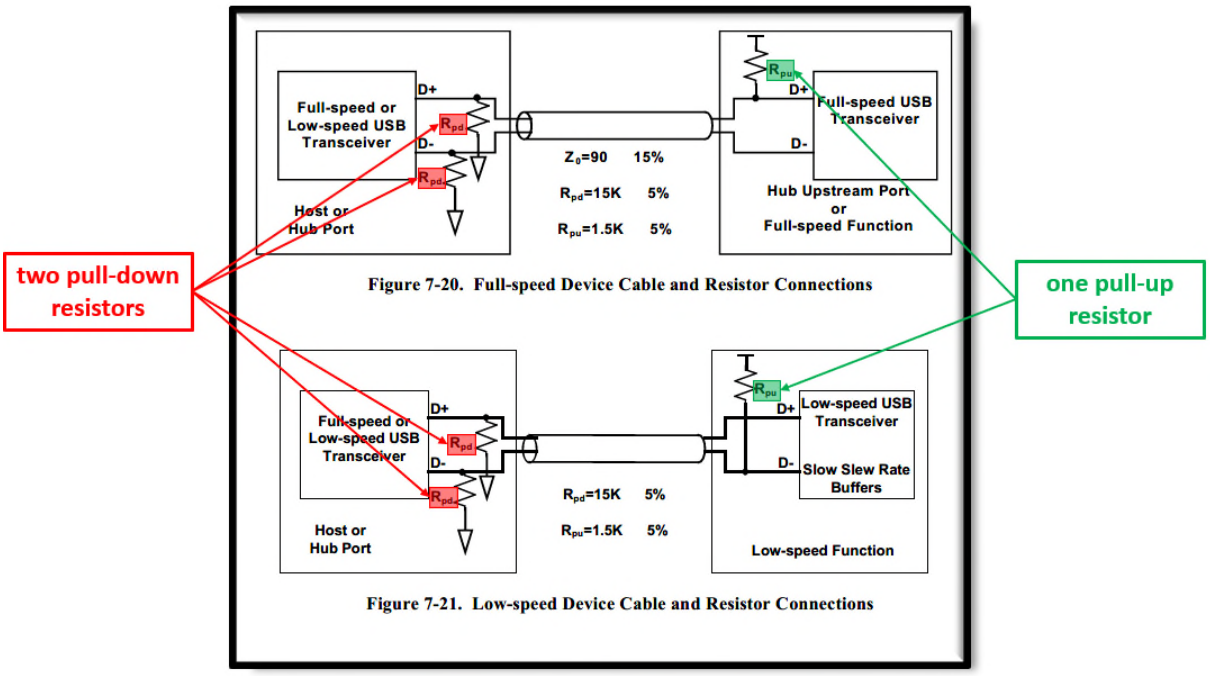
Yang, Figure 2 (annotated).



Yang, Figure 2 and Matsumoto, Figure 1 (combined and annotated). This design and signal would allow the mobile device of Matsumoto to discriminate between the charger of Yang and other devices engaging in typical USB communication and enumeration. Baker Decl., ¶ 156. Specifically, typical USB Hubs and Hosts comprise two "pull-down" resistors and typical USB functions which have only one pull-up resistor on either the D+ or D- line depending on whether the device is low-speed or full-speed. Baker Decl., ¶ 157;

> The USB is terminated at the hub and function ends as shown in Figure 7-20 and Figure 7-21. Full-speed and low-speed devices are differentiated by the position of the pull-up resistor on the downstream end of the cable: Full-speed devices are terminated as shown in Figure 7-20 with the pull-up resistor on the D+ line. Low-speed devices are terminated as shown in Figure 7-21 with the pull-up resistor on the D- line.

USB 2.0 at 141 (Section 7.1.5.1 Low-/Full-Speed Device Speed Identification);



USB 2.0 at Figures 7-20 and 7-21 (annotated) (showing that typical USB hubs and hosts will have two pull down resistors and typical USB functions/devices will have one pull-up resistor to signal either low-speed or full-speed).

A high-high signal on the D+ and D- line is referred to by the USB Specification as a "Single-Ended 1" or "SE1" signal. Baker Decl., ¶ 158. A POSITA would have understood this SE1 signal to be "an identification signal" because it identifies the wall adapter of Yang as the power source (instead of a personal computer). Baker Decl., ¶ 158. Moreover, a POSITA would have understood that the extended SE1 signal is different than enumeration, which does not include sending an SE1 signal. Baker Decl., ¶ 158. Indeed, the USB Specification indicates that low-speed and full-speed USB drivers should not intentionally send such a signal. USB 2.0 at 123 (Section 7.1.1 USB Driver Characteristics) ("Low-speed and full-speed USB drivers must never 'intentionally' generate an SE1 on the bus. SE1 is a state in which both the D+ and D- lines are at a voltage above V_{OSE1} (min), which is 0.8V.").

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto in view of Yang are "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Baker Decl., ¶ 159.

3. Claim 8

Matsumoto in view of Yang renders Claim 8 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Matsumoto in view of Yang under 35 U.S.C. §103. Baker Decl., ¶¶ 163-170.

Please see attached Exhibit CC-B for a claim chart comparing Matsumoto in view of Yang with Claim 8 of the '586 Patent under 35 U.S.C. § 103

a. ***8[a] Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto in view of Yang. Specifically, Matsumoto in view of Yang discloses a mobile phone that comprises a USB connection for connecting to a personal computer or an adapter and is adapted to charge a battery of a mobile device by receiving power through a USB connector. *See* Claim 1[a] and 1[e].

b. ***8[b]: providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface." Matsumoto in view of Yang discloses this element.

Specifically, Matsumoto in view of Yang teaches that the mobile device has a USB interface and connects through a USB connector and a USB cable to a USB connector of another device. *See* Claim 1[b]. Matsumoto in view of Yang also teaches that the mobile device receives power on a V-bus power line at the USB interface. *See* Claim 1[c] and 1[e].

c. ***8[c]: providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem***

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Matsumoto in view of Yang discloses this element. Specifically, Matsumoto in view of Yang discloses that the mobile USB device comprises a charging subsystem that charges the battery of the USB device and is operably connected to the V_{BUS} line of the USB interface. *See* Claim 1[c].

d. ***8[d]: having a battery in operable connection to the charging subsystem;***

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Matsumoto in view of Yang discloses this element. *See* Claim 1[d].

e. ***8[e]: providing power to the battery using the charger subsystem***

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Matsumoto in view of Yang discloses this element. *See* Claim 1[d]-[e].

f. ***8[f]: detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB

enumeration." Matsumoto in view of Yang discloses this element. Specifically, Matsumoto in view of Yang discloses "discriminating means" that identifies the source of supply of power connected to the portable device (*e.g.*, discriminating between a personal computer or a wall adapter). *See* Claim 1[f]. Matsumoto in view of Yang further discloses, as one example, that the discriminating means may be an extended SE0 signal on the data lines (which is different from USB enumeration), and that the mobile USB device detects in order to determine that it is connected to a wall-adapter instead of a computer. *Id.* Matsumoto in view of Yang further discloses, as another example, that the discriminating means may be an SE1 signal on the data lines (which is also different from USB enumeration). *Id.*

C. Matsumoto in view of De Iuliis Renders Obvious Claims 1 and 8

For the reasons stated below, Matsumoto in view of De Iuliis renders obvious Claims 1 and 8. OTH-A (Baker Decl.,), ¶¶ 171-216.

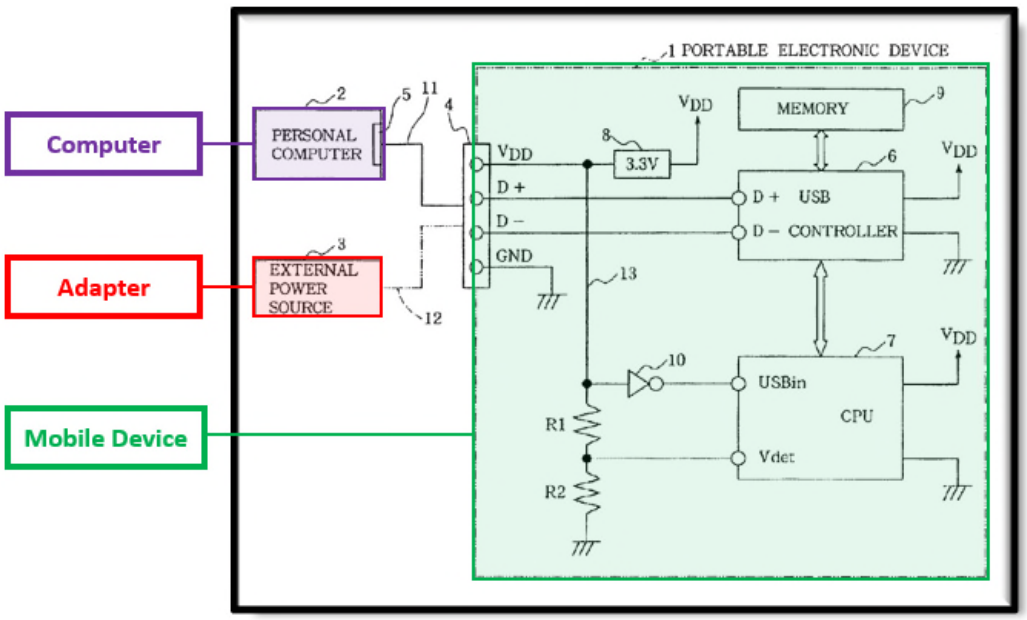
1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Matsumoto with the teachings of De Iuliis. OTH-A (Baker Decl.,), ¶¶ 171-176.

Both Matsumoto and De Iuliis relate to systems and methods for powering portable electronic devices (i.e., mobile devices) through a USB connection. Baker Decl., ¶ 172. Specifically, each involves a system and method for powering such mobile devices using an adapter that connects directly between a wall outlet and the USB connector of a mobile device. Ex. PA-A (Matsumoto), Abstract ("A portable electronic device . . . is adapted to receive a power supply from . . . an external power source.") and 3:46-47 ("an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12."); Ex. PA-C (De Iuliis) at 1:20-39 ("More particularly, the present invention relates to improved techniques for powering and/or charging peripheral devices through a data transmission line . . . .

the peripheral device 12 may be a portable device such as a personal computer, personal digital assistant, cellular phone, digital camera, media player, and the like."); Baker Decl., ¶ 172.

As noted in Section III.C.1, *supra*, Matsumoto discloses that such mobile devices can be connected through a USB connection to either (1) a computer or (2) an adapter connected to a wall outlet. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector . . . . and is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."):



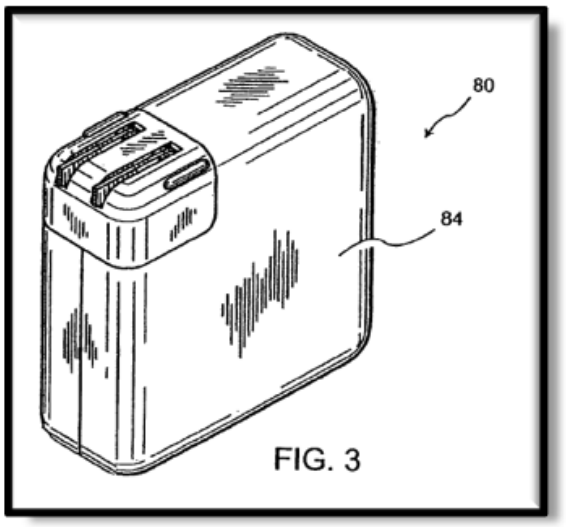
Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)).

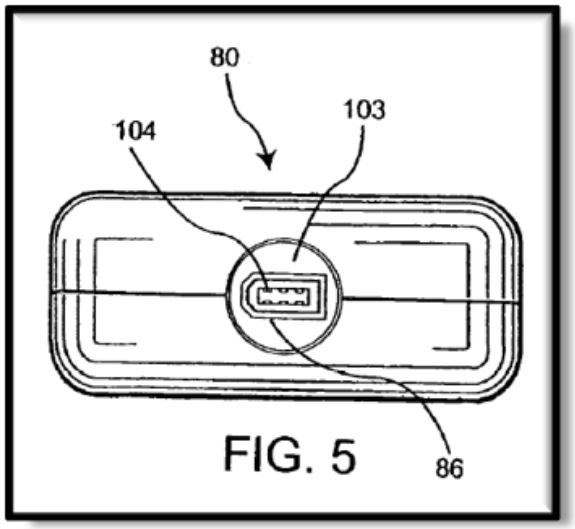
Matsumoto further teaches that, when connected to the adapter, the mobile device need not undergo enumeration and, accordingly, it is beneficial to include "discriminating means" for determining when the mobile device is connected to an adapter (as opposed to a computer). Baker Decl., ¶ 174.

Accordingly, Matsumoto discloses a USB device with a corresponding adapter. Baker Decl., ¶ 174. A person seeking to implement a mobile device and USB wall adapter pursuant to

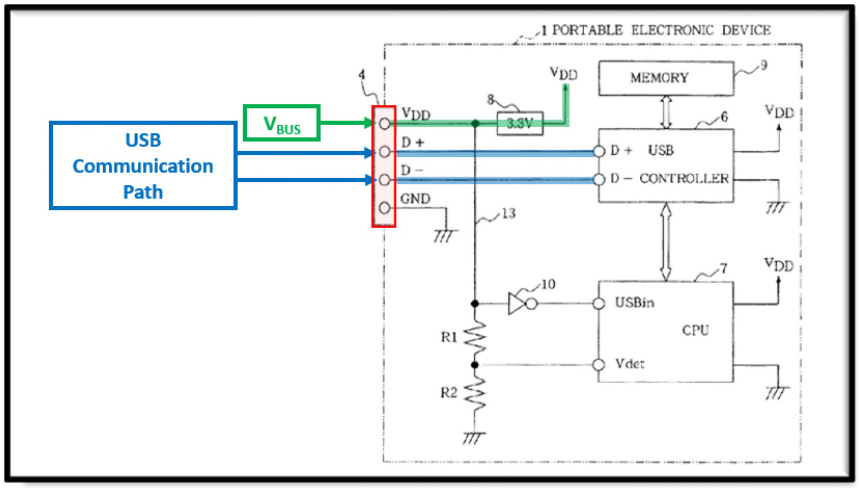
the teachings of Matsumoto would therefore search for references disclosing such adapters and would find De Iuliis. Baker Decl., ¶ 175. De Iuliis discloses precisely what is suggested by Matsumoto, a USB adapter for powering a mobile device through a USB connection. De Iuliis at 4:55-56 ("By way of example, the data transmission line 58 may be a universal serial bus (USB)"); Baker Decl., ¶ 175.

Accordingly, a person of ordinary skill in the art would have been motivated to combine the teachings of De Iuliis and Matsumoto in order to implement a USB Mobile device and associated wall adapter. Baker Decl., ¶ 176;





De Iuliis at Figures 3 and 5 (showing adapter with connection for wall-socket and data port connection to power mobile device).



Matsumoto, Figure 1 (annotated) (showing USB Connector (red), VBUS line (green), and USB communication path (Blue)).

2. Claim 1

Matsumoto in view of De Iuliis renders Claim 1 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Matsumoto in view of De Iuliis under 35 U.S.C. §103.

Please see attached Exhibit CC-C for a claim chart comparing Matsumoto in view of De Iuliis with Claim 1 of the '586 Patent under 35 U.S.C. § 103

a. ***1[a] Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto in view of De Iuliis. Baker Decl., ¶¶ 178-180.

Specifically, Matsumoto discloses a "portable electronic device" that comprises a USB connection for connecting to a personal computer or an adapter. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector 4 . . . and is

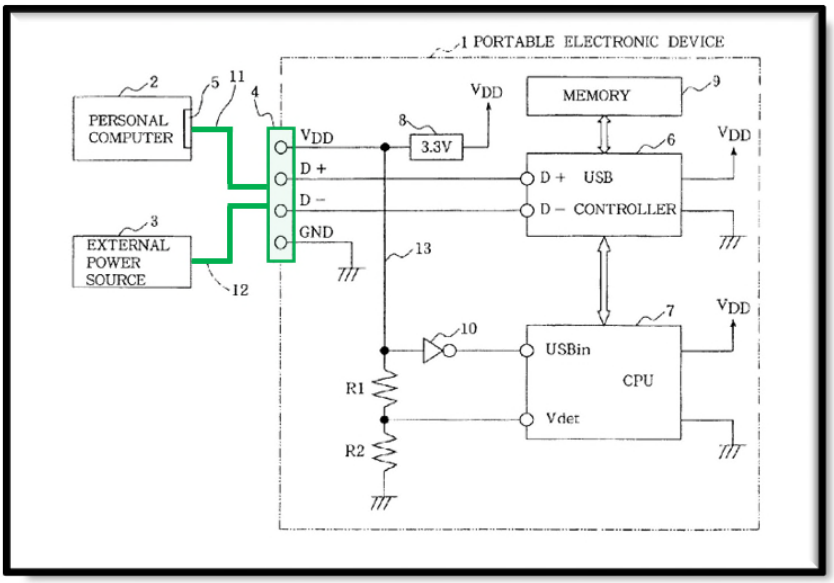
adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4.") (emphasis added). Matsumoto does not limit the "portable" USB device to any particular type of device and a person of ordinary skill in the art would have understood that it be a mobile communications device configurable for use in a wireless telecommunications network. Moreover, De Iuliis similarly discloses an adapter that can be used connected to said portable USB device and expressly states that the device may, for example, a computer, mobile phone, or other portable device. De Iuliis, 1:20-39 ("[T]he present invention relates to improved techniques for powering and/or charging peripheral devices through a data transmission line . . . . the peripheral device 12 may be a portable device such as a personal computer, personal digital assistant, cellular phone, digital camera, media player, and the like.").

Accordingly, a person of ordinary skill in the art would have understood that Matsumoto in view of De Iuliis discloses a mobile communication device configurable for use in a wireless telecommunications network. Baker Decl., ¶ 180.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Matsumoto in view of De Iuliis discloses this element. Baker Decl., ¶ 181.

