IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Request for *Ex Parte* Reexamination of:	)
	) Group Art Unit: Not Yet Assigned
	)
U.S. Patent No. 8,624,550	) Examiner: Not Yet Assigned
	)
Inventor: Fischer, et al.	) Customer No. 34313
	)
Assignee: Fundamental Innovation Systems International LLC	) Confirmation No.: Not Yet Assigned
	)
	)
Filed: June 28, 2012	)
	)
Issued: January 7, 2014	)
	)
For: **Multifunctional Charger System and Method**	)
	)

REQUEST FOR *EX PARTE* REEXAMINATION
OF UNITED STATES PATENT NO. 8,624,550

EFS Web
Commissioner for Patents

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")

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OTH-D	*TCT Mobile (US), Inc., et al. v. Fundamental Innovation Systems International LLC*, IPR2021-00428, Paper 1 (Petition for *Inter Partes* Review)
OTH-E	*Fundamental Innovation Systems International LLC v. Anker Innovations Limited et al,* 1-21-cv-00339 (DDE), Fundamental's Disclosure of Asserted Claims And Infringement Contentions

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Request for *Ex Parte* Reexamination of:)	Group Art Unit: Not Yet Assigned
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U.S. Patent No. 8,624,550)	Examiner: Not Yet Assigned
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Inventor: Fischer, et al.)	Customer No. 34313
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Assignee: Fundamental Innovation Systems)	Confirmation No.: Not Yet Assigned
International LLC)	
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Filed: June 28, 2012)	
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For: **Multifunctional Charger System**)	
and Method)	

REQUEST FOR *EX PARTE* REEXAMINATION
OF UNITED STATES PATENT NO. 8,624,550

EFS Web
Commissioner for Patents

Dear Sir:

Pursuant to 35 U.S.C. §§ 302 *et seq.* and 37 C.F.R. § 1.510, Anker Innovations Ltd.

("Anker" or "Requestor") hereby request *ex parte* reexamination of United States Patent

No. 8,624,550 ("The '550 Patent."). The undersigned is counsel of record and represents that he

is authorized to act in a representative capacity for Anker under 37 C.F.R. § 1.34.

I.   INTRODUCTION

On April 23, 2021, Patent Owner disclaimed Claims 1, 2, 9-11, and 18 of the '550 Patent

in response to a request for *inter partes* review of those claims in view of U.S. Patent No.

7,360,004 ("Dougherty"). *See* Ex. PAT-B ('550 File History) at page 440 (April 23, 2021

Disclaimer). Requestor seeks reexamination of Claims 3-8 and 12-17 of the '550 Patent in view

of several prior art references (including Dougherty) as discussed herein.

The '550 Patent is directed to "a USB adapter." Ex. PAT-A at 2:34-36. The adapter

connects to a power source (*e.g.*, a wall outlet) and provides power from the power source to a

USB device through a USB connection. *Id.*

There is no dispute that wall adapters were common and ubiquitous as of the priority date

of the '550 Patent (2001). The '550 Patent claims, however, that none of the existing wall

adapters provided power to devices through a USB connector. According to the '550 Patent, this

is because any such wall adapter would not comply the USB Specification, which (1) requires

USB devices to engage in a specific handshaking protocol called "enumeration" before

supplying/drawing power to/from each other and (2) limits the manner in which current can be

supplied/drawn (*e.g.*, allowing only certain amounts of current, at certain times, in certain

directions). *See e.g.*, *id.* at 2:3-7 ("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.").

A simple wall adapter supplying power to a USB device would generally not comply

with a number of these limits (e.g., by supplying power in the wrong direction or supplying

incorrect amounts of current at incorrect times). Accordingly, the '550 Patent teaches that the

claimed adapter will comprise a USB connection (which includes a power line, ground line, and

two data lines) and will supply current through a USB connection "without regard" to at least

one of these limits of the USB Specification. *See id.* at Claims 1 & 10.

The '550 Patent also teaches that, in order to supply current in a manner that disregards a

 limit of the USB Specification, there must be means for the adapter and the device to recognize

each other. This allows the device to distinguish between the scenario in which the device is connected to a typical USB host or hub (which will engage in typical USB operations) and other scenarios that are outside typical USB operations. The '550 Patent claims that this can be done using an "abnormal data condition," *i.e.*, a condition that the devices would not typically expect during normal USB enumeration/operation. *See id.* at Claims 4-8 and 13-17. Because the "abnormal data condition" is one that the device would not expect to occur, the mobile device can be configured to recognize the device and simply draw power instead of engaging in typical USB operations. As patentee has noted in prior litigation, the "abnormal data condition" "need not be defined as illegal or invalid by USB 2.0, it only needs to be one that is not expected from a USB hub/host, *i.e.,* that the USB specification does not define as valid or legal."

The '550 Patent states that "the microprocessor 12 may detect the identification signal by detecting the presence of an abnormal data line condition at the USB port 18" and that "detection may also be accomplished through the use of other device subsystems." *Id.*, 9:21-25. But the '550 Patent does not disclose or claim precisely how a processor or other subsystems would be implemented to detect such signals and, instead, leaves this to the knowledge of persons of ordinary skill in the art. *See id.*

The Challenged Claims of the '550 Patent are obvious. Contrary to the premise of the '550 Patent, wall adapters for USB devices were contemplated and disclosed prior to the priority date of the '550 Patent. Indeed, each of Matsumoto, Yang, De Iuliis, Morita, and Dougherty (discussed herein) discloses such an adapter. Moreover, it was further known and obvious that such adapters/devices would supply/draw current in a way that was inconsistent with the limits of the USB specification (*e.g.*, at an improper time, in an incorrect amount, or in an incorrect direction). As discussed herein, the prior art adapters, when used for their intended purposes supply current in incorrect amounts, at incorrect times, and/or in incorrect directions. And,

finally, it was understood and obvious that one could use an "abnormal data condition" to distinguish between such adapters and typical USB devices/operations.

U.S. Patent No. 6,904,488 (Matsumoto), for example, discloses a system and method for implementing USB devices and associated USB adapters. Ex. PA-A (Matsumoto), Abstract. Specifically, Matsumoto teaches "portable electronic devices" (mobile devices) that comprise a USB port that can be connected to either (1) a computer or (2) an adapter. *Id.*
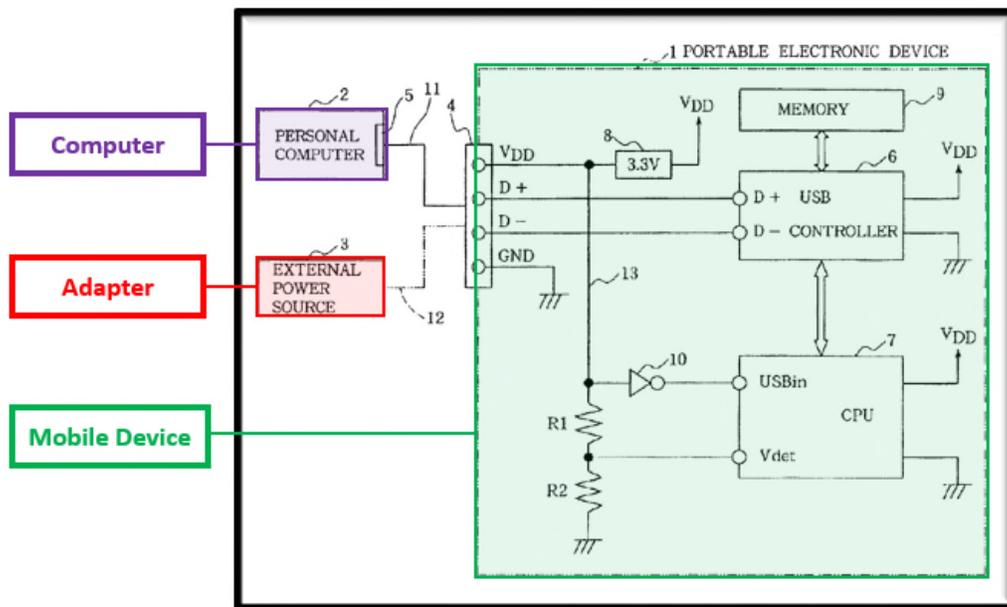
Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)); *id.*, 3:41-47 ("FIG. 1 shows a portable electronic device 1 of the invention, which has a USB connector 4. A USB connector 5 of 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.").

Like the '550 Patent, Matsumoto teaches that the mobile device should be able to determine when it is connected to the adapter (as opposed to the computer) and thus, discloses using "discriminating means" for distinguishing between the two power sources. *Id.*, 2:58-59

("The discriminating means identifies the source of supply of power . . . ."). Also like the '550 Patent, Matsumoto discloses that, once the discriminating means determine that the mobile device is attached to an adapter, it will charge the device while avoiding the typical USB enumeration and communication process. *Id.* at 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."). As discussed in more detail herein, this involves supplying power in a manner that is inconsistent with the USB Specification limits on the direction current may flow and the amounts of current that can be supplied at specific times.

Matsumoto does not disclose the precise structure of the USB adapter, but a person of ordinary skill in the art could have identified a number of such adapters in the prior art. Each of CN2410806Y (Yang) and US Patent No. 7,766,698 (De Iuliis), for example, discloses an adapter that can supply current to a mobile device through a USB connection and that can be recognized as an adapter (as opposed to typical USB device) because of an "abnormal data condition." Yang, for example, discloses an adapter that can be connected to various power supplies (*e.g.*, a wall outlet or a car socket) and provide power to a mobile device through, for example, a USB connection. Yang teaches that the charger comprises two pull-up resistors on the data lines in the USB connection, which is abnormal for a USB device. This results in a high/high (or "SE1") signal on those data lines at attachment, which is an "abnormal data condition" that can be used to distinguish the adapter of Yang from typical USB devices.

De Iuliis also discloses a USB adapter that can be connected to a wall outlet and provide power to a mobile device through a USB connection. De Iuliis, however, discloses that the

adapter maintains an SE0 signal (low/low signal) on the data lines for an extended period of time even after the devices have been connected. Maintaining an SE0 signal for that period of time is also not a valid data condition when connecting USB devices because the USB specification states that a connected device must apply voltage to one of the data lines within 100ms of the devices being connected to signal an "attachment." Accordingly, De Iuliis also discloses using an "abnormal data condition" that can be used to distinguish the adapter from a typical USB device.

U.S. Patent No. 6,625,738 ("Shiga") also discloses means for powering devices using abnormal data conditions. Specifically, Shiga discloses that a USB peripheral device such as a keyboard can be implemented with a power-on and power-off switch to turn a host device on and off without having to physically access the host device. Shiga, Abstract. The disclosed peripheral keyboard instructs the host computer to power-on or power-off using extended SE1 signals and SE0 signals, respectively. *Id.* at 2:4-8 ("There has been a demand for adding value to such computers connected with the USB interface by providing a function that the USB does not have, that is, by providing a key called a power-on key, which allows the host computer to be started by a key input operation at a keyboard."); *id.* at 7:46-55 ("When a predetermined key on the keyboard 11 is operated . . . the main power is turned off."). Once the host is powered on in response to the abnormal data condition, it will draw power from any adapter it is connected to.

Morita and Dougherty, for example, each disclose adapters that can be used in conjunction with a peripheral keyboard like the one disclosed in Shiga (i.e., the adapters provide both (1) a connection to a wall outlet for power and (2) additional USB connections for peripheral devices (e.g., mouse and keyboard). In such systems, Shiga teaches that the peripheral keyboard can be used to power-on a docked device (*e.g.*, a laptop computer) by sending an extended SE1 signal to the dock which, in turn, sends the SE1 signal to the host

device. In response, the host device is powered on and starts drawing current from the dock.

Accordingly, these references also disclose adapters (docks) that power USB powered devices in

response to abnormal data conditions.

As discussed in more detail herein, these references raise substantial new questions of

patentability as to Claims 3-8 and 12-17 of the '550 Patent. Accordingly, Requestor requests

that the examiner institute reexamination of those claims.

II.   PROCEDURAL BACKGROUND AND REQUIREMENTS

A.   Related Proceedings

Patent Owner recently asserted the '550 Patent against Anker in *Fundamental Innovation*

Systems International LLC v. Anker Innovations Limited et al, 1-21-cv-00339 (DDE), which was

filed on March 5, 2021. Patent Owner has also asserted the '550 Patent against numerous other

defendants, including in the following pending matters:

- *Fundamental Innovation Systems International LLC v. Toyota Motor Corporation et al,* 2-21-cv-00281 (EDTX)

- *Fundamental Innovation Systems International LLC v. General Motors Company et al*, 2-21-cv-00282 (EDTX)

- *Fundamental Innovation Systems International LLC v. Hyundai Motor Company et al,* 2-21-cv-00283 (EDTX)

- *Fundamental Innovation Systems International LLC v. Cyber Power Systems (USA), Inc.,* 1-21-cv-00340 (DDE)

- *Fundamental Innovation Systems International LLC v. Lenovo (United States) Inc., et al* 1-20-cv-00551 (DDE)

- *Fundamental Innovation Systems International LLC v. TCT Mobile (US) Inc. et al,* 1-20-cv-00552 (DDE)

Anker has not previously requested *ex parte* reexamination or *inter partes* review of the '550 Patent. The '550 Patent has been subject to *inter partes* review in several proceedings, but the Patent Trials and Appeal Board ("PTAB") did not consider the arguments made herein.

The examiner did <u>not</u> consider Matsumoto, Yang, De Iuliis, or Kim during prosecution, and the PTAB did <u>not</u> consider Matsumoto, Yang, De Iuliis, or Kim during the prior *inter partes* review proceedings.

And while the PTAB did consider three of the prior art references discussed herein during prior *inter partes* review proceedings (Dougherty, Shiga, Morita), it did not consider the reasoning discussed herein. Indeed, the Patent Owner recently disclaimed a number of claims in response to arguments made based on Dougherty, tacitly admitting that Dougherty is relevant prior art.

1. Prior Discussion of Dougherty and Shiga

The Board considered Dougherty and Shiga in several related proceedings for *inter partes* review of the '550 Patent. *See e.g.*, PAT-B at 263-276 (IPR2018-110 Decision); *id.* at 285-304 (IPR2018-465 Decision). In those decisions, however, the Board did not consider the arguments raised here, which are fundamentally different. For example, in prior decisions, the Board noted that the petitioners cited portions of the laptop computer of Dougherty (not the laptop dock/adapter) as comprising the USB Communication Path *of the adapter* and, thus, failed to identify any USB communication path *in the claimed adapter*. *Id.* at 11-12. Here in contrast, Requestor cites the internal components of the laptop <u>*dock*</u> of Dougherty (*i.e.*, the adapter), including the USB communication path. *See* Section IV.D.2.b.

Morover, prior petitioners in the prior requests sought to combine Dougherty and Shiga in a different and less obvious way than Requestor does here. Specifically, prior petitioners proposed modifying Dougherty by replacing the initial "handshaking" protocol between the

laptop and the laptop dock with the SE1 signal of Shiga (which Shiga teaches can be used as a "power-on" or "wake-up" signal). Petitioners argued that a person of ordinary skill in the art would have been motivated to send the SE1 siganl (1) while the laptop was already powered-on and communicating with the laptop dock, (2) for a purpose that was different from the purpose propsosed by Shiga (i.e., not as a power-on signal), and (3) regardless of whether a peripheral keyboard (like the one disclosed in Shiga) was connected to the laptop dock (the petitions did not propose using the peripheral keyboard at all). The Board found that it would not have been obvious to modify Dougherty in this way.

Here, in contrast, the Substnatial New Question of Patentability is based on the obvious and intended configuration of both Dougherty and Shiga. That is, (1) the disclosed periphral keyboard of Shiga is connected to a laptop comptuer through a laptop dock, (2) the laptop dock is not communicating with the laptop at the time because the laptop is powered off, and (3) the "power-on" signal is sent from the keyboard to the laptop for purposes of powering on the laptop and starting normal operations (e.g., receiving power on the VBUS line). *See* Section IV.D. That is, the keyboard is used in exactly the way described by Shiga, *i.e.*, to power-on and power-off the connected host device, and the only modification proposed to Dougherty is specifically taught by Shiga, i.e., implementing circuitry to receive and recognize the SE1 signal and use it to power-on a device. *Id.*

Most recently, Dougherty was cited in in IPR2021-248 as a one-reference ground that rendered Claims 1-2, 9-11, and 18 of the '550 patent obvious. OTH-D (*TCT Mobile (US), Inc. et al. v. Fundamental Innovation Systems International, LLC*, IPR2021-428, Paper 1 (Petition)). The petitioners for that petition corrected some of earlies issued and (1) cited the the internal components of the *dock* of Dougherty for the components of the adapter and (2) asserted that Dougherty would be used for its intended use without modification. *Id.* In that proceeding, the

Patent Owner immeidately disclaimed all claims against which Dougherty was asserted. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer). Accordingly, there is little dispute that Dougherty is relevant prior art, and the Patent Office has yet to consider the arguments based on Dougherty asserted herein.

2.   <u>Prior Discussion of Morita</u>

In IPR2021-428, the Board considered grounds based on Morita alone. PAT-B at 449-464 (*TCT Mobile (US), Inc. et al. v. Fundamental Innovation Systems International, LLC*, IPR2018-428, Paper 8 (Decision)) at 6. As noted above, Morita discloses two modes for using the charger dock: (1) when the dock is connected to a personal computer, mobile videophone, and peripherals (and the comptuer acts as the host) and (2) when the dock is connected only to the mobile videophone and the peripherals (and the mobile videophone acting as host). *Id.* at 458 ("In this first mode, USB hub control unit 27 sets the personal computer as a USB host and the mobile device as a device"); *id.* ("In the second mode . . . the mobile device [i]s set as the USB host.")

In IPR2021-428, the petition argued that the charger dock of Morita could be used in a third mode in which only the mobile videophone was connected to the charger dock (i.e., no personal computer or peripherals were connected). *Id.* at 458-464. The Board disagreed that the charger dock could be used in this way. *Id.* at 460 ("Petitioner's assertion that Morita behaves in a 'charger only' mode of operation is not supported by the present record.")

The arguments contained herein regarding Morita in view of Shiga are distinct from those made in the prior petition. Specifically, this request does not argue that Morita would be configured in a third "charger only" mode. Instead, the substantial new question of patentability is based on the second mode described by the Patent Board and the obvious and intended use of both Morita and Shiga, *i.e.*, the charger dock connected to the videophone and a peripheral

keyboard. *See* Section IV.C. The peripheral keyboard of Shiga is used in exactly the way described by Shiga, *i.e.*, to power-on and power-off the connected host device. *Id.*

B.   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 '550 Patent.

1.   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)(2) 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.

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

The '550 Patent Application was filed on June 28, 2012. It claims priority to two provisional applications: (1) Provisional Application No. 60/273,021, filed on March 1, 2001 and (2) Provisional Application No. 60/330,4846, 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. *See* Section III.B.3. Pre-AIA 35 U.S.C. section 102 applies to the '550 Patent.

On April 23, 2021, Patent Owner disclaimed Claims 1, 2, 9-11, and 18 of the '550 Patent. PAT-B ('550 File History) at page 440 (April 23, 2021 Disclaimer). As set forth below, substantial new questions of patentability exist as to Claims 3-8 and 12-17 of the '550 Patent in view of the following references.

1.   **Exhibit PA-A**: U.S. Patent No. 6,904,488 ("Matsumoto"): Matsumoto is a patent 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 '550 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

2. **Exhibit PA-B**: China Patent No. CN2410806Y ("Yang"): Yang is a Chinese Patent 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 '550 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"): De Iuliis is a patent 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 '550 Patent under pre-AIA 35 U.S.C §§ 102(a) and (e).

4. **Exhibit PA-D**: Japan Patent Application Publication No. 2000-165513 ("Morita"): Morita is a Japanese Patent titled "Charger." Morita was published on June 16, 2000. Morita constitutes prior art to the '550 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (b).

5. **Exhibit PA-E**: U.S. Patent No. 7,360,004 ("Dougherty"): Dougherty is a patent titled "Powering a Notebook Across a USB Interface." The Dougherty application was filed on September 30, 2003. It claims priority to U.S. Patent Application No. 09/608,802, which was filed on June 30, 2000. Dougherty constitutes prior art to the '550 Patent under at least pre-AIA 35 U.S.C. §§ 102 (a) and (e).

6. **Exhibit PA-F**: U.S. Patent No. 6,625,738 ("Shiga"): Shiga is a patent titled "USB Apparatus That Turns On Computer Power Supply Using Signals Substantially Longer Than Information Conveying Pulse Widths When Predetermined Operation Is Performed on Input

Device." The Shiga application was filed on December 6, 1999. Shiga constitutes prior art to the '550 Patent under at least pre-AIA 35 U.S.C. §§ 102 (a) and (e).

7.   **Exhibit PA-K**: Korean Patent No. KR200211505Y1 (Kim): Kim is a Patent titled "A mobile phone charging device using USB." The Kim application was filed on August 19, 2000 and issued on January 15, 2001. Kim constitutes prior art to the '550 Patent under at least pre-AIA 35 U.S.C. § 102(a).

8.   **Exhibits PA-G** through **PA-J** are various patent documents and publications that were all filed or published prior to the priority date of the '550 Patent and thus constitute prior art under at least 35 U.S.C. §§ 102(a).

           3.   <u>Identification of Claims for Reexamination and Detailed Explanation of the Pertinency and Manner of Applying Prior Art to Requested Claims (37 C.F.R. § 1.510(b)(2))</u>

Requestor requests reexamination of Claims 3-8 and 12-17 of the '550 Patent on the following grounds:

1.   Yang, when considered in view of Matsumoto and the knowledge of those skilled in the art, renders obvious Claims 3-7 and 12-16 under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Yang in view of Matsumoto to Claims 3-7 and 12-16 is attached hereto as **Exhibit CC-A**.

2.   De Iuliis, when considered in view of Matsumoto and the knowledge of those skilled in the art, renders Claims 3-6 and 12-15 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying De Iuliis in view of Matsumoto to Claims 3-6 and 12-15 is attached hereto as **Exhibit CC-B**.

3.   Morita, when considered in view of Shiga and the knowledge of those skilled in the art, renders Claims 4-8 and 13-17 obvious under 35 U.S.C. § 103. A claim chart

demonstrating the pertinency and manner of applying Morita in view of Shiga to Claims 4-8 and 13-17 is attached hereto as **Exhibit CC-C**.

4.   Dougherty, when considered in view of Shiga and the knowledge of those skilled in the art, renders Claims 4-8 and 13-17 obvious under 35 U.S.C. § 103. A claim chart demonstrating the pertinency and manner of applying Dougherty in view of Shiga to Claims 4-8 and 13-17 is attached hereto as **Exhibit CC-D**.

In addition to the disclosures in **Exhibits CC-A** through **CC-E** 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.

4.   <u>Copies Prior Art and Translations (37 C.F.R. § 1.510(b)(3))</u>

Requestor has attached 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**.

5.   <u>Copy of U.S. Patent No. 9,451,161 (37 C.F.R. § 1.510(b)(4))</u>

Requestor has attached a copy of the '550 Patent as **Exhibit PAT-A** and a copy of the file history of the '550 Patent as **Exhibit PAT-B**.

6.   <u>Certification of Service on Patent Owner (37 C.F.R. § 1.510(b)(5))</u>

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 '550 Patent as set forth in 37 C.F.R. § 1.33(c):

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

7. 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.

8. 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 '550 PATENT AND RELEVANT PRIOR ART

A. USB Specification

The Universal Serial Bus (USB) Specification is 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-J; Baker Decl., ¶ 47. It is prior art to the '550 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-H; Baker Decl., ¶ 48. It is prior art to the challenged claims of the '550 Patent under at least 35 U.S.C. §§ 102(a) and (b).

Moreover, because the '550 Patent incorporates the conditions and limitations of the USB Specification, a person of ordinary skill in the art to which the '550 Patent claims are directed would have been knowledgeable about the USB Specifications. Baker Decl., ¶¶ 47-48.

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.
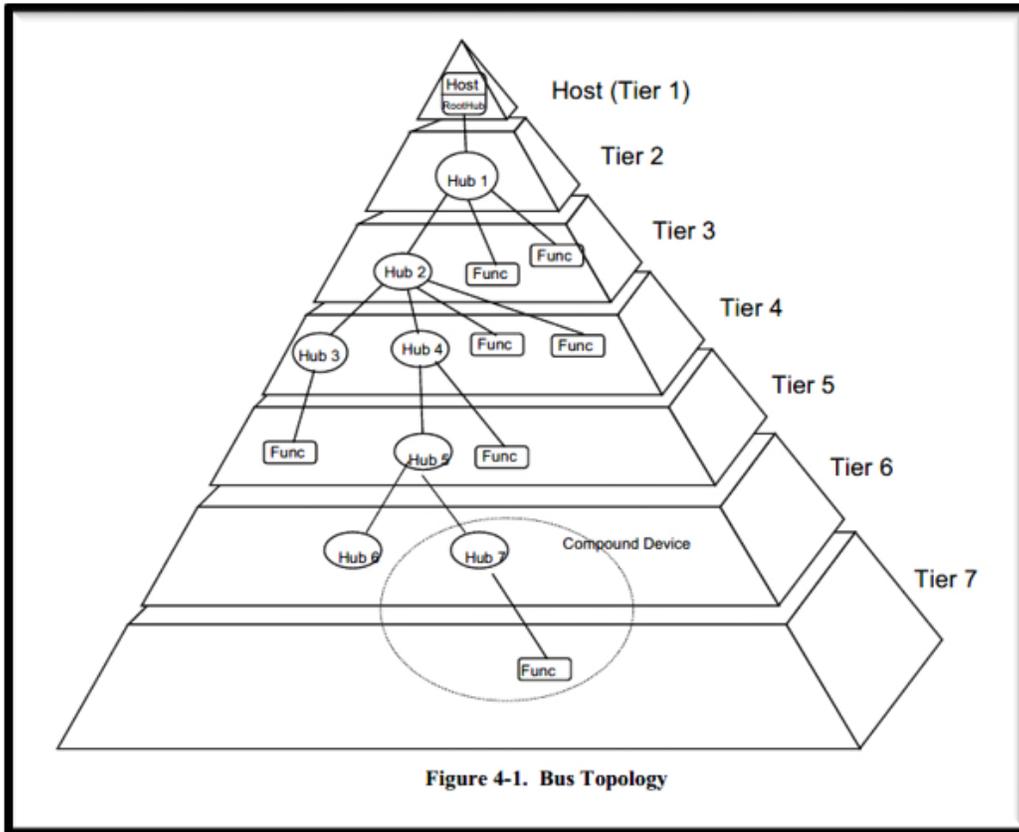

Figure 4-1. Bus Topology

USB 2.0 at 16.

The device acting as the host generally has certain functionality. Baker Decl., ¶ 52 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); Baker Decl., ¶ 52.

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

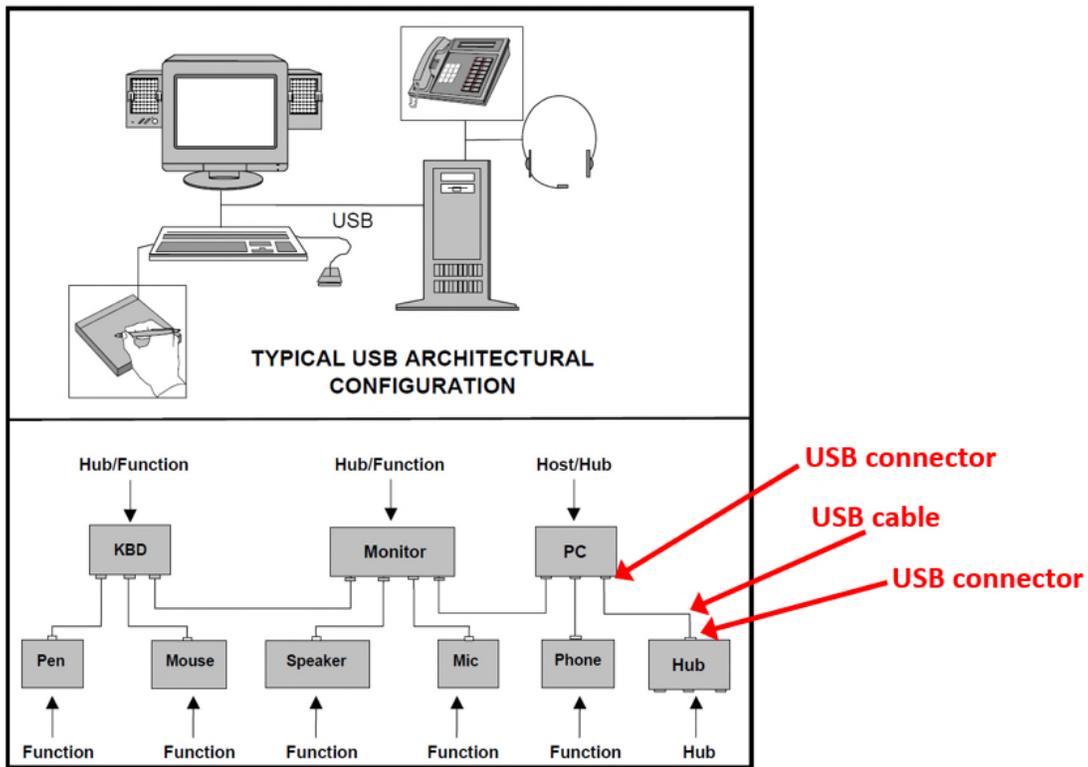Figure 4-4 illustrates how hubs provide connectivity in a typical computer environment.

Figure 4-4. Hubs in a Desktop Computer Environment

USB 2.0 at 23 (annotated).

The USB Specification defines ports that are facing the direction of a host as "Upstream" ports. USB 2.0 at 10 ("Upstream" means "The direction of data flow towards the host. An upstream port is the port on a device electrically closest to the host that generates upstream data traffic from the hub. Upstream ports receive downstream data traffic."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is defined as being towards the device."). In contrast, the

USB Specification defines ports that are facing away from the host device to be "Downstream" Ports. *Id.* at 5 ("Downstream" means "[t]he direction of data flow from the host or away from the host. A downstream port is the port on a hub electrically farthest from the host that generates downstream data traffic from the hub. Downstream ports receive upstream data traffic.")

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

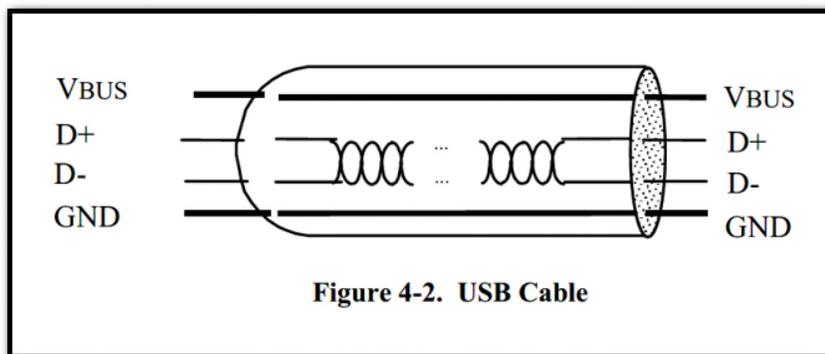| Contact Number	Signal Name	Typical Wiring Assignment
1	V_{BUS}	Red
2	D-	White
3	D+	Green
4	GND	Black
Shell	Shield	Drain Wire

USB 2.0 at 94.

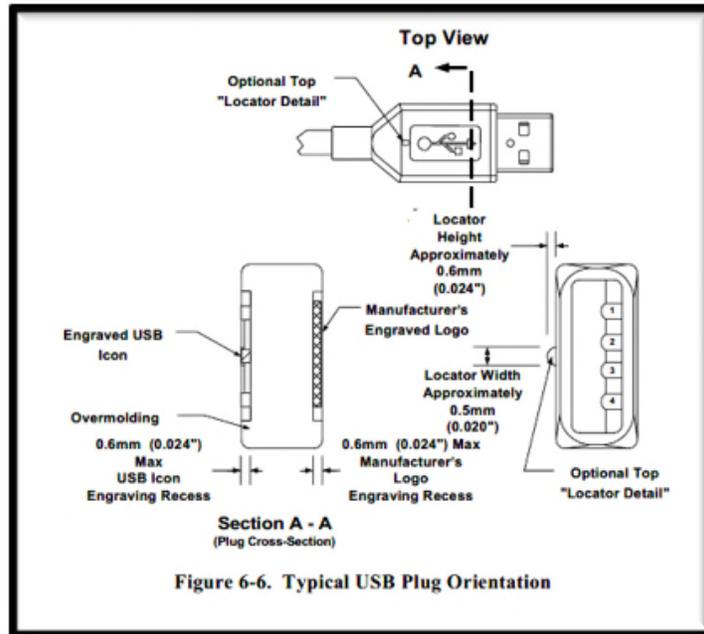**Figure 4-2. USB Cable**

USB 2.0 at 17.