Specifically, Matsumoto teaches that the mobile device has a USB interface that can connect to another device through a USB cable, *e.g.*, to personal computer (2) or to external power source (3):



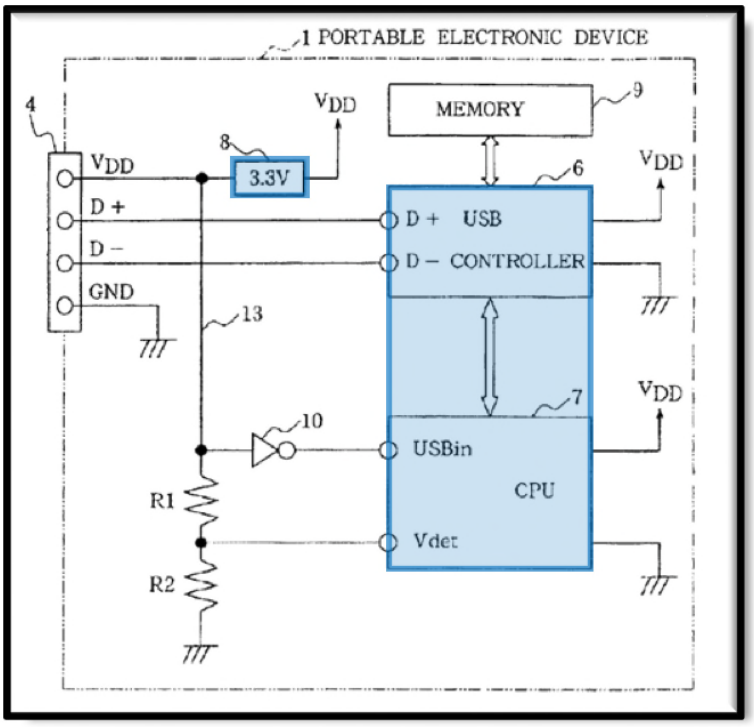
Matsumoto, Figure 1 (annotated) (showing USB interface (4) configured to allow reception of a USB Cable (11 or 12)); *id.* at Abstract ("A portable electronic device according to the invention comprises a USB connector 4 . . . and is adapted to receive a power supply from . . . an external power source 3 as connected to the USB connector 4.") (emphasis added); *id.* at 3:40-50 ("An embodiment of the present invention will be described below in detail with reference to the drawings. FIG. 1 shows a portable electronic device 1 of the invention, which has a USB connector 4. A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12. The USB connector 4 has a pair of data terminals D+ and D−, a power source terminal VDD and a ground terminal GND."); *id.*, at 1:28-36 ("In recent years, USB has attracted attention as a universal interface for connecting a plurality of peripheral devices in common to a host personal computer, and studies are underway for providing USB connectors, which are compliant with the USB standard, on various portable electronic devices. The USB connector has a pair of data terminals D+ and D-,

power source terminal [VBUS line] and ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal.") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto in view of De Iuliis included "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 183.

c. ***1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line***

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Matsumoto in view of De Iuliis discloses this element. Baker Decl., ¶¶ 184-188. Specifically, Matsumoto discloses that the mobile device comprises a voltage regulator (8) a USB controller (6) and a CPU (7), and that each of these components are operably connected to the V_{BUS} line (which Matsumoto refers to as V_{DD}) of the mobile device's USB interface.



Matsumoto, Figure 1 (annotated); *id.* at 3:59-65 (""The pair of data terminals D+ and D- of the USB connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal VDD of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added).

Matsumoto further discloses that at mobile device has a "charging subsystem" comprised at least of the CPU. Specifically, Matsumoto discloses that the CPU controls charging of the mobile device's battery and that power is supplied from the USB connection for that purpose. Matsumoto at 1:17-21 ("Portable electronic devices . . . conventionally have incorporated therein a dry cell or secondary sell serving as the power source to realize the portability of the device."); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V_{BUS} line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."") (emphasis added); *id.* at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); Baker Decl., ¶ 186.

De Iuliis similarly discloses that the portable electronic device can be a mobile phone to which the adapter is connected, and that the device can charge a battery. De Iuliis, 2:12-15 ("The invention pertains to power adapters that allow a user to power and/or charge a peripheral device such as a portable electronic device without requiring any additional cables or connectors."); *id.* at 3:61-4:01 ("The power adapter 50 is generally configured to provide power to a peripheral device during operation and/or charging thereof. In one embodiment, the power adapter 50 may be used to provide power to a peripheral device such as a portable electronic device that includes a battery. By way of example, the portable electronic device may be a

personal computer, personal digital assistant, cellular phone, digital camera, media player, and the like.") (emphasis added); *id.* at 4:41-65 ("The data port 56, in accordance with one embodiment, is configured to provide external power for operation and charging of a peripheral device such as a portable electronic device. The data port 56 includes at least one power contact 57 that is electrically coupled to the power connection 52. The coupling may be direct or indirect. In the case of indirect, the power contact 57 may be coupled to the power connection 52 through the electrical components of the power adapter 50, as for example, a transformer or rectifier circuit. The data port 56 is arranged to receive one end of a data transmission line 58. The data transmission line 58 is preferably a data transmission line having both data and power transmitting capabilities. As was stated earlier, the power transmitting capabilities are associated with data transmissions. By way of example, the data transmission line 58 may be a universal serial bus (USB) or a FIREWIRE IEEE 1394 interface transmission line. The data transmission line 58 typically includes a data connector 60 configured for insertion into the data port 56. The connector 60 [*e.g.*, USB connector] includes at least one power [V_{BUS}] contact 61 since the data transmission line 58 has power transmitting capabilities. As should be appreciated, the power [V_{BUS}] contact 61 of the connector 60 is configured to engage the power [V_{BUS}] contact 57 of the data port 56 so as to provide operational charging power to a peripheral device when the connector 50 is connected to the data port.") (emphasis added); Baker Decl., ¶ 187.

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Matsumoto in view of De Iuliis comprise a charging subsystem comprised of at least the mobile device's CPU, which is operably connected to the USB interface V_{BUS} power line. A person of ordinary skill in the art would have thus understood Matsumoto in view of De Iuliis discloses a mobile device with "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Baker Decl., ¶ 188.

d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Matsumoto in view of De Iuliis discloses this element. Baker Decl., ¶¶ 189-192.

Specifically, as noted above, Matsumoto discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU. *See* Claim 1[c]. Matsumoto further discloses that the CPU controls charging of the battery and that it is operably connected to the battery (through the power line, V_{DD}/V_{BUS}). Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); *id.* at 3:59-65 ("The pair of data terminals D+ and D- of the USB connector 4 are connected to a pair of data terminals D+ and D- provided on the USB controller 6. The power source voltage obtained from the power source terminal V_{DD} of the USB connector 4 is adjusted to 3.3 V by a voltage regulator 8 and then supplied to the USB controller 6 and the main CPU 7.") (emphasis added); Baker Decl., ¶ 190.

De Iuliis similarly discloses that the mobile device (mobile phone) will charge the device's battery using power from the USB connection. De Iuliis, 2:12-15 ("The invention pertains to power adapters that allow a user to power and/or charge a peripheral device such as a portable electronic device without requiring any additional cables or connectors."); *id.* at 3:61-4:01 ("The power adapter 50 is generally configured to provide power to a peripheral device

during operation and/or charging thereof. In one embodiment, the power adapter 50 may be used to provide power to a peripheral device such as a portable electronic device that includes a battery. By way of example, the portable electronic device may be a personal computer, personal digital assistant, cellular phone, digital camera, media player, and the like.") (emphasis added); *id.* at 4:59-65 ("The connector 60 [*e.g.*, USB connector] includes at least one power [V-bus] contact 61 since the data transmission line 58 has power transmitting capabilities. As should be appreciated, the power [V-bus] contact 61 of the connector 60 is configured to engage the power [V-bus] contact 57 of the data port 56 so as to provide operational charging power to a peripheral device when the connector 50 is connected to the data port."); Baker Decl., ¶ 191.

Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Matsumoto in view of De Iuliis (which is comprised at least of the CPU) is "operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 192.

e. ***1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Matsumoto in view of De Iuliis discloses this element. Baker Decl., ¶¶ 193-196.

Specifically, as noted above, Matsumoto discloses that the mobile device includes a charging subsystem comprised of at least the device's CPU that is operably connected to (1) the V_{BUS} line of the USB Interface and (2) the mobile device's battery. *See* Claim 1[c]-[d]. Matsumoto further discloses that portions of the charging subsystem (specifically the CPU) controls the charging of the mobile device's battery and that the power for such charging comes from the V_{DD} (V_{BUS}) line of the USB connection. *See* Claim 1[d]; Matsumoto at 4:44-47 ("In step S5, on the other hand, the CPU 7 controls charging of the built-in secondary cell (not

shown) as required, and executes device operation processing, such as data reproduction control, in response to the user's manipulation.") (emphasis added); *id.* at 1:28-36 ("The USB connector has a pair of data terminals D+ and D-, a power source terminal [USB V-bus line] and a ground terminal, and can be used for supplying power to peripheral devices by way of the power source terminal [USB V_{BUS} line]."); Baker Decl., ¶ 194.

De Iuliis similarly discloses that the mobile device (mobile phone) will charge the device's battery using power from the USB connection. De Iuliis, 3:61-4:01 ("The power adapter 50 is generally configured to provide power to a peripheral device during operation and/or charging thereof. In one embodiment, the power adapter 50 may be used to provide power to a peripheral device such as a portable electronic device that includes a battery. By way of example, the portable electronic device may be a personal computer, personal digital assistant, cellular phone, digital camera, media player, and the like.") (emphasis added); *id.* at 4:59-65 ("The connector 60 [*e.g.*, USB connector] includes at least one power [V-bus] contact 61 since the data transmission line 58 has power transmitting capabilities. As should be appreciated, the power [V-bus] contact 61 of the connector 60 is configured to engage the power [V-bus] contact 57 of the data port 56 so as to provide operational charging power to a peripheral device when the connector 50 is connected to the data port."); Baker Decl., ¶¶ 195.

Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Matsumoto in view of De Iuliis (which is comprised at least of the CPU) of Matsumoto in view of De Iuliis is "configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 196.

f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Matsumoto in view of De Iuliis discloses this element. Baker Decl., ¶¶ 197-206. Specifically, Matsumoto discloses "discriminating means" that identify the type of power source connected to the mobile device (*e.g.*, by discriminating between a personal computer and a wall adapter). Baker Decl., ¶ 200. Moreover, Matsumoto in view of De Iuliis discloses—and a POSITA would have understood—that such "discriminating means" can comprise an identification signal at a D+ and D- data line of the USB interface that is different from USB enumeration. Baker Decl., ¶¶ 201-206.

Matsumoto discloses a portable electronic device (*e.g.*, a mobile phone) with a USB port that can be connected to (1) a computer that supplies power and performs certain communications (*e.g.*, enumeration) over the USB connection or (2) an external power supply (*e.g.*, an adapter/charger) that only supplies power. Matsumoto, Abstract ("A portable electronic device according to the invention . . . is adapted to receive a power supply from the personal computer 2 or an external power source 3 as connected to the USB connector 4."); *id.* at 1:17-27 ("Portable electronic devices Such as audio players or digital cameras of the portable type conventionally have incorporated therein a dry cell or secondary cell serving as the power source to realize the portability of the device. In some cases, however, it is desired to connect a commercial a.c. power source or like external power source to such a device and operate the device therewith. This nevertheless entails the problem that the provision of a connector for connecting the external power Source to the portable electronic device renders the device greater in size."); *id.* at 1:37-45 ("Accordingly, it appears feasible to provide the USB connector on a

portable electronic device for use with an a.c. adaptor (external power source) connectable to the power source terminal of the USB connector, and to connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device, the USB connector thus serving also as a connector for the connection of the external power source, whereby an increase in the size of the electronic device is avoidable."); *id.* at 3:44-48 ("A USB connector 5 of a personal computer 2 serving as a host can be connected to the USB connector 4 by a USB cable 11, or an external power source 3 Such as an a.c. adaptor can be connected to the USB connector 4 by a power source cable 12."); Baker Decl., ¶¶ 198.

Matsumoto further discloses that when portable devices are connected to other USB devices, they will typically (per the USB specification) engage in communication with that device (including, for example, for enumeration), which slows down performance of the portable device.

> However, it is usual practice with the portable electronic device (compliant with the USB standard) having the USB connector to provide a main CPU for executing predetermined device operation processing for various operations of the device including reproduction of data, and a USB controller separate from the main CPU and adapted to execute predetermined data processing for carrying out data communication with the personal computer through the USB connector so as to ensure simplified processing. When the personal computer is connected to the USB connector on the portable electronic device in this case, it is necessary for the USB controller to conduct data communication with the personal computer with a definite period as required by the USB Standard [*e.g.*, enumeration/configuration], so that the leadership in data processing is taken over by the USB controller from the main CPU. This entails the problem that even if the user gives the portable electronic device a command for data reproduction (play operation), the main CPU is unable to rapidly execute device operation processing for data reproduction.
>
> Further while the USB controller is connected to the personal computer for data communication, some kind of data is handled also between the main CPU and the USB controller. This gives rise to the problem that the main CPU must execute very complicated processing since there is a need for the main CPU to execute device processing for data reproduction in this state."

Matsumoto, 1:46-2:4 (emphasis added).

To resolve this issue, Matsumoto discloses "discriminating means" for determining whether the portable device is connected to a computer or an external power supply for charging purposes. Baker Decl., ¶ 200. If the portable device is connected to an adapter/charger, the portable device will avoid the costly communication process (including enumeration/configuration). Baker Decl., ¶ 200. Accordingly, Matsumoto discloses that power is supplied "without enumeration" when connected to an adapter. Baker Decl., ¶ 200; Matsumoto at Abstract ("Discriminating between the sources of supply of power, the main CPU 7 causes the USB controller 6 to execute the predetermined data communication processing [enumeration] while power is supplied from the personal computer 2, or executes the usual device operation processing [no enumeration] while power is supplied from the external power source 3. This assures more rapid and simplified processing even when the USB connector is used also as a connector for the external power source."); *id.* at 2:26-32 ("The control circuit discriminates among the sources of supply of power and causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] while power is supplied from the information processing device [the computer], or executes the usual device [*e.g.*, phone] operation processing [no enumeration] while power is supplied from the external power source [adapter].") (emphasis added); *id.*at 2:33-46 ("With the portable electronic device of the present invention, processing is assigned according to the source of supply of power; the control circuit causes the common serial bus controller to execute the predetermined data communication processing [including enumeration] when the information processing device [computer] is the power source, or executes the usual device operation processing [i.e., no enumeration], such as data reproduction control, when the external power source [adapter] or the internal power source is the source of supply of power. Thus, the control circuit and the common serial bus controller perform processing as distinctly dividedly assigned thereto

according to the source of supply of power. This ensures simplified processing at a higher speed.") (emphasis added); *id.* at 2:47-57 ("Stated more specifically, the control circuit comprises discriminating means for judging which of the information processing device [computer] and the external power source [adapter/charger] is connected to the common serial bus connector [*e.g.*, USB connector], and control means for causing the common serial bus controller [USB connector] to execute the predetermined data communication processing [including enumeration] when the connection of the information processing device [computer] to the common serial bus connector [USB connector] is recognized, or executes the usual device operation processing [no enumeration/communication] when the connection of the external power source to the common serial bus connector is recognized.") (emphasis added).

A POSITA would have understood that there are various ways to implement "discriminating means" to inform the mobile device that it is charging from an A/C adapter, including through a signal on the data lines (D+ and D-) of the USB interface. Baker Decl., ¶ 201. For example, Matsumoto discloses that the discriminating means may comprise determining whether "the common serial bus controller has started communication via the common serial bus connector withing a predetermined period of time" (i.e., within the time required by the USB Specification). Baker Decl., ¶ 201; Matsumoto, 3:2-5. "[I]f data communication has not been started within the predetermined period of time, the external power source is found to be the supply source." *Id.*, 3:6-9. De Iuliis similarly discloses that the charger may use dummy lines that do not provide any specific voltage after connecting to the mobile device. De Iuliis, 6:31-34 ("It should be noted, however, that the power adapter 80 generally does not use the data contacts of the data port 86 for transmitting data (*e.g.*, they act as dummy contacts)."); Baker Decl., ¶ 202. In other words, as one option, Matsumoto and De Iuliis propose that after attaching the mobile device to the adapter, neither device will send any signals on the

data lines to signal the attachment, *i.e.*, they will maintain a low voltage on both data lines for an extended (indefinite) period of time. *Id.* In the USB Specification this is referred to as an extended "SE0" (low/low) signal. Matsumoto at 2:26-27 ("The control circuit discriminates among the sources of supply of power . . . ."); *id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power depending on whether the common serial bus controller has started data communication via the common serial bus connector.") (emphasis added); *id.* at 3:2-9 ("[W]ith the latter method, when the common serial bus controller started data communication via the common serial bus connector within a predetermined period of time, the information processing device is found to be the source of supply of power, whereas if data communication has not been started within the predetermined period of time, the external power Source is found to be the supply source.") (emphasis added); Baker Decl., ¶ 202.

A POSITA would have understood this extended SE0 signal to be "an identification signal." Baker Decl., ¶ 202. The USB Specification routinely treats SE0 as a signal. Baker Decl., ¶ 202; *see also, e.g.*, PA-I (USB 2.0) at 151 (Section 7.1.7.4.1 (Low-/Full-Speed Signaling) (noting that in certain circumstances "[t]he SE0 State is used to signal an end-of-packet (EOP)); *id.* at 153 ("A hub signals reset to a downstream port by driving an extended SE0 at the port. . . . A device operating in low-/full-speed mode that sees an SE0 signal on its upstream facing port for more than 2.5 us (TDETRST) may treat that signal as a reset."). And, in this case, the SE0 signal identifies the wall adapter as the power source (instead of a personal computer). Baker Decl., ¶ 202; *e.g., id.* at 2:58-63 ("The discriminating means . . . . identifies the source of supply of power . . . .").