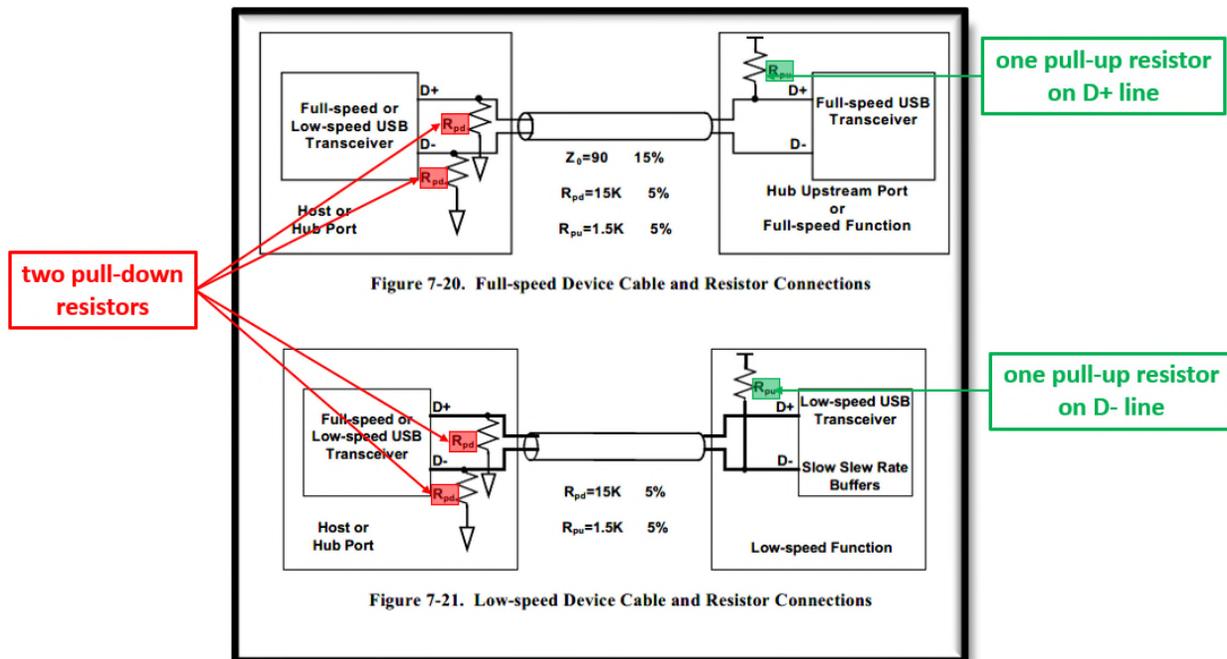**Figure 6-6. Typical USB Plug Orientation**

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., ¶ 54.

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., ¶ 55. 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., ¶ 56. 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 <u>one pull-up resistor</u> attached to the D+ line; and low-speed devices have <u>one pull-up resistor</u> 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.").

Figure 7-20. Full-speed Device Cable and Resistor Connections

Figure 7-21. Low-speed Device Cable and Resistor Connections

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). 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., ¶ 57. 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., ¶ 57.

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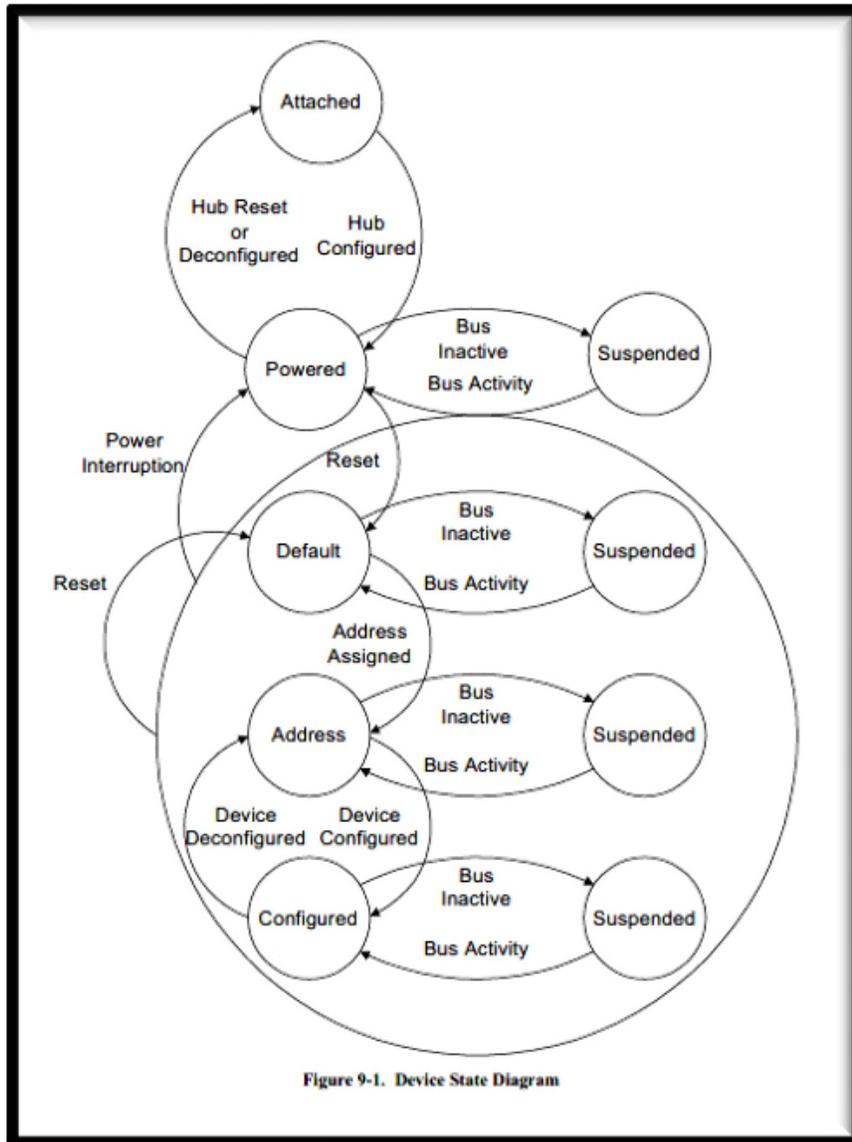
USB 2.0 at 240 (Figure 9-1) (describing states during enumeration).

In the first step, the USB devices are attached and enter the "Attached" state. The VBUS line is pulled up to the required voltage level and, within 100ms, the device signals attachment with a high signal on either the D+ line or D- line (depending on the speed of the device and state of the pull-up resistor, see above). Baker Decl., ¶ 59; 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. <u>Δt2 must be less than 100 ms for all hub and device implementations</u>. (This requirement only applies if the device is drawing power from the bus.)").

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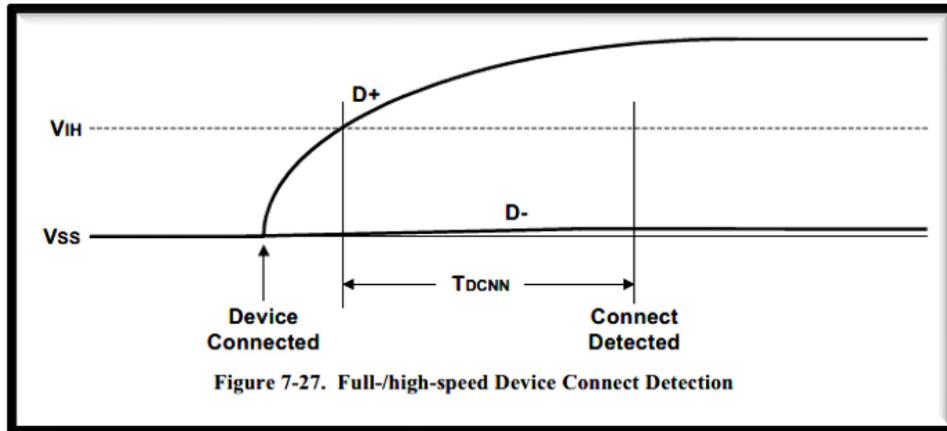
USB 2.0 at 149 (Figure 7-27) (showing high/low on the D+/D- lines for full-speed and high-speed devices).

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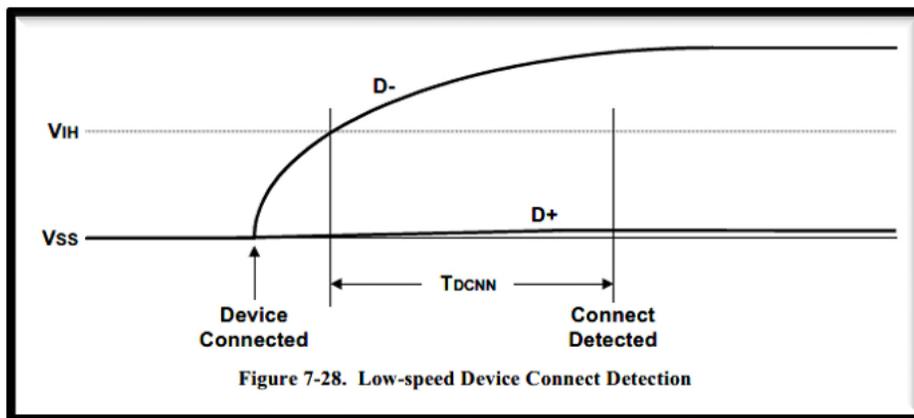
USB 2.0 at 50 (Figure 7-28) (showing low/high on the D+/D- lines for low-speed devices).

Table 7-14. Device Event Timings

| Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond V_{IHZ} (min) (signaling attach)	T_{SIGATT}	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. The devices maintain an idle state (either high/low or low/high on the D+/D- lines, depending on the speed of the device) in this state until the host or hub issues a "reset" command. Baker Decl., ¶ 60. The reset command is a low/low signal on the D+/D- line (SE0) for at 10 ms to 20 ms. 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)."). Once the "reset" 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. 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.

Figure 7-29. Power-on and Connection Events Timing
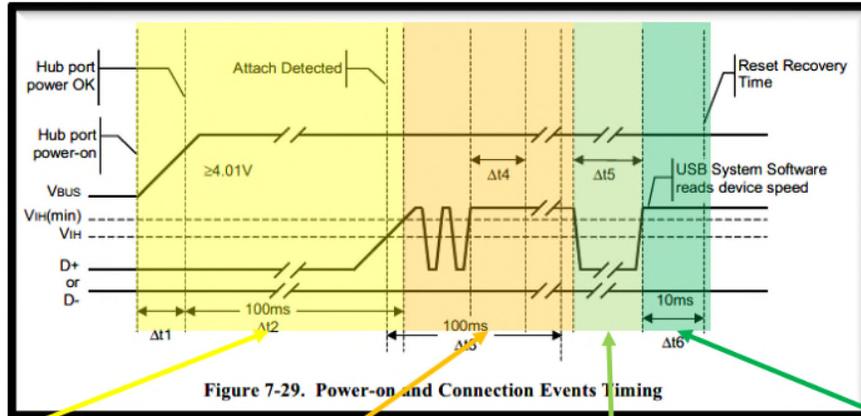
Device is Attached and Powered. Attach is signaled with high/low or low/high signal on data lines.

Device waits 100ms to receive low/low (SE0) Reset Signal

Reset signal

Reset signal is released, and device enters Default mode and can draw up to 100 mA

USB 2.0 at 150 (Figure 2-29) (annotated); Baker Decl., ¶ 60.

4. USB Specification for Supplying and Drawing Power.

The Specification also sets forth limits on the manner in which USB devices can supply/draw power on the V_{BUS} line. The USB Specification indicates, for example, that that the host is responsible for providing power to an attached USB device and that power must only be supplied be supplied in the downstream direction (*i.e.*, supplied only at downstream ports) never in the upstream direction (*i.e.,* not supplied at upstream ports). USB 2.0 at 24 ("The host is responsible for . . . [p]roviding power to the attached USB devices."); USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time."). Baker Decl., ¶ 61.

The specification also describes how much power a device may supply or draw and when such devices may do so. The Specification does so in terms of milliamps (mA) of current and in terms of "unit loads." USB 2.0 at 171. "A unit load is defined to be 100mA" of current. *Id.* Notably, the USB Specification includes the following current conditions/limitations:

- Devices cannot supply or draw any current until after entering the "Default" state;

- Devices cannot supply or draw more than 100 mA of current until after entering the "Configured" state;

- A "low-power" device/function draws a maximum of 100mA of current

- A "high-power" device/function draws a maximum of 500 mA of current

- A self-powered hub (i.e., a hub that obtain operating power from a wall outlet and not the VBUS line) must supply five unit loads (500 mA) to each downstream port.

Baker Decl., ¶ 62. As noted below, for example, the USB Specification indicates that a no current (0 mA) should be supplied or drawn until a "port enable" and "reset" command has been issued and processed, and the device is in the "Default" state. Once in the default state, only 100 mA of current can be supplied/drawn until the device is configured. Once the device is configured it may draw more current (*e.g.*, up to 500 mA for a high-power device).

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 (annotated). Baker Decl., ¶ 63. Certain of these conditions/limitations

are also listed in table 7-5 of the USB 2.0 Specification:

Table 7-7. DC Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Max.	Units
Supply Voltage:					
High-power Port	V$_{BUS}$	Note 2, Section 7.2.1	4.75	5.25	V
Low-power Port	V$_{BUS}$	Note 2, Section 7.2.1	4.40	5.25	V
Supply Current:					
High-power Hub Port (out)	I$_{CCPRT}$	Section 7.2.1	500		mA
Low-power Hub Port (out)	I$_{CCUPT}$	Section 7.2.1	100		mA
High-power Function (in)	I$_{CCHPF}$	Section 7.2.1		500	mA
Low-power Function (in)	I$_{CCLPF}$	Section 7.2.1		100	mA
Unconfigured Function/Hub (in)	I$_{CCINIT}$	Section 7.2.1.4		100	mA
Suspended High-power Device	I$_{CCSH}$	Section 7.2.3; Note 15		2.5	mA
Suspended Low-power Device	I$_{CCSL}$	Section 7.2.3		500	µA

USB 2.0 at 178 (annotated).

> • **Self-powered hubs**: Power for the internal functions and downstream facing ports does not come from
> V$_{BUS}$. However, the USB interface of the hub may draw up to one unit load from V$_{BUS}$ on its upstream
> facing port to allow the interface to function when the remainder of the hub is powered down. Hubs that
> obtain operating power externally (from the USB) must supply five unit loads to each port. Battery-
> powered hubs may supply either one or five unit loads per port.

USB 2.0 at 7.2.1 (Classes of Devices).

B.   The '550 Patent

1.   Disclosure and Claims of the '550 Patent

The '550 Patent is directed to a "Multifunctional Charger System and Method." Ex. PA-

A ('550 Patent) at Title. It discloses "a USB adapter for providing a source of power to a mobile

device through a USB port." *Id.* at 2:34-36. The '550 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 1:54-60. The '550 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 1:61-67. Accordingly, the patent proposes using the standardized USB interface for this purpose.

The '550 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 device (*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 2:3-7 ("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 '550 Patent thus proposes using a USB adapter to provide access to other sources of power, *e.g.*, wall outlets and car sockets. *Id.* at 2:9-15 ("[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.")

Figure 2 of the '550 patent, reproduced below, is a schematic diagram of the disclosed USB adapter coupled to an exemplary mobile device. The adapter provides the standard lines in a USB connection which, as noted in Section III.A, a person of ordinary skill in the art would have understood to include: power (VBUS), data/communication lines (D+ and D-), and ground.
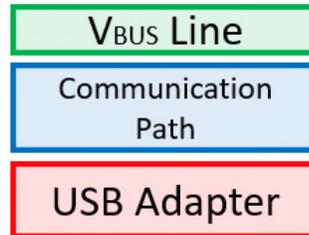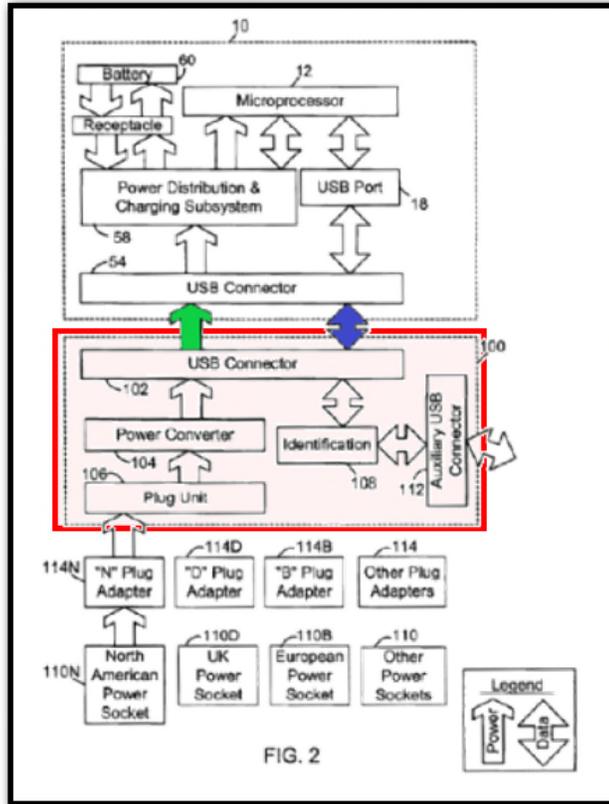
'550 Patent, Figure 2 (annotated).

The claims of the '550 Patent address different characteristics of the disclosed USB adapter. Claims 1 and 10, for example claim that the adapter will supply current across the USB connection "without regard" to at least one condition/limit of the USB Specification (*e.g.*, supplying current upstream or in a way that is otherwise inconsistent with the limits in the USB Specification). *Id.*, Claims 1 and 10.[1] In certain embodiments this pertains specifically to a "current limit." *Id.* Claims 2 and 11.

The '550 Patent also claims embodiments in which the current is supplied without first engaging in enumeration. *See id.*, Claims 3 and 12.

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[1] In response to a petition for *inter partes* review, the patentee disclaimed claims 1 and 10. Requestor nonetheless addresses the claims here because they are independent claims on which the Challenged Claims depend.

The '550 Patent also discloses and claims embodiments in which current is supplied in response to an "abnormal data condition on the data line." *Id.* Claims 4-6 and 13-15. The Patent discloses that this abnormal data condition allows the mobile device to "identify the attached device as a USB adapter" (as opposed to a computer). *Id.*, 9:36-39. The '550 Patent discloses that this abnormal data condition can be, among other things, a logic high signal on each of the data lines (claims 7 and 16).

2.   Prosecution of the '550 Patent

The '550 Patent issued from U.S. Patent Application No. 13/536,767, which was filed on June 28, 2012. On the filing date, the Applicant cancelled all pending claims and added 18 new claims. Ex. PAT-B ('550 Patent File History) at 1-65. On May 28, 2013, the Examiner rejected all pending claims based upon obviousness-type double patenting over claims 1-12 of U.S. Patent No. 7,986,127. *Id.* at 147-150. The original Patent Owner subsequently filed a terminal disclaimer (*id.* at 162), and the Examiner issued a notice of allowance without further rejections. *Id.* at 169.

3.   Priority of the '550 Patent.

The '550 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.

a.   *The '021 Application*

The '021 Application was filed on March 1, 2001. Ex. PAT-C. The application does not disclose, describe, or purport to invent any novel adapter or charger. Baker Decl., ¶ 75. To the contrary, the specification discloses "a charging circuit" that is part of a mobile device and that can use current received from the mobile device's USB connection to charge the device's

battery. *Id.* at 18 (". . . this invention relates to adapting power <u>from</u> the USB for use as a power source <u>by the charging system of the mobile device</u> . . . .") (emphasis added); *id.* at 20 ("It is an object of the invention . . . to use the power traditionally available on the USB as an alternate power source for recharging the portable power supply of the mobile device."); *id.* at 20 (describing embodiments of "charging circuit" in mobile device). The specification indicates that the mobile device is connected to a typical USB port (e.g., a standard hub); 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."). The '021 Application also noticeably omits any discussion of using an "abnormal data condition" on the USB communication path (claims 4 and 13), that comprises a "logic high signal on each of said D+ and D- lines" (claims 7 and 16), wherein "each said logic high signal is greater than 2V" (claims 8 and 17). *Id.* at 20-30 (discussing various embodiments).

In other words, the '021 Application does not disclose receiving any type of abnormal data condition from a USB wall adapter (novel or otherwise). Nor does it purport to invent a USB device that supplie<u>s</u> current "without regard" to the USB Specification. To the contrary, it makes clear that such devices existed at the time. Specifically, the application discloses that the patentee tested existing USB hubs to see how much current they would supply. *Id.* at 22-33 ("It was determined experimentally that current can be drawn from several USB ports at a high rate"). The patentee noted that the tested "high powered" hubs were configured to provide up to 700mA-800mA of current before automatically shutting off the power. *Id.* at 22 ("Furthermore, it seems that certain high-power USB ports, such as a self-powered hub, appear to implement only an over-current protection, i.e., they turn off the voltage on the VBUS line for current valued exceeding 700mA-800mA.").

Accordingly, a person of ordinary skill in the art would not have understood that the '021 Specification discloses the purportedly novel adapter claimed by the '021 Patent. Baker Decl., ¶ 78.

b. *The '486 Application*

The '486 Application was filed on October 23, 2001. Ex. PAT-D ('486 Application). The application, for the first time, discussed "a USB power adapter that can provide power to charge a USB chargeable device via the device USB interface." *Id.* at 14. The application also discusses, again for the first time, the use of "abnormal data line conditions" including a signal in which D+ and D- are held high. *Id.* at 24-25.

c. *Priority Date*

Because the '021 Application does not describe various elements of the Challenged Claims, those claims are entitled to the October 23, 2001 priority date of the '486 Application at the earliest. Moreover, Patent owner has admitted in litigation that the priority date of the '550 Patent is October 23, 2001. Ex. OTH-D (*Fundamental Innovation Systems International LLC v. Anker Innovations Limited et al,* 1-21-cv-00339 (DDE), Fundamental's Disclosure of Asserted Claims And Infringement Contentions) at 9 ("Each of the asserted claims of the Asserted Patents is entitled to a priority date of October 23, 2001.")

C. **Summary of Relevant Prior Art**

1. Matsumoto

Like the '550 Patent, Matsumoto discloses a system and method for implementing a USB device and associated adapter. Specifically, Matsumoto discloses that a USB device can be used for both (1) typical USB communication/operation (e.g., connecting the device to a computer) or (2) powering the device through a USB adapter the USB device if the device contains "discriminating means" for discriminating between the two. Baker Decl., ¶¶ 79-80.

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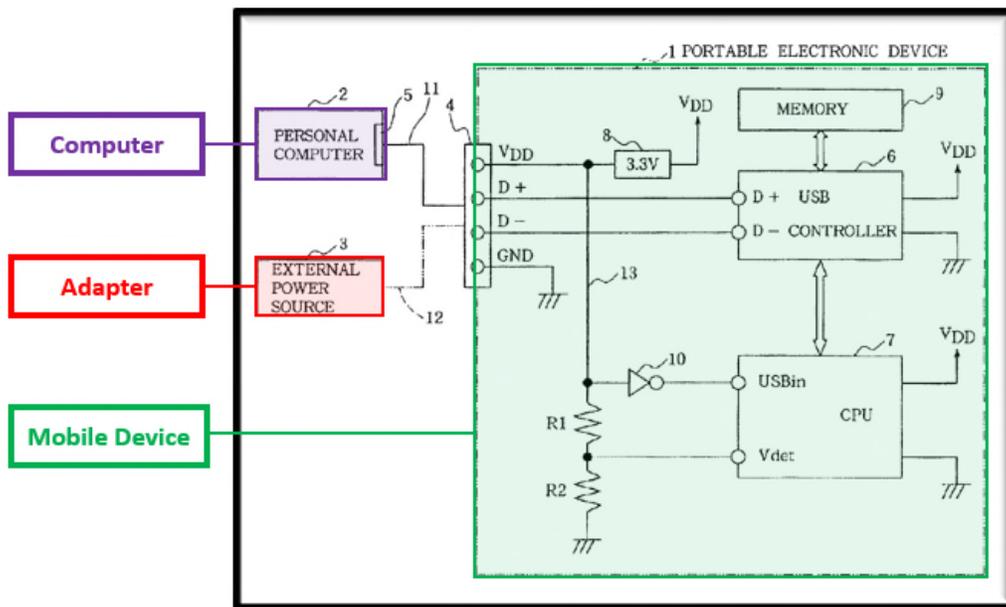
Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)).

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. *Id.*, 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."). Baker Decl., ¶ 81.

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 determine when the mobile device is connected to the adapter (as opposed to a typical USB device). Matsumoto, 2:58-59 ("The discriminating means identifies the source of supply of power . . . ."); *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); Baker Decl., ¶ 82.

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. 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."); Baker Decl., ¶ 83.

The examiner did not consider Matsumoto during prosecution of the '550 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 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 Decl., ¶ 84.

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.
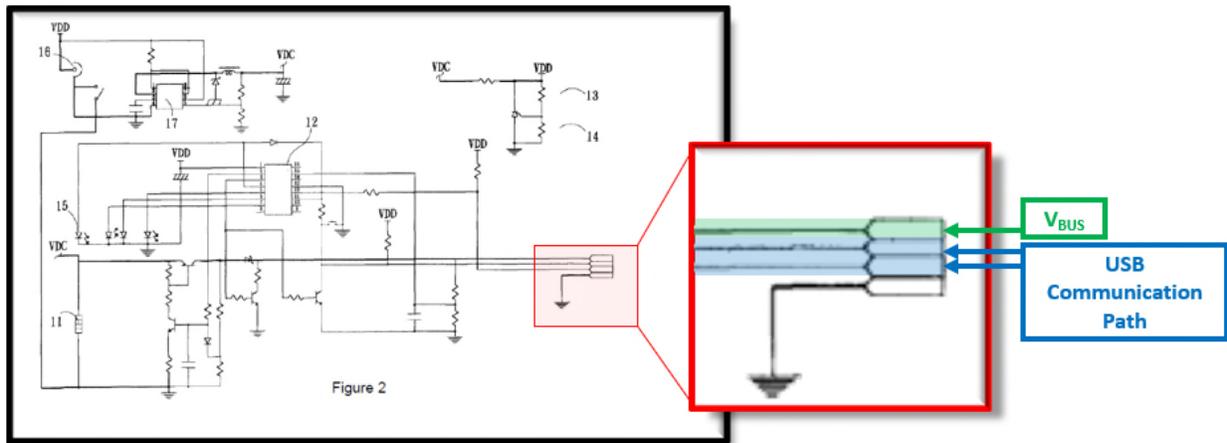
Yang, Figure 2 (annotated). The schematic shows that the charger comprises two pull-up

resistors attached to the data lines of the connection with the mobile device. *Id.* In other words,

the default signal on the data lines is a high/high signal on the data lines:
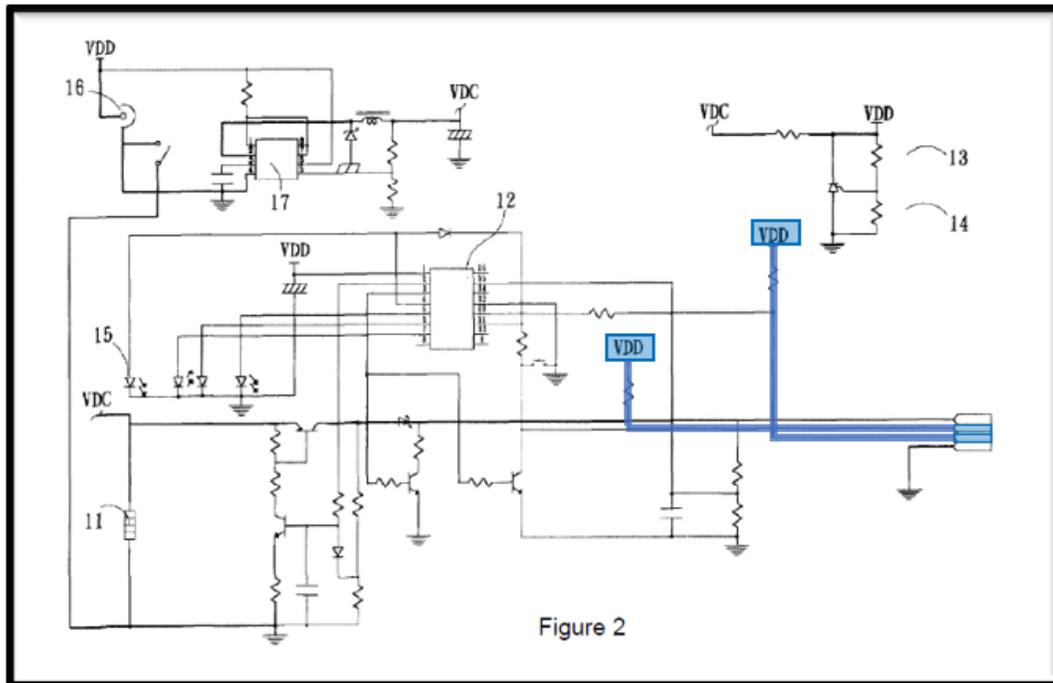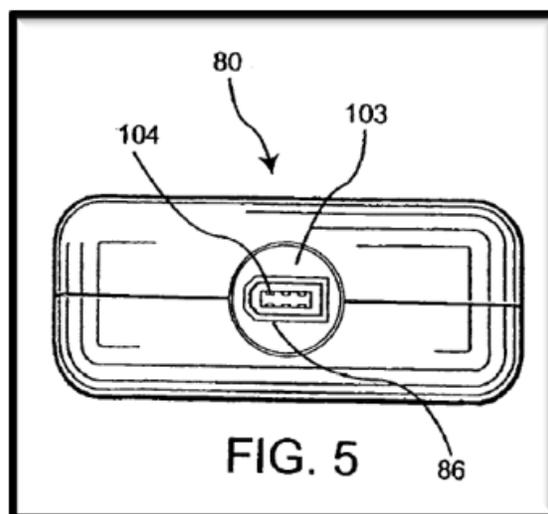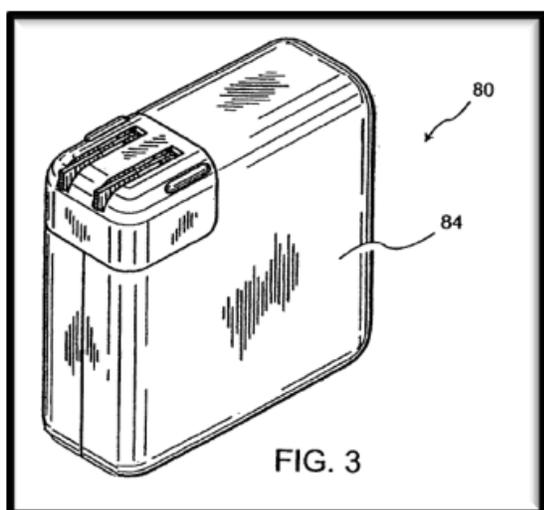
Figure 2

Yang, Figure 2 (annotated); Baker Decl., ¶¶ 86-87.

The examiner did not consider Yang during prosecution of the '550 Patent.[2]

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[2] The '550 Patent lists U.S. Patent No. 6,184,652 to Yang ("'652 Patent") on the face of the patent. That patent, however, does not disclose an "adapter" that can convert power from a wall-socket to be used by a mobile device. PA-I ('652 Patent). Instead, that charger 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.

3.   De Iuliis[3]

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., ¶ 88.

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

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[3] De Iuliis claims priority to U.S. Provisional Application No. 60/345,252, which is attached hereto as Exhibit PA-G. 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).

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 high signals on the D+ or D- lines or otherwise communicate with the mobie device once it is connected.

The examiner did not consider De Iuliis during prosecution of the '550 Patent.

4. Shiga

Shiga is directed to a system and method for powering on and powering off a computer from a peripheral device (e.g., a keyboard) connected through a USB connection. Shiga, Abstract. Shiga discloses that this operation can be implemented, for example, using a "power-on" and "power-off" key on the disclosed keyboard. *Id.* at 2:4-8 ("There has been a demand for adding value to such computers connected with the USB interface by providing a function that the USB does not have, that is, by providing a key called a power-on key, which allows the host computer to be started by a key input operation at a keyboard."); *id.* at 7:46-55 ("When a predetermined key on the keyboard 11 is operated . . . the main power is turned off."); Baker Decl., ¶ 89.

Shiga further discloses that the disclosed "power-on" key will cause the keyboard to send a logic high signal on both of the data lines to the connected computer (a high/high signal). *Id.* ("An apparatus for turning on a computer power supply in which when an input operation of a predetermined key is carried out, predetermined H Signals are output to a first signal line and a second signal line of a USB chip provided in a keyboard."); *id.*at 3:36-37 ("the predetermined operation may be performed at the input device in order to output H signals of a predetermined pulse width to both the first Signal line and the second signal line"); *id.* at 6:34-47 ("When the power-on key on the keyboard 11 is operated . . . . The first signal line D+ and the second signal line D- are in a fourth mode in which both signal lines D+ and D- are in the H state. The pulse

width and the pulse voltage of the predetermined Signals are, for example, 50 ms and 3 volts, respectively.")

Like the '550 Patent, Shiga notes that this high/high signal is not a normal condition used by the USB specification and, thus, the computer can be configured to recognize the signal as something separate, *i.e.*, an instruction to "power on" the computer. *Id.*, Abstract ("Since this signal combination is not a USB standard signal combination, they can be distinguished from ordinary data signals. Since a wake-up device which has received these signals outputs predetermined start-up signals to a main power supply, the main power supply can be turned on."); *id.*, 6:47-58 ("The fourth mode of first signal line D+ and second signal line D- in which both of them are in the H level state is not shown in Table 1 because it is not a USB standard mode. Taking into account that the data transfer speed of the USB is measured in nanoseconds (nsec), it can be said that a pulse width of 50 ms is very large. Therefore, even when fourth mode signals (H level signals with a pulse width of 50 ms) are set as signals that are not USB Standard signals, and then transmitted to first signal line D+ and second signal line D-, they can be easily distinguished from USB standard data signals.")