Moreover, a POSITA would have understood that the extended SE0 signal is different than enumeration because enumeration requires specific communication protocol that does not involve an extended SE0 signal. Baker Decl., ¶ 203. Indeed, the typical idle status for a USB

device is either high/low or low/high (depending on the speed of the device) and USB enumeration requires pulling either the D+ line high or the D- line high within 100ms to signal an "attach." Baker Decl., ¶ 205. Maintaining an SE0 signal after connecting a device specifically avoids USB enumeration. Baker Decl., ¶ 204; ex. PA-I (USB 2.0) at 150 (Section 7.1.7.3 Connect and Disconnect Signaling) ("Δt2 (TSIGATT) This is the maximum time from when VBUS is up to valid level (4.01 V) to when a device has to signal attach. Δt2 represents the time required for the device's internal power rail to stabilize and for D+ or D- to reach VIH (min) at the hub. Δt2 must be less than 100 ms for all hub and device implementations. (This requirement only applies if the device is drawing power from the bus.)"

Table 7-14. Device Event Timings

Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond VIHZ (min) (signaling attach)	TSIGATT	Figure 7-29		100	ms

Id. at 188 (Table 7-14 Device Event Timings); *id.*at 242 ("A USB device must be able to be addressed within a specified period of time from when power is initially applied (refer to Chapter 7). After an attachment to a port has been detected, the host may enable the port, which will also reset the device attached to the port.")

Accordingly, a person of ordinary skill in the art would have understood that the portable USB devices of Matsumoto in view of De Iuliis are "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Baker Decl., ¶ 205.

3. Claim 8

Matsumoto in view of De Iuliis renders Claim 8 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Matsumoto in view of De Iuliis under 35 U.S.C. §103. Baker Decl., ¶¶ 207-216.

Please see attached Exhibit CC-C for a claim chart comparing Matsumoto in view of De Iuliis with Claim 8 of the '586 Patent under 35 U.S.C. § 103

a. 8[a] ***Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Matsumoto in view of De Iuliis. Specifically, Matsumoto in view of De Iuliis discloses a "portable electronic device" that comprises a USB connection for connecting to a personal computer or an adapter and is adapted to charge a battery of a mobile device by receiving power through a USB connector. *See* Claim 1[a] and 1[e].

b. 8[b]: ***providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface." Matsumoto in view of De Iuliis discloses this element. Specifically, Matsumoto in view of De Iuliis teaches that the mobile device has a USB interface and connects through a USB connector and a USB cable to a USB connector of another device. *See* Claim 1[b]. Matsumoto in view of De Iuliis also teaches that the mobile device receives power on a V-bus power line at the USB interface. *See* Claim 1[c] and 1[e].

c. 8[c]: *providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem*

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Matsumoto in view of De Iuliis discloses this element. Specifically, Matsumoto in view of De Iuliis discloses that the mobile USB device comprises a charging subsystem that charges the battery of the USB device and is operably connected to the V_{BUS} line of the USB interface. *See* Claim 1[c].

d. 8[d]: *having a battery in operable connection to the charging subsystem;*

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Matsumoto in view of De Iuliis discloses this element. *See* Claim 1[d].

e. 8[e]: *providing power to the battery using the charger subsystem*

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Matsumoto in view of De Iuliis discloses this element. *See* Claim 1[d]-[e].

f. 8[f]: *detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.*

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Matsumoto in view of De Iuliis discloses this element. Specifically, Matsumoto in view of De Iuliis discloses "discriminating means" that identifies the source of supply of power connected to the portable device (*e.g.*, discriminating between a personal computer or a wall adapter). *See* Claim 1[f]. Matsumoto in view of De Iuliis further discloses, as one example,

that the discriminating means may be an extended SE0 signal on the data lines (which is different from USB enumeration), and that the mobile USB device detects in order to determine that it is connected to a wall-adapter instead of a computer. *Id.*

D. Kerai in view of Zyskowski Renders Obvious Claims 1 and 8

For the reasons stated below, Kerai in view of Zyskowski renders obvious Claims 1 and 8. OTH-A (Baker Decl.,), ¶¶ 217-261.

1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Kerai in view of Zyskowski. OTH-A (Baker Decl.,), ¶¶ 217-222.

Both Kerai and Zyskowski relate to systems and methods for charging USB devices from a computer system, such as a laptop. Baker Decl., ¶ 218. Indeed, each reference discloses means for more efficiently charging such mobile devices and overcoming some of the problems associated with charging from a computer. Baker Decl., ¶ 218. As Kerai explains, for example, prior art mobile devices (such as mobile phones) were powered by rechargeable batteries, but typically required a "dedicated charger" that connected to the phone by a propriety or unique connection. Kerai, 1:11-25. Baker Decl., ¶ 218. This often resulted in users having to carry multiple chargers that were "heavy, bulky and inconvenient to transport." Kerai, 1:11-25; Baker Decl., ¶ 218. Accordingly, Kerai proposed a mobile phone with (1) USB interface for connecting to the USB port of a laptop computer and (2) a "charging circuit" that can draw current from the USB connection and use it to charge the mobile phone's battery:

> It is thus an object of the present invention to overcome the disadvantages set out above and to further provide a device which permits a user to remove the need to carry a plurality of chargers and adapters when traveling . . . . Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port wherein the port, in use, provides power to the charging circuit.

Kerai, 1:29-40.

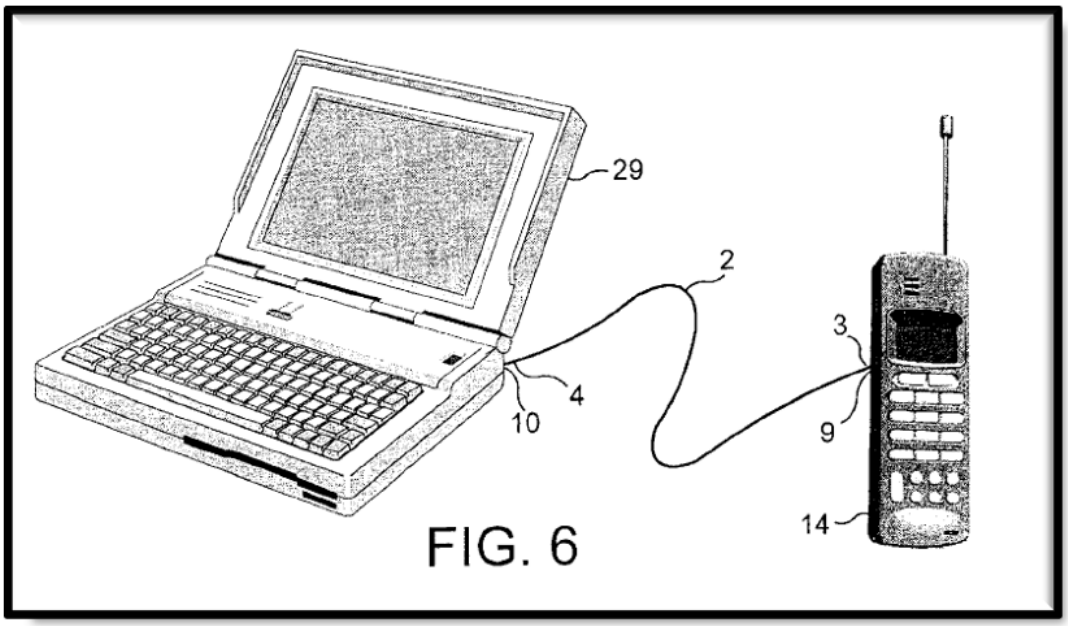


FIG. 6

Kerai, Figure 6 (showing mobile device (14) connected to computer (29)).

Zyskowsi builds on the system of Kerai. Baker Decl., ¶ 219. Specifically, Zyskowski similarly discloses a system by which a "host" computer system (*e.g.*, a laptop) is connected to a "bus device" through a USB connection. Zyskowski, ¶ 0017 ("[H]ost 104 is a computer system which may comprise a personal computer (PC), laptop computer, or handheld computer, among many possibilities. Device 106 may be virtually any electronic device . . . . [B]us 108 is compliant with USB signaling protocols and Specifications."). Zyskowski notes, however, that in many cases the system of Kerai will not work as efficiently as possible because the laptop computer may enter into an inactive or "reduced power" state (*e.g.*, the computer may enter sleep mode after a period of inactivity). Zyskowski, ¶ 0005 ("In some environments the host device

may enter a reduced power state in which the host consumes less power than in a fully-powered stated. In this low power state, power consumption by certain components of the computer system may be curtailed in order to reduce overall power consumption"). In that state, the laptop's "primary power source" may be cut off and only devices supplied by a second "standby power source" will continue to work or charge. Zyskowski, ¶ 0006 ("The host may have two sources of power for components, a primary power source and a standby power source . . . . Placing the host in a reduced power consumption state may thus involve cutting off the primary power source. The standby power source may remain available while the host is in the reduced power state.") In other words, Zyskowki discloses that a user attempting to charge the mobile device of Kerai from a laptop may run into problems when the computer switches to a "reduced power state" after a period of inactivity; in that case, the laptop of Kerai may stop charging the mobile device of Kerai. Baker Decl., ¶ 219.

To address this issue, Zyskowski proposed a configuration in which the laptop is capable of charging the mobile device from the laptop's standby power source when the laptop enters an inactive or reduced power state. *See* Section, III.C.5, *supra*. The laptop signals to the mobile device the state of the computer (and the power source being used) by sending a signal on the data lines. *Id.*

A person of ordinary skill in the art would have been motivated to apply the teachings of Zyskowski to the laptop and mobile phone of Kerai such that the laptop may charge the mobile device even when it enters an inactive or "reduced power" state. Baker Decl., ¶ 221. Indeed, Zyskowski's teachings expressly state that they should be applied to systems like those disclose in Kerai, *i.e.*, a host computer system connected via a USB connection to a mobile USB device. *See e.g.*, Zyskowski, ¶ 0017; Baker Decl., ¶ 221. In other words, the laptop and mobile phone of Kerai are the same as (or at least comparable to) the "base" devices disclosed in Zyskowski (a

laptop computer connected to a bus device by a USB connection). Accordingly, applying the teachings of Zyskowski to such a system simply follows the teachings and suggestions already present in Zyskowski. Baker Decl., ¶ 221. Moreover, the combination would constitute nothing more than applying the known technique of Zyskowski to similar devices (if not the same devices) that were contemplated by Zyskowski, to achieve the results predicted by Zyskowski. Baker Decl., ¶ 221. At a minimum, it would have been obvious to try implementing the teachings of Zyskowski on various USB devices, including, eventually, a mobile phone like the one disclosed in Kerai. Baker Decl., ¶ 221.

Moreover, it is likely that a person seeking to implement Kerai would have run into the problem identified by Zyskowski, *i.e.*, the laptop may enter an inactive mode after a period of inactivity and stop charging the mobile phone. Baker Decl., ¶ 222. A person of ordinary skill in the art implementing Kerai would, therefore, seek out solutions and would identify Zyskowski. He or she would be able to implement the teachings of Zyskowski in the system of Kerai (as disclosed below) without undue experimentation. Baker Decl., ¶ 222. Indeed, as noted above, that type of implementation (a laptop computer connected to a USB device) is exactly the implementation contemplated and taught by Zyskowski. Baker Decl., ¶ 222.

2. Claim 1

Kerai in view of Zyskowski renders Claim 1 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 223-251. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Zyskowski under 35 U.S.C. §103.

Please see attached Exhibit CC-D for a claim chart comparing Kerai in view of Zyskowski with Claim 1 of the '586 Patent under 35 U.S.C. § 103

a. ***1[a] Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Zyskowski. Baker Decl., ¶¶ 224-228. Specifically, Zyskowski discloses a "host" computer system that is connected to a "bus device" through a USB connection. Zyskowski ¶ 0017 ("In one embodiment, bus 108 is compliant with USB signaling protocols and Specifications [USB cable]. USB Specifications typically specify four signal paths, a ground GRD, a power path S [VBUS], and two data paths D1 and D2. The signal path between host 104 [computer system] and device 106 [USB device] may also comprise additional components not shown so as not to obscure the present discussion. For example, the Signal path may comprise well-known hub and repeater components.")

Zyskowski further discloses that the host computer system may be a personal computer, laptop computer, or handheld computer and that the "bus device" can be "virtually any electronic device." Zyskowski ¶ 0017 ("FIG. 1 shows a block diagram illustrating one embodiment 100 of a system in accordance with the present invention. Host 104 is coupled to a bus device 106 by way of a bus 108. In one embodiment, host 104 is a computer system which may comprise a personal computer (PC), laptop computer, or handheld computer, among many possibilities. Device 106 may be virtually any electronic device, including mass Storage devices (hard drives, compact disk drives, digital video disk drives, etc.) and consumer electronic devices (video cassette recorders, music devices, etc.)") (emphasis added). A POSITA would have understood, or at least found obvious, that the bus device may be a mobile communication device configurable for use in a wireless telecommunication network.

Moreover, Kerai specifically discloses that the "bus device" may be a mobile phone (i.e., a mobile device configurable for use in a wireless telecommunications network). Specifically,

Kerai, like Zyskowski, discloses a bus device connected to a host computer system through a USB connection. Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device.") Kerai also specifically discloses embodiments in which the mobile device is a "mobile radio telephone," which a POSITA would have understood to be a mobile communication device configurable for use in a wireless telecommunication network.

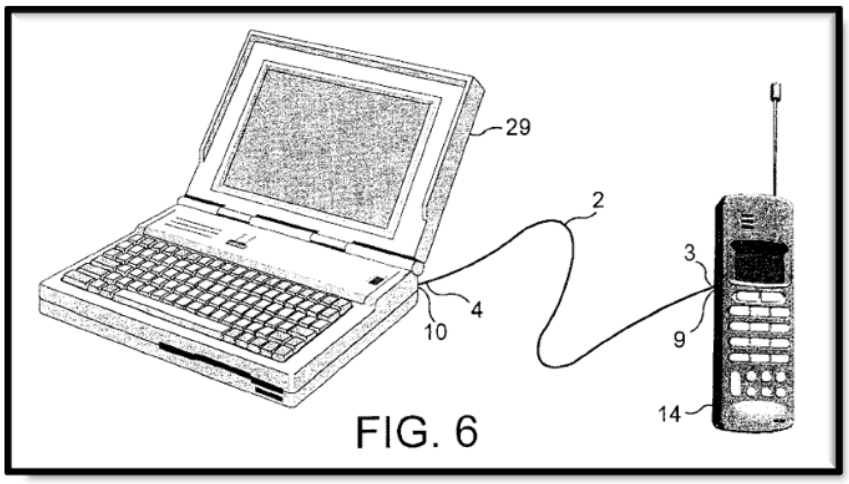


FIG. 6

Kerai, Figure 6; Kerai, Abstract ("The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone.") (emphasis added); Baker Decl., ¶ 227.

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Zyskowski discloses "A mobile communication device . . . configurable for use in a wireless telecommunications network." Baker Decl., ¶ 228.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Kerai in view of Zyskowski discloses this element. Baker Decl., ¶¶ 229-232. Specifically, Zyskowski discloses that the computer system (laptop) and the "bus device" (mobile phone) are connected through a USB cable. Zyskowski ¶ 0017 ("Host 104 is coupled to a bus device 106 by way of a bus 108 . . . . bus 108 is compliant with USB signaling protocols and Specifications. USB Specifications typically specify four signal paths, a ground GRD, a power path S [VBUS], and two data paths D1 and D2.") A POSITA would have understood that, in order to connect to the laptop through a USB cable, the mobile phone would have had to include a USB interface to allow reception of that USB cable. Baker Decl., ¶ 230.

Similarly, Kerai expressly discloses that the mobile phone comprises a USB interface configured to allow reception of a USB cable. Kerai, 3:25-30 ("The telephone 14 further incorporates a USB interface or port shown generally as P. The USB interface P comprises a connector 22 having data 23, power 24 and ground pins or terminals. The connector 22 is provided in the handset housing to which a downstream plug of a USB cable is connectable in use.") (emphasis added); *id*, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone").

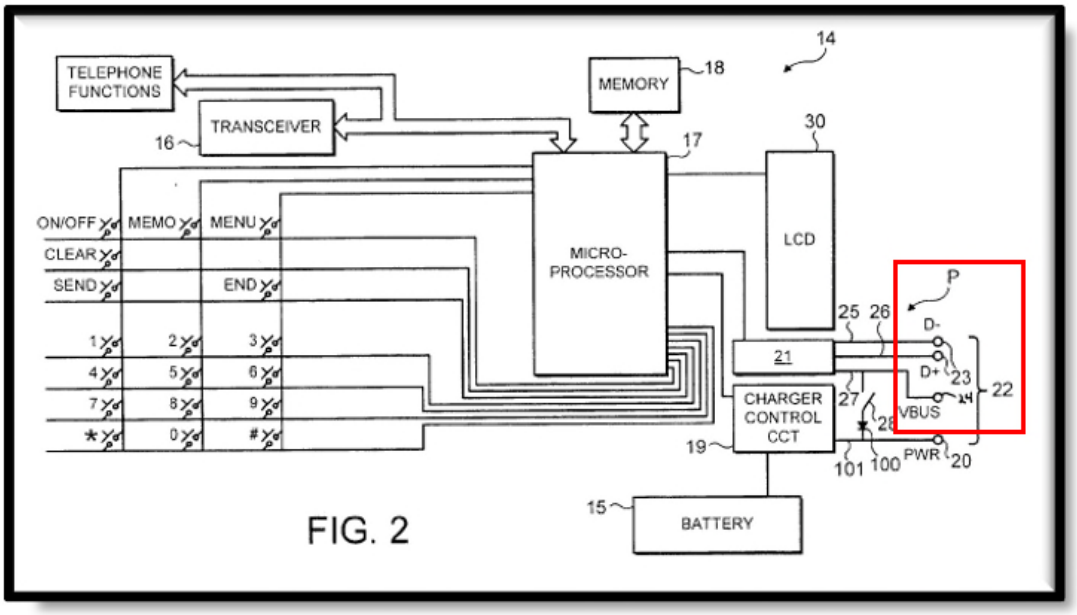


FIG. 2

Kerai, Figure 2 (annotated) (showing USB interface); Baker Decl., 231.