The examiner did not consider Shiga during prosecution of the '550 Patent.

5. Morita

Morita is directed to a charger dock for a mobile videophone device. The charger dock connects directly between a wall outlet and the mobile videophone, and charges the videophone via a USB connection. Morita, ¶ 0012. Moreover, the charger dock can also connect to various other USB devices including a personal computer and numerous peripheral devices (*e.g.*, the keyboard of Shiga). Morita at Abstract ("To provide a hub-controllable charger capable of accessing a plurality of external devices in a state wherein a mobile phone is coupled to the charger, and capable of managing transmission and branching of signals between each.")
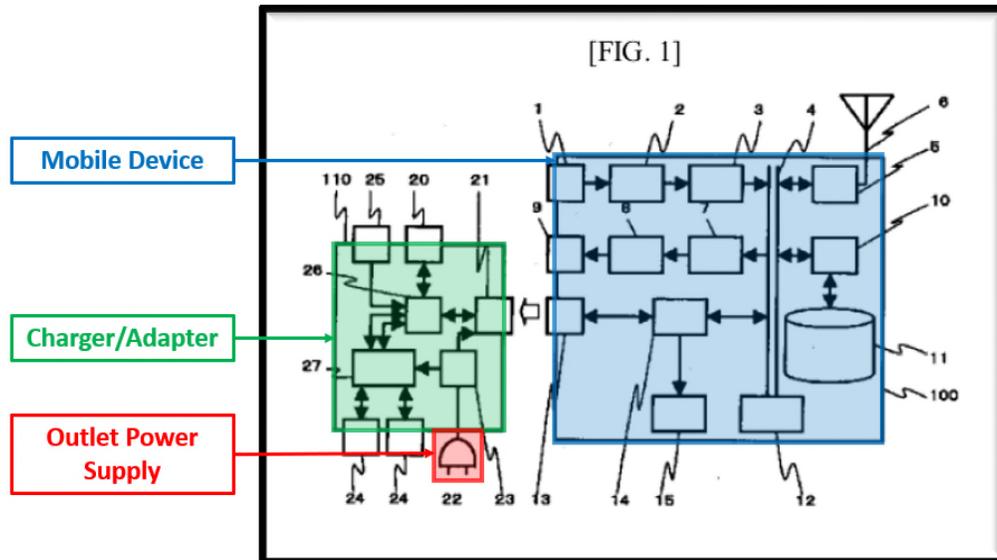
Morita, Figure 1 (annotated).
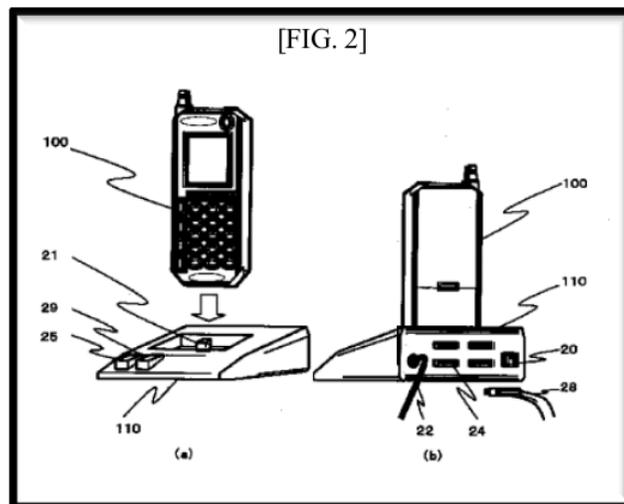
Morita, Figure 2; Morita, ¶ 0001 ("The present invention relates to a charger capable of charging a mobile phone and coupling to an external device and more specifically relates to a USB format charger provided with a HUB function capable of connecting a plurality of external devices.")

As the PTAB recently found, Morita discloses that the charger has two modes of operation. PAT-B ('550 File History) at 457-58 (Decision from *TCT Mobile (US), Inc., et al. v. Fundamental Innovation Systems International LLC*, IPR2021-00428 at Paper 8 (Decision Denying Institution) ('550 Decision) at 10). In the first mode the charger dock is connected from

the power source to (1) a personal computer, (2) the mobile videophone, and (3) peripheral

devices (*e.g.*, keyboard and monitor). *Id.* In this mode, the personal computer acts as the host.

Id.

[FIG. 3]
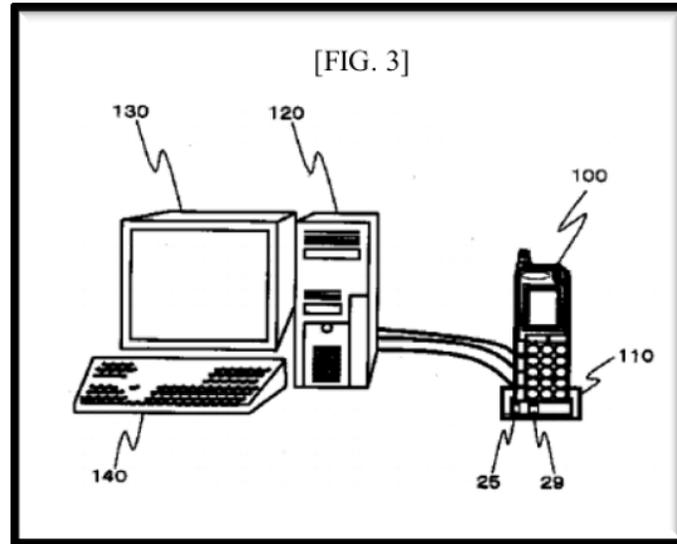
Morita, Figure (shosing first mode in which the personal comptuer is host); *id.*, ¶ 0015

("Normally, when connecting another host personal computer, the other host personal computer

is connected to the first USB port 20 via a USB cable, the connection switching unit 26 connects

the connection destination of the first USB port 20 to the USB hub control unit 27, the

connection destination being the host end, and the mobile videophone device 100 connected to

the second USB port 21 is connected to the USB hub control unit 27 as a device.")

In the second mode, no computer is connected; the charger dock is connected from the

power source to (1) the mobile videophone and (2) the peripheral devices. In this mode, the

mobile videophone acts as the host to control the peripheral devices and continues to charge on

the dock. Ex. PAT-B at 458 ("In the second mode, the connection switching unit of the charger

changes which port is connected to USB hub control unit 27, so that the mobile device as set as

the USB host and port 20, connected to the personal computer, 'becomes vacant' (*i.e.*, is

disabled). In this second mode, the external peripherals, such as the keyboard and monitor,

remain connected to port 24 as peripherals to the mobile device. That is, in the second mode of operation, Morita's mobile device continues to charge and be in USB communication with external peripheral devices through USB ports 24."):
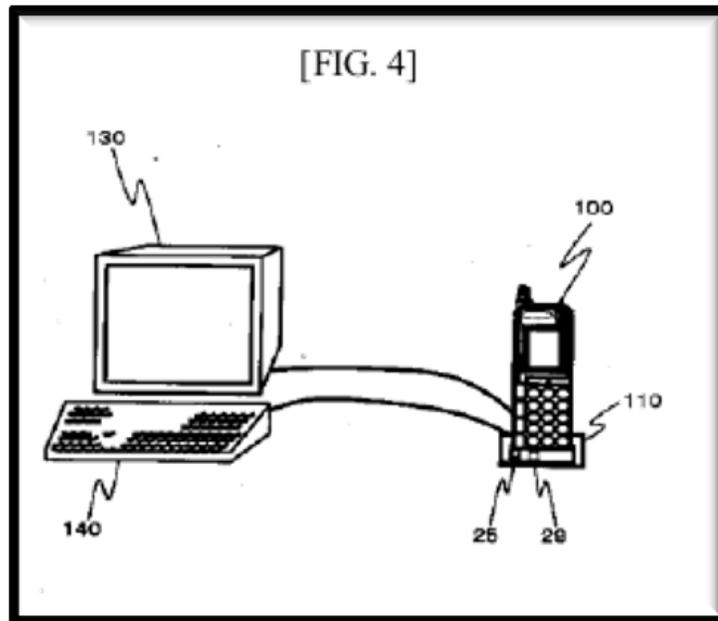
Morita, Figure 4 (showing second mode in which no personal computer is connected and the mobile videophone acts as the host); Morita, ¶ 0015 ("On the other hand, when the mobile videophone device 100 is used as the host personal computer, the connection switching unit 26 connects the second USB port 21 to the USB hub control unit 27 as the host end, and the first USB port 20 is not connected to the USB hub control unit 27 and is in disconnected state. That is, in the USB hub control 27, one first USB port to be connected to the external device becomes vacant. Also, external peripherals (devices) connected to the third USB port 24 are connected as peripherals of the mobile videophone device 100. Note, when the connection is switched or when the mobile videophone device 100 is connected to the charger 110, the connection state due to the connection switching switch is sent to the mobile videophone device 100, and operation settings in the USB connection are changed and correspondingly operated by the CPU 14 inside

the mobile videophone device 100.") (emphasis added). In other words, in this mode, the charger dock provides power to the host at its upstream port.

The examiner did not cite or consider Morita during prosecution of the '550 Patent.

6.   Dougherty

Dougherty is directed to a system and method for "Powering a Notebook Across a USB interface." PA-E (Dougherty) at [54]. Specifically, Dougherty discloses a docking station that powers a laptop using a USB connection. *Id.* at 2:55-58 (disclosing "a laptop computer and related docking station adapted to supply power from the docking station to the laptop computer across the USB connection."); *see id.* at Figure 2. The laptop dock connects the laptop to power and to various peripheral devices (e.g., the keyboard of Shiga). *Id.*, 1:61-67 ("When the user returns to the home or office, the laptop is docked with a non-portable unit. Docking in this manner may expand the capabilities of the laptop computer to include a full size keyboard, a full size monitor, more serial ports, and other functionality typically associated only with desktop computing devices."); *id.* at 2:24-28 ("Another method of expanding the capabilities of a laptop may be a form of port replication across a USB port. A user connects a laptop, via a USB connection, to a port replication device which generates plurality of communication ports for use as described above.").

Dougherty refers to the lines in the connection as "USB power rails" and "serial communication conductors." *See e.g., id.* at Abstract ("A laptop computer and mating docking station where the docking station provides power to the laptop computer over the power rails of the Universal Serial Bus (USB) interface.") and 5:26-37; Baker Decl., ¶ 95. As explained in Section III.A, a person of ordinary skill would have understood this includes a VBUS line and a communication path including D+ and D- lines; Baker Decl., ¶ 95.

FIG.2
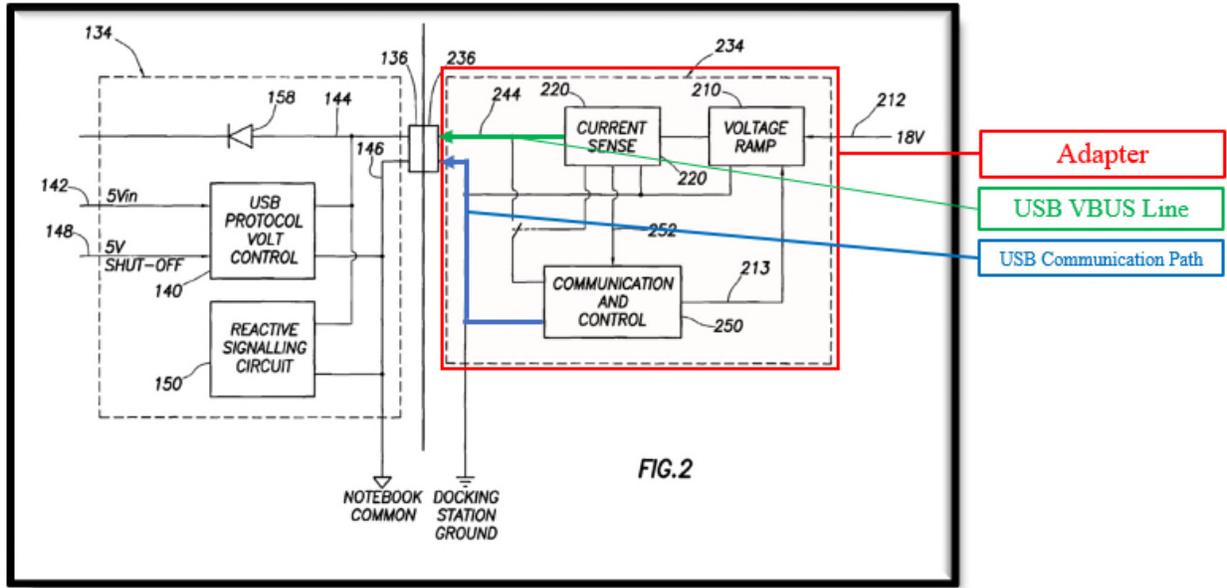
Dougherty, Figure 2 (annotated) (showign generally were data lines may be implemented); *see also id.*, 5:47-52 ("It will be understood that this handshaking protocol between the laptop computer 100 and the docking station 200 occurs over the serial communication lines [data lines] 126, and these lines are not shown in FIG. 2"); Baker Decl., ¶ 96.

In order to power the laptop, the system of Dougherty disregards a number of the conditions associated with the USB Specification. *See e.g.*, *id.* at 2:55-3:10; *id.* at 6:1 (disclosing that the system "breaks with standard USB protocol"); Baker Decl., ¶ 98. Among other things, the host laptop computer does not supply power as required by the USB Specification and, instead, draws power from the dock. *Id.* at 2:58-64 ("To accomplish this, the laptop computer is modified to have circuitry which is capable of being detected across USB power rails by the docking station and also capable of turning off the five volts typical supplied by the laptop onto the USB port, and instead, receiving power at 18.5 volts, from the docking station across the USB connections."). As a result of this connection, the dock supplies up to 2.5 Amps (2,500 mA) of current to the laptop over the USB connection at its upstream port. *Id.* at 7:47-51 ("When the dock station 200 provides power for full

- 45 -

operation of the laptop computer 100, as many as 2.5 amps of current may flow from the dock station 200 to the laptop computer 100 across the USB connectors 136,236."); Baker Decl., ¶ 98.

Dougherty does not appear to have been considered by the examiner during prosecution. As noted in Section II.A1, *supra*, the PTAB considered certain grounds involving Dougherty but did not consider the reasoning disclosed herein. As also noted in Section II.A.1, *supra,* Dougherty was cited in a petition for *inter partes* review as prior art to Claims 1, 2, 9-11, and 18 and, in response, patent owner disclaimed those claims. *TCT Mobile (US), Inc., et al. v. Fundamental Innovation Systems International LLC*, IPR2021-00428 at Paper 1 (Petition); PAT-B ('550 Patent File History) at 440 (disclaimer).

7.   Kim

KR200211505Y1 ("Kim") is a Korean Patent directed to "A mobile phone charging device using USB." Ex. PA-K (Kim) at [54]. It discloses an adapter cord that can draw power/current from a USB port and adapt it for use by a mobile phone with a proprietary mobile phone connector.
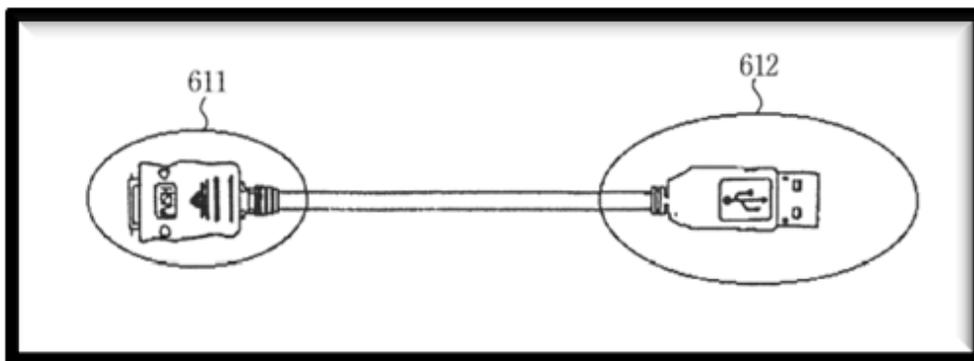

Kim, Figure 6. As demonstrated in Figure 6, above, the adapter cord comprises a USB connector on one end (612) and a mobile phone connector at the other end (611). Because the cord can connect to USB ports, Kim discloses that it comprises the typical lines used for USB connections:
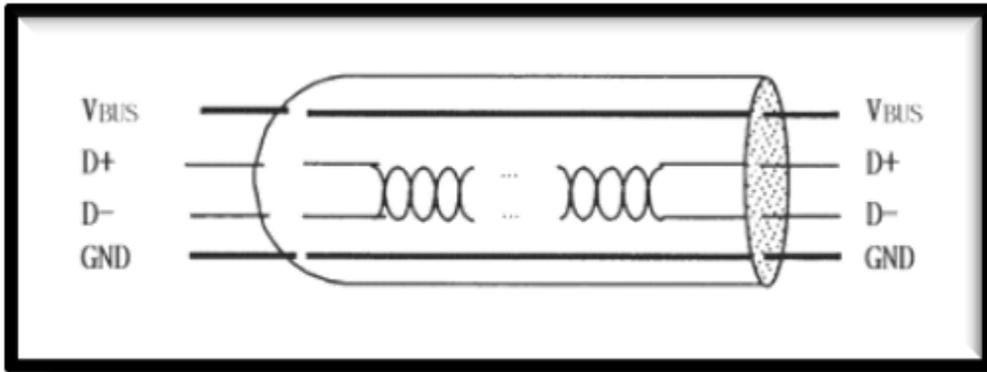
Kim, Figure 2 (showing VBUS line, Data lines (D+ and D-), and Ground line).

The adapter cord draws power/current from a USB formaton the VBUS line, but it adapts that current and supplies it pursuant to whatever standard/format is used by the mobile phone that the cord is implemented to be used with. Accordingly, when the cord supplies current, it does so pursuant to the mobile phone connector standard and without regard to the USB Specification. In converts the current/voltage for use by the cell phone using a "module":
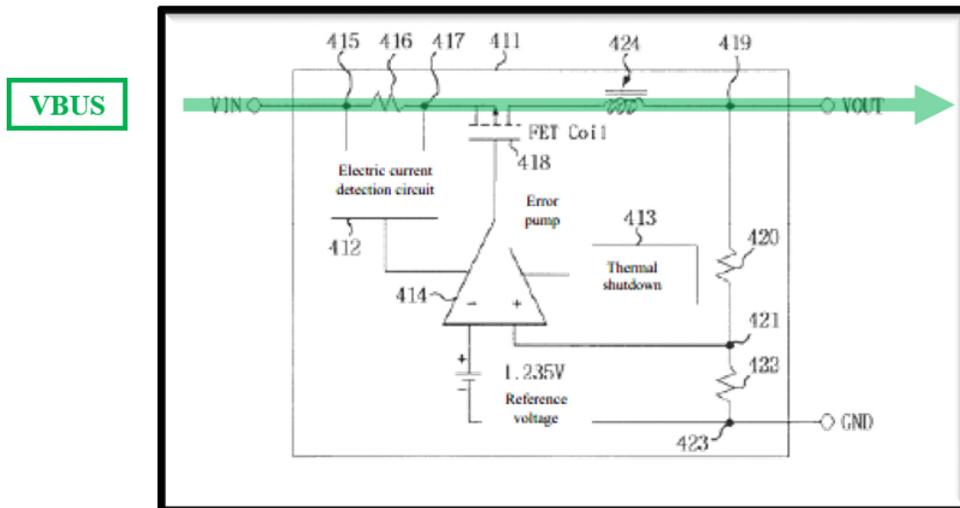
Kim, Figure 4 (annotated) (showing "module" (411) use to "charge mobile phones by using USB's power supply line"); *id.* at 6-3 ("Figure 4 illustrates a module (411) to charge mobile phones by using USB's power supply line (VIN); Baker Decl., ¶ 98. The USB power supply line

is connected to the power input (VIN) of the circuit, and the charging power line of a mobile

phone's data communication port is connected to the power output (VOUT).")

Kim discloses that the adapter cord will draw and supply up to 500 mA of current, but

that it comprises means to shut down if the current reaches 500 mA or higher. *Id.* at 6-3 ("The

electric current detection circuit (412) is the circuit to maintain the output electric currents to

500mA or less since the output electric currents of the USB power line are limited to 500mA . . .

. If the output electric currents of the USB power line are 500mA or higher, the FET (418) is

turned off by the error amp connected to the FET (418)'s gate.").

D. Claim Construction

"During reexamination proceedings of unexpired patents . . . the Board uses the

'broadest reasonable interpretation consistent with the specification' standard, or BRI" when

construing claim terms. *In re CSB-Sys. Int'l, Inc.*, 832 F.3d 1335, 1340 (Fed. Cir. 2016). "The

rationale for permitting this broader standard in reexaminations is that a patent owner before the

Patent and Trademark Office ('PTO') with an unexpired patent 'may amend claims to narrow

their scope,' negating any unfairness that may otherwise result from adopting the BRI standard."

Id. at 1340-41.

The '550 Patent will expire March 1, 2022. Accordingly, the Broadest Reasonable

Interpretation applies.

1. "configured to supply current on the VBUS line without regard to at least
    one associated condition specified in a USB specification" (Claim 1);

During IPR2018-111, the PTAB considered this claim element. It held that the phrase

"without regard to at least one associated condition" refers back to the phrase "supply current on

the VBUS line." Ex. PAT-B ('550 File History) at 313-316 (*ZTE (USA) Inc. v. Fundamental

Innovation Systems International, LLC*, IPR2018-111, Paper 62 (Final Written Decision) at 7-

11). Accordingly, the Board held that this requires a condition "associated with the supply of current on the VBUS line," "and not a condition associated with, for example, voltage." *Id.*

Under the broadest reasonable interpretation, the claims must be at least this broad. Moreover, the term "configured to supply current" should be construed under the broadest reasonable interpretation to mean "capable of supplying current" should any connected device attempt to draw such current. *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1362 (Fed. Cir. 2018) ("[W]here claim language recites 'capability, as opposed to actual operation,' an apparatus that is 'reasonably capable' of performing the claimed functions 'without significant alterations' can infringe those claims.") The claims are directed to an "adapter," but an adapter, on its own, will not supply any amount of current unless connected to a device that draws current. At most, the adapter will be configured to supply current up to a certain amount *if drawn* by a connected device, and will only supply that current when connected to such a device.

Accordingly, the broadest reasonable interpretation should include devices that are capable of supplying current without regard to any conditions that affect or limit the supply of current on the VBUS line if connected to a device/function that draws such current, including for example disregarding conditions on the amount of current, direction of current, or the timing of current. *Id.* at 10 (noting that there are "multiple conditions"—other than a "current limit"— related to supplying current, including, for example, limits on the "current flow direction" and "a time limit for providing current" and, accordingly, Claim 1 is broader than Claim 2, which claims a current limit).

> 2.   <u>"configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit" (Claim 10)</u>

During the IPR2018-111, the Board initially held that this phrase was different from the corresponding phrase in Claim 1 because it did not include the "associated with" language and, thus, could "include any limit set forth in a USB specification, including limits related to

voltage." *ZTE (USA) Inc. v. Fundamental Innovation Systems International, LLC*, IPR2018-111, Paper 16 (Decision to Institute) at 10 and Paper 62 (Final Written Decision) at 11.

In the final decision, however, the Board changed course and construed the term consistently with Claim 1, i.e., to include any limits that "affect or limit" the supply of current. *Id.*, Paper 62 ("[W]e construe claim 10 to encompass only those USB specification imposed limits <u>that affect or limit the supply of current on the VBUS line</u>. For the same reasons as discussed above with respect to claim 1, Petition has not persuasively demonstrated that the voltage limit set forth in the USB specification affects or serves to limit the current on the VBUS line.") (emphasis added).

Under the broadest reasonable interpretation, the claim must be at least this broad. Moreover, the term "configured to supply current" should be construed under the broadest reasonable interpretation to mean "capable of supplying current" should any connected device attempt to draw such current. *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1362 (Fed. Cir. 2018) ("[W]here claim language recites 'capability, as opposed to actual operation,' an apparatus that is 'reasonably capable' of performing the claimed functions 'without significant alterations' can infringe those claims.") The claims are directed to an "adapter," but an adapter, on its own, will not supply any amount of current unless connected to a device that draws current. At most, the adapter will be configured to supply current up to a certain amount *if drawn* by a connected device, and will only supply that current when connected to such a device.

Accordingly, like the related limitation from Claim 1, this limitation should encompass devices that are capable of supplying current without regard to *any* limits that "affect or limit the supply of current on the VBUS line" if connected to a device/function that draws such current, including, for example, limits on the amount of current, direction of current, or the timing of current. *Id.* at 315 and n7 (noting that there are "multiple limits related to supplying current on

the VBUS line" other than a "current limit," including limits on the "current flow direction" and "a time limit for providing current" and, accordingly, Claim 10 is broader than Claim 11 which requires a "current limit."). As the Board found, the patentee did not specify any particular kind of limit (e.g., direction, timing, amount, etc.) and so this should be interpreted broadly. To the extent patentee intended or intends that this claim encompass only certain types of limits (amount of current, direction of current, time period of current, etc.) it was and is capable of using precise language to so specify.

3. "without USB enumeration" (Claims 3 and 12)

In prior proceedings, Patent Owner argued that this term "means that not all steps of enumeration are performed." 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 12. The court subsequently adopted patentee's argument and construed this term to mean "without the occurrence of all the steps of USB enumeration." 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 32.

Under the broadest reasonable interpretation, the claims must be at least this broad. Accordingly, this limitation should encompass any situation in which current is supplied without engaging in *every* step of USB enumeration.

IV. DETAILED STATEMENT OF SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY

A. Yang in view of Matsumoto Renders Obvious Claims 3-7 and 12-16
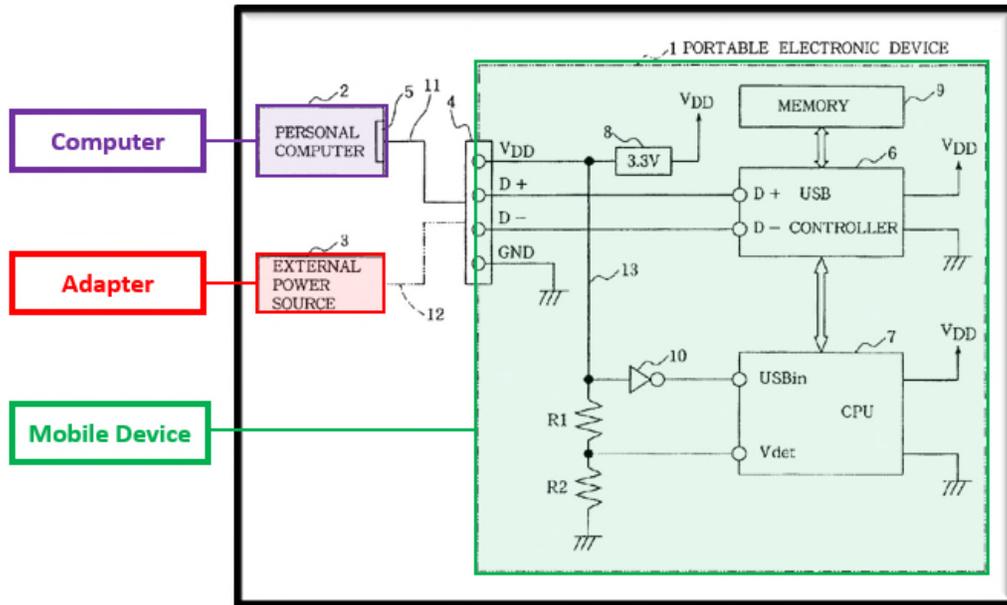
For the reasons stated below, Yang in view of Matsumoto renders obvious Claims 3-7 and 12-16.

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.,), ¶¶ 99-105.

Both Matsumoto and Yang relate to systems and methods for powering portable electronic devices (*i.e.*, mobile devices). 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.");

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).

Accordingly, Matsumoto discloses a USB device with a corresponding adapter. 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 therefore search for references disclosing the structure of such adapters and would find Yang. Baker Decl., ¶ 104. 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., ¶ 104. 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., ¶ 104.

Moreover, 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.
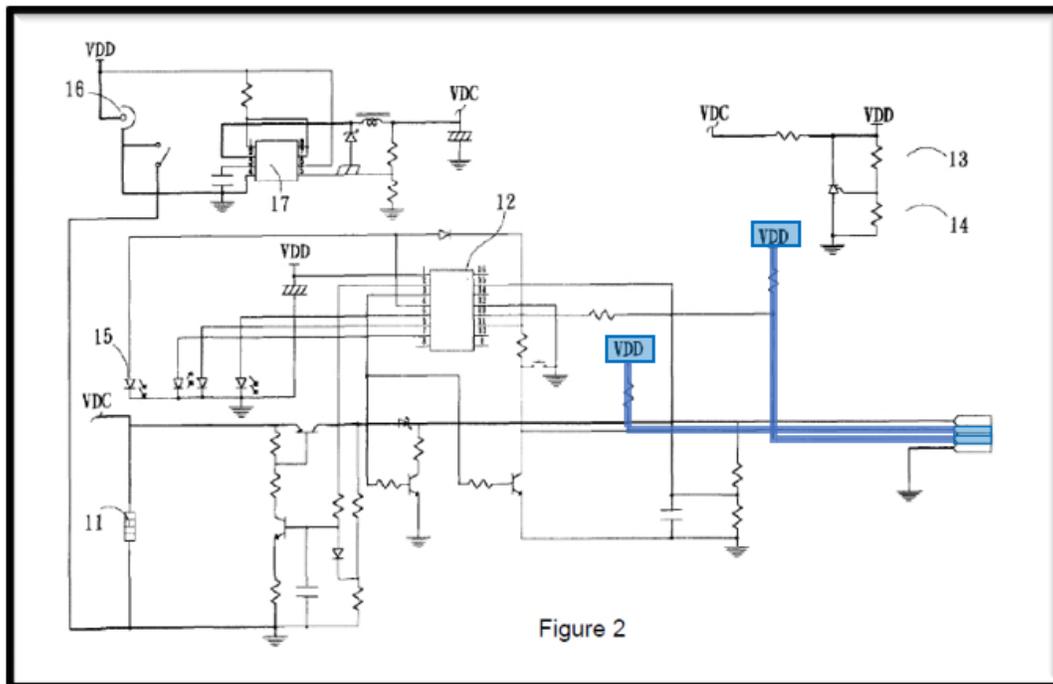
Figure 2

Yang, Figure 2 (annotated); Baker Decl., ¶ 104. 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.

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:
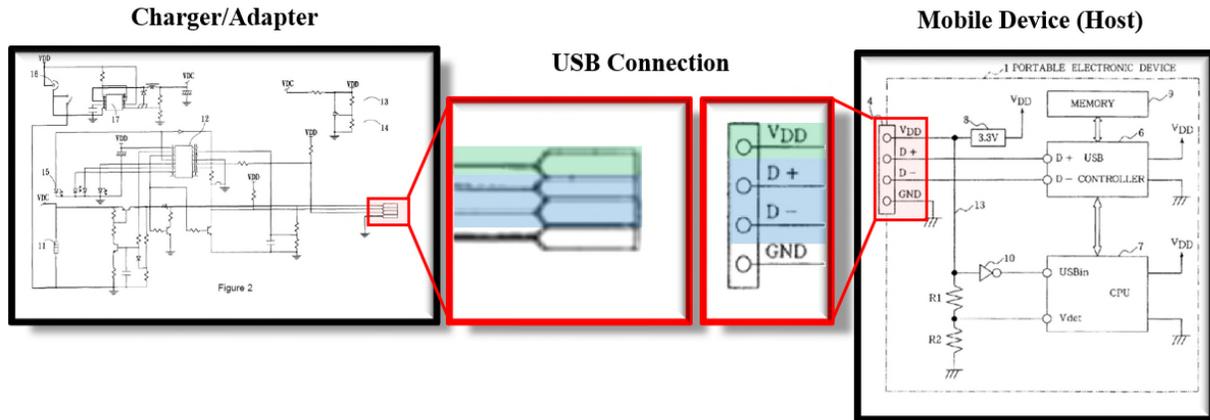
Yang Figure 2 and Matsumoto Figure 1 (annotated); Baker Decl., ¶ 105.

2.   Claim 1

Yang in view of Matsumoto 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 1 based on Yang in view of Matsumoto under 35 U.S.C. §103.[4]

Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 1 of the '550 Patent under 35 U.S.C. § 103

a.   *Preamble: An adapter comprising*

The preamble of Claim 1 describes "An adapter." To the extent this preamble is limiting, it is satisfied by Yang in view of Matsumoto. Specifically, Yang discloses a "mobile phone

_____

[4] Patent owner disclaimed Claim 1 on April 23, 2021. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer). Requestor nonetheless sets forth the reasons that Yang in view of

charger" for powering and charging a mobile phone. Yang, Title ("Mobile Phone Charger with Multiple Power Supply Inputs") and Abstract ("A mobile phone charger with multiple power supply inputs."). The charger can draw power from any of three different types of sources (including a wall-socket, an automobile power supply, or a USB connection) and convert or "adapt" that 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."). Under the broadest reasonable interpretation, the charger of Yang is an "adapter."