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Zyskowsi discloses a mobile device comprising "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 232.

c. *1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line*

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Kerai in view of Zyskowski discloses this element. Baker Decl., ¶¶ 233-236.

Specifically, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the mobile phone. Kerai, at 3:6-24 ("FIG. 2 shows a portable radio telephone 14 powered by a rechargeable battery pack 15 . . . . A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added); *id.* at 1:34-39 (". . . there is

provided a battery powered device including a communications port [USB] and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port [USB] where in the port, in use, provides power to the charging circuit.") (emphasis added). A person of ordinary skill in the art would have thus understood that mobile device comprises a "charging subsystem" comprising at least said "charging circuit." Baker Decl., ¶ 234.

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit is operably connected to the power line of the USB interface (the V_{BUS} line) for purposes of drawing power to supply to the battery when the phone is connected to power through its USB port (instead of its conventional power jack). Baker Decl., ¶ 235; Kerai, 3:37-51 ("A conductor 27, which carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21, is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19. The switch 28 is under the control of the interface ASIC 21 whilst the diode 100 prevents power from being supplied in an upstream direction via the connector 22, in accordance with the above USB standard.") (emphasis added).

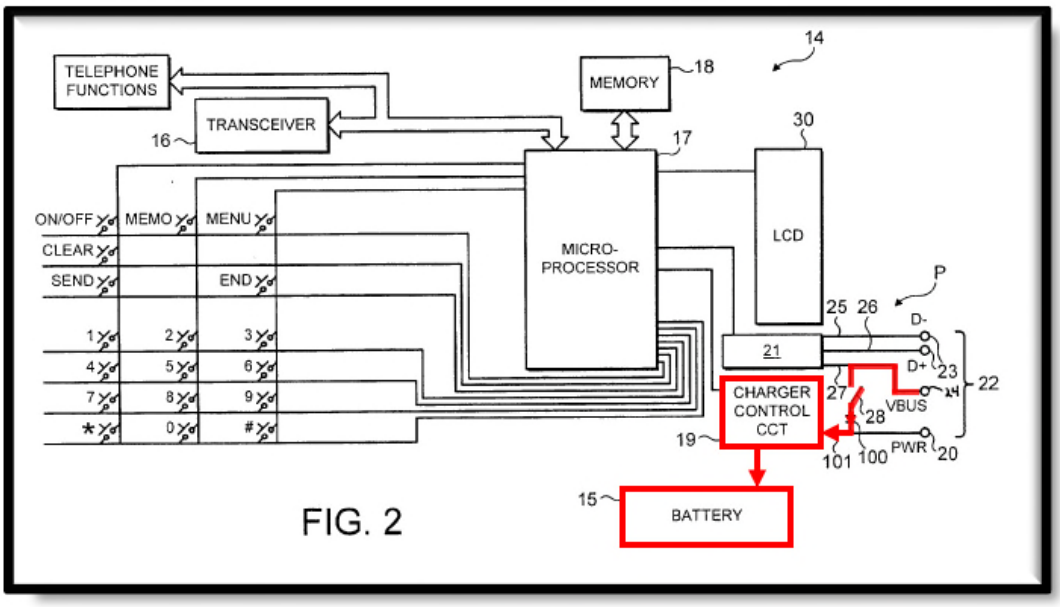


FIG. 2

Kerai, Figure 2 (annotated) (showing Charger Control Circuit 19 which (1) comprises or, at a minimum, is a component of the charging subsystem, and (2) is operably connected to the USB interface V-bus power line 14).

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Kerai in view of Zyskowski comprise "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line," as required by Claim 1. Baker Decl., ¶ 236.

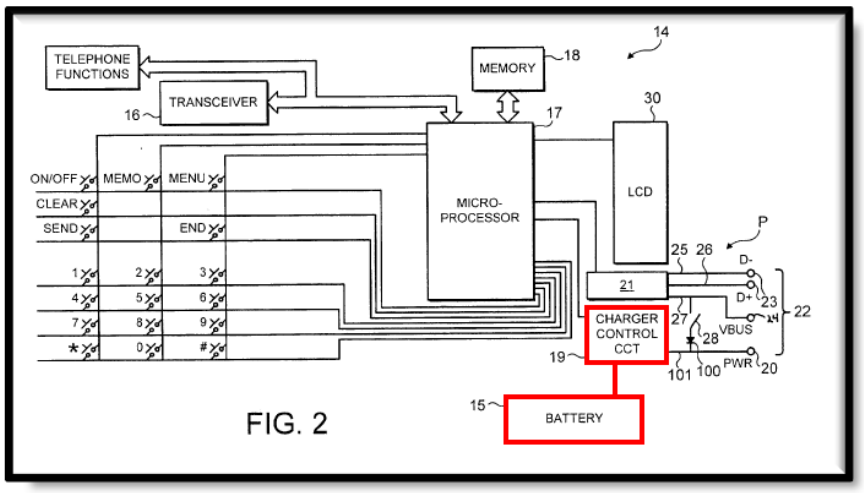
d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Kerai in view of Zyskowski discloses this element. Baker Decl., ¶¶ 237-240.

Specifically, as noted above, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the communications device when using the USB interface. *See* Claim 1[c]; Kerai, 3:6-24 ("FIG. 2

shows a portable radio telephone 14 powered by a rechargeable battery pack 15. A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added). Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Kerai is "configured to charge a battery if a battery is operably connected."

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging subsystem is operably connected to the battery for this purpose.



Kerai, Figure 2 (annotated) (showing charger control circuit 19 operatively connected to battery 15); *id.* at 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port [USB] where in the port, in use, provides power to the charging circuit [via V_{BUS} line].") (emphasis added); Baker Decl., ¶ 239.

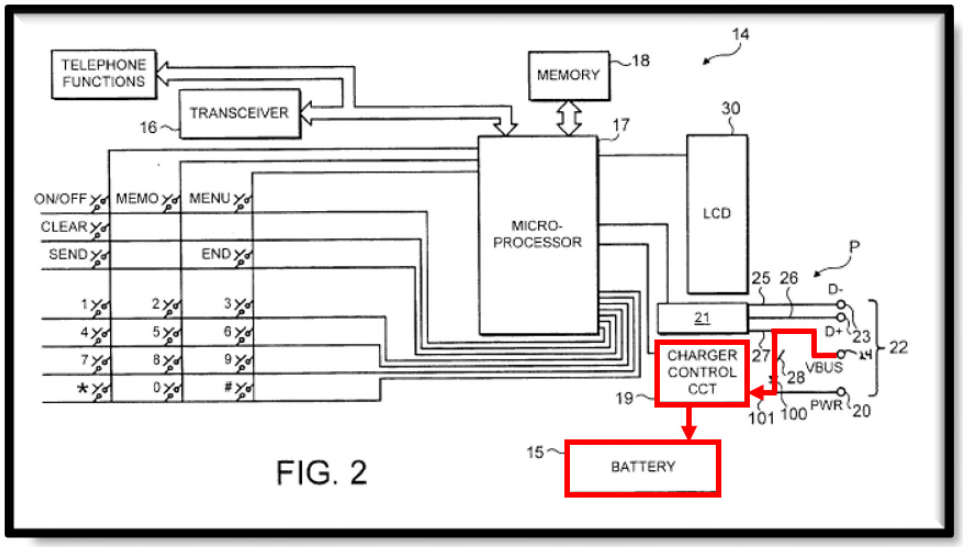
Accordingly, a person of ordinary skill in the art would have understood that the mobile device of Kerai in view of Zyskowski comprises a charging subsystem wherein "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 240.

e. *1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery*

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Kerai in view of Zyskowski discloses this element. Baker Decl., ¶¶ 241-244.

Specifically, as noted above, Kerai discloses that the communications device comprises a charging subsystem (comprising at least a "charging circuit") that is (1) operably connected between the USB Interface and the battery and that (2) charges the battery. *See* Claim 1[c]-[d]; Kerai, 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit [charging subsystem] connectable to a battery, the charging circuit having a further connection to the communications port [USB interface] where in the port, in use, provides power to the charging circuit.") (emphasis added).

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit charges the battery using power from the V_{BUS} line when the mobile phone is connected to the USB port for power instead of the conventional power jack. Baker Decl., ¶ 243; Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device."); Kerai, 3:37-41 (" conductor 27 . . . carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21 [and] is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19.").



Kerai, Figure 2 (annotated) (showing the charger control circuit using power from VBUS line to charge the battery).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Zyskowski discloses a mobile device comprising a charging subsystem wherein "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 244.

f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Kerai in view of Zyskowski discloses this element. Baker Decl., ¶¶ 245-251.

Specifically, as noted above, Kerai in view of Zyskowski discloses a host computer system (laptop) that is connected to a bus device (mobile phone) through a USB cable. *See* Claim 1[a]-[b]. Zyskowski in view of Kerai further discloses that the mobile phone comprises a

charging subsystem that draws power from the V_{BUS} line of the USB connection and uses that power to charge the mobile phone's battery. *See* Claim 1[b]-[e].

Zyskowski further discloses that the host computer (laptop) may have two sources of power from which to power the connected USB device: a primary power source and a standby power source. Zyskowski, ¶ 0006 ("The host may have two sources of power for components, a primary power source and a standby power source.") When the laptop is operating in a normal state it may supply all components with primary power. *Id.* When the laptop is operating in a reduced power state (*e.g.*, sleep mode) it may supply certain components from the standby power source while denying power to other non-essential components. Zyskowski, ¶ 0005 ("In some environments the host device may enter a reduced power state in which the host consumes less power than in a fully-powered stated. In this low power state, power consumption by certain components of the computer system may be curtailed in order to reduce overall power consumption").

Prior art laptops would only supply power to a connected mobile device from primary power and only when the laptop was "awake" (i.e., not in a reduced-power state). Baker Decl., ¶ 248. Zyskowski, however, teaches a system and method by which the laptop can also charge the mobile device from the standby power source when the laptop is asleep (i.e., in a reduced power state). Zyskowski, ¶ 0009 ("A system includes a power supply adapted to supply power to a device on a peripheral bus at least when the computer system is in a reduced power state."); Zyskowski, ¶ 0018 ("Device 106 may derive operating power from power path S [V_{BUS}] from host 104. Unlike conventional USB devices, which may derive power from the primary power source of the host 104, device 106 may derive power from the host's standby power source via power path S [V_{BUS}]. In other words, conventional USB implementations may couple [the V_{BUS} line] of bus to the host's primary power source. The present invention, however, may couple

[the VBUS line] to the hosts standby power source. Thus, even when the host 104 has entered a reduced power state (in which primary power source is cut off), device 106 may derive operating power from the host's standby power source.") (emphasis added).

Zyskowski further discloses that the bus device (mobile phone) will be able to detect when the host computer (laptop) transitions into a reduced power state (asleep) or into a fully-powered state (awake). Baker Decl., ¶ 249. Zyskowski discloses that one method for signaling these states is through a signal on the data lines, D+ and D-. *Id.* Zyskowski discloses for example, that the laptop may signal a full-power state (primary power) by raising the D1 and D2 lines to 5 volts. Zyskowski, ¶ 0019 ("On USB, device 106 may detect that the host 104 is in a reduced power state by monitoring the state of one or both of the data paths D1 and D2. When the host 104 is in a full power state, data lines D1 and D2 may be raised to a predefined DC voltage level, for example, 5 volts (systems operating at lower voltages might raise the data paths to 3 volts, 2 volts, or even less).") The laptop may signal a reduced-power state (standby power) by placing the D1 and D2 lines in a "floating" state. If the laptop is transitioning into a fully-powered state, communication will begin once the laptop has signaled the transition. Zyskowski, ¶ 0019 ("When the host 104 is operating in a reduced power state, the data paths D1 and D2 may be 'floating' (an electrical characteristic well known in the art) or grounded, or in some other state wherein the predefined DC voltage level is not present on the paths. The device 106 may detect the power state of host 104 by detecting the presence or absence of the predefined DC voltage level on the data paths D1 and D2.").

A person of ordinary skill in the art would have understood the signal indicating whether the laptop is powering from primary power or standby power is an "identification signal" because it is distinguishing between the primary power source and the secondary power source. Baker Decl., ¶ 250. Moreover, a POSITA would have understood that the high/high signal

(SE1) is different than enumeration, which does not include sending an SE1 signal. Baker Decl., ¶ 250. Indeed, the USB Specification indicates that low-speed and full-speed USB drivers should never intentionally send such a signal. USB 2.0 at 123 (Section 7.1.1 USB Driver Characteristics) ("Low-speed and full-speed USB drivers must never 'intentionally' generate an SE1 on the bus. SE1 is a state in which both the D+ and D- lines are at a voltage above V_{OSE1} (min), which is 0.8V."). Zyskowski discloses that only once the signal has been sent and the host is awake will the host laptop and device engage in enumeration and normal USB communication. Zyskowski, ¶ 0020 ("Once the host 104 is awake, data paths D1 and D2 become useable to communicate with host 104, and device 106 may use the data paths to request that host 104 process the command."); Baker Decl., ¶ 250.

Accordingly, a POSITA would have understood that the mobile device of Kerai in view of Zyskowski is "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration" as required by Claim 1. Baker Decl., ¶ 251.

3. Claim 8

Kerai in view of Zyskowski renders Claim 8 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 252-261. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Zyskowski under 35 U.S.C. §103.

Please see attached Exhibit CC-D for a claim chart comparing Kerai in view of Zyskowski with Claim 8 of the '586 Patent under 35 U.S.C. § 103

a. ***Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Zyskowski. Specifically, Kerai in view of Zyskowski discloses a mobile phone that can connect to a laptop computer through a USB connection for purposes of charging the battery of the mobile phone. *See* Claim 1[a] and 1[e].

b. ***providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface." Kerai in view of Zyskowski discloses this element. Specifically, Kerai in view of Zyskowski discloses a mobile phone that can connect to a laptop computer through a USB connection for purposes of charging the battery of the mobile phone. *See* Claim 1[a] and 1[e].

c. ***providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem***

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Kerai in view of Zyskowski discloses this element. Specifically, Kerai in view of Zyskowski discloses that the charging subsystem of the mobile phone is connected to the V_{BUS} line. *See* Claim 1[c].

d. ***having a battery in operable connection to the charging subsystem;***

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Kerai in view of Zyskowski discloses this element. *See* Claim 1[d].

e. ***providing power to the battery using the charger subsystem***

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Kerai in view of Zyskowski discloses this element. *See* Claim 1[d]-[e].

f. ***detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Kerai in view of Zyskowski discloses this element. Specifically, Kerai in view of Zyskowski discloses that the mobile phone detects a signal on the USB data lines indicating whether power is coming from the laptop's a primary power source or standby power source. *See* Claim 1[f]. The signal indicating primary power, for example, may be an SE1 signal, which is different from USB enumeration. *Id.*

E. Kerai in view of Casebolt Renders Obvious Claims 1 and 8

For the reasons stated below, Kerai in view of Casebolt renders obvious Claims 1 and 8. OTH-A (Baker Decl.,), ¶¶ 262-303.

1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Kerai in view of Casebolt. OTH-A (Baker Decl.,), ¶¶ 262-265.

Both Kerai and Casebolt relate to systems and methods for connecting peripheral devices to a computer system. Baker Decl., ¶ 263. Indeed, each reference discloses means for making such peripheral devices more flexible and convenient. Baker Decl., ¶¶ 263-265. As Kerai explains, for example, prior art mobile devices (such as mobile phones) were powered by rechargeable batteries, but typically required a "dedicated charger" that connected to the phone by a propriety or unique connection. Kerai, 1:11-25; Baker Decl., ¶ 263. This often resulted in users having to carry multiple chargers that were "heavy, bulky and inconvenient to transport." Kerai, 1:11-25; Baker Decl., ¶ 263. Accordingly, Kerai proposed a mobile phone with (1) USB interface for connecting to the USB port of a laptop computer and (2) a "charging circuit" that can draw current from the USB connection and use it to charge the mobile phone's battery:

> It is thus an object of the present invention to overcome the disadvantages set out above and to further provide a device which permits a user to remove the need to carry a plurality of chargers and adapters when traveling . . . . Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port wherein the port, in use, provides power to the charging circuit.

Kerai, 1:29-40.

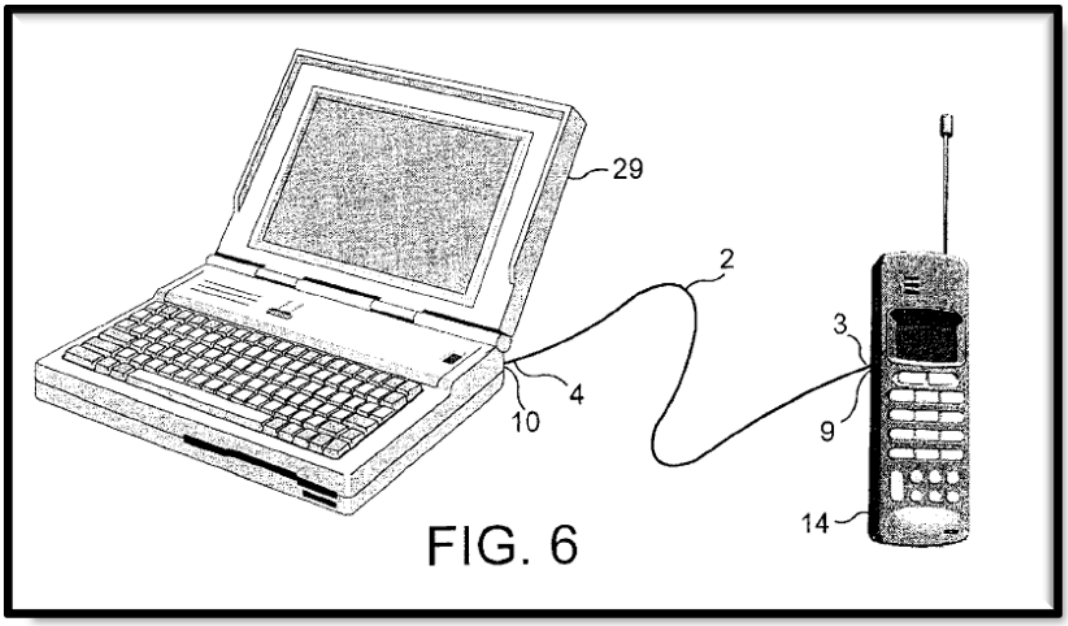


FIG. 6

Kerai, Figure 6 (showing mobile device (14) connected to computer (29)).