Matsumoto also discloses an adapter. Specifically, Matsumoto discloses a portable electronic device with a USB connection that can be connected to (1) a computer or (2) an "a.c. adaptor" for charging a device from an "external power source" like a wall outlet. Matsumoto, Abstract ("A portable electronic device . . . 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.*, 1:20-23 ("In some cases . . . 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."); *id.*, 1:36-42 ("Accordingly, it appears feasible to provide the USB connector on a portable electronic device for use with an a.c. adaptor (external power Source) . . . to connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device."); *id.* at 3:43-47 ("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.") Matsumoto, 3:46-47.

Matsumoto disclose or render obvious each of the limitations of Claim 1 under 35 U.S.C § 103 because Claims 3-7 depend on Claim 1.

Accordingly, under the broadest reasonable interpretation, the charger of Yang implemented pursuant to the teachings of Matsumoto discloses an "adapter" as claimed by Claim 1 of the '550 Patent. Baker Decl., ¶ 109.

b. *a USB VBUS line and a USB communication path*

The first element of Claim 1 requires "a USB VBUS line and a USB communication path." Yang in view of Matsumoto discloses this element. Specifically, Yang in view of Matsumoto discloses a charger/adapter and mobile device that connect via a USB connection for purposes of charging. A person of ordinary skill in the art would have understood (and Yang and Matsumoto expressly disclose) that the devices thus comprise four connecting lines: (1) a power/voltage line, (2) a D+ data line, (3) a D- data line, and (4) a Ground line. Baker Decl., ¶ 111. Under the broadest reasonable interpretation, the voltage line constitutes a "USB VBUS line" and that the data lines collectively comprise a "USB communication path." Baker Decl., ¶¶ 111-112.

Matsumoto teaches, for example, that the mobile device can connect to an adapter (like the charger of Yang) through a USB connection. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector" and "is adapted to receive power supply from . . . an external power source 3 as connected to the USB connector 4.") (emphasis added). Matsumoto further discloses that the connector comprises connections for a "power source terminal" (USB VBUS line) and "a pair of data terminals" (USB communication path). *Id.*, 1:33-35 ("The USB connector has a pair of data terminals D+ and D- [USB Communication Path], 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."). Because they are connected through a USB connector, a person of ordinary skill in the art would have understood that both

the adapter and the portable device comprise a VBUS line (power/voltage) and a USB

communication path (the D+ and D- lines). Baker Decl., ¶ 111.
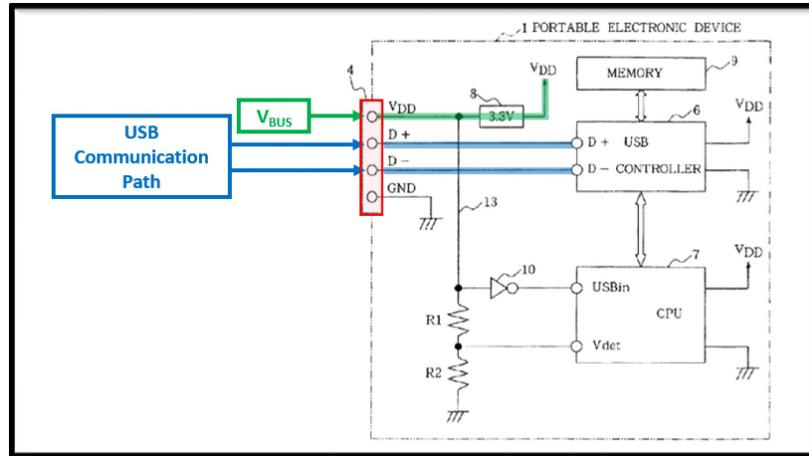
Matsumoto, Figure 1 (annotated) (showing USB Connector (red), VBUS line (green), and USB

communication path (Blue)).

Yang similarly teaches that the adapter can comprise a VBUS line and USB

Communication path. Specifically, Yang teaches that the charger can draw power from a wall

outlet. Yang, 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.").

When power is drawn from the wall socket, the charger first converts the power to the format

used by an automobile power supply. *Id.*, Abstract ("The power supply input device converts the

civil electricity to the same voltage as the automobile power supply through an AC

transformer . . . ."). The charger then converts the power to a USB format. *Id.* ("[T]he DC

voltage conversion circuit converts the automobile voltage to the same voltage as the USB

interface.") The charger can then provide power to a mobile device according to the format used

by the device which, in the case of the mobile device of Matsumoto, is a USB connection. *Id.*

Like Matsumoto, Yang expressly discloses that the connection to the mobile device comprises a

power line (USB VBUS line), two data lines (USB Communication path), and a Ground line:
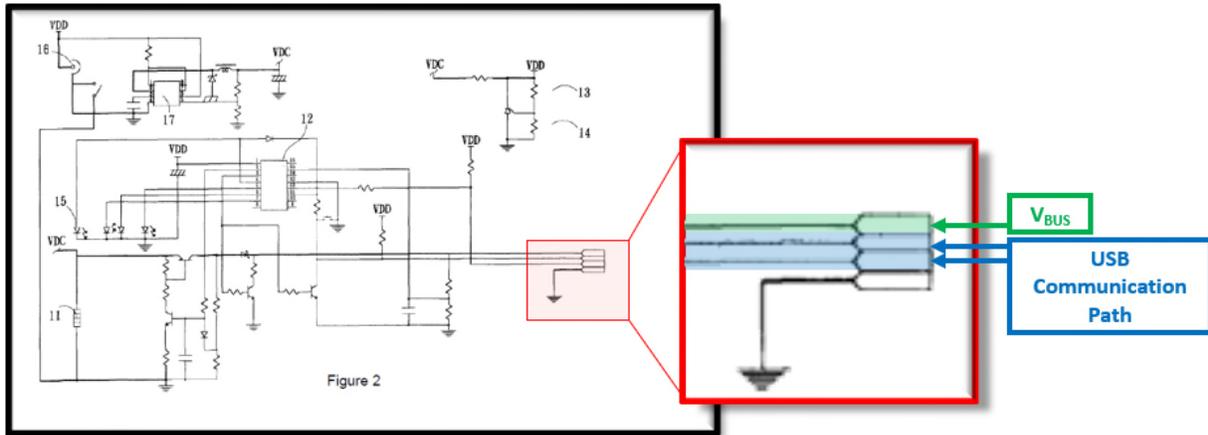
Yang, Figure 2 (annotated) (showing USB connector (red), VBUS power line (green), and data

lines (blue)). Baker Decl., ¶ 112.
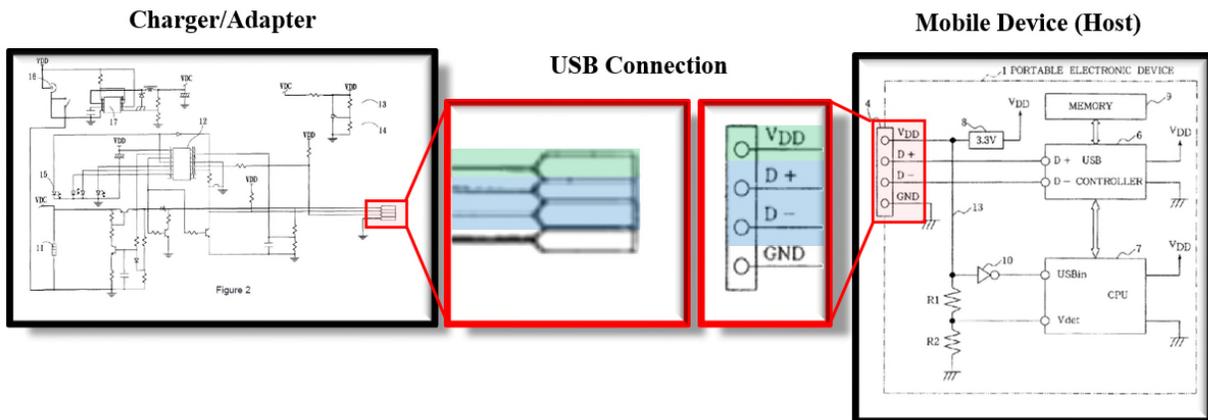
Yang Figure 2 and Matsumoto Figure 1 (annotated); Baker Decl., ¶ 112.

Accordingly, under the broadest reasonable interpretation, the adapter of Yang in view of

Matsumoto comprises a USB VBUS line and a USB Communication path as required by Claim

1. Baker Decl., ¶ 113.

said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification

The second element of Claim 1 requires "said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification." Yang in view of Matsumoto discloses this element. Specifically, Yang in view of Matsumoto discloses that the adapter supplies power to the mobile device on the power (VBUS) line. Matsumoto, 1:33-35 ("The USB connector has a pair of data terminals D+ and D- [USB communication path], a power source terminal [USB VBUS line] and a ground terminal, <u>and can be used for supplying power to peripheral devices by way of the power source terminal [USB VBUS line]</u>.") (emphasis added); *id.* at 1:40-42 ("connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device"). Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses that the adapter is configured to supply current on the VBUS line.

Moreover, Yang in view of Matsumoto discloses that the adapter is configured to supply current "without regard to at least one associated condition specified in a USB specification" because it is configured to (1) supply current in the upstream direction (i.e., at an upstream port), (2) supply current (e.g., 100 mA) without reaching the "Default" state, and (3) supply more than 100mA of current without reaching the "Configured" state. Each of these disregards a condition of the USB Specification. Baker Decl., ¶ 115.

(1) <u>**Supplying Current at an Upstream Port**</u>

As discussed in section III.A.2, *supra*, the USB specification dictates that an upstream port is the port closest to the host. USB 2.0 at 10 ("An upstream port is the port on a device electrically closest to the host . . . ."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is

defined as being towards the device."). As also disclosed in section III.A.3, *supra*, it is a condition of the USB specification that no device *supply* current on the VBUS at its upstream facing port. USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time.").

Yang in view of Matsumoto teaches an adapter that supplies current without regard to this condition. Specifically, a person of ordinary skill in the art would have understood that when the mobile device and adapter of Yang in view of Matsumoto are connected, the mobile device is the host. Baker Decl., ¶¶ 119-120. A USB network must have a host, and the host must comprise a USB controller and CPU. *See* Section III.A.1, *supra*. The mobile device of Matsumoto contains both of these elements and the adapter of Yang contains neither.
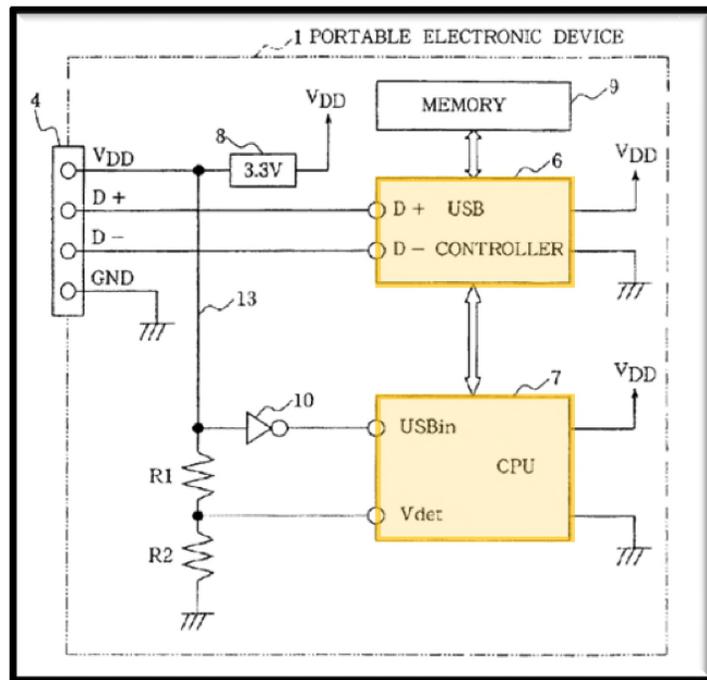
Matsumoto, Figure 1 (annotated) (showing USB Controller and CPU of portable electronic device in orange); *see also* Yang, Figure 2 (adapter does not contain USB controller or CPU).

Because the mobile device is the host, the USB port of the adapter that connects to the mobile device (host) is an "upstream" port. Because the adapter supplies power at that port, it

supplies current without regard to at least one condition of the USB Specification, *i.e.*, that a device should not provide power at its upstream port.
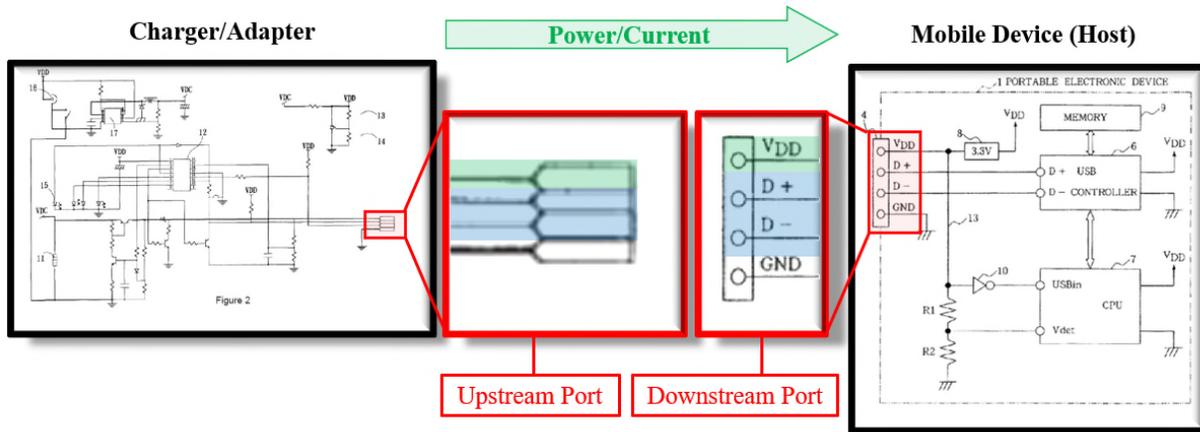
Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses an adapter "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

(2) Supplying More Current Than Stated in the USB Specification.

As discussed in section III.A.3, *supra*, the USB specification dictates a device shall not supply any current until the "Default" state and shall not supply more than 100 mA of current until the "Configured" state:

> **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 V$_{BUS}$. 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 V$_{BUS}$ 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 (annotated).

Yang in view of Matsumoto renders obvious an adapter that supplies current without regard to these conditions. Specifically, as noted below with respect to Claim 3, Yang in view of Matsumoto discloses "discriminating means" that allow the adapter and device to engage in charging without performing enumeration. *See* Section IV.A.3, *infra*. Once the adapter and device have recognized each other through these "discriminating means," the charger simply applies voltage to the VBUS line, and the mobile device draws current as needed. Baker Decl., ¶ 125. Because USB devices can be classified as either low-power (drawing 100mA) or high-power (drawing 500mA) (*see* Section III.A.4), the adapter would be configured to supply at least 100 mA (if the mobile device is a low-powered device), and it would have been obvious to

configure the adapter to supply up to 500 mA (for use with a high-powered device). Baker Decl., ¶ 125. Indeed, as explained in Section III.A.4, *supra*, because the adapter of Yang in view of Matsumoto is "self-powered" the USB specification requires that it supply 500mA of current. *See* Section III.A.4. Accordingly, at a minimum, the adapter must be capable of supplying (i.e., "configured to supply") 500 mA current in case it is used with a high power device that draws such current. In either event, the adapter would be configured to supply current without regard to the condition/limit that no such current be supplied until the "Default" state. *Id.*; USB 2.0 at 243-244. ("The USB device is now in the Default state and can draw no more than 100 mA from VBUS.")

Moreover, it would have been obvious for to configure the adapter to supply more than 100 mA of current prior to entering the "Configured" state. Baker Decl., ¶ 126. Indeed, once the mobile device and the adapter recognize each other through the "discriminating means," they operate outside of the USB Specification. Accordingly, a person of ordinary skill in the art would have understood that the adapter can maintain a set voltage and the mobile device can draw as much current as it needs. Baker Decl., ¶ 126. As noted above, USB devices can be classified as either low-power (drawing 100 mA) or high-power (drawing 500 mA). *See* Section III.A.4. It would thus have been obvious (and at least obvious to try) to configure the adapter to supply up to 500 mA so that it can be used with a high-power USB device. Indeed, as explained in Section III.A.4, *supra*, because the adapter of Yang in view of Matsumoto is "self-powered" the USB specification requires that it supply 500mA of current. *See* Section III.A.4. Accordingly, at a minimum, the adapter must be capable of supplying (i.e., "configured to

supply") 500 mA current in case it is used with a high power device that draws such current. [5]

Indeed, Yang specifically discloses that the max current to be drawn from a USB connection would be 500 mA, which would suggest that such current could be used for powering the USB device of Matsumoto. Yang at Specification page 3 ("As we all know, the power supply of the USB interface of a regular PC is DC +5V, and the maximum current is 0.5A."). Moreover, Matsumoto does not limit the mobile device to any particular device, and Yang teaches that it may be a mobile phone. A person of ordinary skill in the art would have understood that a mobile phone would typically be a high-powered device, requiring as much current as possible for operation and charging. Baker Decl., ¶ 127.

Accordingly, a person of ordinary skill in the art implementing the charger of Yang according to the teachings of Matsumoto would have found it obvious to implement the charger to supply more than 0 mA (and at least 100 mA) of current prior to the "Default" state and more than 100 mA of current prior to the "Configured" state. Under the broadest reasonable interpretation, the adapter would therefore be "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

3.   Claim 3

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

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[5] Alternatively, if the adapter of Yang in view of Matsumoto is configured to always provide less than 500 mA, then it is supplying current without regard to the condition/limit that such self-powered ports must provide 500 mA. *See* Section III.A.4.

Claim 3 requires the adapter of Claim 1. As noted in Section IV.A.2, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 1.

Claim 3 further requires "wherein said current is supplied without USB enumeration." As explained in Section III.A.4, *supra*, "enumeration" "is the activity that identifies and assigns unique addresses to the devices attached to a bus." USB 2.0 at 20 (Section 4.6.3 Bus Enumeration); *id.* at 243-244 (Section 9.1.2 Bus Enumeration) (listing the steps of enumeration). Yang in view of Matsumoto discloses an adapter that meets this limitation. Specifically, Yang in view of Matsumoto discloses an adapter and mobile device that use "discriminating means" to determine when the mobile device is connected to the adapter (as opposed to a computer that may need to engage in typical USB communication). When the "discriminating means" determines that the mobile device is connected to the adapter, it avoids the enumeration process and other USB communication and proceeds only with charging and typical device operation.

Matsumoto teaches, for example, that the portable device can be connected via a USB connector to either (1) a computer or (2) an adapter (i.e., an external power source). Matsumoto, Abstract ("A portable electronic device . . . 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 2:13-25 ("The present invention provides a portable electronic device comprising a serial bus connector . . . the electronic device being capable of receiving power supply from the information processing device [computer] or an external power source [adapter] as connected to the common serios bus connector . . . ."). When the mobile device is connected to the computer,

it results in USB communication (e.g., enumeration) between the two devices. *Id.*, 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 with 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.") Such communication, however, slows down the operation of the portable

electronic 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.")

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). Accordingly, Matsumoto discloses using "discriminating means" to determine when the

mobile device is connected to the adapter. Matsumoto, 2:58-59 ("The discriminating means

identifies the source of supply of power . . . ."); *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 control circuit will avoid the costly communication process (including enumeration/configuration) and simply move forward with charging and usual device operation/processing. 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.")

Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses that the adapter will supply current without engaging in enumeration as required by Claim 3. Baker Decl., ¶¶ 129-133.

4.   Claim 4

Yang in view of Matsumoto renders Claim 4 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 4 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 4 of the '550 Patent under 35 U.S.C. § 103**

Claim 4 requires the adapter of Claim 1. As noted in Section IV.A.2, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 1.

Claim 4 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." Yang in view of Matsumoto discloses this element. Specifically, as explained with respect to Claim 3, Yang in view of Matsumoto discloses using "discriminating means" to determine whether the mobile device is connected to a typical USB device or, alternatively, the adapter. There are a number of such discriminating means that would have been obvious to a person of ordinary skill in the art. Baker Decl., ¶ 134. For example, a person of ordinary skill in the art would have found obvious—and Yang and Matsumoto expressly disclose—that a data condition other than what the devices would expect from typical USB operation (i.e., an "abnormal data condition") would allow the devices to discriminate between a typical USB device and an adapter. Baker Decl., ¶ 134. Indeed, if the adapter presented a normal data condition, the mobile device would likely mistake the adapter for a typical USB device and would attempt to engage in typical USB communication/enumeration, which is what Matsumoto is teaching to avoid. Baker Decl., ¶ 134.

Yang in view of Matsumoto discloses at least two abnormal data conditions that could be used for this purpose: (1) maintaining a low/low signal on the data lines (SE0 Signal) for an extended period of time after attachment and (2) a high/high signal on the data lines (SE1 Signal) at attachment.

a. *Abnormal Data Condition 1: Maintaining an SE0 Signal After Connection*

Matsumoto expressly discloses, for example, that the adapter may keep both of the data lines low (*i.e.*, not send any signals on either line) after being connected to the mobile device and that, after a certain period of time, the discriminating means may thus determine that the mobile device is connected to an adapter. Matsumoto, 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).

Generally, a short low/low signal is not an abnormal data condition. Baker Decl., ¶ 137. However, under the broadest reasonable interpretation of the term "abnormal data condition," an extended SE0 signal (e.g., for more than 100ms) would be an abnormal data condition because it is a condition that is not expected. Baker Decl., ¶ 137. A typical "idle" signal is either a high/low or low/high signal on the D+ and D- lines (depending on the speed of the device). Baker Decl., ¶ 137. Sending an SE0 signal for 10-20 ms is used to reset a device, but the reset signal is released after those 10-20 ms. Baker Decl., ¶ 137. Accordingly, sending an SE0 signal for more than 100ms upon attachment, under the Broadest Reasonable Interpretation, would be an "abnormal data condition" on the data lines because it is not defined as a valid data condition after connecting a device. Indeed, the USB Specification requires that a connecting device signal that it is connected within 100ms of detecting voltage on the VBUS line by pulling either D+ or D- positive (i.e., signaling an "attach").

Table 7-14. Device Event Timings

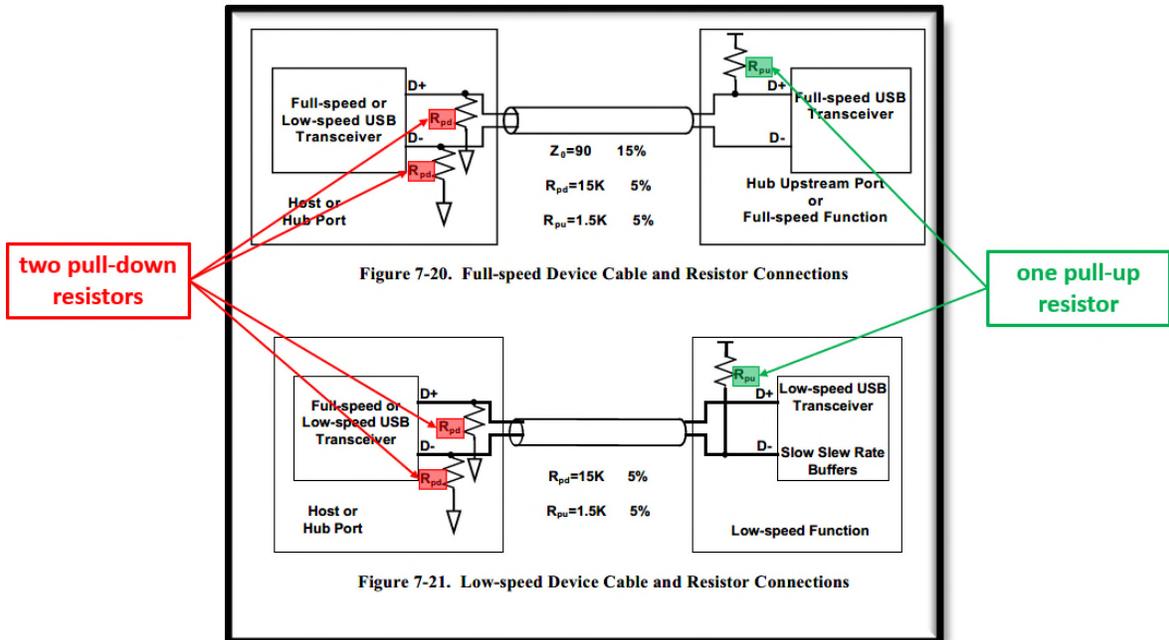| Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond V_{IHZ} (min) (signaling attach)	T_{SIGATT}	Figure 7-29		100	ms

USB 2.0 at 188 (Table 7-14 Device Event Timings) (annotated); see also 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. $\Delta t2$ 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. <u>$\Delta t2$ must be less than 100 ms for all hub and device implementations</u>. (This requirement only applies if the device is drawing power from the bus.)").

Accordingly, under the broadest reasonable interpretation of this claim, Yang in view of Matsumoto teaches that one option for the "discriminating means" is to send no signals (SE0) for an extended period of time, Yang in view of Matsumoto discloses an adapter that supplies current "in response to an abnormal data condition on said USB communication path" as required by Claim 4.

b.   ***Abnormal Data Condition 2: Using Termination Resistors to Send an SE1 signal***

Yang in view of Matsumoto further discloses that the adapter may pull each of the data lines high upon attachment (SE1 signal). Specifically, the USB Specification explains that when a device is connected, its termination resistors will determine whether it is a hub/host, a low-speed device, or a full-speed device. *See* Section III.A.4, *supra*; USB 2.0 at 242 (9.1.1.3 Default) ("The speed selection for low- and full-speed is determined by the device termination resistors."). USB hubs and hosts have two pull-down resistors; full-speed and high-speed devices have a pull-up resistor on the D+ line; low-speed devices have a 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."); Baker Decl., ¶ 140.

Figure 7-20. Full-speed Device Cable and Resistor Connections

Figure 7-21. Low-speed Device Cable and Resistor Connections

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). Accordingly, full-speed devices 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., ¶ 140.

Table 7-2. Low-/full-speed Signaling Levels

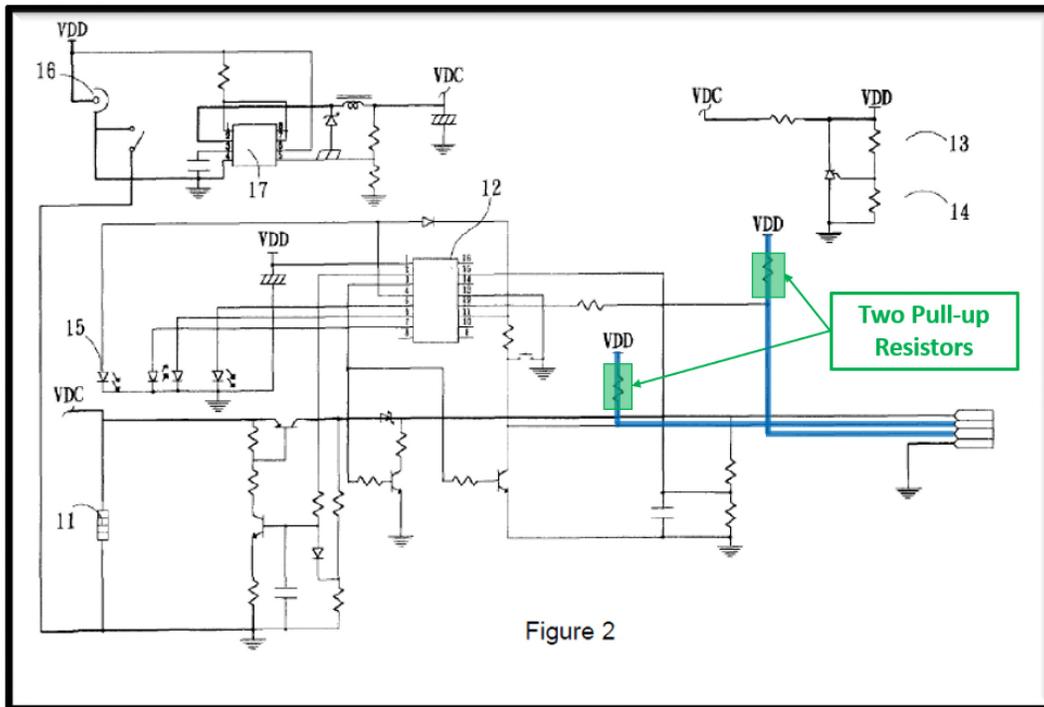| Bus State	Signaling Levels		
	At originating source connector (at end of bit time)	At final target connector	
		Required	Acceptable
Differential "1"	D+ > V_{OH} (min) and D- < V_{OL} (max)	(D+) - (D-) > 200 mV and D+ > V_{IH} (min)	(D+) - (D-) > 200 mV
Differential "0"	D- > V_{OH} (min) and D+ < V_{OL} (max)	(D-) - (D+) > 200 mV and D- > V_{IH} (min)	(D-) - (D+) > 200 mV
Single-ended 0 (SE0)	D+ and D- < V_{OL} (max)	D+ and D- < V_{IL} (max)	D+ and D- < V_{IH} (min)
Single-ended 1 (SE1)	D+ and D- > V_{OSE1}(min)	D+ and D- > V_{IL} (max)	

Data J state:
  Low-speed
  Full-speed
	
	Differential "0"
	Differential "1"
		
		Differential "0"
		Differential "1"	

Data K state:
  Low-speed
  Full-speed
	
	Differential "1"
	Differential "0"
		
		Differential "1"
		Differential "0"	

Idle state:
  Low-speed
 	
  Full-speed
	NA	D- > V_{IHZ} (min) and D+ < V_{IL} (max)
		D+ > V_{IHZ} (min) and D- < V_{IL} (max)
			D- > V_{IHZ} (min) and D+ < V_{IH} (min)
			D+ > V_{IHZ} (min) and D- < V_{IH} (min)

USB 2.0 at 145 (Table 7-2) annotated (showing: (1) full speed idle at D+ high (greater than V_{IHZ}) and D- low (less than V_{IL}))and (2) low-speed idle and D- high (greater than V_{IHZ}) and D+ low (less than V_{IL})).

Table 7-7. DC Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Max.	Units
Supply Voltage:					
High-power Port	V_{BUS}	Note 2, Section 7.2.1	4.75	5.25	V
Low-power Port	V_{BUS}	Note 2, Section 7.2.1	4.40	5.25	V
Supply Current:					
High-power Hub Port (out)	I_{CCPRT}	Section 7.2.1	500		mA
Low-power Hub Port (out)	I_{CCUPT}	Section 7.2.1	100		mA
High-power Function (in)	I_{CCHPF}	Section 7.2.1		500	mA
Low-power Function (in)	I_{CCLPF}	Section 7.2.1		100	mA
Unconfigured Function/Hub (in)	I_{CCINIT}	Section 7.2.1.4		100	mA
Suspended High-power Device	I_{CCSH}	Section 7.2.3; Note 15		2.5	mA
Suspended Low-power Device	I_{CCSL}	Section 7.2.3		500	µA
Input Levels for Low-/full-speed:					
High (driven)	V_{IH}	Note 4, Section 7.1.4	2.0		V
High (floating)	V_{IHZ}	Note 4, Section 7.1.4	2.7	3.6	V
Low	V_{IL}	Note 4, Section 7.1.4		0.8	V

USB 2.0 at 178 (Table 7-7) (annotated) (showing voltage maximums and minimums for V_{IHZ} and V_{IL}).

Yang, in contrast, discloses that the charger can comprise <u>two pull-up resistors</u> connected to the data lines and thus sends a high/high signal on the data lines.

Figure 2

Yang, Figure 2 (annotated) (showing tow pull up resistors (green)). Baker Decl., ¶¶ 141-142.

This signal is referred to as a "Single Ended 1" or "SE1" signal in the USB Specification:

Table 7-2. Low-/full-speed Signaling Levels

Bus State	Signaling Levels		
	At originating source connector (at end of bit time)	At final target connector	
		Required	Acceptable
Differential "1"	D+ > V_{OH} (min) and D- < V_{OL} (max)	(D+) - (D-) > 200 mV and D+ > V_{IH} (min)	(D+) - (D-) > 200 mV
Differential "0"	D- > V_{OH} (min) and D+ < V_{OL} (max)	(D-) - (D+) > 200 mV and D- > V_{IH} (min)	(D-) - (D+) > 200 mV
Single-ended 0 (SE0)	D+ and D- < V_{OL} (max)	D+ and D- < V_{IL} (max)	D+ and D- < V_{IH} (min)
Single-ended 1 (SE1)	D+ and D- > V_{OSE1} (min)	D+ and D- > V_{IL} (max)	
Data J state: Low-speed Full-speed	Differential "0" Differential "1"	Differential "0" Differential "1"	
Data K state: Low-speed Full-speed	Differential "1" Differential "0"	Differential "1" Differential "0"	
Idle state: Low-speed Full-speed	NA	D- > V_{IHZ} (min) and D+ < V_{IL} (max) D+ > V_{IHZ} (min) and D- < V_{IL} (max)	D- > V_{IHZ} (min) and D+ < V_{IH} (min) D+ > V_{IHZ} (min) and D- < V_{IH} (min)

USB 2.0 at 145 (Table 7-2) (annotated). A person of ordinary skill in the art would understand that an SE1 signal on the data lines is an "abnormal data condition" because it is not defined as a valid data condition when connecting a device. To the contrary, as noted above, a device must provide either a high/low signal or a low/high signal to indicate that it is a low-speed or full-speed device. Indeed, the USB Specification states that devices should not send SE1 signals. 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 VOSE1 (min), which is 0.8V.")

Accordingly, Yang in view of Matsumoto teaches that one option for the "discriminating means" is to send an SE1 signal at attachment. Under the broadest reasonable interpretation, Yang in view of Matsumoto thus discloses an adapter that supplies current "in response to an abnormal data condition on said USB communication path" as required by Claim 4.
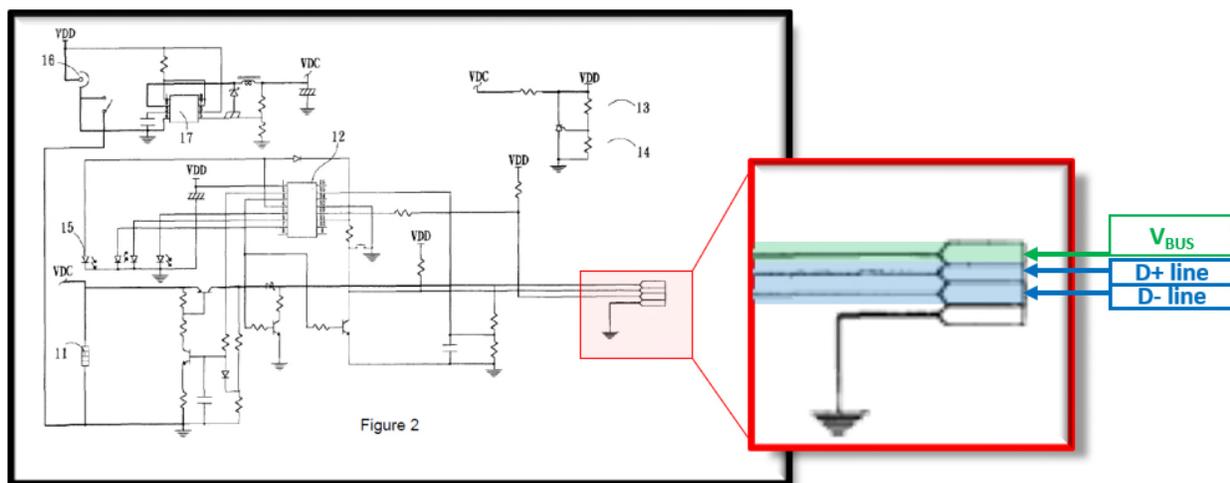
5.   Claim 5

Yang in view of Matsumoto renders Claim 5 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

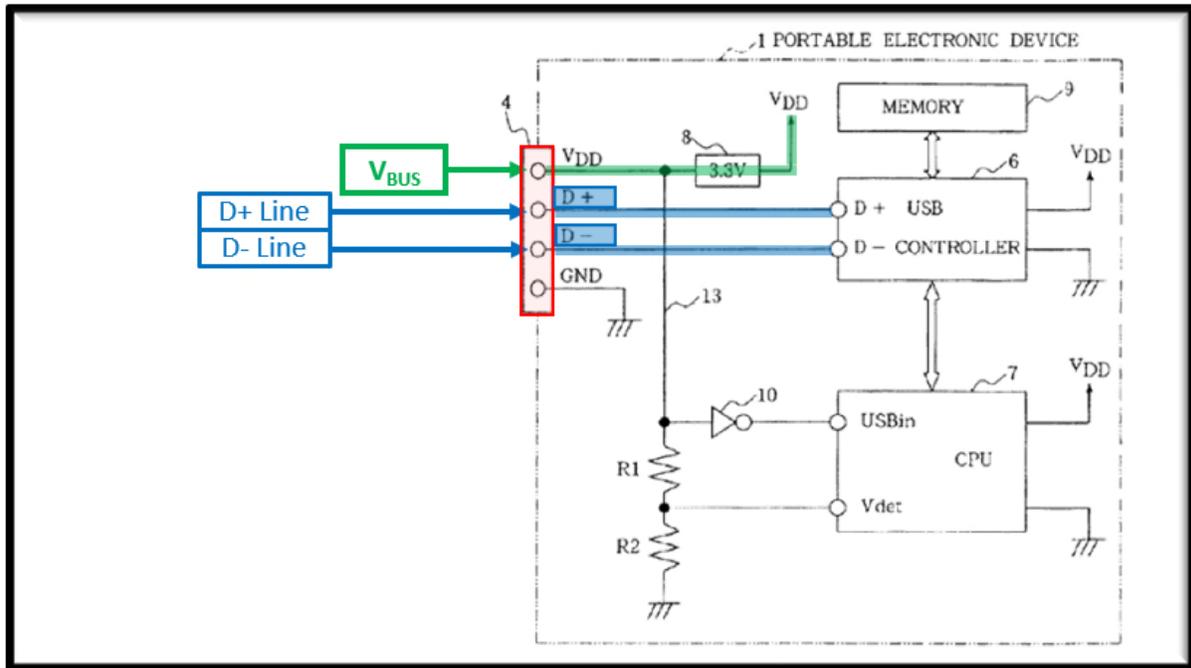Claim 5 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim
> chart comparing Yang in view of Matsumoto with
> Claim 5 of the '550 Patent under 35 U.S.C. § 103**

Claim 5 requires the adapter of Claim 4. As noted in Section IV.A.4, Yang in view of

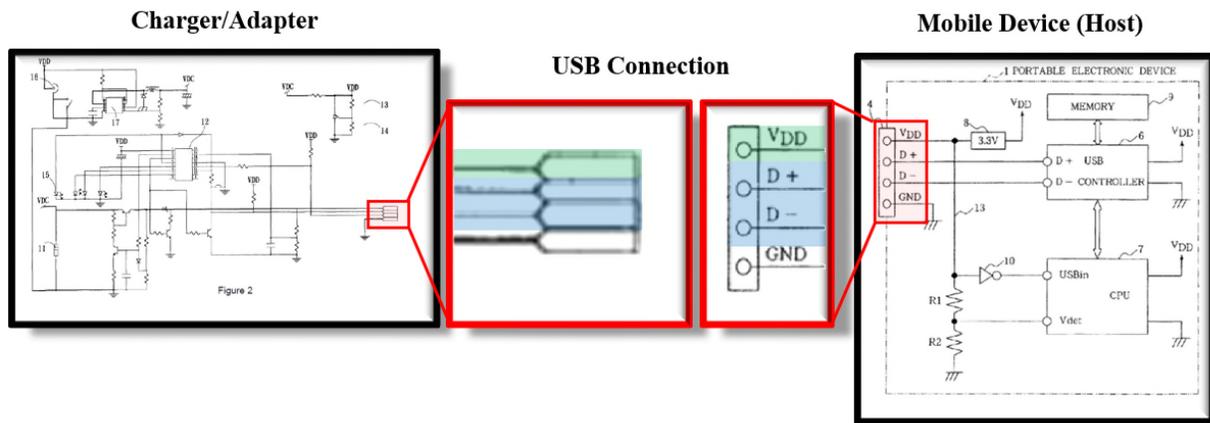Matsumoto discloses or renders obvious the adapter of Claim 4.

Claim 5 further requires "wherein said USB communication path includes a D+ line and a

D-line." Yang in view of Matsumoto discloses this element. Specifically, as noted with respect

to Claim 1, Yang in view of Matsumoto discloses a charger/adapter that connects to a mobile

device via a USB port. As further noted with respect to Claim 1, a person of ordinary skill in the

art would have understood—and Yang and Matsumoto expressly disclose—that such a port

comprises a communication path comprising a D+ and D- line.

Figure 2

Yang, Figure 2 (annotated).

Matsumoto, Figure 1 (annotated).

Yang Figure 2 and Matsumoto Figure 1 (annotated).

Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses that the adapter comprises a USB communication path "wherein said USB communication path includes a D+ line and a D-line" as required by Claim 5.

6. Claim 6

Yang in view of Matsumoto renders Claim 6 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 6 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 6 of the '550 Patent under 35 U.S.C. § 103**

Claim 6 requires the adapter of Claim 5. As noted in Section IV.A.5, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 5.

Claim 6 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." Yang in view of Matsumoto renders discloses this element. Specifically, as disclosed with respect to Claim 4, Yang in view of Matsumoto discloses that the "discriminating means" for determining that the mobile device is connected to a charger/adapter may be (1) maintaining a low/low (SE0) signal for an extended period of time (e.g., more than 100ms) after the charger is connected or (2) intentionally sending a high/high signal (SE1) when the charger is connected. *See* Section IV.A.4. Because these conditions exist on the D+ and D- lines, a person of ordinary skill in the art would have understood that they represent "abnormal data line conditions" on the D+ line and D- line.

Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses an adapter that supplies current in response to an abnormal data condition "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line" as required by Claim 6.

7. Claim 7

Yang in view of Matsumoto renders Claim 7 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 7 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 7 of the '550 Patent under 35 U.S.C. § 103

Claim 7 requires the adapter of Claim 6. As noted in Section IV.A.6, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 6.

Claim 7 further requires "wherein said abnormal data line condition is a logic high signal on each of said D+ and D lines." Yang in view of Matsumoto discloses this element. Specifically, as explained with respect to Claim 4, Yang in view of Matsumoto discloses that the "discriminating means" for determining that the mobile device is connected to a charger/adapter may be (1) an extended low/low signal (SE0) after the device is connected or (2) a high/high signal (SE1) after the device is connected. *See* claim 4. A person of ordinary skill in the art would have understood that the latter constitutes "a logic high signal on each of said D+ and D-lines."

Accordingly, under the broadest reasonable interpretation, Yang in view of Matsumoto discloses an adapter that supplies current in response to an abnormal data condition "wherein said abnormal data line condition is a logic high signal on each of said D+ and D lines" as required by Claim 7.

8. Claim 10

Patent owner disclaimed Claim 10 on April 23, 2021. PAT-B ('550 File History) at 440(April 23, 2021 Disclaimer). Because Claims 12-16 depend on Claim 10, however, Requestor sets forth below the reasons that Yang in view of Matsumoto renders the limitations of Claim 10 obvious under 35 U.S.C § 103.

> **Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 10 of the '550 Patent under 35 U.S.C. § 103**

a.   *Preamble: An adapter comprising*

The preamble of Claim 10 describes "An adapter." As discussed with respect to Claim 1, Yang in view of Matsumoto discloses an adapter. *See* Section IV.A.2.a.

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 10 requires "a USB VBUS line and a USB communication path." As explained with respect to Claim 1, Yang in view of Matsumoto discloses this element. *See* Section IV.A.2.b.

Specifically, as explained with respect to Claim 1, Yang in view of Matsumoto discloses a mobile USB device and associated USB adapter that connect to each other via USB connectors. *Id.* A person of ordinary skill in the art would have understood—and Yang and Matsumoto expressly disclose—that such connections would comprise a USB VBUS line and a USB communication path. *Id.*

said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit.

The second element of Claim 10 requires "said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit." Yang in view of Matsumoto discloses this element. *See* Section IV.A.2.c.

First, Yang in view of Matsumoto discloses an adapter that supplies current in an upstream direction (i.e., at an "upstream port"). *Id.* The USB Specification, however, limits the direction of current flow and states that current should not be supplied upstream. *Id.*

Second, Yang in view of Matsumoto discloses and renders obvious an adapter that (1) supplies more than 0 mA (and at least 100 mA) prior to the "Default" state of enumeration and (2) supplies more than 100mA of current prior to the "Configured" state of enumeration. *Id.* The USB Specification, however, states that no current shall be provided prior to the Default state and no more than 100mA of current shall be supplied prior to the Configured State. *Id.*

9. Claim 12

Yang in view of Matsumoto renders Claim 12 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 12 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 12 of the '550 Patent under 35 U.S.C. § 103**

Claim 12 requires the adapter of Claim 10. As noted in Section IV.A.8, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 10.

Claim 12 further requires "wherein said current is supplied without USB enumeration." As explained with respect to Claim 3, Yang in view of Matsumoto discloses this element. *See*

Section IV.A.3. Specifically, Yang in view of Matsumoto disclose that the adapter and mobile device use "discriminating means" to determine when the mobile device is connected to the adapter and not a typical USB device (e.g., a computer). *Id.* When the mobile device is connected to the computer it will engage in typical USB communication (including enumeration). *Id.* When the mobile device is connected to the adapter the devices will not engage in enumeration. *Id.*

    10.   Claim 13

Yang in view of Matsumoto renders Claim 13 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 13 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim chart comparing Yang in view of Matsumoto with Claim 13 of the '550 Patent under 35 U.S.C. § 103**

Claim 13 requires the adapter of Claim 10. As noted in Section IV.A.8, Yang in view of Matsumoto discloses or renders obvious the adapter of Claim 10.

Claim 13 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." As explained with respect to Claim 4, Yang in view of Matsumoto discloses this element. *See* Section IV.A.4.

Specifically, Yang in view of Matsumoto discloses that the mobile device uses "discriminating means" to determine when the mobile device is connected to an adapter. *Id.* A person of ordinary skill in the art would have found obvious—and Matsumoto expressly discloses—that this could be done with a condition on the data lines. *Id.* A person of ordinary skill in the art would have further understood that such a condition would have to be an

"abnormal data condition" in order for the "discriminating means" to distinguish between normal

USB operation (e.g., between the computer and the mobile device) and abnormal USB operation

(between the adapter and the mobile device). *Id.*

Matsumoto discloses, for example, that an extended SE0 signal (e.g., more than 100ms)

could be used to distinguish the adapter from a typical USB device. *Id.* As another example,

Yang discloses that the adapter may use two pull-up resistors to send an SE1 signal upon

attaching the devices. *Id.* Under the broadest reasonable interpretation, each of these two

methods constitutes and abnormal data condition on the USB communication path. *Id.*

11.   Claim 14

Yang in view of Matsumoto renders Claim 14 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 14 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-A for a claim
> chart comparing Yang in view of Matsumoto with
> Claim 14 of the '550 Patent under 35 U.S.C. § 103**

Claim 14 requires the adapter of Claim 13. As noted in Section IV.A.10, Yang in view of

Matsumoto discloses or renders obvious the adapter of Claim 13.

Claim 14 further requires "wherein said USB communication path includes a D+ line and

a D-line." As explained with respect to Claim 5, Yang in view of Matsumoto discloses this

element. *See* Section IV.A.5.

12. Claim 15

Yang in view of Matsumoto renders Claim 15 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 15 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> Please see attached Exhibit CC-A for a claim
> chart comparing Yang in view of Matsumoto with
> Claim 15 of the '550 Patent under 35 U.S.C. § 103

Claim 15 requires the adapter of Claim 14. As noted in Section IV.A.11, Yang in view of

Matsumoto discloses or renders obvious the adapter of Claim 14.

Claim 15 further requires "wherein said abnormal data condition is an abnormal data line

condition on said D+ line and said D-line." As explained with respect to Claim 6, Yang in view

of Matsumoto discloses this element. *See* Section IV.A.6.

13. Claim 16

Yang in view of Matsumoto renders Claim 16 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 16 based on Yang in view of Matsumoto under 35 U.S.C. §103.

> Please see attached Exhibit CC-A for a claim
> chart comparing Yang in view of Matsumoto with
> Claim 16 of the '550 Patent under 35 U.S.C. § 103

Claim 16 requires the adapter of Claim 15. As noted in Section IV.A.12, Yang in view of

Matsumoto discloses or renders obvious the adapter of Claim 15.

Claim 16 further requires "wherein said abnormal data line condition is a logic high signal on each of said D+ and D-lines." As explained with respect to Claim 7, Yang in view of Matsumoto discloses this element. *See* Section IV.A.7.

B.   De Iuliis in view of Matsumoto renders Claims 3-6 and 12-15 Obvious.

For the reasons stated below, De Iuliis in view of Matsumoto renders Claims 3-6 and 12-15 obvious.
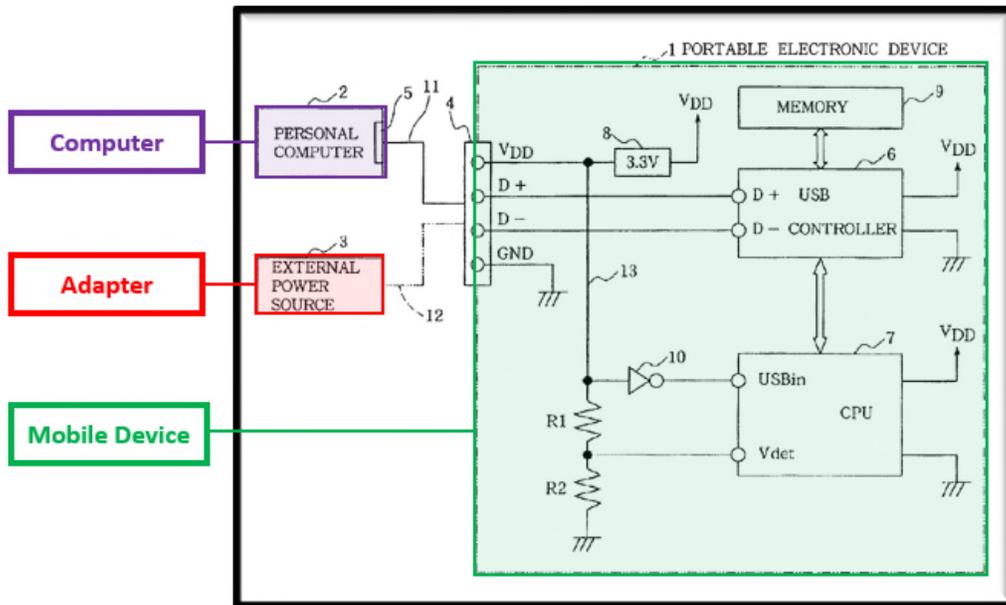
1.   Motivation to Combine

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.,), ¶¶ 158-163.

Both Matsumoto and De Iuliis relate to systems and methods for powering portable electronic devices (i.e., mobile devices) through a USB connection. 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., ¶ 159.

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."):
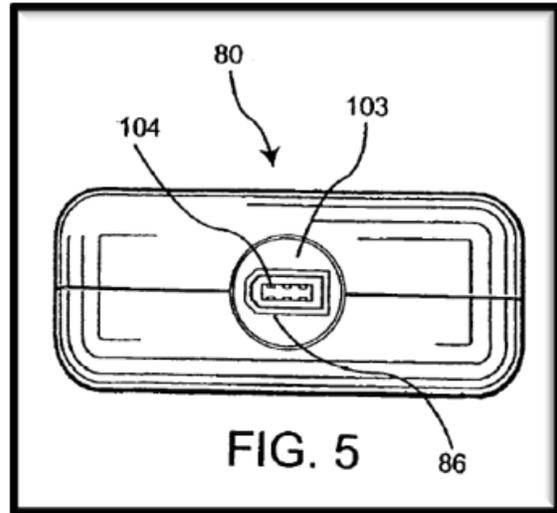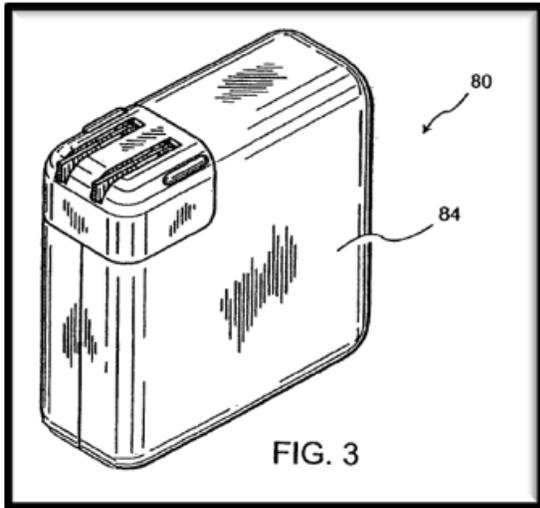

Matsumoto, Figure 1 (annotated) (showing mobile device (green), which can be connected through USB connector (4) to either a personal computer (purple) or an adapter (red)). Matsumoto further teaches that, when connected to the adapter, the mobile device need not undergo enumeration and, accordingly, 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., ¶ 160.

Accordingly, Matsumoto discloses a USB device with a corresponding adapter 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., ¶¶ 161-162. 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., ¶ 162.

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:

De Iuliis at Figures 3 and 5 (showing adapter with connection for wall-socket and data port connection to power mobile device).
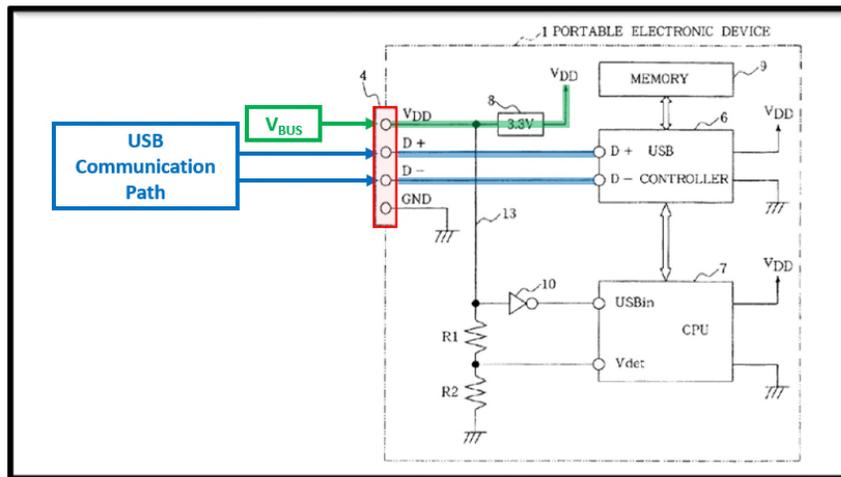
Matsumoto, Figure 1 (annotated) (showing USB Connector (red), VBUS line (green), and USB communication path (Blue)); Baker Decl., ¶ 163.

2.   Claim 1

Patent owner disclaimed Claim 1 on April 23, 2021. PAT-B ('550 File History) at 440
(April 23, 2021 Disclaimer). Because Claims 3-6 depend on Claim 1, however, Requestor sets
forth the reasons that De Iuliis in view of Matsumoto renders obvious the limitations of Claim 1
under 35 U.S.C § 103.

> **Please see attached Exhibit CC-B for a claim chart
> comparing De Iuliis in view of Matsumoto with
> Claim 1 of the '550 Patent under 35 U.S.C. § 103**

a.   *Preamble: An adapter comprising*

The preamble of Claim 1 describes "An adapter." To the extent this preamble is limiting,
it is satisfied by De Iuliis in view of Matsumoto. Specifically, De Iuliis discloses a power
adapter that can be sued to power and charge portable electronic devices. De Iuliis at Title
("Power Adapters for Powering and/or Charging Peripheral Devices"). *Id.* at Abstract ("A
power adapter for a peripheral device such as portable electronics device is disclosed.")
(emphasis added); *id.* at 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.").

FIG. 3
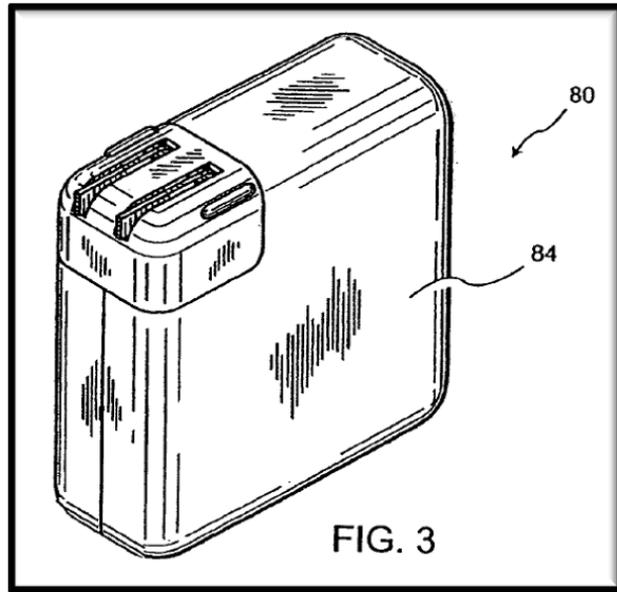
De Iuliis at Figure 3.

Matsumoto also discloses an adapter. Specifically, Matsumoto discloses a portable electronic device with a USB connection that can be connected to (1) a computer or (2) an "a.c. adaptor" for charging a device from an "external power source" like a wall-socket. Matsumoto, Abstract ("A portable electronic device . . . 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.*, 1:20-23 ("In some cases . . . 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."); *id.*, 1:36-42 ("Accordingly, it appears feasible to provide the USB connector on a portable electronic device for use with an a.c. adaptor (external power Source) . . . to connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device."); *id.* at 3:43-47 ("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.") Matsumoto, 3:46-47.
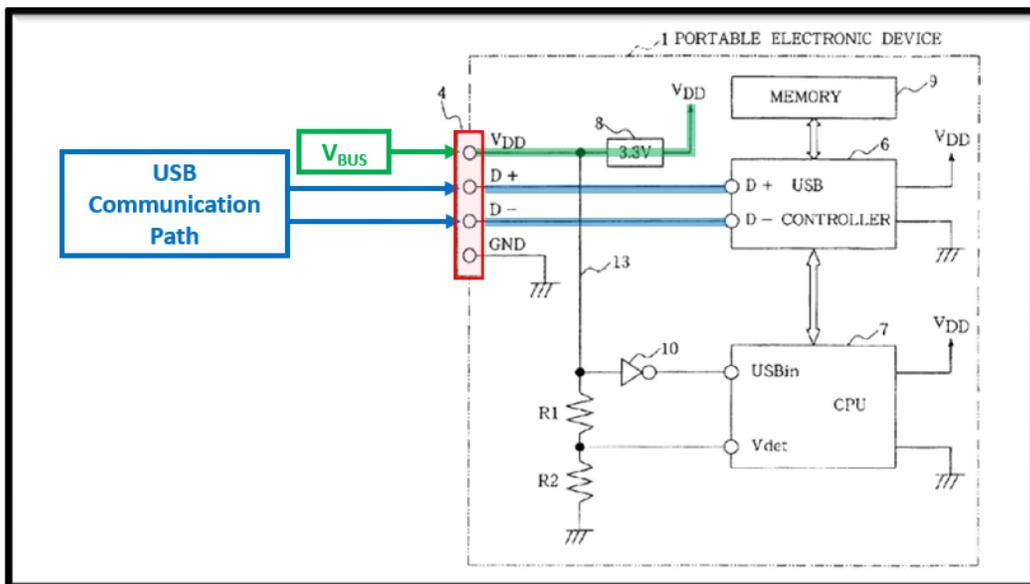
Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses an "adapter" as claimed by Claim 1 of the '550 Patent. Baker Decl., ¶¶ 164-166.

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 1 requires "a USB VBUS line and a USB communication path." De Iuliis in view of Matsumoto discloses this element. Specifically, De Iuliis in view of Matsumoto discloses a charger/adapter and mobile device that connect via a USB connection for purposes of charging. A person of ordinary skill in the art would have understood (and De Iuliis and Matsumoto expressly disclose) that the devices thus comprise four connecting lines: (1) a power/voltage line, (2) a D+ data line, (3) a D- data line, and (4) a Ground line. A person of ordinary skill in the art would have understood that the voltage line constitutes a "USB VBUS line" and that the data lines collectively comprise a "USB communication path." Baker Decl., ¶ 167.

Matsumoto teaches, for example, that the mobile device can connect to an adapter (like the adapter of De Iuliis) through a USB connection. Matsumoto, Abstract ("A portable electronic device according to the invention comprises a USB connector" and "is adapted to receive power supply from . . . an external power source 3 as connected to the USB connector 4.") (emphasis added). Matsumoto further discloses that the connector comprises connections for a "power source terminal" (USB VBUS line) and "a pair of data terminals" (USB communication path). *Id.*, 1:33-35 ("The USB connector has a pair of data terminals D+ and D- [USB Communication Path], 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."). Because they are connected through a USB connector, a person of ordinary skill in the art would

have understood that both the adapter and the portable device comprise a VBUS line

(power/voltage) and a USB communication path (the D+ and D- lines).

Matsumoto, Figure 1 (annotated) (showing USB Connector (red), VBUS line (green), and USB

communication path (Blue)).

De Iuliis similarly discloses that the power adapter includes a standard data port that can

be used to supply both power as well as data and specifically states that this can be a USB

connection. De Iuliis, Abstract ("The power adapter also includes a data port provided at a

surface of the housing. The data port is configured to provide external power to the peripheral

device."); *id.*, 2:22-29 ("The power adapter also includes a data connector assembly electrically

coupled to the power connection, the data connector assembly providing at least one combined

power [USB VBUS Line] and data connection [USB communication path], wherein the power

provided by the combined data and power connection is used to operate or charge a peripheral

device."); *id.* at 4:51-53 ("The data transmission line 58 is preferably a data transmission line

having both data [USB Communication Path] and power transmitting [USB VBUS line]

capabilities. As was stated earlier, the power transmitting capabilities are associated with data

transmissions."); *id.* at 4:55-56 ("By way of example, the data transmission line 58 may be a universal serial bus (USB)").

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses that the adapter of De Iuliis in view of Matsumoto comprises a USB VBUS line and a USB Communication path as required by Claim 1.

c. *said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification*

The second element of Claim 1 requires "said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification." De Iuliis in view of Matsumoto discloses this element. Specifically, De Iuliis in view of Matsumoto discloses that the adapter supplies power to the mobile device on the power (VBUS) line. Matsumoto, 1:33-35 ("The USB connector has a pair of data terminals D+ and D- [USB communication path], a power source terminal [USB VBUS line] and a ground terminal, <u>and can be used for supplying power to peripheral devices by way of the power source terminal [USB VBUS line]</u>.") (emphasis added); *id.* at 1:40-42 ("connect the a.c. adaptor to the power source terminal of the USB connector for the supply of power to the device"). Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses that the adapter is configured to supply current on the VBUS line.

Moreover, De Iuliis in view of Matsumoto discloses that the adapter is configured to supply current "without regard to at least one associated condition specified in a USB specification" because it is configured to (1) supply current in the upstream direction (*i.e.*, at an upstream port), (2) supply more than 0 mA (and at least 100 mA) without reaching the "Default" state, and (3) supply more than 100mA of current without reaching the "Configured" state. Each of these disregards a condition of the USB Specification. Baker Decl., ¶ 72.
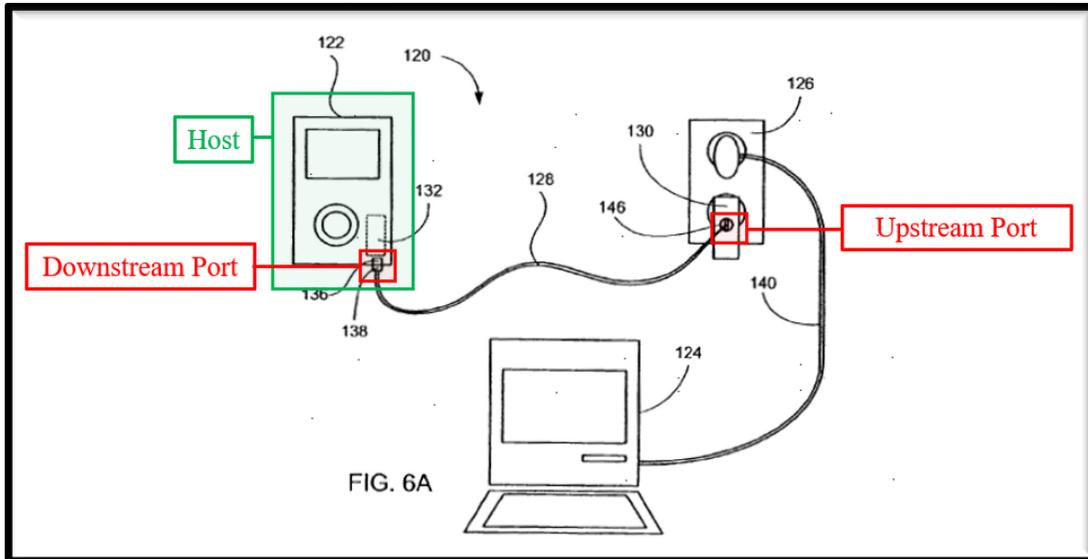
(1)   Supplying Current at an Upstream Port

As discussed in section III.A.2, *supra*, the USB specification dictates that an upstream port is the port closest to the host. USB 2.0 at 10 ("An upstream port is the port on a device electrically closest to the host . . . ."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is defined as being towards the device."). As also disclosed in section III.A.3, *supra*, it is a condition of the USB specification that no device *supply* current on the VBUS at its upstream facing port. USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time.").