Casebolt, in turn, notes that not all computers will have a USB connection and, therefore, devices that can only connect to USB ports will not always be compatible with the user's computer. Casebolt, 1:38-40 ("[A] conventional computer is typically provided with only one interface (such as a PS2 or USB interface)."). To remedy this issue, Casebolt discloses (1) using an adapter for connecting the USB interface of the mobile device to the PS/2 port of a computer and (2) configuring the mobile device to distinguish between a USB connection and a PS/2 connection (through the USB to PS/2 adapter). *Id.*, 2:43-59 ("The peripheral device includes an interface detection component configured to detect which of the first and second interfaces [USB and PS/2] the peripheral device is connected to."). Applying the teachings of Casebolt to Kerai allows the mobile phone of Kerai to be connected to a laptop for charging even if that laptop has only a PS/2 port. Baker Decl., ¶¶ 264.

A person of ordinary skill in the art would have been motivated to apply the teachings of Casebolt to the mobile phone of Kerai such that the mobile phone may connect to a computer with only a PS/2 port. Baker Decl., ¶ 265. Indeed, Casebolt's teachings expressly state that they should be applied to such devices, *i.e.*, peripheral USB devices that connect to computer systems. *See e.g.*, Casebolt, 4:58-63 ("disclosing an embodiment of "a high-speed USB peripheral device 100 connected through USB interface 102 to CPU 21of host computer 20" and noting that "high-speed USB peripheral device 100 can be any suitable peripheral device, such as a keyboard 40 or mouse 42 or another suitable peripheral device."); Baker Decl., ¶ 265. In other words, the mobile phone of Kerai is at least comparable to the "base" devices disclosed in Casebolt (USB peripheral devices). Baker Decl., ¶ 265. Accordingly, applying the teachings of Casebolt to such a device would not require more than the teachings of Casebolt and ordinary skill in the art. Baker Decl., ¶ 265. Indeed, the combination would constitute nothing more than applying the

known technique of Casebolt to devices similar to (or the same as) those disclosed in Casebolt, to achieve the results predicted by Casebolt. Baker Decl., ¶ 265. At a minimum, it would have been obvious to try implementing the teachings of Casebolt on various USB devices, including, eventually, a mobile phone like the one disclosed in Kerai. Baker Decl., ¶ 265.

2. Claim 1

Kerai in view of Casebolt renders Claim 1 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 266-292. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Casebolt under 35 U.S.C. §103.

Please see attached Exhibit CC-E for a claim chart comparing Kerai in view of Casebolt with Claim 1 of the '586 Patent under 35 U.S.C. § 103

a. ***1[a] Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Casebolt. Baker Decl., ¶¶ 267-269. Specifically, Kerai discloses a system and method for charging a "mobile radio telephone" device by connecting it to a laptop computer through a USB connection. Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone.") (emphasis added).

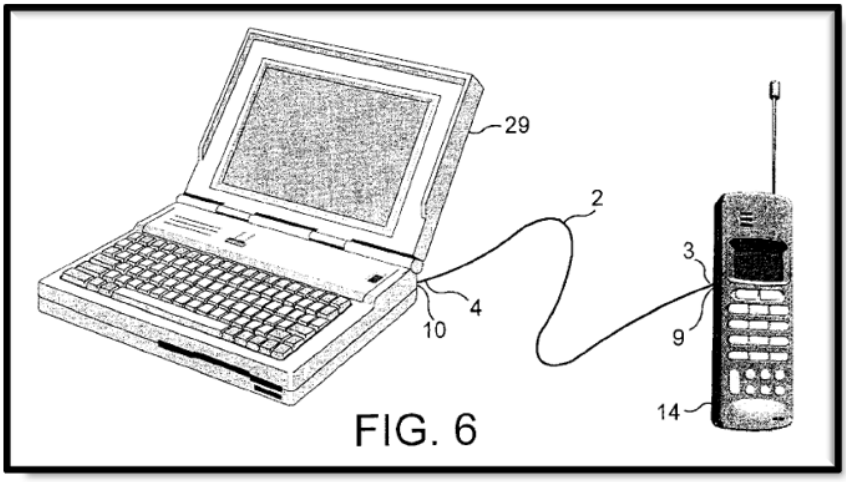


FIG. 6

Kerai, Figure 6.

A person of ordinary skill in the art would have understood the mobile radio telephone to be a mobile communication device configurable for use in a wireless telecommunication network. Baker Decl., ¶ 269.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Kerai in view of Casebolt discloses this element. Baker Decl., ¶¶ 270-272.

Specifically, Kerai teaches that the mobile phone has a USB interface and connects through a USB cable to a USB port of another device. Kerai, 3:25-30 ("The telephone 14 further incorporates a USB interface or port shown generally as P. The USB interface P comprises a connector 22 having data 23, power 24 and ground pins or terminals. The connector 22 is provided in the handset housing to which a downstream plug of a USB cable is connectable in use.") (emphasis added); *id*. at Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a

mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone").

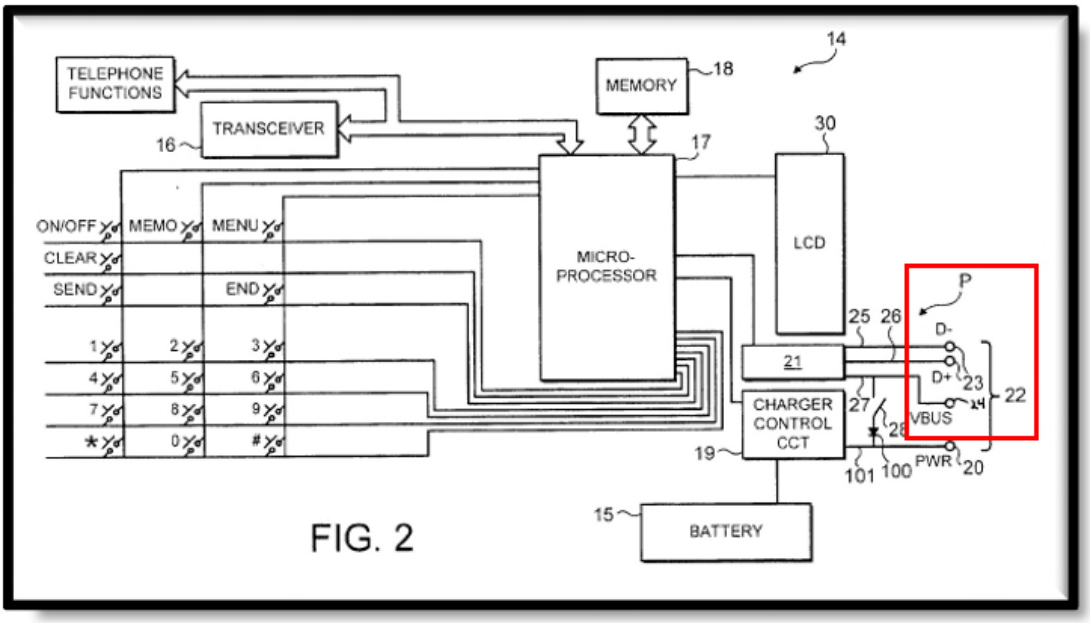


FIG. 2

Kerai, Figure 2 (annotated) (showing USB interface); see also Figure 6 (disclosing USB cable 2).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Casebolt discloses a mobile device comprising "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 272.

c. *1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line*

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Kerai in view of Casebolt discloses this element. Baker Decl., ¶¶ 273-276.

Specifically, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the mobile phone. Kerai, at

3:6-24 ("FIG. 2 shows a portable radio telephone 14 powered by a rechargeable battery pack 15 . . . . A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added); *id.* at 1:34-39 (". . . there is provided a battery powered device including a communications port [USB] and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port where in the [USB] port, in use, provides power to the charging circuit.") (emphasis added). A person of ordinary skill in the art would have thus understood that mobile device comprises a "charging subsystem" comprising at least said "charging circuit." Baker Decl., ¶ 274.

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit is operably connected to the power line of the USB interface (the V_{BUS} line) for purposes of drawing power to supply to the battery when the phone is connected to power through its USB port (instead of its conventional power jack). Baker Decl., ¶ 275; Kerai, 3:37-51 ("A conductor 27, which carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21, is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19. The switch 28 is under the control of the interface ASIC 21 whilst the diode 100 prevents power from being supplied in an upstream direction via the connector 22, in accordance with the above USB standard.") (emphasis added).

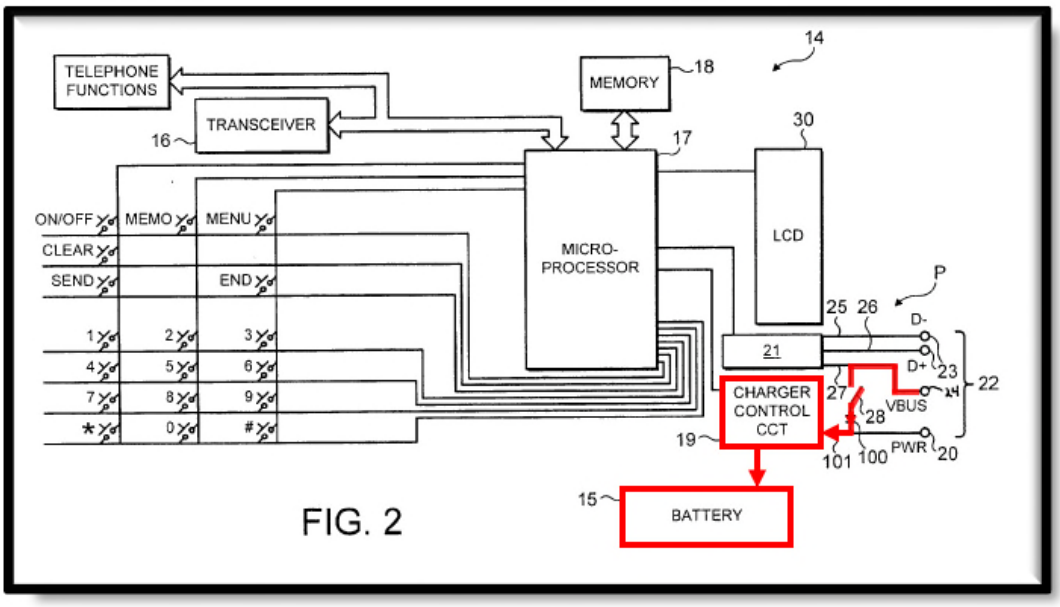


FIG. 2

Kerai, Figure 2 (annotated) (showing Charger Control Circuit 19 which (1) comprises or, at a minimum, is a component of the charging subsystem, and (2) is operably connected to the USB interface V-bus power line 14).

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Kerai in view of Casebolt comprise "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line," as required by Claim 1. Baker Decl., ¶ 276t.

d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Kerai in view of Casebolt discloses this element. Baker Decl., ¶¶ 277-280.

Specifically, as noted above, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the communications device when using the USB interface. *See* Claim 1[c]; Kerai, 3:6-24 ("FIG. 2

shows a portable radio telephone 14 powered by a rechargeable battery pack 15 . . . . A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added). Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Kerai is "configured to charge a battery if a battery is operably connected."

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging subsystem is operably connected to the battery for this purpose. Baker Decl., ¶ 279;

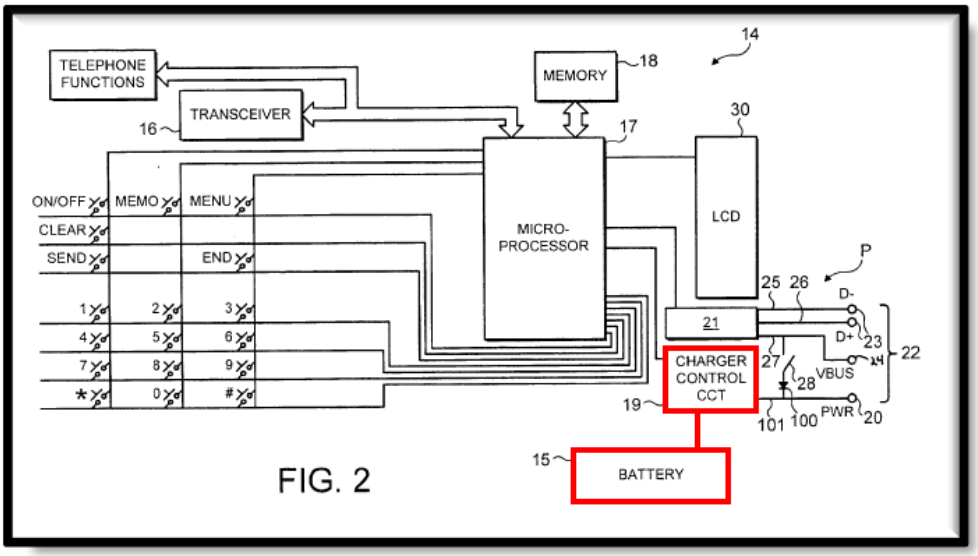


FIG. 2

Kerai, Figure 2 (annotated) (showing charger control circuit 19 operatively connected to battery 15); *id.* at 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port [USB] where in the port, in use, provides power to the charging circuit [via V_{BUS} line].") (emphasis added).

Accordingly, a person of ordinary skill in the art would have understood that the mobile device of Kerai in view of Casebolt comprises a charging subsystem wherein "the charging

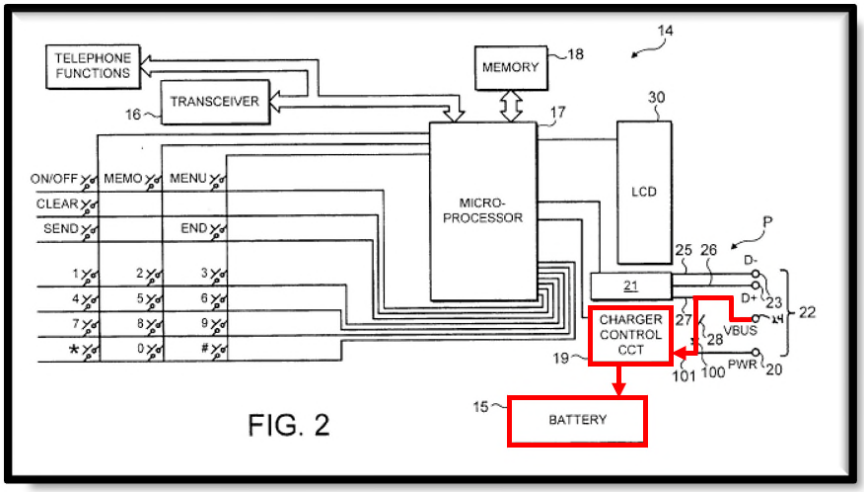
subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 280.

e. *1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery*

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Kerai in view of Casebolt discloses this element. Baker Decl., ¶¶ 281-284.

Specifically, as noted above, Kerai discloses that the communications device comprises a charging subsystem (comprising at least a "charging circuit") that is (1) operably connected between the USB Interface and the battery and that (2) charges the battery. *See* Claim 1[c]-[d]; Kerai, 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit [charging subsystem] connectable to a battery, the charging circuit having a further connection to the communications port [USB interface] where in the port, in use, provides power to the charging circuit.") (emphasis added).

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit charges the battery using power from the V_{BUS} line when the mobile phone is connected to the USB port for power instead of the conventional power jack. Baker Decl., ¶ 283; Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device."); Kerai, 3:37-41 ("conductor 27 . . . carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21 [and] is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19.")



Kerai, Figure 2 (annotated) (showing the charger control circuit using power from VBUS line to charge the battery).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Casebolt discloses a mobile device comprising a charging subsystem wherein "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 284.

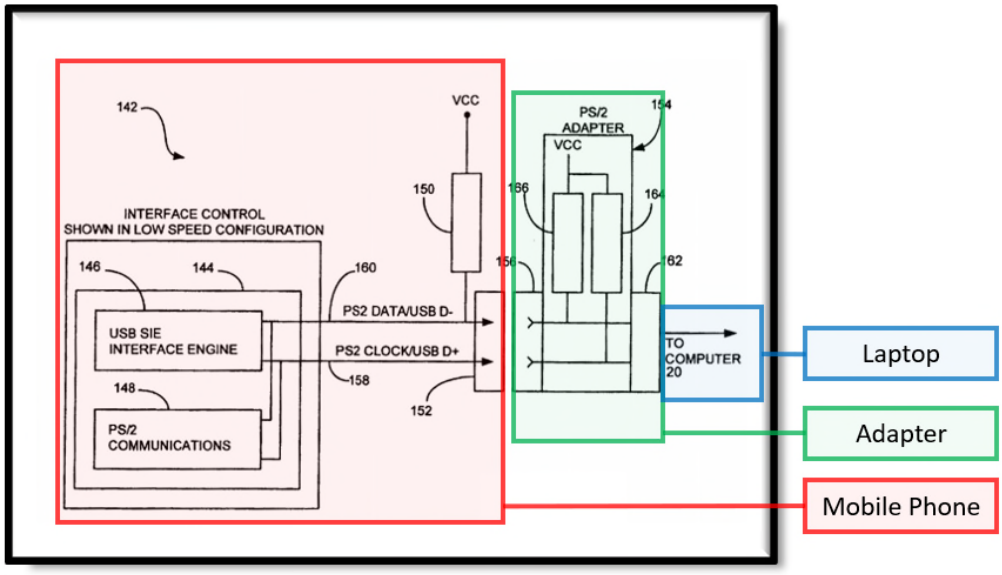
f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Kerai in view of Casebolt discloses this element. Baker Decl., ¶¶ 285-292.