De Iuliis in view of Matsumoto teaches an adapter that supplies current without regard to this condition. Specifically, a person of ordinary skill in the art would have understood that when the mobile device and adapter of De Iuliis in view of Matsumoto are connected without a separate computing device (*i.e.*, personal computer), the mobile device is the host. A USB network must have a host, and the host must comprise a USB controller and CPU. *See* Section III.A.1, *supra*; Baker Decl., ¶ 174. De Iuliis and Matsumoto disclose that the peripheral device comprises both of these elements, but the adapter does not.
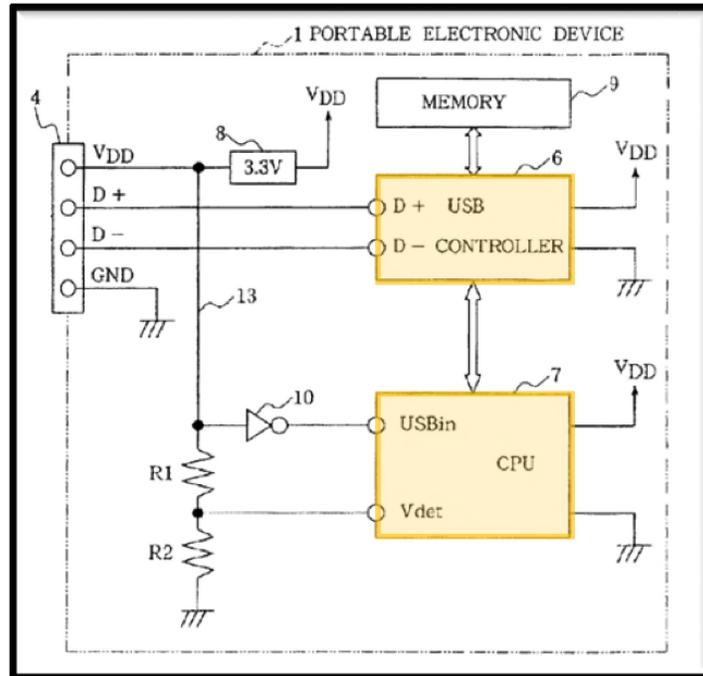
Matsumoto, Figure 1 (annotated) (showing USB Controller and CPU of portable electronic device in orange); *see also* De Iuliis, 6:55-63 ("The peripheral device 122 generally <u>represents a portable computing device</u> such as a portable computer, personal digital assistant, cellular phone, a media player, and the like. As such, the peripheral device 122 . . . . includes internal circuitry 134 for processing data. By way of example, <u>the internal circuitry may correspond to processors, controllers</u>, bridges, memory, buses and the like.") (emphasis added). Moreover, De Iuliis expressly discloses that the peripheral device may act as host. De Iuliis at 12:31-34 ("Furthermore, referring to FIG. 10, the second data port may be electrically coupled to the power connection so as to provide power to a second peripheral device (<u>which acts as the host device</u>)."); Baker Decl., ¶¶ 1749-175.

Because the mobile device is the host, the USB port of the adapter that connects to the mobile device is an "upstream" port. Baker Decl., ¶ 176. Because the adapter supplies power at that port, it supplies current without regard to at least one condition of the USB Specification, *i.e.*, that a device should not provide power at its upstream port. *Id.*

FIG. 6A

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses an adapter "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

(2) Supplying more current than Specified in the USB Specification

As discussed in section III.A.3, *supra*, the USB specification dictates a device shall not supply any current until the "Default" state and shall not supply more than 100 mA of current until the "Configured" state:

USB 2.0 at 243-244 (annotated).

De Iuliis in view of Matsumoto renders obvious an adapter that supplies current without regard to these conditions. Specifically, as noted below with respect to Claim 3, De Iuliis in view of Matsumoto discloses "discriminating means" that allow the adapter and device to engage in charging without performing enumeration. *See* Section IV.B.3, *infra*. Once the adapter and device have recognized each other through these "discriminating means," the charger simply applies voltage to the VBUS line and the mobile device draws current as needed. Baker Decl., ¶ 180. Because USB devices can be classified as either low-power (drawing 100mA) or high-power (drawing 500mA) (*see* Section III.A.4), the adapter would be configured to supply at least 100 mA (if the mobile device is a low-powered device), and it would have been obvious to

configure the adapter to supply up to 500 mA (for use with a high-powered device). Baker

Decl., ¶ 180. Indeed, as explained in Section III.A.4, *supra*, because the adapter of De Iuliis in

view of Matsumoto is "self-powered" the USB specification requires that it supply 500mA of

current. *See* Section III.A.4. Accordingly, at a minimum, the adapter must be capable of

supplying (i.e., "configured to supply") 500 mA current in case it is used with a high power

device that draws such current. In either event, the adapter would be configured to supply

current without regard to the condition/limit that no such current be supplied until the "Default"

state. *Id.*; USB 2.0 at 243-244. ("The USB device is now in the Default state and can draw no

more than 100 mA from VBUS.")

Moreover, it would have been obvious to configure the adapter to supply more than 100

mA of current prior to entering the "Configured" state. Baker Decl., ¶ 181. Indeed, once the

mobile device and the adapter recognize each other through the "discriminating means," they

operate outside of the USB Specification. Accordingly, a person of ordinary skill in the art

would have understood that the adapter can maintain a set voltage and the mobile device can

draw as much current as it needs. Baker Decl., ¶ 181. As noted above, USB devices can be

classified as either low-power (drawing 100 mA) or high-power (drawing 500 mA). *See* Section

III.A.4. It would thus have been obvious (and at least obvious to try) to configure the adapter to

supply up to 500 mA so that it can be used with a high-power USB device. Indeed, as explained

in Section III.A.4, *supra*, because the adapter of De Iuliis in view of Matsumoto is "self-

powered" the USB specification requires that it supply 500mA of current. *See* Section III.A.4.

Accordingly, at a minimum, the adapter must be capable of supplying (i.e., "configured to

supply") 500 mA current in case it is used with a high power device that draws such current.[6]

Moreover, Matsumoto does not limit the mobile device to any particular device, and De Iuliis teaches that it may be a personal computer, personal digital assistant, or cellular phone, which a person of ordinary skill in the art would draw as much current as possible. De Iuliis, 1:36-39 ("For example, the peripheral device may be a portable device such as a personal computer, personal digital assistant, cellular phone . . . . and the like.")

Accordingly, a person of ordinary skill in the art implementing the charger of De Iuliis according to the teachings of Matsumoto would have implemented the charger to supply more than 0 mA (and at least 100 mA) prior to the "Default" state and more than 100 mA of current prior to the "Configured" state. Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses that the device is "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by claim 1.

3. Claim 3

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

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 3 of the '550 Patent under 35 U.S.C. § 103**

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[6] Alternatively, if the adapter of De Iuliis in view of Matsumoto is configured to always provide less than 500 mA, then it is supplying current without regard to the condition/limit that such self-powered ports must provide 500 mA. *See* Section III.A.4.

Claim 3 requires the adapter of Claim 1. As noted in Section IV.B.2, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 1.

Claim 3 further requires "wherein said current is supplied without USB enumeration." As explained in Section III.A.4, *supra*, "enumeration" "is the activity that identifies and assigns unique addresses to the devices attached to a bus." USB 2.0 at 20 (Section 4.6.3 Bus Enumeration); *id.* at 243-244 (Section 9.1.2 Bus Enumeration) (listing the steps of enumeration). De Iuliis in view of Matsumoto discloses an adapter that meets this limitation. Specifically, De Iuliis in view of Matsumoto discloses an adapter and mobile device that use a "discriminating means" to determine when the mobile device is connected to the adapter (as opposed to a computer that may need to engage in typical USB communication). When the "discriminating means" determines that the mobile device is connected to the adapter, it avoids the enumeration process and other USB communication and proceeds only with charging and typical device operation.

Matsumoto teaches, for example, that the portable device can be connected via a USB connector to either (1) a computer or (2) an adapter (i.e., an external power source). Matsumoto, Abstract ("A portable electronic device . . . 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 2:13-25 ("The present invention provides a portable electronic device comprising a serial bus connector . . . the electronic device being capable of receiving power supply from the information processing device [computer] or an external power source [adapter] as connected to the common serios bus connector . . . ."). When the mobile device is connected to the computer, it results in USB communication (e.g., enumeration) between the two devices. *Id.*, 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 with 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.") Such communication, however, slows down the operation of the portable

electronic 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.")

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). Baker Decl., ¶ 185. Accordingly, Matsumoto discloses using "discriminating means"

to determine when the mobile device is connected to the adapter. Matsumoto, 2:58-59 ("The

discriminating means identifies the source of supply of power . . . ."); *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 . . . . <u>The control circuit discriminates among the sources of supply of</u>

<u>power</u>.") (emphasis added).

When the mobile device is connected to the adapter (instead of a typical USB device like

the computer), the control circuit will avoid the costly communication process (including

enumeration/configuration) and simply move forward with charging and usual device

operation/processing. 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.")

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses that the adapter will supply current without engaging in enumeration as required by Claim 3.

4. Claim 4

De Iuliis in view of Matsumoto renders Claim 4 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 4 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 4 of the '550 Patent under 35 U.S.C. § 103**

Claim 4 requires the adapter of Claim 1. As noted in Section IV.B.2, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 1.

Claim 4 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." De Iuliis in view of Matsumoto discloses this

element. Specifically, as explained with respect to Claim 3, De Iuliis in view of Matsumoto discloses using "discriminating means" to determine whether the mobile device is connected to a typical USB device or the adapter. There are a number of such discriminating means that would have been obvious to a person of ordinary skill in the art. Baker Decl., ¶ 188. A person of ordinary skill in the art would have found obvious—and De Iuliis and Matsumoto expressly disclose—using an "abnormal data condition" on the data lines to discriminate between a typical USB device and an adapter. Baker Decl., ¶ 188. Indeed, if the adapter presented a "normal" data condition, the mobile device would likely mistake the adapter for a typical USB device and would attempt to engage in typical USB communication/enumeration, which is what Matsumoto teaches to avoid. Baker Decl., ¶ 188.

De Iuliis in view of Matsumoto discloses that the discriminating means may comprise maintaining a low/low signal on the data lines (SE0 Signal) for an extended period of time after connection. Matsumoto discloses, for example, that the adapter may keep both of the data lines low (*i.e.*, not send any signals on either line) after being connected to the mobile device and that, after a certain period of time, the discriminating means may thus determine that the mobile device is connected to an adapter. Matsumoto, 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 <u>if data communication has not been started within the predetermined period of time, the external power source is found to be the supply source</u>.") (emphasis added). De Iuliis similarly discloses that the data connections from the adapter may be "dummy contacts," *i.e.*, connections that don't provide any signals. 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., ¶ 189

Generally, a short low/low signal is not an abnormal data condition. Baker Decl., ¶ 190. However, an extended SE0 signal (e.g., for more than 100ms) would be an abnormal data condition, particularly under the broadest reasonable interpretation of the term. Baker Decl., ¶ 190. A typical "idle" signal is either a high/low or low/high signal on the D+ and D- lines (depending on the speed of the device). Baker Decl., ¶ 190. Sending an SE0 signal for 10-20 ms is used to reset a device. Baker Decl., ¶ 190. Accordingly, sending an SE0 signal for more than 100ms upon attachment, under the Broadest Reasonable Interpretation, would be an "abnormal data condition" on the data lines because it is not defined as a valid data condition after connecting a device. Indeed, the USB Specification requires that a connecting device signal that it is connected within 100ms of detecting voltage on the VBUS line by pulling either D+ or D-positive (i.e., signaling an "attach").

Table 7-14. Device Event Timings

Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond V$_{IHZ}$ (min) (signaling attach)	T$_{SIGATT}$	Figure 7-29		100	ms

USB 2.0 at 188 (Table 7-14 Device Event Timings) (annotated); *see also* USB 2.0 at 150 (Section 7.1.7.3 Connect and Disconnect Signaling) ("$\Delta t2$ (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. $\Delta t2$ 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. $\Delta t2$ 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.)").

Accordingly, under the Broadest Reasonable Interpretation of this claim, because De Iuliis in view of Matsumoto teaches that one option for the "discriminating means" is to send no

signals (SE0) for an extended period of time, De Iuliis in view of Matsumoto discloses an adapter that supplies current "in response to an abnormal data condition on said USB communication path" as required by Claim 4.

5. Claim 5

De Iuliis in view of Matsumoto renders Claim 5 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 5 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 5 of the '550 Patent under 35 U.S.C. § 103**

Claim 5 requires the adapter of Claim 4. As noted in Section IV.B.4, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 4.

Claim 5 further requires "wherein said USB communication path includes a D+ line and a D-line." De Iuliis in view of Matsumoto discloses this element. Specifically, as noted with respect to Claim 1, De Iuliis in view of Matsumoto discloses an adapter that connects to a mobile device via a USB port. As further noted with respect to Claim 1, a person of ordinary skill in the art would have understood—and Matsumoto expressly discloses—that such a port comprises a communication path comprising a D+ and D- line.

Matsumoto, Figure 1 (annotated). In other words, a person of ordinary skill in the art would have understood that the USB connector of the adapter of De Iuliis comprises the same standard lines recited in the USB Specification and identified in Matsumoto, i.e., a VBUS line, D+ line, D- line, and ground line.

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses that the adapter comprises a USB communication path "wherein said USB communication path includes a D+ line and a D-line" as required by Claim 5.
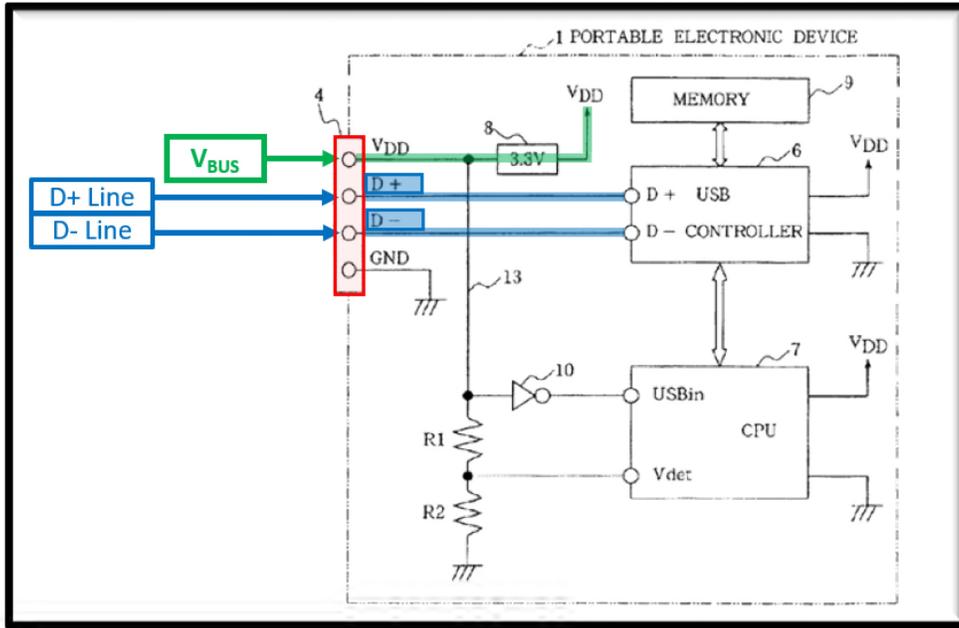
6. Claim 6

De Iuliis in view of Matsumoto renders Claim 6 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 6 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 6 of the '550 Patent under 35 U.S.C. § 103**

Claim 6 requires the adapter of Claim 5. As noted in Section IV.B.5, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 5.

Claim 6 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." De Iuliis in view of Matsumoto discloses this element. Specifically, as disclosed with respect to Claim 4, De Iuliis in view of Matsumoto discloses that the "discriminating means" for determining that the mobile device is connected to a charger/adapter may be maintaining a low/low (SE0) signal for an extended period of time (i.e., indefinitely) after the charger is connected. *See* Section IV.B.4. Because this condition exists on the D+ and D- lines, a person of ordinary skill in the art would have understood that it represents and "abnormal data line condition" on the D+ line and D- line.

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Matsumoto discloses an adapter that supplies current in response to an abnormal data condition "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line" as required by Claim 6.

7.   Claim 10

Patent owner disclaimed Claim 10 on April 23, 2021. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer). Because Claims 12-16 depend on Claim 10, however, Requestor sets forth below the reasons that De Iuliis in view of Matsumoto renders the limitations of Claim 10 obvious under 35 U.S.C § 103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 10 of the '550 Patent under 35 U.S.C. § 103**

a.   *Preamble: An adapter comprising*

The preamble of Claim 10 describes "An adapter." As discussed with respect to Claim 1, De Iuliis in view of Matsumoto discloses an adapter. *See* Section IV.B.2.a.

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 10 requires "a USB VBUS line and a USB communication path." De Iuliis in view of Matsumoto discloses this element. As explained with respect to Claim 1, De Iuliis in view of Matsumoto discloses this element. *See* Section IV.B.2.b.

Specifically, as explained with respect to Claim 1, De Iuliis in view of Matsumoto discloses a mobile USB device and associated USB adapter that connect to each other via USB connectors. *Id.* A person of ordinary skill in the art would have understood—and De Iuliis and Matsumoto expressly disclose—that such connections would comprise a USB VBUS line and a USB communication path. *Id.*

c.   *said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit.*

The second element of Claim 10 requires "said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit." De Iuliis in view of Matsumoto discloses this element. *See* Section IV.B.2.c.

First, De Iuliis in view of Matsumoto discloses an adapter that supplies current in an upstream direction at its "upstream port." *Id.* The USB Specification, however, limits the direction in which current may be supplied, i.e., it cannot be supplied at upstream ports. *Id.*

Second, De Iuliis in view of Matsumoto discloses and renders obvious an adapter that (1) supplies more than 0 mA (and at least 100 mA) prior to the "Default" state of enumeration and (2) supplies more than 100mA of current prior to the "Configured" state of enumeration. *Id.* The USB Specification, however, states that no current shall be provided prior to the Default state and no more than 100mA of current shall be supplied prior to the Configured State. *Id.*

8.   Claim 12

De Iuliis in view of Matsumoto renders Claim 12 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 12 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 12 of the '550 Patent under 35 U.S.C. § 103**

Claim 12 requires the adapter of Claim 10. As noted in Section IV.B.7, De Iuliis in view

of Matsumoto discloses or renders obvious the adapter of Claim 10.

Claim 12 further requires "wherein said current is supplied without USB enumeration."

As explained with respect to Claim 3, De Iuliis in view of Matsumoto discloses this element.

See Section IV.B.3.

Specifically, De Iuliis in view of Matsumoto discloses that the adapter and mobile device

use "discriminating means" to determine when the mobile device is connected to the adapter and

not a typical USB device (e.g., a computer). *Id.* When the mobile device is connected to the

computer it will engage in typical USB communication (including enumeration). *Id.* When the

mobile device is connected to the adapter the devices will not engage in enumeration. *Id.*

9.   Claim 13

De Iuliis in view of Matsumoto renders Claim 13 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 13 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

> **Please see attached Exhibit CC-B for a claim chart comparing De Iuliis in view of Matsumoto with Claim 13 of the '550 Patent under 35 U.S.C. § 103**

Claim 13 requires the adapter of Claim 10. As noted in Section IV.B.7, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 10.

Claim 13 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." As explained with respect to Claim 4, De Iuliis in view of Matsumoto discloses this element. *See* Section IV.B.4.

Specifically, De Iuliis in view of Matsumoto discloses that the mobile device uses "discriminating means" to determine when the mobile device is connected to a charger. *Id.* A person of ordinary skill in the art would have found obvious—and Matsumoto expressly discloses—that this could be done with a condition on the data lines. *Id.* A person of ordinary skill in the art would have further understood that such a condition would have to be an "abnormal data condition" in order for the "discriminating means" to distinguish between normal USB operation (e.g., communication from a connected) and abnormal USB operation (connection to a charger without such communication). *Id.* Matsumoto and De Iuliis disclose, for example, that an extended SE0 signal (e.g., more than 100ms) could be used to distinguish the adapter from a typical USB device. *Id.*

10.   Claim 14

De Iuliis in view of Matsumoto renders Claim 14 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 14 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

Claim 14 requires the adapter of Claim 13. As noted in Section IV.B.9, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 13.

Claim 14 further requires "wherein said USB communication path includes a D+ line and a D-line." As explained with respect to Claim 5, De Iuliis in view of Matsumoto discloses this element. *See* Section IV.B.5.

11.   Claim 15

De Iuliis in view of Matsumoto renders Claim 15 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 15 based on De Iuliis in view of Matsumoto under 35 U.S.C. §103.

Claim 15 requires the adapter of Claim 14. As noted in Section IV.B10, De Iuliis in view of Matsumoto discloses or renders obvious the adapter of Claim 14.

Claim 15 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." As explained with respect to Claim 6, De Iuliis in view of Matsumoto discloses this element. *See* Section IV.B.6.

C.   **Morita in view of Shiga renders Claims 4-8 and 13-17 Obvious.**

1.   Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Morita and Shiga. OTH-A (Baker Decl.,), ¶¶ 203-207.

Both Morita and Shiga relate to USB compatible devices including computing host devices (e.g., computer, videophone) and related peripheral devices (e.g., keyboard, mouse). *See e.g.*, Morita at Claims 1-2 ("A charger capable of charging a mobile phone and coupling to an external device . . . wherein the first coupling means and the second coupling means are configured from a USB format"); Shiga at Title ("USB Apparatus that turns on computer power supply . . . ."); Baker Decl., ¶ 204.   Indeed, both teach that such devices can be used together, and both teach improvements for using a host computing device in combination with a peripheral keyboard. *Id.;* Baker Decl., ¶ 204.

Morita, for example, discloses a charging dock that can charge a mobile videophone while connecting it to multiple peripheral devices, e.g., a keyboard, mouse, and monitor. Morita, ¶ 0005 ("when connecting the mobile videophone device to a device, the mobile videophone device being the host end, it similarly becomes necessary to increase the number of USB hubs according to the number of peripherals used.") and ¶ 0012 ("24 illustrates a third USB port for coupling devices such as a mouse, keyboard, and monitor").
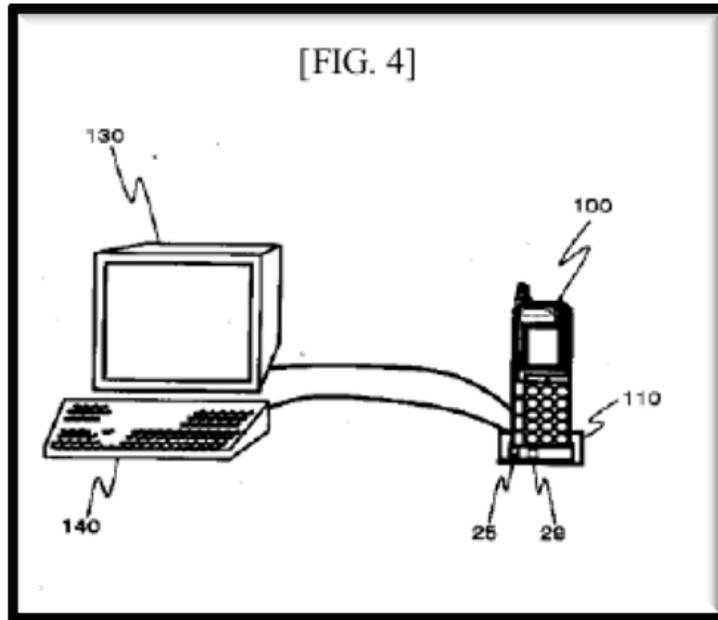
[FIG. 4]

Morita, Figure 4 (showing second mode in which no personal computer is connected and the mobile videophone acts as the host). Morita, however, does not disclose or limit the functionality of the peripherals to be used with the charger dock and the mobile videophone.

Accordingly, as of the priority date of the '550 Patent a person seeking to implement the system disclosed by Morita would have been motivated to use prior art peripheral devices with the charger dock of Morita and the mobile videophone. Baker Decl., ¶ 206. Shiga, which is also prior art to the '550 Patent, also discloses a system and method for using such peripheral devices in combination with a computing device. Baker Decl., ¶ 206. Specifically, Shiga teaches a helpful feature for improving such peripherals, *i.e.*, a power-on/power-off switch that can be used to turn the host device on and off. Shiga, Abstract ("An apparatus for turning on a computer power supply . . . when an input operation of a predetermined key is carried out . . . ."). Shiga discloses that this "power-on" and "power-off" switch can be implemented, for example, on a peripheral keyboard like the one connected to the charger dock of Morita. *Id.* at 2:44-47 ("Here, the operation may be performed on a special-purpose power-on key on the keyboard or

on any combination of a plurality of keys.") *Id.* at 2:4-8 ("There has been a demand for adding value to such computers connected with the USB interface by providing a function that the USB does not have, that is, by providing a key called a power-on key, which allows the host computer to be started by a key input operation at a keyboard."); *id.* at 7:46-55 ("When a predetermined key on the keyboard 11 is operated . . . the main power is turned off.")

A person of ordinary skill in the art would have immediately recognized the benefit of the teachings of Shiga in a system like that disclosed in Morita (*i.e.*, where the disclosed peripheral devices is connected to the host device through a dock). Baker Decl., ¶ 207. When the user is done using the host device (e.g., the mobile video phone) for a particular purpose, he or she does not have to remove the phone from the dock to turn it on or off. Baker Decl., ¶ 207. Moreover, Shiga expressly teaches how to implement the claimed feature in a host computer device attached to a peripheral keyboard and, accordingly, applying the teachings of Shiga to the videophone, charger, and peripheral keyboard of Morita would simply involve applying a known technique to a similar device. Baker Decl., ¶ 207.
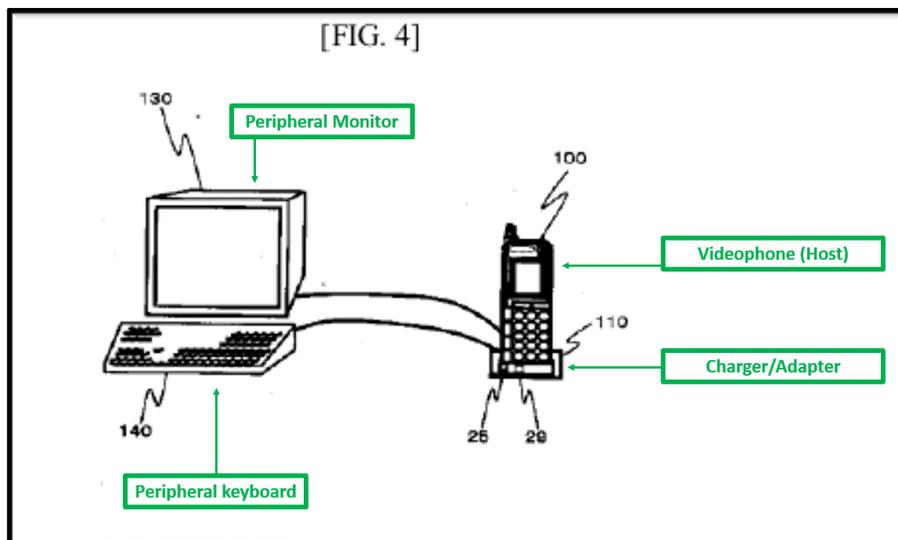
Morita, Figure 4 (annotated) (showing configuration in which mobile videophone is connected to peripheral devices (keyboard and monitor) but no personal computer).

2.   Claim 1

Patent owner disclaimed Claim 1 on April 23, 2021. PAT-B ('550 File History) at 440
(April 23, 2021 Disclaimer). Because Claims 4-8 depend on Claim 1, however, Requestor sets
forth the reasons that Morita in view of Shiga renders obvious the limitations of Claim 1 under
35 U.S.C § 103.

> **Please see attached Exhibit CC-C for a claim chart
> comparing Morita in view of Shiga with Claim 1 of
> the '550 Patent under 35 U.S.C. § 103**

a.   *Preamble: An adapter comprising*

The preamble of Claim 1 describes "An adapter." To the extent this preamble is limiting,
it is satisfied by Morita in view of Shiga. Specifically, Morita discloses an "charger" that can
connect to a power source (*e.g.*, a wall socket) and to a mobile "videophone" and thereby power
and charge the videophone. Morita, Abstract ("To provide a hub-controllable charger [adapter]
capable of accessing a plurality of external devices in a state wherein a mobile phone is coupled
to the charger, and capable of managing transmission and branching of signals between each.")
(emphasis added); *id.*, at Claim 1 ("A charger [adapter] capable of charging a mobile phone.");
id., ¶ 0001 ("The present invention relates to a charger capable of charging a mobile phone.")
(emphasis added); *id.*, ¶ 0016 ("The power supply cable 22 is connected to an outlet or the like
connected to a commercial power supply, and the supplied power supply volage is supplied to
the mobile videophone device 100 via the USB port 21 . . . ."); *id.*, ¶ 0012 ("22 illustrates a
power supply connection unit such as an outlet").
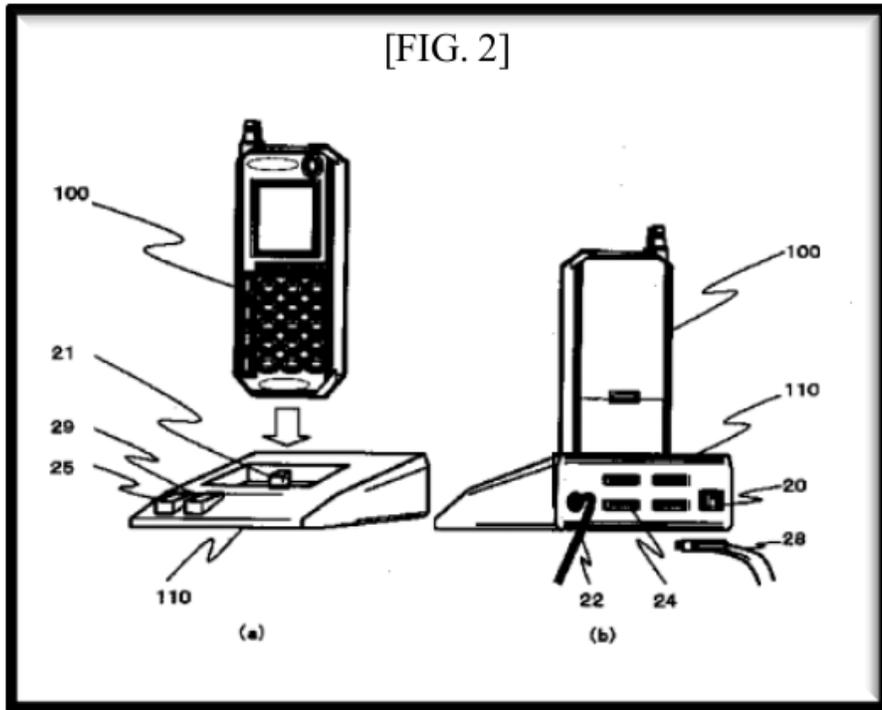
Morita, Figure 2 (showing videophone and charger/adapter).
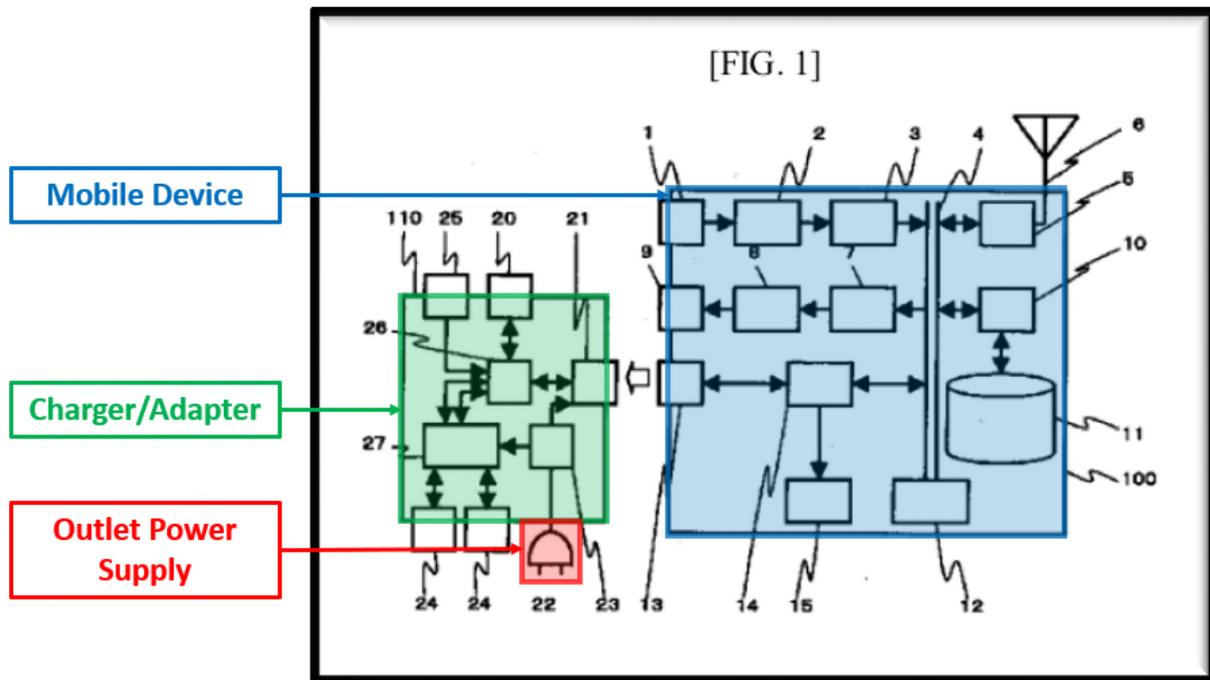
Morita, Figure 1 (annotated) (showing adapter (green) with connection to wall socket (red)).