Specifically, Kerai in view of Casebolt teaches that the USB interface of the mobile phone may be connected to either (1) the USB port of a laptop or (2) the PS/2 port of a laptop (through an adapter). Baker Decl., ¶ 286. If the mobile phone is connected to a PS/2 port (if, for example, the laptop has no USB port), then the adapter sends (and the mobile phone detects) an

identification signal indicating that the power source is a PS/2 port and not a USB port. Baker Decl., ¶ 286. The identification signal is a high/high (SE1) signal on the data lines that is different from enumeration. Baker Decl., ¶ 286.

As noted above, Kerai discloses a mobile phone that can connect to a computer through a USB connection for purposes of charging the mobile phone. *See* limitations 1[a]-1[d]. Casebolt teaches a system and method for implementing the mobile phone of Kerai such that the phones USB port can be connected to either (1) a USB port of the laptop computer (as disclosed in Kerai) ***or*** (2) a PS/2 port of the laptop computer (through an adapter). Baker Decl., ¶ 287; Casebolt, Abstract ("A peripheral device [mobile phone] is connectable to a computer having one of a first interface [USB] and a second interface [PS/2]."") (emphasis added). Specifically, Casebolt teaches that the USB interface of the mobile phone can be connected to a USB-to-PS/2 adapter, which can then be connected to the laptop computer's PS/2 port. Baker Decl., ¶ 287;



Casebolt, Figure 3 (annotated) (showing mobile device (142) connected to adapter (154) which connects to PS/2 port of computer (20)); *id.* at 6:6-15 ("FIG. 3 illustrates a peripheral device [mobile phone] 142 in accordance with one embodiment of the present invention . . . . Peripheral device 142 also includes, in one illustrative embodiment, a cable with USB connector 152")

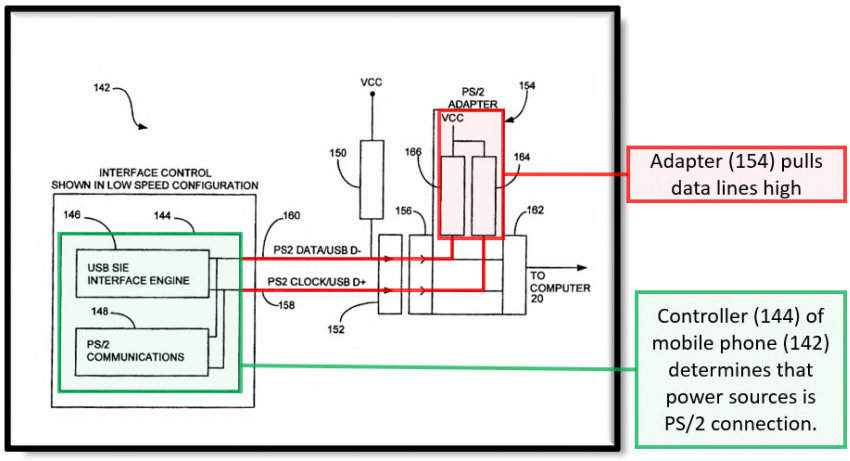
(emphasis added); *id.* at 6:31-40 ("FIG. 3 further illustrates a PS2 adapter 154 in accordance with one embodiment of the present invention. Adapter 154 includes a USB connector 156 which mates with USB connector 152. Adapter 154 connects the signal lines 158 and 160 to an output connector 162 which is suitable for being coupled to a connector or cable from computer 20. In one illustrative embodiment, connectors 152 and 156 are implemented as a USB series A plug and receptacle, respectively. Connector 162 is implemented as a PS2 mini-din connector.") (emphasis added).

Casebolt further teaches that the peripheral device (mobile phone) can be improved to detect which interface is being used at the laptop (USB or PS/2) and interact and charge accordingly. Casebolt, 2:37-41 ("The present invention defines a method and apparatus in the peripheral device such that the peripheral device can determine which type of interface it is connected to, and configure itself accordingly."); *id.* at 2:43-59 ("The peripheral device includes an interface detection component configured to detect which of the first and second interfaces the peripheral device is connected to. The peripheral device also includes a controller component configured to communicate between the peripheral device and the computer according to a protocol corresponding to the detected interface"). In other words, the mobile phone can detect whether it is connected to a USB port or a PS/2 port (through the adapter). *Id.*; Baker Decl., ¶ 288.

Casebolt further teaches that the mobile phone determines which type of power source it is connected to (USB or PS/2) by detecting an identification signal that is different from USB enumeration. Baker Decl., ¶ 289. Specifically, Casebolt discloses that when mobile phone is connected to a PS/2 port (through the USB-to-PS/2 adapter), the adapter will send (and the mobile phone will detect) a high/high (SE1) signal on the D+/D- lines of the USB connector in the mobile phone. Casebolt, 7:30-39 ("In the indeterminate state 174, controller 144 also

periodically polls for the presence of a PS2 interface by monitoring the state of signal lines 158 and 160. In one specific embodiment, controller 144 looks for I/O state 3 in Table 1 (or the SE1 condition) on signal lines 158 and 160.") (emphasis added); *id.* at 7:40-46 ("[I]f the SE1 condition is maintained for the necessary time period, and the terminal count is reached, controller 144 determines that it has detected a PS2 interface and moves to state 180. This causes USB functions to be terminated, and PS2 communications controller 148 takes over communication between peripheral device 142 and computer 20.")

The adapter sends this signal by pulling both data lines high through two "pull up resistors." Casebolt, 6:41-50 ("Adapter 154, in the illustrative embodiment, also includes a pair of pull-up resistors 164 and 166. When adapter 154 is coupled to peripheral device 142, pull-up resistor 164 pulls the PS2 clock/USB D+ signal line to VCC. Resistor 166 pulls the PS2 data/USB D— signal line to VCC as well [high/high signal]. The pull-ups in adapter 154 eliminate the necessity for the microprocessor on peripheral device 142 to control these dynamically.") (emphasis added).



Casebolt, Figure 2 (annotated). This indicates to the controller (144) of the mobile phone that it is connected to the computer via a PS/2 connection. Baker Decl., ¶ 290. The phone with then communicate and draw power according to the PS/2 connection which, as Dr. Baker explains,

has different power ratings than a USB connection and thus requires, for example, that the mobile phone draw different amounts of current. Baker Decl., ¶ 290. Thus, a person of ordinary skill in the art would have understood that this is an identification signal. Baker Decl., ¶ 290.

Casebolt further discloses—and a POSITA would have understood—that the high/high (SE1) signal is different from USB enumeration. Baker Decl., ¶ 291. The SE1 signal is not defined as a valid data condition when connecting a device. To the contrary, as noted above, a USB device typically will receive either a high/low signal or a low/high signal to indicate that it is a low-speed or full-speed device, and the USB Specification indicates that a typical device should not send SE1 signals as part of the typical USB process. Casebolt, 2:15-27 ("When a peripheral device is attached to the USB port, the USB host determines whether it is a low-Speed or high-speed device by determining which of the D+ or D- conductors is pulled to the logical high level."); Casebolt, 6:51-54 ("Table 1 below illustrates the configuration of the two signals provided by both USB and PS2 devices. Table 1 illustrates the signals for a USB low speed device");

TABLE 1

I/O State	D+/CLK	D−/DAT	USB	PS/2
0	L	L	SEO (Single Ended O) or Reset	Host Inhibit
1	L	H	J, Idle	Host Inhibit
2	H	L	K, Xmit Resume	Host Xmit
3	H	H	SE1	Idle,

Casebolt, 6:55-67 (Table 1) (annotated); USB 2.0 at 123 (Section 7.1.1 USB Driver Characteristics) ("Low-speed and full-speed USB drivers must never 'intentionally' generate an

SE1 on the bus. SE1 is a state in which both the D+ and D- lines are at a voltage above V_{OSE1} (min), which is 0.8V.").

Accordingly, a person of ordinary skill in the art would have understood that the mobile device of Kerai in view of Casebolt is "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration" as required by Claim 1. Baker Decl., ¶ 292.

3. Claim 8

Kerai in view of Casebolt renders Claim 8 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 293-303. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Casebolt under 35 U.S.C. §103.

Please see attached Exhibit CC-E for a claim chart comparing Kerai in view of Casebolt with Claim 8 of the '586 Patent under 35 U.S.C. § 103

a. ***Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Casebolt. Specifically, Kerai in view of Casebolt discloses a mobile phone that can connect to a laptop computer through a USB connection for purposes of charging the battery of the mobile phone. *See* Claim 1[a] and 1[e].

b. ***providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus

power line at the USB interface." Kerai in view of Casebolt discloses this element. Specifically, Kerai in view of Casebolt teaches that the mobile phone has a USB interface that connects to a laptop computer. *See* Claim 1[b]. Kerai in view of Zyskowski further teaches that the mobile phone receives power from the laptop computer through the V_{BUS} line. *See* Claim 1[c]-[e].

c. ***providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem***

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Kerai in view of Casebolt discloses this element. Specifically, Kerai in view of Casebolt discloses that the charging subsystem of the mobile phone is connected to the V_{BUS} line. *See* Claim 1[c].

d. ***having a battery in operable connection to the charging subsystem;***

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Kerai in view of Casebolt discloses this element. *See* Claim 1[d].

e. ***providing power to the battery using the charger subsystem***

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Kerai in view of Casebolt discloses this element. *See* Claim 1[d]-[e].

f. ***detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Kerai in view of Casebolt discloses this element. Specifically, Kerai in view of

Casebolt discloses that the mobile phone detects a signal on the USB data lines indicating that the mobile device is connected to the laptop computer through a USB-to-PS/2 adapter and, thus, whether the power source is a USB port or a PS/2 port. *See* Claim 1[f]. The signal indicating that the power source is a PS/2 port is an SE1 signal, which is different from USB enumeration. *Id.*

F. Kerai in view of Gilbert Renders Obvious Claims 1 and 8

For the reasons stated below, Kerai in view of Gilbert renders obvious Claims 1 and 8. OTH-A (Baker Decl.,), ¶¶ 204-349.

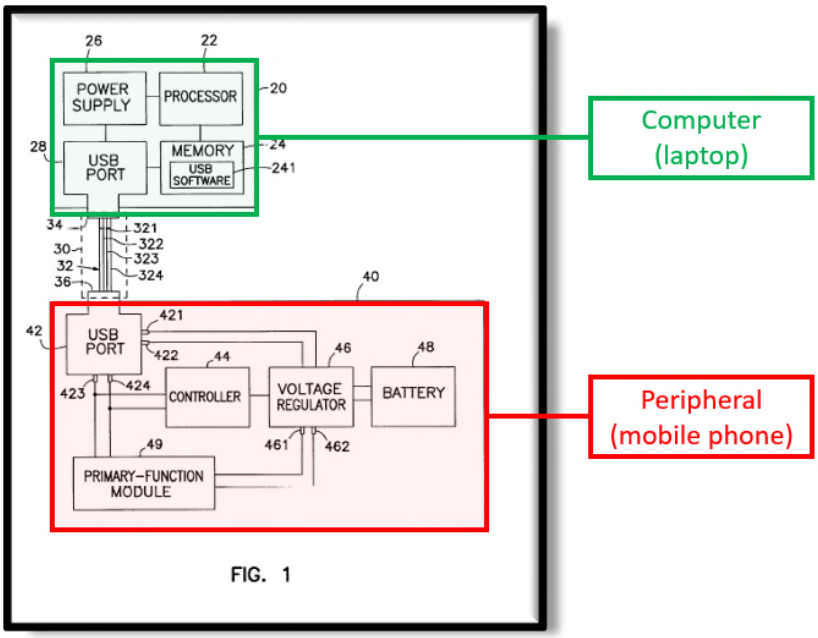
1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Kerai in view of Gilbert. OTH-A (Baker Decl.,), ¶¶ 304-308.

Both Kerai and Gilbert relate to systems and methods for connecting peripheral devices to a computer system. Baker Decl., ¶ 305. Gilbert explains, for example, that certain peripheral USB devices needed more power to operate than could be supplied by a USB connection alone. Gilbert at Abstract ("The serial bus [USB] may also supply a limited amount of power to some peripherals. Unfortunately, the power limit compels high-power peripherals to include independent power supplies, an arrangement which increases their complexity and cost."); *id.* at 1:41-43 ("One problem with the USB and other serial bus specification are the power limits they impose on peripherals"). Thus, in one embodiment, Gilbert teaches designing peripheral devices (*e.g.*, a mobile phone) with an internal rechargeable battery that the device may charge using power from an inactive computer system connected via a USB cable. *Id.* at 1:54-56 ("To address this and other needs, the present invention provides a peripheral with a rechargeable battery that stores energy during inactive periods for use during active periods.") Gilbert further teaches that the device can distinguish between an inactive period (when the device is not using power and is,

instead, storing it) and active periods (when the device is using power from the battery and the USB port) using an identification signal on the data lines. Specifically, in order to determien the difference between these two modes, the "interface-controller module 44 [of the peripheral] monitors and decodes data received at data terminals 423 and 423 [of the USB interface]." *Id.* at 1:21-22. Based on the data signals received on the data lines, "the controller switches the battery between a charge mode and a supply mode according to signals received through the bus data lines." *Id.* at 1:61-63.

Gilbert does not limit the system to any specific type of peripheral device, but notes that the system can be used with "high-power peripherals that require more power than available through [a typical USB connection]." Gilbert, 3:18-20 ("Ultimately, the invention encompasses any type of computer peripheral, including high-power peripherals that require more power than available through bus 30.");



Gilbert, Figure 1 (annotated); Baker Decl., ¶ 306

Kerai discloses a specific embodiment for implementing the invention of Gilbert, i.e., a mobile phone (peripheral) connected to a computer system. Kerai, like Gilbert, discloses that the

mobile phone will include its own internal rechargeable battery, which, in the prior art, was typically charged using a "dedicated charger" that connected to the phone by a propriety or unique connection. Kerai, 1:11-25. Baker Decl., ¶ 307. This often resulted in users having to carry multiple chargers that were "heavy, bulky and inconvenient to transport." Kerai, 1:11-25; Baker Decl., ¶ 307. Accordingly, Kerai proposed a mobile phone with (1) USB interface for connecting to the USB port of a laptop computer and (2) a "charging circuit" that can draw current from the USB connection and use it to charge the mobile phone's battery.

> It is thus an object of the present invention to overcome the disadvantages set out above and to further provide a device which permits a user to remove the need to carry a plurality of chargers and adapters when traveling . . . . Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port wherein the port, in use, provides power to the charging circuit.

Kerai, 1:29-40.

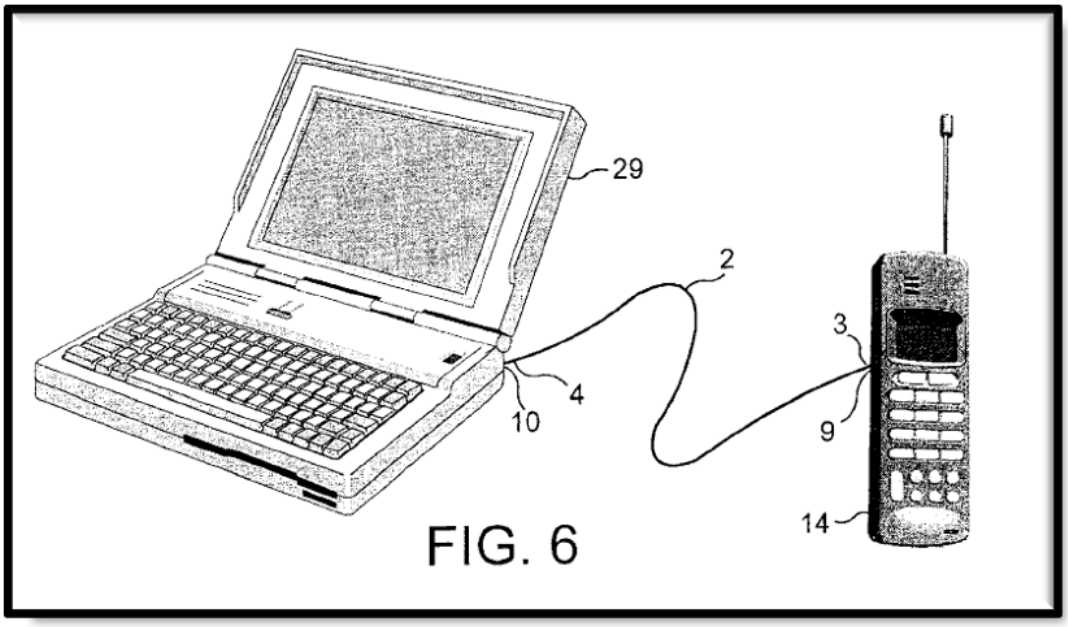


FIG. 6

Kerai, Figure 6 (showing mobile device (14) connected to computer (29)). Applying the teachings of Gilbert to Kerai, a person of ordinary skill would be able to implement the mobile phone that can determine whether the computer is an active mode (for purposes of drawing

power from the battery) or in an inactive mode (for purposes of drawing power from the USB port and storing it). Baker Decl., ¶ 308. Such a person would have been motivated to do so because both Kerai and Gilbert discloses methods and systems for powering devices using a rechargeable battery that can be charged via a USB connection. Baker Decl., ¶ 308. Moreover, applying the teachings of Gilbert to the mobile phone of Kerai would be within the skill and knowledge of a person of ordinary skill in the art. Baker Decl., ¶ 308.

2. Claim 1

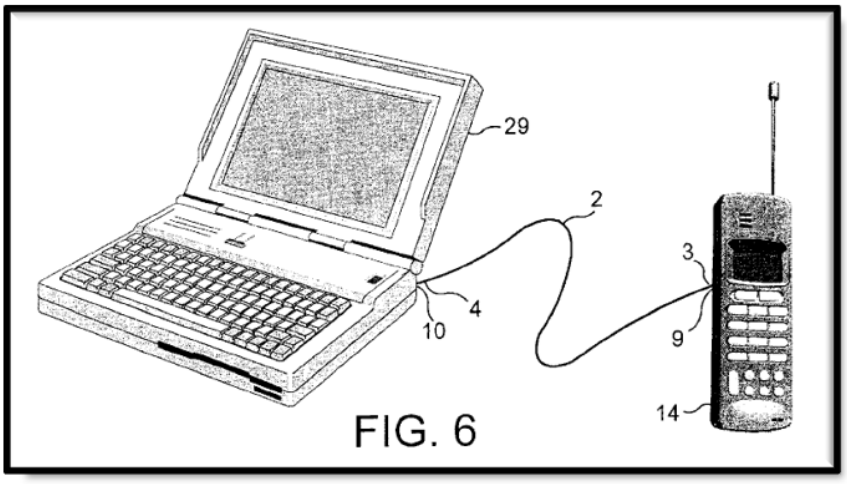
Kerai in view of Gilbert renders Claim 1 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 309-338. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Gilbert under 35 U.S.C. §103.

Please see attached Exhibit CC-F for a claim chart comparing Kerai in view of Gilbert with Claim 1 of the '586 Patent under 35 U.S.C. § 103

a. ***1[a] Preamble: A mobile communication device, the mobile device configurable for use in a wireless telecommunications network, comprising***

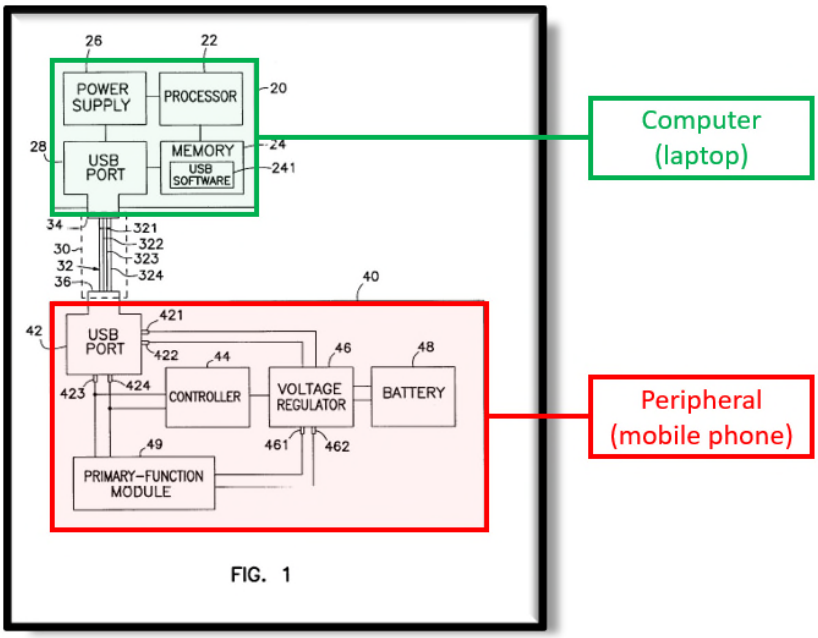
The preamble of Claim 1 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Gilbert. Baker Decl., ¶¶ 310-313. Specifically, Kerai discloses a system and method for charging a "mobile radio telephone" device by connecting it to a laptop computer through a USB connection. Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding

the need for a user to carry a dedicated battery charger for the radio telephone.") (emphasis added).



Kerai, Figure 6. A POSITA would have understood the mobile radio telephone to be a mobile communication device configurable for use in a wireless telecommunication network. Baker Decl.; ¶ 311.

Gilbert similarly discloses a system and method for connecting a "peripheral device" to a computer system through a USB cable and thereby supplying power to the peripheral device. Baker Decl., ¶ 312. Gilbert, Abstract ("one embodiment of the present invention provides a bus-powered peripheral that includes a controller, a rechargeable battery, and a voltage regulator or recharge circuit. The recharge circuit monitors data on a serial bus, recharges the battery during inactive periods, and allows the battery to supplement bus power during active periods, thereby overcoming the power limit of the serial bus.") Gilbert does not limit the system to any specific type of peripheral device, but notes that the system can be used with "high-power peripherals that require more power than available through [a typical USB connection]." Gilbert, 3:18-20 ("Ultimately, the invention encompasses any type of computer peripheral, including high-power peripherals that require more power than available through bus 30.")



Gilbert, Figure 1 (annotated).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Gilbert discloses "a mobile communication device . . . configurable for use in a wireless telecommunications network." Baker Decl., ¶ 313.

b. ***1[b]: a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable***

Claim 1 of the '586 Patent requires "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable." Kerai in view of Gilbert discloses this element. Baker Decl., ¶¶ 314-317.

Specifically, Kerai teaches that the mobile phone has a USB interface and connects through a USB cable to a USB port of another device. Kerai, 3:25-30 ("The telephone 14 further incorporates a USB interface or port shown generally as P. The USB interface P comprises a connector 22 having data 23, power 24 and ground pins or terminals. The connector 22 is provided in the handset housing to which a downstream plug of a USB cable is connectable in use.") (emphasis added); *id*. at Abstract ("A battery charging circuit is described in which power

is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device. The communications device, which may be a mobile radio telephone, can be charged from the power supply or internal battery of a laptop computer equipped with a USB port and connected thereto with a suitable cable thereby avoiding the need for a user to carry a dedicated battery charger for the radio telephone").

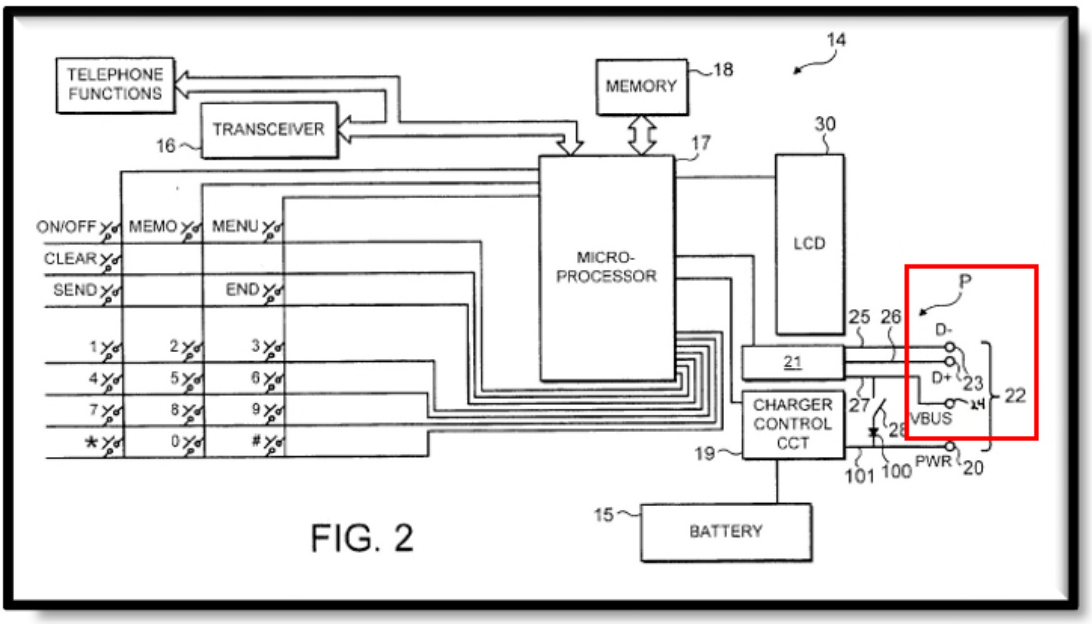
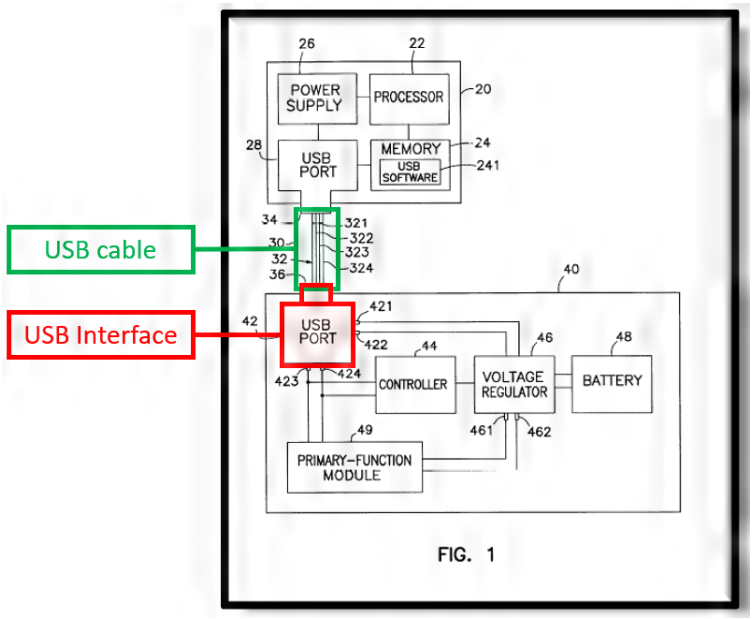


FIG. 2

Kerai, Figure 2 (annotated) (showing USB interface); see also Figure 6 (disclosing USB cable 2).

Gilbert similarly teaches that the peripheral device (mobile phone) comprises a USB Port (42) that connects to USB cable (32). Gilbert, 2:47-59 ("USB port 28 connects to USB serial bus 30. USB serial bus 30 includes a USB cable 32 which terminates at one end (computer end) with USB connector 34 and at its other end (peripheral end) with USB connector 36. In accord with the USB Specification, cable 32, which has 90-ohm impedance, includes four insulated wires 321-324. Wires 321 and 322 provide respective nominal voltages of 5 volts and return ground, and carry a maximum of 2.5 watts of power. Wires 323 and 324 are differential data lines that carry differential data signals as well as an NRZI-encoded clock signal. Connector 34, at the computer end of cable 32, mates with USB port 26, and connector 36, at the peripheral end,

mates with USB port 42 of USB peripheral 40") (emphasis added); Gilbert, 2:60-63 ("Port 42 includes not only power terminals 421 and 422 which connect respectively to wires 321 and 322, but also data terminals 423 and 424 which connect respectively to wires 323 and 324."); Baker Decl., ¶ 316.



Gilbert, Figure 1 (annotated) (showing USB interface configured to allow reception of a USB cable).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Gilbert discloses a mobile device comprising "a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable" as required by Claim 1. Baker Decl., ¶ 317.

c. *1[c]: a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line*

Claim 1 of the '586 Patent further requires "a charging subsystem, the charging subsystem operably connected to the USB interface V-bus power line." Kerai in view of Gilbert discloses this element. Baker Decl., ¶¶ 318-322.

Specifically, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the mobile phone. Kerai, at

3:6-24 ("FIG. 2 shows a portable radio telephone 14 powered by a rechargeable battery pack 15 . . . . A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added); *id.* at 1:34-39 (". . . there is provided a battery powered device including a communications port [USB] and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port [USB] where in the port, in use, provides power to the charging circuit.") (emphasis added). A person of ordinary skill in the art would have thus understood that mobile device comprises a "charging subsystem" comprising at least said "charging circuit." Baker Decl., ¶ 319.

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit is operably connected to the power line of the USB interface (the V_{BUS} line) for purposes of drawing power to supply to the battery when the phone is connected to power through its USB port (instead of its conventional power jack). Baker Decl., ¶ 320; Kerai, 3:37-51 ("A conductor 27, which carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21, is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19. The switch 28 is under the control of the interface ASIC 21 whilst the diode 100 prevents power from being supplied in an upstream direction via the connector 22, in accordance with the above USB standard.") (emphasis added).

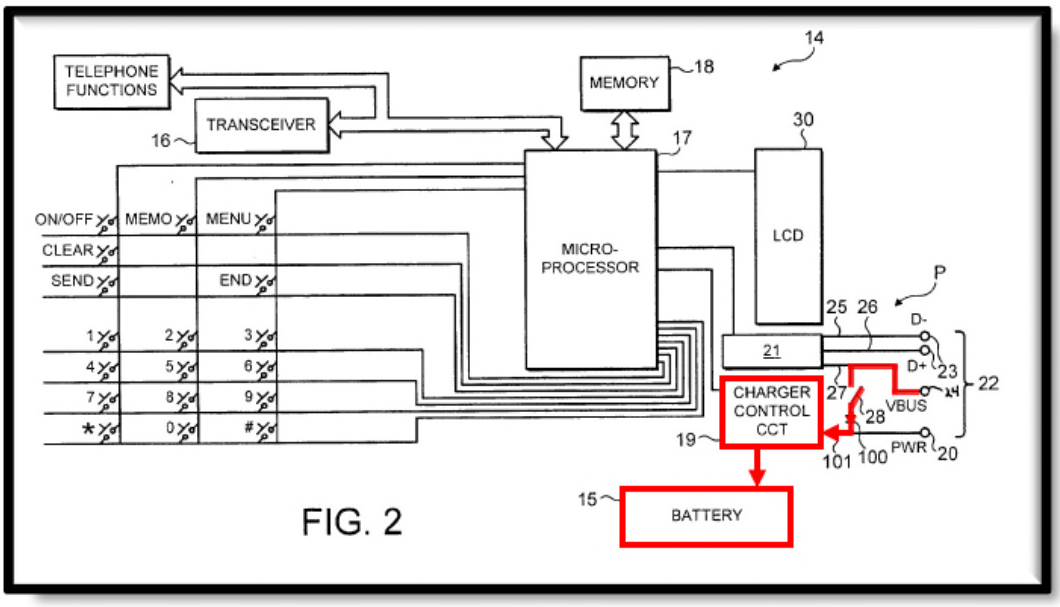


FIG. 2

Kerai, Figure 2 (annotated) (showing Charger Control Circuit 19 which (1) comprises or, at a minimum, is a component of the charging subsystem, and (2) is operably connected to the USB interface V-bus power line 14).

Gilbert similarly discloses that the peripheral device (mobile phone) will have a "controller" and a "voltage regulator/recharge circuit" that are coupled to the USB Port (including the Vbus power line) and a rechargeable battery. Gilbert, 1:57-67 ("In one exemplary embodiment, the peripheral [mobile phone] includes a voltage regulator for coupling to a pair of bus power lines; a controller coupled between the voltage regulator and one or more bus data lines; and a rechargeable battery coupled to the voltage regulator. In operation, the controller switches the battery between a charge mode and a supply mode according to the signals received through the data lines. The charged battery supplements the power available through the bus power lines, thereby providing more power for operating the peripheral than otherwise available over the bus power lines") (emphasis added); Gilbert, 2:60-3:9 ("Port 42 includes not only power terminals 421 and 422 which connect respectively to wires 321 and 322, but also data terminals 423 and 424 which connect respectively to wires 323 and 324. USB peripheral 40 additionally

includes an interface-controller module 44, a voltage regulator (or recharge circuit) 46, a rechargeable battery 48, and a primary-function module 49. Interface-controller module 44 is connected to data terminals 423 and 424 of USB port 42. Power terminals 421 and 422 (of port 42) connect to voltage regulator 46. Voltage regulator 46 connects to battery (or energy-storage device) 48, which includes one or more energy-storage cells (not shown), preferably long-life rechargeable lithium, nickel-cadmium, zinc-bromine, or alkaline-manganese cells with minimum charging hysteresis. In addition, Voltage regulator 46 includes output terminals 461 and 462 which are connected to primary function module 49.") (emphasis added);Baker Decl., ¶ 321.

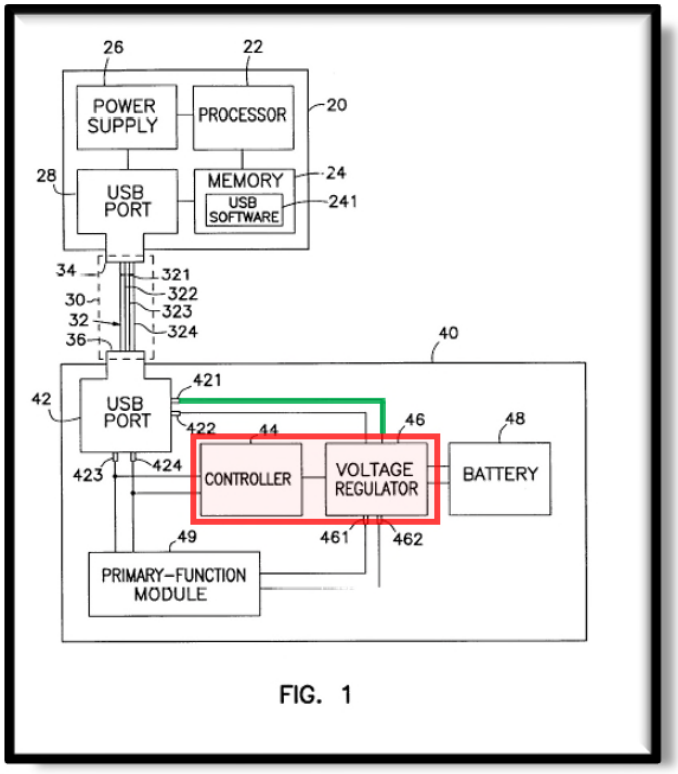


FIG. 1

Gilbert, Figure 1 (annotated) (showing charging subsystem (red) operably connected to VBUS line (green)). A POSITA would have understood these components to be part of a charging subsystem. Baker Decl., ¶ 321.

Accordingly, a person of ordinary skill in the art would have understood that the mobile devices of Kerai in view of Gilbert comprise "a charging subsystem, the charging subsystem

operably connected to the USB interface V-bus power line," as required by Claim 1. Baker Decl., ¶ 322.

d. ***1[d]: the charging subsystem operably connected to a battery, and configured to charge a battery if a battery is operably connected;***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected." Kerai in view of Gilbert discloses this element. Baker Decl., ¶¶ 323-327.