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga discloses an adapter.

b. *a USB VBUS line and a USB communication path*

The first element of Claim 1 requires "a USB VBUS line and a USB communication path." Morita in view of Shiga discloses this element. Specifically, Morita discloses that the charger (adapter) connects to various devices through USB connections, including the videophone that the charger is intended to charge and various peripheral devices (keyboard, mouse, etc.). Morita, Claim 1 ("A charger [adapter] capable of charging a mobile phone and coupling to an external device, comprising: first coupling means for coupling to a mobile phone, one or a plurality of second coupling means for coupling to an external device.") (emphasis added); *id.*, Claim 2 ("The charger according to claim 1, wherein the first coupling means and the second coupling means are configured from a USB format.") (emphasis added); *id.*, ¶ 0001 ("The present invention relates to a charger capable of charging a mobile phone and coupling to an external device and more specifically relates to a USB format charger provided with a HUB function capable of connecting a plurality of external devices.") (emphasis added); *id.*, ¶ 0011 ("Furthermore, the charger according to claim 2 is characterized by the first coupling means and second coupling means being configured from a USB format.").
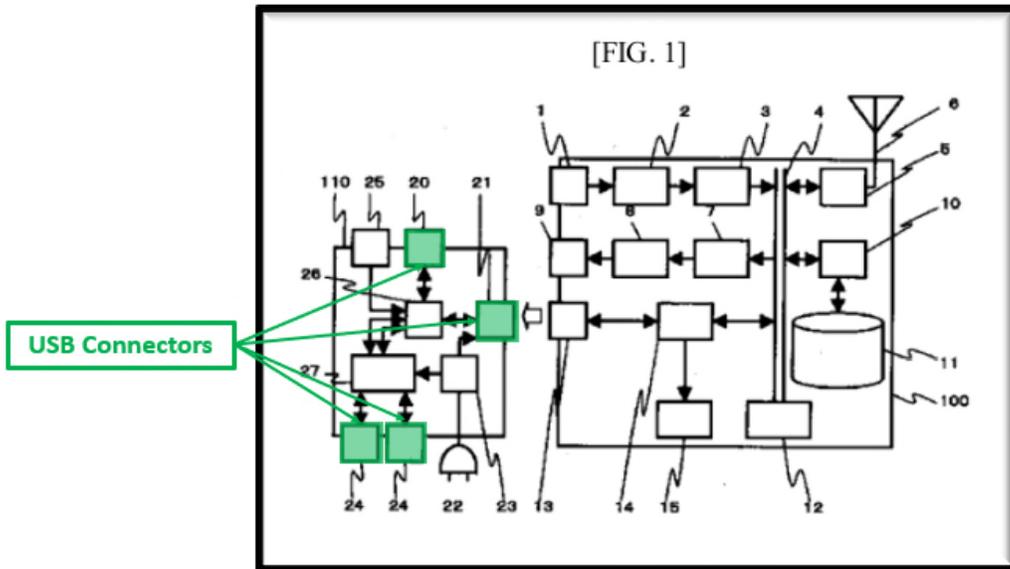
Morita, Figure 1 (annotated) (showing "First USB port" (20), "Second USB Port" (21) and

"Third USB Port[s]" (24)); *see also* Morita at "Description of Reference Numerals."

A person of ordinary skill would have understood—and Shiga expressly discloses—that

USB connections like those disclosed for the charger of Morita include four lines: a VBUS; two

data lines (D+ and D-) (collectively a USB Communication Path); and a ground line. Baker

Decl., ¶ 210.
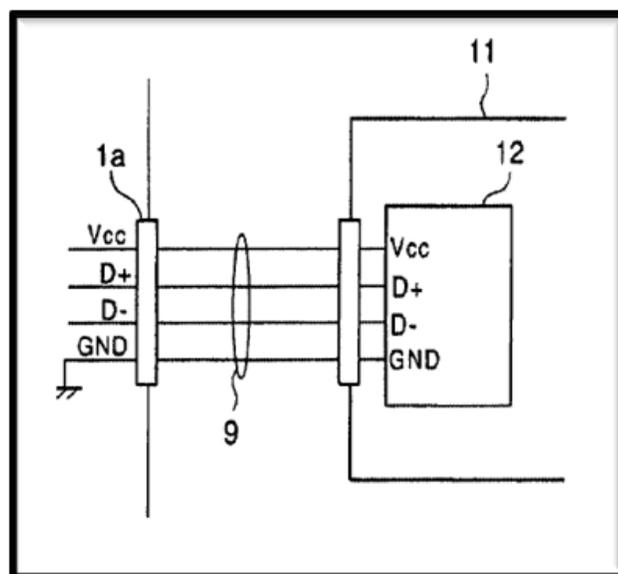
Shiga, Figure 1 (excerpted) (showing Vcc (VBUS), D+ and D- (USB communication Path), and GND (Ground)); *id.*, at 4:15-19 ("The USB chip 2 includes a power supply input terminal Vcc [VBUS], a ground terminal GND, a first signal line D+, and a second signal line D- [USB Communication Path], which correspond to those in a USB interface specification."); *see also* Section III.A.2, *supra* (describing USB Specification, which would have been known to a person of ordinary skill in the art).

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga discloses an adapter comprising "a USB VBUS line and a USB communication path."

> **c.** ***said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification***

The second element of Claim 1 requires "said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification." Morita in view of Shiga discloses this element. Specifically, Morita in view of Shiga renders obvious a charger/adapter that is configured to supply current at an upstream port.

As discussed in section III.A.2, *supra*, the USB specification dictates that an upstream port is the port closest to the host. USB 2.0 at 10 ("An upstream port is the port on a device electrically closest to the host . . . ."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is defined as being towards the device."). As also disclosed in section III.A.3, *supra*, it is a condition of the USB specification that no device supply current on the VBUS at its upstream facing port. USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time.").

Morita in view of Shiga teaches an adapter that supplies current without regard to this condition. Baker Decl., ¶¶ 213-215. Specifically, as the Board recently found, Morita discloses

that the charger has two modes of operation. *Id.* "In the first mode, the charger is connected to a personal computer through port 20, to the mobile device through port 21, and external peripherals such as a mouse and keyboard through port 24." *Id.* "In this first mode, USB hub control unit 27 sets the personal computer as a USB host and the mobile device as a device, enabling access to the hard disk inside the mobile device via the keyboard that is connected to USB port 24 as an external device." *Id.*; Morita, ¶ 0015 ("Normally, when connecting another host personal computer, <u>the other host personal computer is connected to the first USB port 20 via a USB cable</u>, the connection switching unit 26 connects the connection destination of the first USB port 20 to the USB hub control unit 27, the connection destination being the host end, and <u>the mobile videophone device 100 connected to the second USB port 21 is connected to the USB hub control unit 27 as a device</u>.")

"In the second mode, the connection switching unit of the charger changes which port is connected to USB hub control unit 27, so that the mobile device as set as the USB host and port 20, connected to the personal computer, 'becomes vacant' (*i.e.*, is disabled)." Morita '550 Decision at 10. "In this second mode, the external peripherals, such as the keyboard and monitor, remain connected to port 24 as peripherals to the mobile device." *Id.* "That is, in the second mode of operation, Morita's mobile device continues to charge and be in USB communication with external peripheral devices through USB ports 24." *Id.* at 14; Morita, ¶ 0015 ("On the other hand, when the mobile videophone device 100 is used as the host personal computer, the connection switching unit 26 connects the second USB port 21 to the USB hub control unit 27 <u>as the host end</u>,) (emphasis added); *id.* at ¶ 0018 ("In FIG. 4, the mobile videophone device 100 is set to operate as a device for host controlling a connected device.")

[FIG. 4]

Morita, Figure 4 (showing second mode in which no personal computer is connected and the mobile videophone acts as the host); Morita, ¶ 0015 ("On the other hand, <u>when the mobile videophone device 100 is used as the host personal computer</u>, the connection switching unit 26 connects the second USB port 21 to the USB hub control unit 27 <u>as the host end</u> . . . .) (emphasis added); *id.* at ¶ 0018 ("In FIG. 4, the mobile videophone device 100 is set to operate as a device for host controlling a connected device.")

Because the videophone of Morita is the host in the second mode of operation, the USB port of the charger (adapter) that connects to the videophone (host) is an "upstream" port. Accordingly, in this configuration, the charger supplies power at its upstream port. Morita, ¶ 0022 ("[T]he mobile phone always accesses the external device while receiving the supply of power from the charger, and thus the mobile phone can be used without worrying about battery consumption due to long-term and continuous use."); *id.*, ¶ 0019 ("Thus, the mobile videophone device 100 on the host end can be continuously used for a long time.")

Because the charger of Morita in view of Shiga supplies power at its upstream port in this configuration, under the broadest reasonable interpretation, it is "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as requires by Claim 1. Baker Decl., ¶ 216.

3.   Claim 4

Morita in view of Shiga renders Claim 4 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 4 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 4 of the '550 Patent under 35 U.S.C. § 103**

Claim 4 requires the adapter of Claim 1. As noted in Section IV.C.2, Morita in view of Shiga discloses or renders obvious the adapter of Claim 1.

Claim 4 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." Morita in view of Shiga discloses this element. Specifically, Morita in view of Shiga discloses a system comprising the host videophone, connected to the USB charger, connected to the peripheral keyboard. The peripheral keyboard comprises a "power-on" and "power-off" button capable of turning the host videophone on or off while docked in the charger. To power-on the videophone from a powered-off state, the keyboard sends an SE1 signal—which, as descried in more detail in Section IV.A.4.b and below, is an "abnormal data condition"—through the charger to the videophone. The videophone will then turn on, and the charger will supply current to the videophone. Under the broadest

reasonable interpretation, the adapter is thus configured to supply current upstream to a host device "in response to an abnormal data condition on said USB communication path."

Specifically, as noted above, Morita discloses a mobile video phone that can be connected via USB connection to charger dock. Morita further discloses that the charger dock can also be connected to peripheral devices (e.g., keyboard, mouse) through other USB ports such that the peripherals can be used with videophone as if connected directly to said videophone. Morita, ¶ 0001 ("The present invention relates to a charger capable of charging a mobile phone and coupling to an external device and more specifically relates to a USB format charger provided with a HUB function capable of connecting a plurality of external devices.") (emphasis added); id., Abstract ("To provide a hub-controllable charger [adapter] capable of accessing a plurality of external devices in a state wherein a mobile phone is coupled to the charger, and capable of managing transmission and branching of signals between each.") (emphasis added).

[FIG. 4]
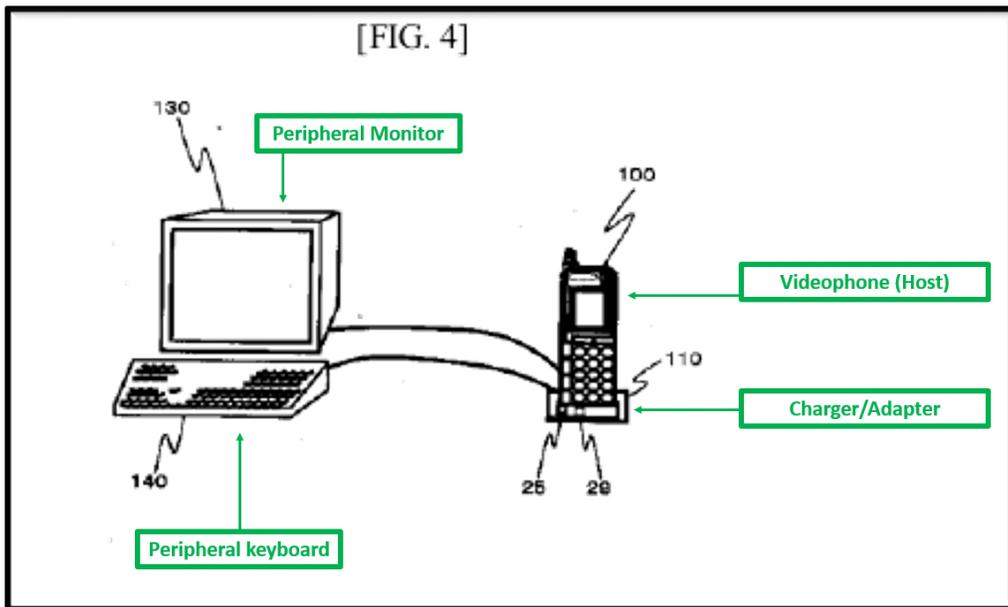
Morita, Figure 4 (annotated) (showing configuration in which mobile videophone is connected to peripheral devices (keyboard and monitor) but no personal computer). Thus, the adapter/charger

of Morita allows the user to operate the videophone of Morita using said peripheral devices while the phone is docked in the charger.

Shiga in turn, discloses certain improvements that can be made to a peripheral keyboard and a host computing device like the keyboard and the videophone of Morita. Specifically, Shiga discloses the keyboard can be implemented with a "power-on" and "power-off" key that can be used to power-on and power-off a connected host device like the mobile videophone of Morita. Shiga, 2:43-49 ("When the predetermined operation is performed at the input device [keyboard], the main power supply is turned on. Here, the operation may be performed on a special-purpose power-on key on the keyboard or on any combination of a plurality of keys."). Shiga further discloses a circuit that can be implemented in the host device to turn the device off or on in response to the signals sent by the keyboard. Shiga, Figure 1. A person of ordinary skill in the art would have understood that the teachings of Shiga could be applied to the keyboard, charger, and videophone of Morita. Baker Decl., ¶ 219.

[FIG. 4]

Videophone is powered on/off by keyboard.

Charger sends and receives signals to/from keyboard and videophone.

Peripheral keyboard with power-on/power-off capability
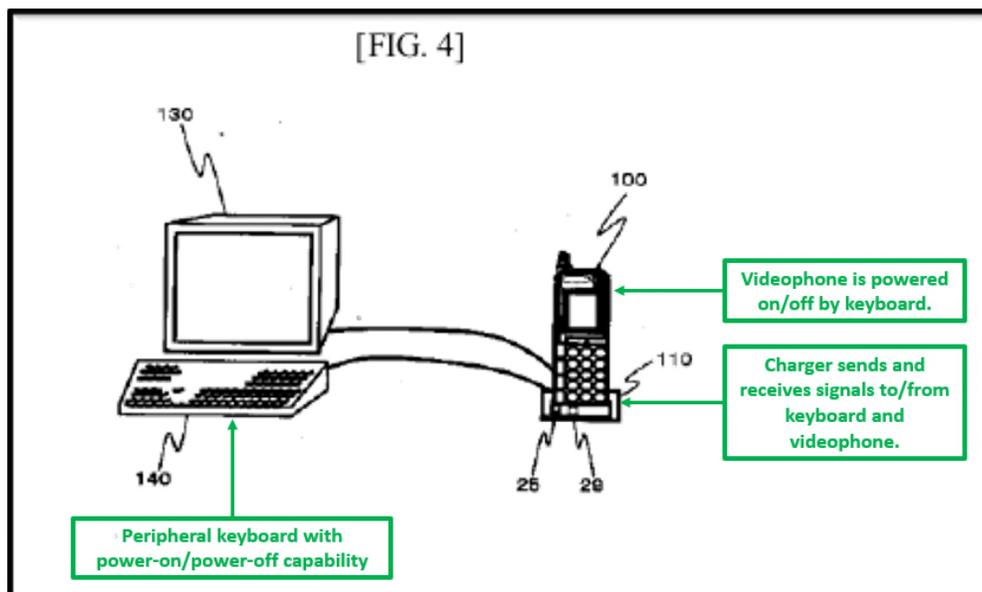
Morita, Figure 4 (showing configuration with videophone has host connected to peripherals, e.g., a keyboard with the functionality of Shiga and a monitor).

Shiga specifically discloses that when the peripheral device (keyboard) is connected to the host device (videophone) through USB connections, the power-on signal can be a logic high signal on each of the data lines, *i.e.*, a high/high signal on the USB communication path (D+ and D-). Shiga, 3:34-39 ("[T]the predetermined operation [power-on button] may be performed at the input device in order to output H signals of a predetermined pulse width to both the first signal line and the second signal line [high/high signal], after which the H signals with a predetermined pulse width equal to or greater than the predetermined pulse width are output from the AND circuit to turn on the power supply."); *id.*, 6:34-47 ("When the power-on key on the keyboard 11 is operated . . . predetermined signals are generated by the aforementioned 8-bit microcontroller (not shown), which is a controlling means (or signal-generating means) at the key board 11 side. The first signal line D+ and the second signal line D- are in a fourth mode in which both signal lines D+ and D- are in the H state. The pulse width and the pulse voltage of the predetermined Signals are, for example, 50 ms and 3 volts, respectively.") (emphasis added).

Shiga further discloses that this high/high signal (SE1) is an abnormal data condition and, thus, it allows the host device to distinguish the signal from normal USB operations and recognize the signal as a start-up signal. *Id.* at 3:40-56 ("The communication mode in which both of the first signal line and the second signal line are in an H state result from a combination that does not exist in ordinary USB standard operation modes [abnormal data condition]. Therefore, when the wake-up means is constructed so that it starts up when H signals are applied to both of these lines, there is no obstacle to carrying out ordinary communications using the USB interface. When the communication mode is switched at the USB interface, the first signal line and the second signal line may both be instantaneously set in the H state. When the duration in which the first signal line and the second signal line are in the H state becomes equal to or greater than a predetermined time period (more specifically, a time period which is longer than a

USB Standard Signal transfer rate), and an attempt is made to start up the wake-up means, it is possible to prevent confusion with the case where communication modes are switched by the USB interface.").

TABLE 1			
	Low Speed	Full Speed	Unconnected
D+	L (Hi-Z)	H	L (Hi-Z)
D−	H (Hi-Z)	L (Hi-Z)	L (Hi-Z)

Shiga, 5:38-45 (showing normal data conditions); *id.*, 5:59-62 ("The state in which both of these first and the second signal lines D+ and D- are in the H state is not a USB standard state."); *id.* at 6:47-58 ("The fourth mode of first signal line D+ and second signal line D- in which both of them are in the H level state is not shown in Table 1 because it is not a USB standard mode. Taking into account that the data transfer speed of the USB is measured in nanoseconds (nsec), it can be said that a pulse width of 50 ms is very large. Therefore, even when fourth mode signals (H level signals with a pulse width of 50 ms) are set as signals that are not USB Standard signals, and then transmitted to first signal line D+ and second signal line D-, they can be easily distinguished from USB standard data signals.")

A person of ordinary skill in the art would have understood that, once powered on, the host device (the videophone) and the charger would engage in typical USB operations. Baker Decl., ¶ 222. That is, as disclosed with respect to Claim 1, the charger (adapter) would supply current on the VBUS line in order to charge the videophone. *See* claim 1; Baker Decl., ¶ 222. A person of ordinary skill in the art would have understood, for example, that enumeration would occur and the charger could provide up to 100 mA of current if the videophone is a lower power device or up to 500mA of current if the device is a high-power device after enumeration. Baker Decl., ¶ 222. The charger only supplies this current because the "power-on" signal

(abnormal data signal) turned on the host videophone. Accordingly, under the Broadest Reasonable Interpretation, the current is supplied "in response to" the abnormal data condition.

Accordingly, Morita in view of Shiga discloses that the peripheral device of Shiga (keyboard) can be used to power-on the mobile device of Morita by sending and SE1 signal through the charger of Morita, and the mobile device subsequently draws current from the charger. Baker Decl., ¶ 223. Thus, under the broadest reasonable interpretation of this claim, Morita in view of Shiga discloses an adapter that is configured to supply current on the VBUS line "in response to an abnormal data condition on said USB communication path." Baker Decl., ¶ 223.

    4.   <u>Claim 5</u>

Morita in view of Shiga renders Claim 5 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 5 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 5 of the '550 Patent under 35 U.S.C. § 103**

Claim 5 requires the adapter of Claim 4. As noted in Section IV.C.3, Morita in view of Shiga discloses or renders obvious the adapter of Claim 4.

Claim 5 further requires "wherein said USB communication path includes a D+ line and a D-line." Morita in view of Shiga discloses this element. Specifically, as noted with respect to Claim 1, Morita in view of Shiga discloses a charger (adapter) that connects to a mobile device via a USB port. *See* Section IV.C.2.b. As further noted with respect to Claim 1, a person of

ordinary skill in the art would have understood—and Shiga expressly discloses—that the

connection would comprise a communication path comprising a D+ and D- line. *Id.*

Shiga, Figure 1 (excerpted) (showing Vcc (VBUS), D+ and D- (USB communication Path), and

GND (Ground)).

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga

discloses that "said USB communication path includes a D+ line and a D-line."

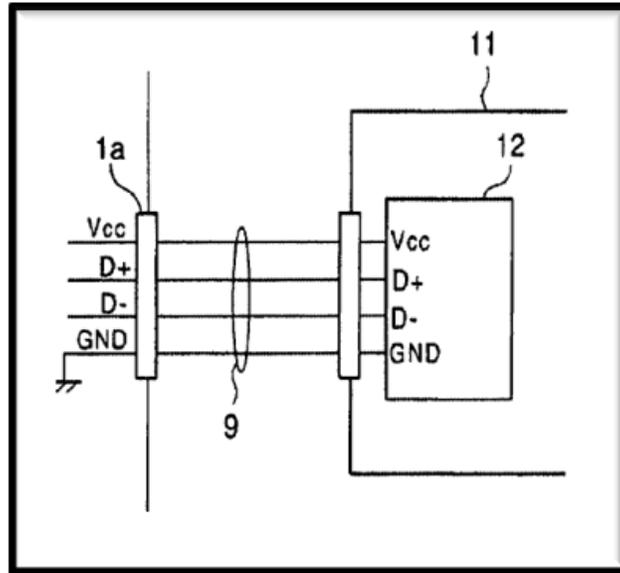### 5. Claim 6

Morita in view of Shiga renders Claim 6 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 6 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart
> comparing Morita in view of Shiga with Claim 6 of
> the '550 Patent under 35 U.S.C. § 103**

Claim 6 requires the adapter of Claim 5. As noted in Section IV.C.4, Morita in view of Shiga discloses or renders obvious the adapter of Claim 5.

Claim 6 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." Morita in view of Shiga discloses this element. Specifically, as disclosed with respect to Claim 4, Morita in view of Shiga discloses that the peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the videophone of Morita (which is connected through the charger of Morita). *See* Section IV.C.3. Shiga further discloses that such means causes the peripheral keyboard to send a logic high/high (SE1) signal to the charger of Morita, which sends the signal to the videophone of Morita, which then powers on. *Id.* A person of ordinary skill in the art would have understood—and Shiga expressly discloses—that the SE1 signal is an abnormal data line condition on the D+ and D- lines as required by Claim 6.

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga discloses that "said abnormal data condition is an abnormal data line condition on said D+ line and said D-line."

6.   Claim 7

Morita in view of Shiga renders Claim 7 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 7 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 7 of the '550 Patent under 35 U.S.C. § 103**

Claim 7 requires the adapter of Claim 6. As noted in Section IV.C.5, Morita in view of Shiga discloses or renders obvious the adapter of Claim 6.

Claim 7 further requires "wherein said abnormal data line condition is a logic high signal on each of said D+ and D lines." Morita in view of Shiga discloses this element. Specifically, as explained with respect to Claim 4, Morita in view of Shiga discloses that the peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the videophone of Morita (which is connected through the charger of Morita). *See* Section IV.C.3. Shiga further discloses that such means causes the peripheral keyboard to send a logic high/high (SE1) signal to the charger of Morita, which sends the signal to the videophone of Morita, which then powers on. *Id.* A person of ordinary skill in the art would have understood—and Shiga expressly discloses that the SE1 signal is a logic high signal on each of said D+ and D- lines. *Id.*

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga discloses that "said abnormal data line condition is a logic high signal on each of said D+ and D lines."

7.   Claim 8

Morita in view of Shiga 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 8 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 8 of the '550 Patent under 35 U.S.C. § 103**

Claim 8 requires the adapter of Claim 7. As noted in Section IV.C.6, Morita in view of Shiga discloses or renders obvious the adapter of Claim 7.

Claim 8 further requires "wherein each said logic high signals is greater than 2V." Morita in view of Shiga discloses this element. Specifically, as explained with respect to Claim 4, Morita in view of Shiga discloses that the peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the videophone of Morita (which is connected through the charger of Morita). *See* Section IV.C.3. Shiga further discloses that such means causes the peripheral keyboard to send a logic high/high (SE1) signal to the charger of Morita, which sends the signal to the videophone of Morita, which then powers on. *Id.*

Shiga also specifically discloses that the SE1 signal may comprise logic high signals of, for example, 3 volts on each of the data lines for 50ms. Shiga, 6:43-47 ("The first signal line D+ and the second signal line D- are in a fourth mode in which both signal lines D+ and D- are in the H state. The pulse width and the pulse voltage of the predetermined signals are, for example, 50 ms <u>and 3 volts</u>, respectively.") (emphasis added).

Accordingly, under the broadest reasonable interpretation, Morita in view of Shiga discloses that the SE1 signal is a logic high signal on each of said D+ and D- lines of greater than 2 volts. *Id.*

8.   Claim 10

Patent owner disclaimed Claim 10 on April 23, 2021. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer). Because Claims 13-17 depend on Claim 10, however, Requestor sets forth below the reasons that Morita in view of Shiga renders the limitations of Claim 10 obvious under 35 U.S.C § 103.

a.   *Preamble: An adapter comprising*

The preamble of Claim 10 describes "An adapter." As explained with respect to Claim 1, Morita in view of Shiga discloses this element. *See* Section IV.C.2.a. Specifically, Morita discloses an adapter for charging a mobile videophone. *Id.*

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 10 requires "a USB VBUS line and a USB communication path." As explained with respect to Claim 1, Morita in view of Shiga discloses this element. *See* Section IV.C.2.b.

Specifically, Morita discloses an adapter that can draw power from a wall outlet and supply power to a mobile videophone via a USB connection. *Id.* Morita further discloses that the charger can be connected to peripheral devices (like the keyboard of Shiga) via a USB connection as well. *Id.* A person of ordinary skill in the art would have understood—and Shiga expressly discloses—that such USB ports/connectors comprise USB VBUS line and a USB communication path (D+ and D- lines). *Id.*

c.   *said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit.*

The second element of Claim 10 requires "said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit." As explained with respect to Claim 1, Morita in view of Shiga discloses this element. *See* Section IV.C.2.c. Specifically, a person of ordinary skill in the art would have understood—and Morita expressly discloses—that the adapter is configured to supply power at an upstream port. This disregards

the USB Specification which limits the types of ports that can supply power to downstream ports. *Id.*

9.   Claim 13

Morita in view of Shiga renders Claim 13 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 13 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 13 of the '550 Patent under 35 U.S.C. § 103**

Claim 13 requires the adapter of Claim 10. As noted in Section IV.C.8, Morita in view of Shiga discloses or renders obvious the adapter of Claim 10.

Claim 13 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." As explained with respect to Claim 4, Morita in view of Shiga discloses this element. *See* Section IV.C.3. Specifically, Morita in view of Shiga discloses that the charger of Morita can be connected to the videophone of Morita and the keyboard of Shiga. *Id.* The peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the videophone of Morita (pursuant to the teachings of Shiga). *Id.* To power-on the videophone from a powered-off state, the keyboard sends an SE1 signal, which is an "abnormal data condition" through the charger to the videophone. *Id.* The videophone will then turn on, and the charger will supply current to the videophone. Under the broadest reasonable interpretation, the adapter is thus configured to supply current upstream to a host device "in response to an abnormal data condition on said USB communication path." *Id.*

10. Claim 14

Morita in view of Shiga renders Claim 14 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 14 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 14 of the '550 Patent under 35 U.S.C. § 103**

Claim 14 requires the adapter of Claim 13. As noted in Section IV.C.9, Morita in view of

Shiga discloses or renders obvious the adapter of Claim 13.

Claim 14 further requires "wherein said USB communication path includes a D+ line and

a D-line." As explained with respect to Claim 5, Morita in view of Shiga discloses this element.

See Section IV.C.4.

11. Claim 15

Morita in view of Shiga renders Claim 15 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 15 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 15 of the '550 Patent under 35 U.S.C. § 103**

Claim 15 requires the adapter of Claim 14. As noted in Section IV.C.10, Morita in view

of Shiga discloses or renders obvious the adapter of Claim 14.

Claim 15 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." As explained with respect to Claim 6, Morita in view of Shiga discloses this element. *See* Section IV.C.5.

12.   Claim 16

Morita in view of Shiga renders Claim 16 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 16 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 16 of the '550 Patent under 35 U.S.C. § 103**

Claim 16 requires the adapter of Claim 15. As noted in Section IV.C.11, Morita in view of Shiga discloses or renders obvious the adapter of Claim 15.

Claim 16 further requires "wherein said abnormal data line condition is a logic high signal on each of said D+ and D-lines." As explained with respect to Claim 7, Morita in view of Shiga discloses this element. *See* Section IV.C.6.

13.   Claim 17

Morita in view of Shiga renders Claim 17 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 17 based on Morita in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-C for a claim chart comparing Morita in view of Shiga with Claim 17 of the '550 Patent under 35 U.S.C. § 103**

Claim 17 requires the adapter of Claim 16. As noted in Section IV.C.12, Morita in view of Shiga discloses or renders obvious the adapter of Claim 16.

Claim 17 further requires "wherein each said logic high signals is greater than 2V." As explained with respect to Claim 8, Morita in view of Shiga discloses this element. *See* Section IV.C.7.

D.   Dougherty in view of Shiga renders Claims 4-8 and 13-17 Obvious.

1.   Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of Dougherty and Shiga. OTH-A (Baker Decl.,), ¶¶ 238-241.

Both Dougherty and Shiga relate to USB compatible devices including computing host devices (e.g., laptop computer) and related peripheral devices (e.g., keyboard, mouse). *See e.g.*, Dougherty at Title ("Powering a Notebook Across a USB Interface"); Shiga at Title ("USB Apparatus that turns on computer power supply . . . .")

Dougherty, for example, teaches a laptop computer connected to a dock which can expand the number of connected peripheral devices including, for example, a keyboard. Dougherty, 1:61-67 ("When the user returns to the home or office, the laptop is docked with a non-portable unit. Docking in this manner may expand the capabilities of the laptop computer to include a full size keyboard, a full size monitor, more serial ports, and other functionality typically associated only with desktop computing devices."); *id.* at 2:24-28 ("Another method of expanding the capabilities of a laptop may be a form of port replication across a USB port. A user connects a laptop, via a USB connection, to a port replication device which generates plurality of communication ports for use as described above.") Shiga, in turn, teaches a helpful feature for improving such peripherals, *i.e.*, a power-on/power-off switch that can be used to turn the host device on and off. Shiga, Abstract ("An apparatus for turning on a computer power

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supply . . . when an input operation of a predetermined key is carried out . . . ."). Shiga discloses

that this "power-on" and "power-off" switch can be implemented, for example, on a peripheral

keyboard which can be connected to the dock of Dougherty. *Id.* at 2:44-47 ("Here, the operation

may be performed on a special-purpose power-on key on the keyboard or on any combination of

a plurality of keys.") *Id.* at 2:4-8 ("There has been a demand for adding value to such computers

connected with the USB interface by providing a function that the USB does not have, that is, by

providing a key called a power-on key, which allows the host computer to be started by a key

input operation at a keyboard."); *id.* at 7:46-55 ("When a predetermined key on the keyboard 11

is operated . . . the main power is turned off.")

A person of ordinary skill in the art would have immediately recognized the benefit of the

teachings of Shiga in a system like that disclosed in Dougherty (i.e., where the disclosed

peripheral devices is connected to the host device through a dock). Baker Decl., ¶ 241. When

the user is done using the host device (e.g., the laptop) for a particular purpose, he or she does

not have to remove the phone from the dock to turn it on or off. Moreover, Shiga expressly

teaches how to implement the claimed feature in a host computer device attached to a peripheral

keyboard and, accordingly, applying the teachings to the laptop of Dougherty would simply

involve applying a known technique to a similar device.

2.   Claim 1

Patent owner disclaimed Claim 1 on April 23, 2021. PAT-B ('550 File History) at 440

(April 23, 2021 Disclaimer). Because Claims 4-8 depend on Claim 1, however, Requestor sets

forth the reasons that Dougherty in view of Shiga renders obvious the limitations of Claim 1

under 35 U.S.C § 103.

a.   *Preamble: An adapter comprising*

The preamble of Claim 1 describes "An adapter." To the extent this preamble is limiting,

it is satisfied by Dougherty in view of Shiga. Specifically, Dougherty discloses a docking station

(adapter) that connects to a wall and adapts the power to be used by a laptop computer.