Specifically, as noted above, Kerai discloses that the mobile phone includes a charging subsystem (comprising at least a "charging circuit") for charging the battery of the communications device when using the USB interface. *See* Claim 1[c]; Kerai, 3:6-24 ("FIG. 2 shows a portable radio telephone 14 powered by a rechargeable battery pack 15. A battery charger control circuit 19 is also included in the telephone 14. This circuit 19 delivers power to the rechargeable battery 15.") (emphasis added). Accordingly, a person of ordinary skill in the art would have understood that the charging subsystem of Kerai is "configured to charge a battery if a battery is operably connected."

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging subsystem is operably connected to the battery for this purpose. Baker Decl., ¶ 325;

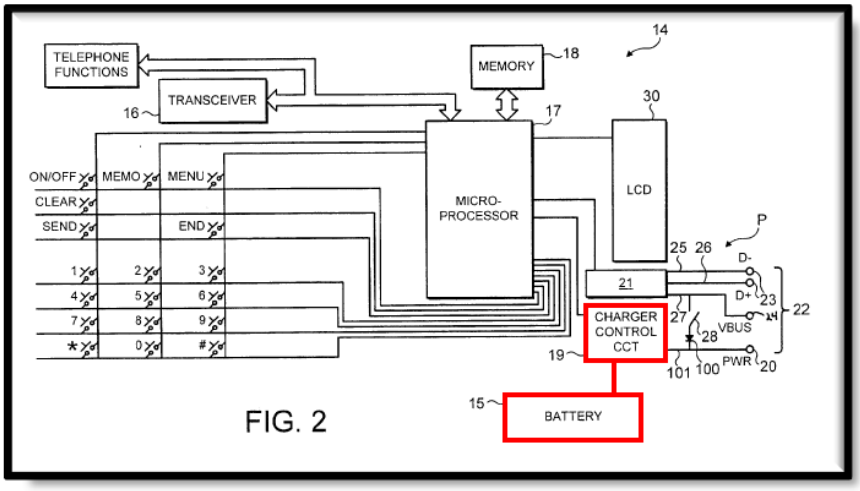
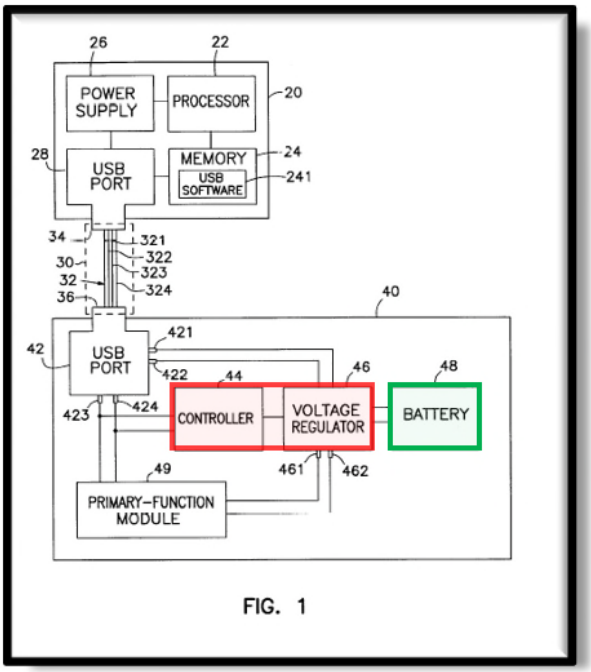


FIG. 2

Kerai, Figure 2 (annotated) (showing charger control circuit 19 operatively connected to battery 15); *id.* at 1:34-39 ("Thus, according to one aspect of the present invention there is provided a battery powered device including a communications port and a charging circuit connectable to a battery, the charging circuit having a further connection to the communications port [USB] where in the port, in use, provides power to the charging circuit [via V_{BUS} line].") (emphasis added).

As also noted above, Gilbert discloses that the peripheral device (mobile phone) will have a charging subsystem that is operably connected to a USB Port and a rechargeable battery. *See* limitation 1[c]. Gilbert further discloses that the charging subsystem is configured to charge the battery if operably connected. Gilbert, 1:57-67 ("In one exemplary embodiment, the peripheral [mobile phone] includes a voltage regulator for coupling to a pair of bus power lines; a controller coupled between the voltage regulator and one or more bus data lines; and a rechargeable battery coupled to the voltage regulator. In operation, the controller switches the battery between a charge mode and a supply mode according to the signals received through the data lines. The charged battery supplements the power available through the bus power lines, thereby providing more power for operating the peripheral than otherwise available over the bus power lines") (emphasis added); Gilbert, 2:60-3:9 ("Port 42 includes not only power terminals 421 and 422

which connect respectively to wires 321 and 322, but also data terminals 423 and 424 which connect respectively to wires 323 and 324. USB peripheral 40 additionally includes an interface-controller module 44, a voltage regulator (or recharge circuit) 46, a rechargeable battery 48, and a primary-function module 49. Interface-controller module 44 is connected to data terminals 423 and 424 of USB port 42. Power terminals 421 and 422 (of port 42) connect to voltage regulator 46. Voltage regulator 46 connects to battery (or energy-storage device) 48, which includes one or more energy-storage cells (not shown), preferably long-life rechargeable lithium, nickel-cadmium, zinc-bromine, or alkaline-manganese cells with minimum charging hysteresis. In addition, Voltage regulator 46 includes output terminals 461 and 462 which are connected to primary function module 49") (emphasis added); Gilbert, 3:21-29 ("In operation, interface-controller module 44 monitors and decodes data received at data terminals 423 and 424. If it receives data indicating or invoking an inactive period, for example, data instructing that the peripheral be turned off, it sends a control signal to voltage regulator 46. The control signal invokes a charge mode in voltage regulator 46. In the charge mode, voltage regulator 46 diverts power away from primary-function module 49 to battery 48, thereby charging battery 48.") (emphasis added).; Baker Decl., ¶ 326.



Gilbert, Figure 1 (annotated) (showing charging subsystem (red) operably connected to the battery (green)).

Accordingly, a person of ordinary skill in the art would have understood that the mobile device of Kerai in view of Gilbert comprises a charging subsystem wherein "the charging subsystem [is] operably connected to a battery, and configured to charge a battery if a battery is operably connected" as required by Claim 1. Baker Decl., ¶ 327.

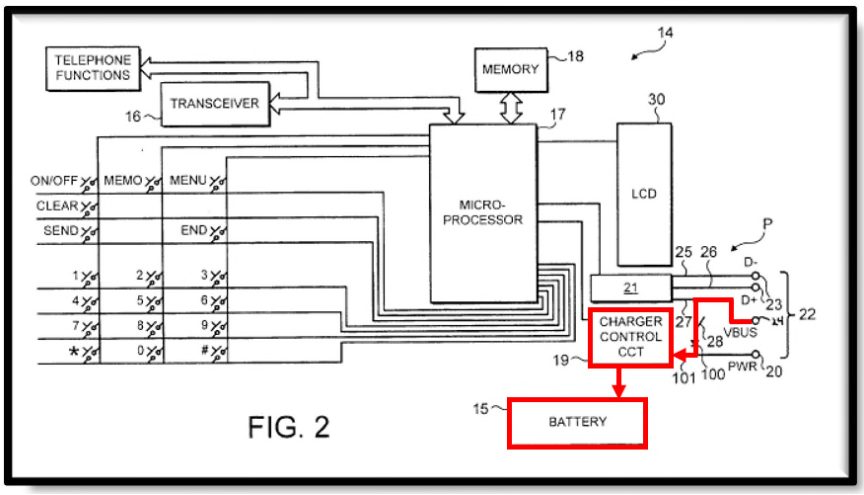
e. ***1[e]: the charging subsystem further configured to use power from the V-bus power line for the charging of a battery***

Claim 1 of the '586 Patent further requires that "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery." Kerai in view of Gilbert discloses this element. Baker Decl., ¶¶ 328-332.

Specifically, as noted above, Kerai discloses that the communications device comprises a charging subsystem (comprising at least a "charging circuit") that is (1) operably connected between the USB Interface and the battery and that (2) charges the battery. *See* Claim 1[c]-[d]; Kerai, 1:34-39 ("Thus, according to one aspect of the present invention there is provided a

battery powered device including a communications port and a charging circuit [charging subsystem] connectable to a battery, the charging circuit having a further connection to the communications port [USB interface] where in the port, in use, provides power to the charging circuit.") (emphasis added).

Kerai further discloses—and a person of ordinary skill in the art would have understood—that the charging circuit charges the battery using power from the V_{BUS} line when the mobile phone is connected to the USB port for power instead of the conventional power jack. Baker Decl., ¶ 330; Kerai, Abstract ("A battery charging circuit is described in which power is derived from a communications port such as a USB interface (22) and is supplied to a rechargeable battery of a communications device."); Kerai, 3:37- (" conductor 27 . . . carries power signals (Vbus) from the power pin 24 of the connector 22 to the Interface ASIC 21 [and] is also connected via a switch 28 in series with a diode 100 to a conductor 101 connecting the charger jack 20 to the charger control circuit 19.").



Kerai, Figure 2 (annotated) (showing the charger control circuit using power from VBUS line to charge the battery).

Gilbert similarly discloses that the charging subsystem will use power from the V_{BUS} line to charge the battery. Baker Decl., ¶ 331; Gilbert, 3:21-29 ("In operation, interface-controller

module 44 monitors and decodes data received at data terminals 423 and 424. If it receives data indicating or invoking an inactive period, for example, data instructing that the peripheral be turned off, it sends a control signal to voltage regulator 46. The control signal invokes a charge mode in voltage regulator 46. In the charge mode, voltage regulator 46 diverts power away from primary-function module 49 to battery 48, thereby charging battery 48") (emphasis added);

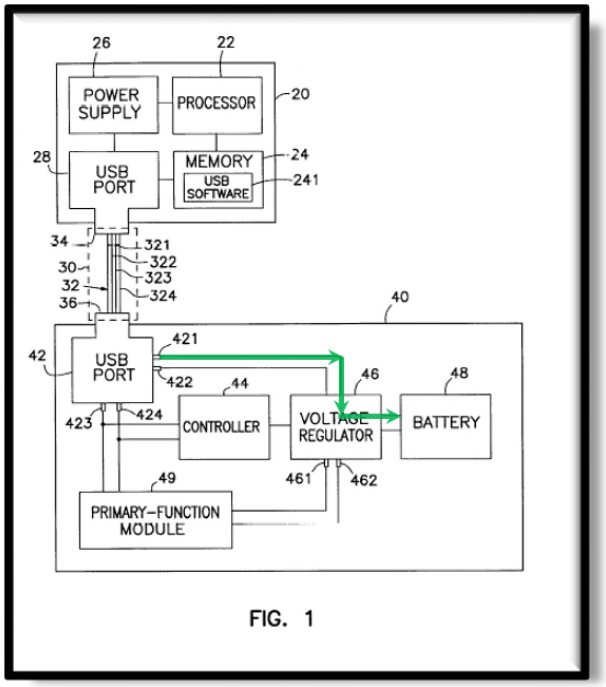


FIG. 1

Gilbert, Figure 1 (annotated).

Accordingly, a person of ordinary skill in the art would have understood that Kerai in view of Gilbert discloses a mobile device comprising a charging subsystem wherein "the charging subsystem [is] further configured to use power from the V-bus power line for the charging of a battery" as required by Claim 1. Baker Decl., ¶ 332.

f. ***1[f]: where the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 1 of the '586 Patent further requires that "the mobile device is configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal

being different than USB enumeration." Kerai in view of Gilbert discloses this element. Baker Decl., ¶¶ 333-338.

Specifically, as noted above, Kerai in view of Gilbert discloses a computer system (laptop) that is connected to a peripheral device (mobile phone) through a USB cable. *See* Claim 1[a]-[c]; Baker Decl., ¶ 334. Kerai in view of Gilbert further discloses that the mobile phone comprises a charging subsystem that draws power from the VBUS line of the USB connection and uses that power to charge the mobile phone's battery; Baker Decl., ¶ 334. *See* limitations 1[c]-[e].

337. Gilbert further discloses that the mobile device switches between two modes (the battery charging and the battery supplying power) based on signals received on the data lines. Gilbert, 1:61-67 ("In operation, the controller switches the battery between a charge mode and a supply mode according to signals received through the bus data lines. The charged battery supplements the power available through the bus power lines, thereby providing more power for operating the peripheral than otherwise available over the bus power lines alone") (emphasis added). 338. In order to determine which mode the phone needs to be in (and therefore whether it will be (a) drawing power from the USB port to charge the battery or (b) drawing power from the battery to power the phone) the port and the controller of the mobile phone monitors the data lines for specific signals. Gilbert, 3:21-29 ("In operation, interface-controller module 44 monitors and decodes data received at data terminals 423 and 424. If it receives data indicating or invoking an inactive period, for example, data instructing that the peripheral be turned off, it sends a control signal to voltage regulator 46. The control signal invokes a charge mode in voltage regulator 46. In the charge mode, voltage regulator 46 diverts power away from primary-function module 49 to battery 48, thereby charging battery 48") (emphasis added); Gilbert, 3:65-4:12 ("More precisely, port 42 and controller 44 of power extension peripheral 50 decode and

monitor data on bus 30. If controller 44 detects data indicating or invoking an inactive period for peripheral 70, it directs regulator 46 to divert power away from connector 64 and thus away from peripheral 70 to charge battery 48. On the other hand, if controller 44 detects data indicating or invoking an active period for peripheral 70, it allows battery 48 to provide supplemental power through connector 64, cable 66, and connector 68 to peripheral 70, thereby overcoming the 2.5-watt power limit of bus 30. Furthermore, two or more substantially similar power-extension peripherals can be connected in parallel to provide even more supplemental power to a given high-power peripheral."); Baker Decl., ¶ 335.

A person of ordinary skill in the art would have understood that such signals are identification signals because they distinguish between the phone drawing power from the laptop computer (for purposes of charging the battery) or from the battery (for purposes of operating the phone). Baker Decl., ¶ 337. Moreover, a person would have understood that at least one of the signals would be different from USB enumeration. Baker Decl., ¶ 337. Specifically, the signal indicating that an "inactive" period would be different from enumeration because enumeration would be done at the outset of a device being connected and active. Baker Decl., ¶ 337. Transitioning to an "inactive" mode would not result in a second round of enumeration. Baker Decl., ¶ 337.

Accordingly, a person of ordinary skill in the art would have understood that the mobile device of Kerai in view of Casebolt is "configured to detect an identification signal at a D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration" as required by Claim 1. Baker Decl., ¶ 338.

3. Claim 8

Kerai in view of Gilbert renders Claim 8 obvious under 35 U.S.C. § 103. Baker Decl., ¶¶ 339-349. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 3 based Kerai in view of Gilbert under 35 U.S.C. §103.

Please see attached Exhibit CC-F for a claim chart comparing Kerai in view of Gilbert with Claim 8 of the '586 Patent under 35 U.S.C. § 103

a. ***Preamble: A method of charging a battery in a mobile device, the mobile device configurable for use in a wireless telecommunications network, comprising***

The preamble of Claim 8 is not limiting. Even were the preamble limiting, it is satisfied by Kerai in view of Gilbert. Specifically, Kerai in view of Gilbert discloses a mobile phone that can connect to a laptop computer through a USB connection for purposes of charging the battery of the mobile phone. *See* Claim 1[a] and 1[e].

b. ***providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface***

Claim 8 of the '586 Patent requires the step of "providing a Universal Serial Bus ("USB") interface configured to allow reception of a USB cable, and receiving power on a V-bus power line at the USB interface." Kerai in view of Gilbert discloses this element. Specifically, Kerai in view of Gilbert teaches that the mobile phone has a USB interface that connects to a laptop computer. *See* Claim 1[b]. Kerai in view of Gilbert further teaches that the mobile phone receives power from the laptop computer through the V_{BUS} line. *See* Claim 1[c]-[e].

c. ***providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem***

Claim 8 of the '586 Patent further requires the step of "providing an operable connection between the power received at the USB interface on the V-bus power line and a charging subsystem." Kerai in view of Gilbert discloses this element. Specifically, Kerai in view of Gilbert discloses that the charging subsystem of the mobile phone is connected to the V_{BUS} line. *See* Claim 1[c].

d. ***having a battery in operable connection to the charging subsystem.***

Claim 8 of the '586 Patent further requires the step of "having a battery in operable connection to the charging subsystem." Kerai in view of Gilbert discloses this element. *See* Claim 1[d].

e. ***providing power to the battery using the charger subsystem***

Claim 8 of the '586 Patent further requires the step of "providing power to the battery using the charger subsystem." Kerai in view of Gilbert discloses this element. *See* Claim 1[d]-[e].

f. ***detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration.***

Claim 8 of the '586 Patent further requires the step of "detecting an identification signal at D+ and a D- data line of the USB interface, the identification signal being different than USB enumeration." Kerai in view of Gilbert discloses this element. Specifically, Kerai in view of Gilbert discloses that the mobile phone detects a signal on the USB data lines indicating whether the computer and mobile phone are in an inactive mode (in which power is diverted to the battery) or an active mode (in which power is drawn from the battery and the USB connection for the primary function of the mobile phone). *See* Claim 1[f].

V. CONCLUSION

Requestor is willing to provide any appropriate assistance to permit the Examiner to address and decide the issues presented by this Request. As the M.P.E.P. explains, the Examiner may, when appropriate, cut and paste claim charts or other material within the Request to incorporate them within the body of an Office Action. *See* M.P.E.P. § 2262. Requestor is therefore, through the undersigned counsel, available to provide the Examiner with a digital copy of this Request, or any portion of it, in response to a request by email or phone. Requestor also understands that the Examiner may, in appropriate circumstances, set forth specific rejections in an Office Action and incorporate by reference Requestor's reasons for the proposed rejections, if the Examiner agrees with the proposed rejections and reasons supporting them.

For the reasons set forth above, Requestor believes that substantial new questions of patentability exist with respect to Claims 1 and 8 of the '586 Patent and requests that *ex parte* reexamination be ordered.

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Respectfully submitted,

/Joseph Chern/

Joseph Chern, Reg. No. 63,246
ORRICK, HERRINGTON &
SUTCLIFFE LLP
2050 Main Street, Suite 1100
Irvine, CA 92614
Telephone: (949) 567-6700