Dougherty, Abstract ("A laptop computer and mating docking station where the docking station

provides power to the laptop computer over power rails of the Universal Serial Bus (USB)

interface."); *id.* at 1:20-23 ("The present invention relates generally to docking a laptop computer

to a docking station. More particularly, the invention relates to powering the laptop through the

docking station when the laptop is in the docked position.")
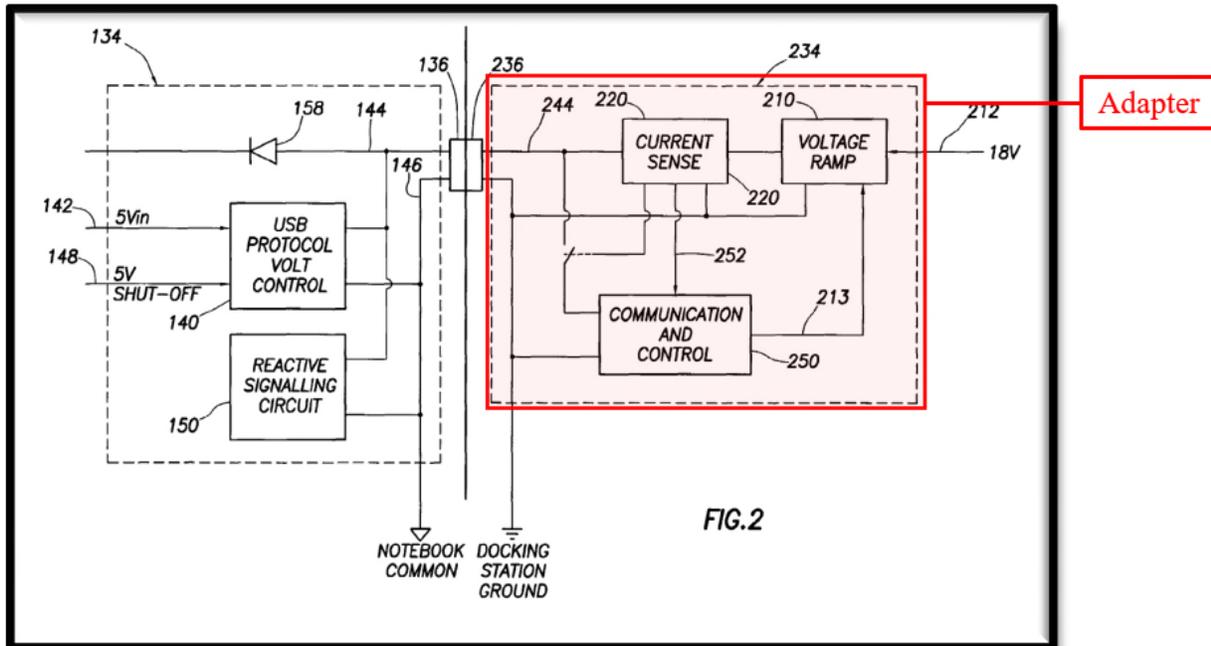
Dougherty, Figure 2 (annotated); *id.*, 5:8-14 ("FIG. 2 shows in more detail the docking logic 134

of the laptop computer 100 coupled to docking logic 234 of the docking station 200. Docking of

these two logic circuits is preferably through USB connector 136 of the laptop computer 100 and

a mating USB connector 236 of the docking Station 200."); *id.*, 2:45-51 ("Thus, it would be

desirable to have a USB based docking station that has the capability of both operating the laptop

computer and charging the batteries in the laptop computer while docked without the need to

plug in a separate power connection, thus reducing the time and complexity to couple the laptop

to the docking unit. Despite the desirability of Such systems, none are available in the prior art.")

Accordingly, under the broadest reasonable interpretation, Dougherty in view of

Shiga discloses an adapter.

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 1 requires "a USB VBUS line and a USB communication

path." Dougherty in view of Shiga discloses this element. Specifically, Dougherty discloses a

laptop dock (adapter) that connects to a laptop and various peripherals via USB connections.

Dougherty, Abstract ("A laptop computer and mating docking station where the docking station

provides power to the laptop computer <u>over power rails of the Universal Serial Bus (USB)</u>

<u>interface</u>.") (emphasis added); *id.* at 1:24-25 ("[T]he invention relates to powering the laptop

across a USB interface when in the docked position."); *id.* at 2:55-58 ("The problems noted

above are solved in large part by a laptop computer and related docking station adapted to supply

power from the docking station to the laptop computer across the USB connection.").

A person of ordinary skill would have understood—and Dougherty and Shiga expressly

disclose—that USB connections like those disclosed for the dock, peripheral keyboard, and

laptop of Dougherty in view of Shiga include four lines: a VBUS power line; two data lines (D+

and D-) (collectively a USB Communication Path); and a ground line. Dougherty, 4:61-66

("More specifically, the standard USB communication cable has four conductors. Two of these

conductors are serial communication conductors 126 which allow communication between

devices using USB protocol [**USB Communication Path**]. The other two conductors carry

power between USB devices [**USB VBUS line and Ground**].”);

FIG.2
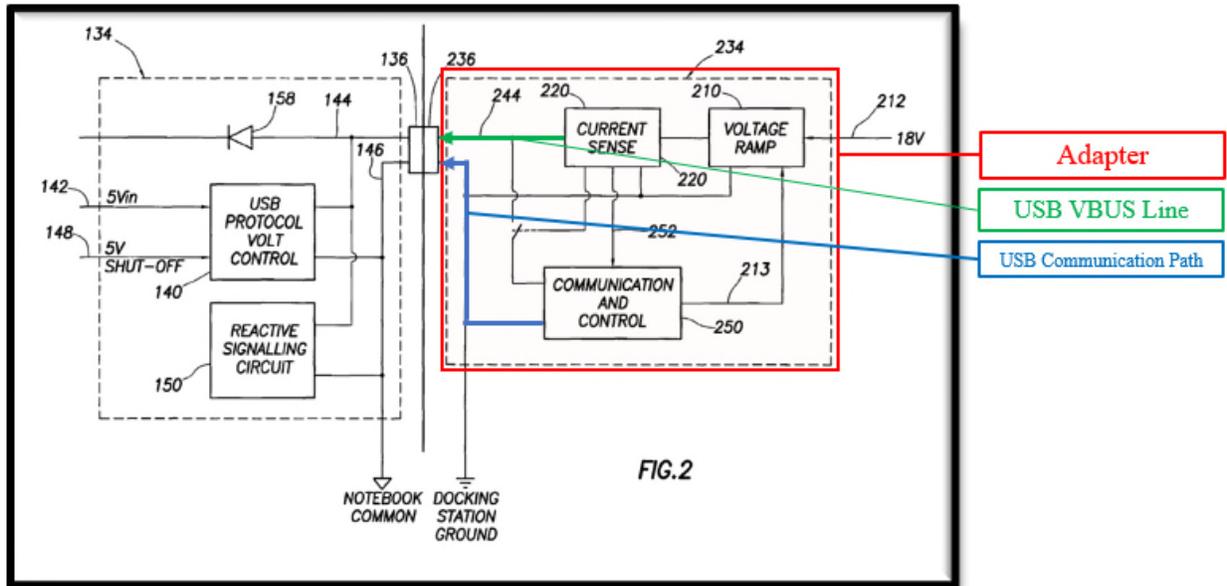
Dougherty, Figure 2 (annotated) (showing generally were data lines may be located); *id.* at 5:47-

52 (“It will be understood that this handshaking protocol between the laptop computer 100 and

the docking station 200 occurs over the serial communication lines [data lines] 126, and these

lines are not shown in FIG. 2”); Baker Decl., ¶ 245.
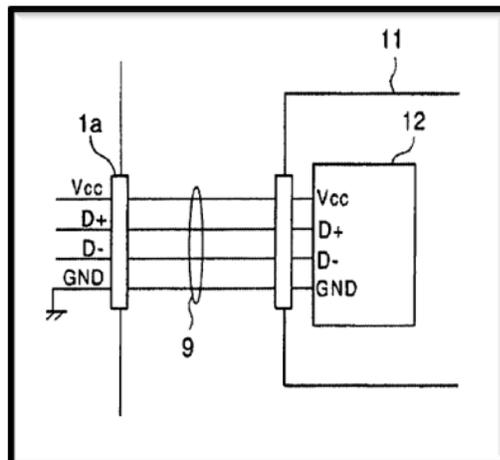
Shiga, Figure 1 (excerpted) (showing Vcc (VBUS), D+ and D- (USB communication Path), and GND (Ground)); Shiga, 4:15-19 ("The USB chip 2 includes a power supply input terminal Vcc [VBUS], a ground terminal GND, a first signal line D+, and a second signal line D- [USB Communication Path], which correspond to those in a USB interface specification.").

      c.   ***said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification***

The second element of Claim 1 requires "said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification." Dougherty in view of Shiga discloses this element. Specifically, Dougherty in view of Shiga discloses that the laptop dock (adapter) supplies current to the laptop computer via the power (VBUS) line. Dougherty, 4:61-66 ("More specifically, the standard USB communication cable has four conductors. Two of these conductors are serial communication conductors 126 which allow communication between devices using USB protocol [**USB Communication Path**]. The other two conductors carry power between USB devices [**USB VBUS line and Ground**]."); *id.*, Abstract ("[T]he docking station provides power to the laptop computer <u>over power rails of the Universal Serial Bus (USB) interface</u>."); *id.* at 7:47-51 ("[A]s many as 2.5 amps of current may flow from the dock station 200 to the laptop computer 100 across the USB connectors 136, 236.").
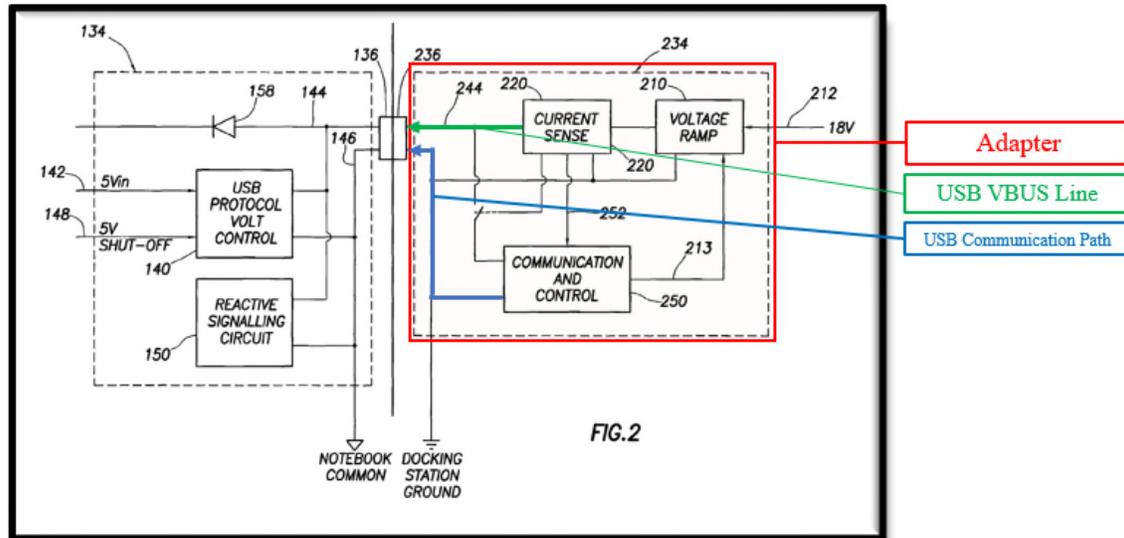
Dougherty, Figure 2 (annotated).

Moreover, Dougherty in view of Shiga discloses that the laptop dock (adapter) (1) supplies power in the upstream direction (*i.e.*, at an upstream port) and (2) supplies more than 500 mA of current to the laptop. Both of these are limits of the USB Specification that affect or limit the supply of current.

(1) Supplying Current at an Upstream Port

As discussed in section III.A.2, *supra*, the USB specification dictates that an upstream port is the port closest to the host. USB 2.0 at 10 ("An upstream port is the port on a device electrically closest to the host . . . ."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is defined as being towards the device."). As also disclosed in section III.A.3, *supra*, it is a condition of the USB specification that no device *supply* current on the VBUS at its upstream facing port. USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time.").

Dougherty in view of Shiga teaches an adapter that supplies current without regard to this condition. Baker Decl., ¶¶ 249-251. Specifically, a person of ordinary skill in the art would have

understood that when the laptop device, laptop dock, and peripheral keyboard of Dougherty in view of Shiga are connected, the laptop is the host. Dougherty expressly discloses that that laptop is the host and, thus, the dock is a downstream device. Dougherty, 5:39-43 ("Under normal USB protocol, coupling of USB devices requires a series of USB handshaking protocols to identify both the host or master device, which would be the laptop computer 100, and any downstream device, which in this exemplary case is the docking station 200.") (emphasis added).

Because the laptop is the host, the USB port of the laptop dock (adapter) that connects to the laptop (host) is an "upstream" port. Because the dock supplies power at that port, it supplies current without regard to at least one limit of the USB Specification, *i.e.*, that a device should not provide power at its upstream port. Dougherty, 5:67-6:3 (disclosing "Thus, the laptop computer 100 breaks with standard USB protocol . . . . "); *id.* at 7:47-51 ("When the dock station 200 provides full power for full operation of the laptop computer 100, as many as 2.5 amps of current may flow from the dock station 200 to the laptop computer 100 across the USB connectors 136, 236.").

Accordingly, under the broadest reasonable interpretation, Dougherty in view of Shiga discloses an adapter "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

(2) Supplying more than 500 mA of Current

As discussed in section III.A.3, *supra*, the USB specification dictates that a device shall not supply more than 500 mA of current:

Table 7-7. DC Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Max.	Units
Supply Voltage:					
High-power Port	VBUS	Note 2, Section 7.2.1	4.75	5.25	V
Low-power Port	VBUS	Note 2, Section 7.2.1	4.40	5.25	V
Supply Current:					
High-power Hub Port (out)	ICCPRT	Section 7.2.1	500		mA
Low-power Hub Port (out)	ICCUPT	Section 7.2.1	100		mA
High-power Function (in)	ICCHPF	Section 7.2.1		500	mA
Low-power Function (in)	ICCLPF	Section 7.2.1		100	mA
Unconfigured Function/Hub (in)	ICCINIT	Section 7.2.1.4		100	mA
Suspended High-power Device	ICCSH	Section 7.2.3; Note 15		2.5	mA
Suspended Low-power Device	ICCSL	Section 7.2.3		500	µA

USB 2.0 at 178 (Table 7-7) (annotated) (showing maximum current amounts that can be supplied).

Dougherty in view of Shiga discloses a dock (adapter) that supplies current without regard to this limitation. Specifically, Dougherty discloses that the dock (adapter) will supply— and the laptop will draw—up to 2.5 Amps, *i.e.*, five times the 500mA limit imposed by the USB specification. Dougherty, 7:15-18 ("Laptop computer 100 preferably operates using the 18 volt power supplied by the docking station 200 across the USB interface. Also, the laptop computer may charge its battery, if needed, with this same supply.") (emphasis added); *id.* at 7:47-51 ("When the dock station 200 provides full power for full operation of the laptop computer 100, as many as 2.5 amps of current may flow from the dock station 200 to the laptop computer 100 across the USB connectors 136, 236.") (emphasis added).

Accordingly, under the broadest reasonable interpretation, Dougherty in view of Shiga discloses an adapter that supplies current "without regard to at least one associated condition specified in a USB specification." Baker Decl., ¶¶ 252-254.

3.   Claim 4

Dougherty in view of Shiga renders Claim 4 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 4 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 4 of the '550 Patent under 35 U.S.C. § 103**

Claim 4 requires the adapter of Claim 1. As noted in Section IV.D.2, Dougherty in view

of Shiga discloses or renders obvious the adapter of Claim 1.

Claim 4 further requires "wherein said current is supplied in response to an abnormal data

condition on said USB communication path." Dougherty in view of Shiga discloses this

element. Specifically, Dougherty in view of Shiga discloses a system comprising of the laptop

computer (host) connected to the laptop dock (adapter), which is connected to a keyboard

(peripheral). The peripheral keyboard comprises a "power-on" and "power-off" button capable

of turning the host laptop on or off while docked in the laptop dock (adapter). To power-on the

laptop, the keyboard sends an SE1 signal—which, as descried in more detail in Section IV.A.4.b

and below, is an "abnormal data condition"—through the dock to the laptop. The laptop will

then turn on, and the laptop dock will supply up to 2.5 Amps of current to the laptop.

Specifically, Dougherty discloses a laptop computer that can be connected via USB

connection to a dock (adapter). *See* Claim 1. Dougherty further discloses that the dock can also

be connected to peripheral devices (e.g., keyboard, mouse) through other USB ports so that those

peripheral devices can be used with the laptop. Dougherty, 1:61-67 ("When the user returns to

the home or office, the laptop is docked with a non-portable unit. Docking in this manner may

expand the capabilities of the laptop computer to include a full size keyboard, a full size monitor, more serial ports, and other functionality typically associated only with desktop computing devices."); *id.* at 2:24-28 ("Another method of expanding the capabilities of a laptop may be a form of port replication across a USB port. A user connects a laptop, via a USB connection, to a port replication device which generates plurality of communication ports for use as described above."); *id.*, 2:39-44 ("Also, there are prior art devices that have the appearance of a full docking station, that is the laptop may physically couple to a non-portable docking station where the act of docking couples the USB ports; however, these devices still require the user to separately apply power to the laptop."); *id.* at 2:45-50 ("Thus, it would be desirable to have a USB based docking station that has the capability of both operating the laptop computer and charging the batteries in the laptop computer while docked without the need to plug in a separate power connection, thus reducing the time and complexity to couple the laptop to the docking unit. Despite the desirability of Such systems, none are available in the prior art.")

Shiga discloses a system and method for using a peripheral keyboard and a host device (like the laptop of Dougherty). Specifically, Shiga discloses a keyboard that comprises a "power-on" and "power-off" key that can be used to power-on and power-off a connected host device like the laptop of Dougherty. Shiga, 2:43-49 ("When the predetermined operation is performed at the input device [keyboard], the main power supply is turned on. Here, the operation may be performed on a special-purpose power-on key on the keyboard or on any combination of a plurality of keys.") A person of ordinary skill in the art would have understood that the teachings of Shiga could be applied to the laptop of Dougherty and a connected peripheral keyboard. Baker Decl., ¶ 257.

Shiga specifically discloses that when the peripheral device (keyboard) is connected to the host device (laptop) through USB connections, the power-on signal can be a logic high signal

on each of the data lines, *i.e.*, a high/high signal on the USB communication path (D+ and D-). Shiga, 3:34-39 ("[T]the predetermined operation [power-on button] may be performed at the input device in order to output H signals of a predetermined pulse width to both the first signal line and the second signal line [high/high signal], after which the H signals with a predetermined pulse width equal to or greater than the predetermined pulse width are output from the AND circuit to turn on the power supply."); *id.*, 6:34-47 ("When the power-on key on the keyboard 11 is operated . . . predetermined signals are generated by the aforementioned 8-bit microcontroller (not shown), which is a controlling means (or signal-generating means) at the key board 11 side. The first signal line D+ and the second signal line D- are in a fourth mode in which both signal lines D+ and D- are in the H state. The pulse width and the pulse voltage of the predetermined Signals are, for example, 50 ms and 3 volts, respectively.") (emphasis added).

Shiga further that this high/high signal (SE1) is an abnormal data condition and, thus, it allows the host device to distinguish the signal from normal USB operations and recognize the signal as a start-up signal. *Id.* at 3:40-56 ("The communication mode in which both of the first signal line and the second signal line are in an H state result from a combination that does not exist in ordinary USB standard operation modes [abnormal data condition]. Therefore, when the wake-up means is constructed so that it starts up when H signals are applied to both of these lines, there is no obstacle to carrying out ordinary communications using the USB interface. When the communication mode is switched at the USB interface, the first signal line and the second signal line may both be instantaneously set in the H state. When the duration in which the first signal line and the second signal line are in the H state becomes equal to or greater than a predetermined time period (more specifically, a time period which is longer than a USB Standard Signal transfer rate), and an attempt is made to start up the wake-up means, it is possible to

prevent confusion with the case where communication modes are switched by the USB interface.").

TABLE 1			
	Low Speed	Full Speed	Unconnected
D+	L (Hi-Z)	H	L (Hi-Z)
D−	H (Hi-Z)	L (Hi-Z)	L (Hi-Z)

Shiga, 5:38-45 (showing normal data conditions); *id.*, 5:59-62 ("The state in which both of these first and the second signal lines D+ and D- are in the H state is not a USB standard state."); *id.* at 6:47-58 ("The fourth mode of first signal line D+ and second signal line D- in which both of them are in the H level state is not shown in Table 1 because it is not a USB standard mode. Taking into account that the data transfer speed of the USB is measured in nanoseconds (nsec), it can be said that a pulse width of 50 ms is very large. Therefore, even when fourth mode signals (H level signals with a pulse width of 50 ms) are set as signals that are not USB Standard signals, and then transmitted to first signal line D+ and second signal line D-, they can be easily distinguished from USB standard data signals.")

A person of ordinary skill in the art would have understood that, once powered on, the host device (the laptop) and the dock would engage in the operations discussed in Dougherty. Baker Decl., ¶ 260.   That is, as disclosed with respect to Claim 1, the dock (adapter) would supply current on the VBUS line in order to charge the laptop. *See* Claim 1; Baker Decl., ¶ 260. Because this happens because of the power-on signal from Shiga, under the broadest reasonable interpretation, the current is supplied "in response to" the abnormal data condition.

Accordingly, Dougherty in view of Shiga discloses that the peripheral device of Shiga (keyboard) can be used to power-on the laptop of Dougherty by sending an SE1 signal through the dock of Dougherty and that, as a result, the powered-on laptop draws up to 2.5 Amps of

current from the dock. Under the broadest reasonable interpretation of this claim, Dougherty in view of Shiga thus discloses an "adapter" that is configured to supply up to 2,500 mA of current in an upstream direction "in response to an abnormal data condition on said USB communication path." Baker Decl., ¶ 261.
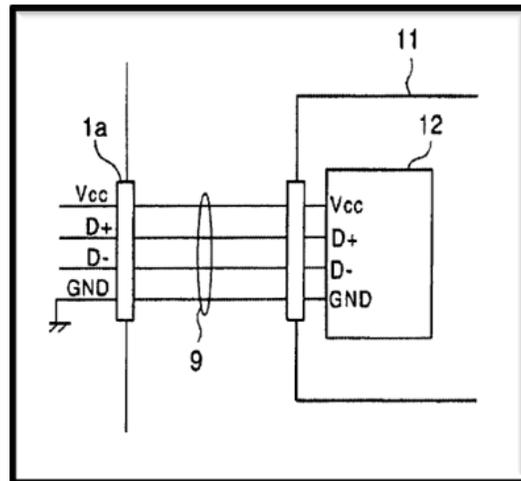
4.   Claim 5

Dougherty in view of Shiga renders Claim 5 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 5 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 5 of the '550 Patent under 35 U.S.C. § 103**

Claim 5 requires the adapter of Claim 4. As noted in Section IV.D.3, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 4.

Claim 5 further requires "wherein said USB communication path includes a D+ line and a D-line." Dougherty in view of Shiga discloses this element. Specifically, as noted with respect to Claim 1, Dougherty in view of Shiga discloses a laptop dock (adapter) that connects to a laptop computer via USB connectors. *See* Section IV.C.2.b. As further noted with respect to Claim 1, a person of ordinary skill in the art would have understood—and Dougherty and Shiga expressly discloses—that the connection would comprise a communication path comprising a D+ and D- line. *Id.*   Dougherty, 4:61-66 ("More specifically, the standard USB communication cable has four conductors. Two of these conductors are serial communication conductors 126 which allow communication between devices using USB protocol [**USB Communication Path**]. The other two conductors carry power between USB devices [**USB VBUS line and Ground**].");

Shiga, 4:15-19 ("The USB chip 2 includes a power supply input terminal Vcc [VBUS], a ground terminal GND, a first signal line D+, and a second signal line D- [USB Communication Path], which correspond to those in a USB interface specification.").

Shiga, Figure 1 (excerpted) (showing Vcc (VBUS), D+ and D- (USB communication Path), and GND (Ground)).

5.   Claim 6

Dougherty in view of Shiga renders Claim 6 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 6 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 6 of the '550 Patent under 35 U.S.C. § 103**

Claim 6 requires the adapter of Claim 5. As noted in Section IV.D.4, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 5.

Claim 6 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." Dougherty in view of Shiga discloses this element.

Specifically, as disclosed with respect to Claim 4, Dougherty in view of Shiga discloses that the peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the laptop of Dougherty (which is connected through the laptop dock of Dougherty). *See* Section IV.D.3. Shiga further discloses that such means causes the peripheral keyboard to send a logic high/high (SE1) signal to the dock of Dougherty, which sends the signal to the laptop of Dougherty, which then powers on. *Id.* A person of ordinary skill in the art would have understood—and Shiga expressly discloses—that the SE1 signal is an abnormal data line condition on the D+ and D- lines as required by Claim 6.

6.   Claim 7

Dougherty in view of Shiga renders Claim 7 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 7 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 7 of the '550 Patent under 35 U.S.C. § 103**

Claim 7 requires the adapter of Claim 6. As noted in Section IV.D.5, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 6.

Claim 7 further requires "wherein said abnormal data line condition is a logic high signal on each of said D+ and D lines." Dougherty in view of Shiga discloses this element. Specifically, as explained with respect to Claim 4, Dougherty in view of Shiga discloses that the peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like

the laptop of Dougherty (which is connected through the laptop dock of Dougherty). *See* Section

IV.D.3. Shiga further discloses that such means causes the peripheral keyboard to send a logic

high/high (SE1) signal to the laptop dock of Dougherty, which sends the signal to the laptop of

Dougherty, which then powers on. *Id.* A person of ordinary skill in the art would have

understood—and Shiga expressly discloses—that the SE1 signal is a logic high signal on each of

said D+ and D- lines. *Id.*

7.   Claim 8

Dougherty in view of Shiga 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 8 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim
> chart comparing Dougherty in view of Shiga with
> Claim 8 of the '550 Patent under 35 U.S.C. § 103**

Claim 8 requires the adapter of Claim 7. As noted in Section IV.D.6, Dougherty in view

of Shiga discloses or renders obvious the adapter of Claim 7.

Claim 8 further requires "wherein each said logic high signals is greater than 2V."

Dougherty in view of Shiga discloses this element. Specifically, as explained with respect to

Claim 4, Dougherty in view of Shiga discloses that the peripheral keyboard comprises "power-

on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-

on and power-off a connected host device like the laptop of Dougherty (which is connected

through the laptop dock of Dougherty). *See* Section IV.D.3. Shiga further discloses that such

means causes the peripheral keyboard to send a logic high/high (SE1) signal to the laptop dock

of Dougherty, which sends the signal to the laptop of Dougherty, which then powers on. *Id.*

Shiga also specifically discloses that the SE1 signal may comprise logic high signals of, for example, 3 volts on each of the data lines for 50ms. Shiga, 6:43-47 ("The first signal line D+ and the second signal line D- are in a fourth mode in which both signal lines D+ and D- are in the H state. The pulse width and the pulse voltage of the predetermined signals are, for example, 50 ms and 3 volts, respectively.") Shiga, 6:34-47 (emphasis added).

Accordingly, under the broadest reasonable interpretation, Dougherty in view of Shiga discloses that the SE1 signal is a logic high signal on each of said D+ and D- lines of greater than 2 volts. *Id.*

8. Claim 10

Patent owner disclaimed Claim 10 on April 23, 20201. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer in Patent). Because Claims 13-17 depend on Claim 10, however, Requestor sets forth below the reasons that Dougherty in view of Shiga renders the limitations of Claim 10 obvious under 35 U.S.C § 103.

> Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 10 of the '550 Patent under 35 U.S.C. § 103

a. *Preamble: An adapter comprising*

The preamble of Claim 10 describes "An adapter." As explained with respect to Claim 1, Dougherty in view of Shiga discloses this element. *See* Section IV.C.2.a. Specifically, Dougherty in view of Shiga discloses a laptop dock that a person of ordinary skill in the art would have understood to be an adapter. *Id.*

b.   *a USB VBUS line and a USB communication path*

The first element of Claim 10 requires "a USB VBUS line and a USB communication path." As explained with respect to Claim 1, Dougherty in view of Shiga discloses this element. *See* Section IV.D.2.b.

Specifically, Dougherty discloses a laptop dock that can draw power from a wall outlet and supply power to a laptop computer via a USB connection. *Id.* Dougherty further discloses that the charger can be connected to peripheral devices (like the keyboard of Shiga) via a USB connection as well. *Id.* A person of ordinary skill in the art would have understood—and Dougherty and Shiga expressly disclose—that such USB ports/connectors comprise USB VBUS line and a USB communication path (D+ and D- lines). *Id.*

c.   *said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit.*

The second element of Claim 10 requires "said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit." As explained with respect to Claim 1, Dougherty in view of Shiga discloses this element. *See* Section IV.D.2.c. Specifically, a person of ordinary skill in the art would have understood—and Dougherty expressly discloses—that the laptop dock is configured to (1) supply power at an upstream port and (2) supply up to 2.5 Amps (2,500 mA) of current. This disregards the USB Specification which limits the types of ports that can supply power to downstream ports and limits the amount of current a device can provide to 500 mA. *Id.*

9.   Claim 13

Dougherty in view of Shiga renders Claim 13 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 13 based on Dougherty in view of Shiga under 35 U.S.C. §103.

Claim 13 requires the adapter of Claim 10. As noted in Section IV.D.8, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 10.

Claim 13 further requires "wherein said current is supplied in response to an abnormal data condition on said USB communication path." As explained with respect to Claim 4, Dougherty in view of Shiga discloses this element. *See* Section IV.D.3. Specifically, Dougherty in view of Shiga discloses that the laptop dock of Dougherty can be connected to the laptop of Dougherty and the keyboard of Shiga. *Id.* The peripheral keyboard comprises "power-on" and "power-off" means (e.g., a button or a combination of keys) that can be used to power-on and power-off a connected host device like the laptop of Dougherty (pursuant to the teachings of Shiga). *Id.* Shiga further discloses that such means causes the peripheral keyboard to send a logic high/high (SE1) signal to the laptop dock, which sends the signal to the laptop, which then powers on. *Id.* A person of ordinary skill in the art would have understood—and Shiga expressly discloses—that the SE1 signal is an abnormal data condition on the USB communication path.

10.   Claim 14

Dougherty in view of Shiga renders Claim 14 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 14 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 14 of the '550 Patent under 35 U.S.C. § 103**

Claim 14 requires the adapter of Claim 13. As noted in Section IV.D.9, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 13.

Claim 14 further requires "wherein said USB communication path includes a D+ line and a D-line." As explained with respect to Claim 5, Dougherty in view of Shiga discloses this element. *See* Section IV.D.4.

11.   Claim 15

Dougherty in view of Shiga renders Claim 15 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 15 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 15 of the '550 Patent under 35 U.S.C. § 103**

Claim 15 requires the adapter of Claim 14. As noted in Section IV.D.10, Dougherty in view of Shiga discloses or renders obvious the adapter of Claim 14.

Claim 15 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." As explained with respect to Claim 6, Dougherty in view of Shiga discloses this element. *See* Section IV.D.5.

12.   Claim 16

Dougherty in view of Shiga renders Claim 16 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 16 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 16 of the '550 Patent under 35 U.S.C. § 103**

Claim 16 requires the adapter of Claim 15. As noted in Section IV.D.11, Dougherty in

view of Shiga discloses or renders obvious the adapter of Claim 15.

Claim 16 further requires "wherein said abnormal data line condition is a logic high

signal on each of said D+ and D-lines." As explained with respect to Claim 7, Dougherty in

view of Shiga discloses this element. *See* Section IV.D.6.

13.   Claim 17

Dougherty in view of Shiga renders Claim 17 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 17 based on Dougherty in view of Shiga under 35 U.S.C. §103.

> **Please see attached Exhibit CC-D for a claim chart comparing Dougherty in view of Shiga with Claim 17 of the '550 Patent under 35 U.S.C. § 103**

Claim 17 requires the adapter of Claim 16. As noted in Section IV.D.12, Dougherty in

view of Shiga discloses or renders obvious the adapter of Claim 16.

Claim 17 further requires "wherein each said logic high signals is greater than 2V." As explained with respect to Claim 8, Dougherty in view of Shiga discloses this element. *See* Section IV.D.7.

### E. De Iuliis in view of Kim renders Claims 3-6 and 12-15 Obvious.

For the reasons stated below, De Iuliis in view of Kim renders Claims 3-6 and 12-15 obvious.

1. Motivation to Combine

A person of ordinary skill in the art would have been motivated to combine the teachings of De Iuliis with the teachings of Kim. OTH-A (Baker Decl.,), ¶¶ 276-280.

Both De Iuliis and Kim relate to systems and methods for powering portable electronic devices (i.e., mobile devices) using USB connections. De Iuliis discloses an adapter device that connects to a wall outlet. The device draws power from the wall outlet and uses it to supply current to a USB port that can be used to power another device. De Iuliis at 4:55-56 ("By way of example, the data transmission line 58 may be a universal serial bus (USB)"); Baker Decl., ¶ 276.
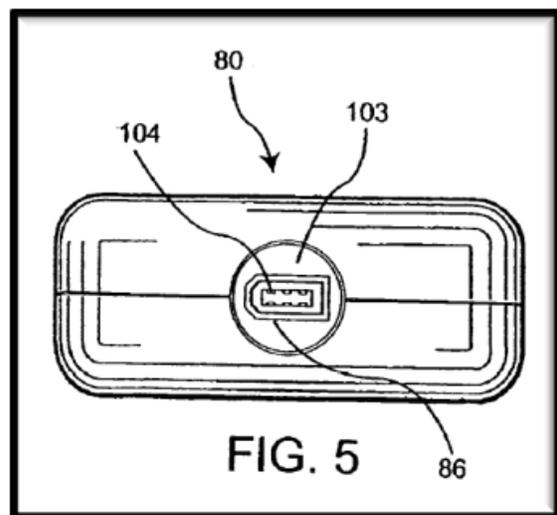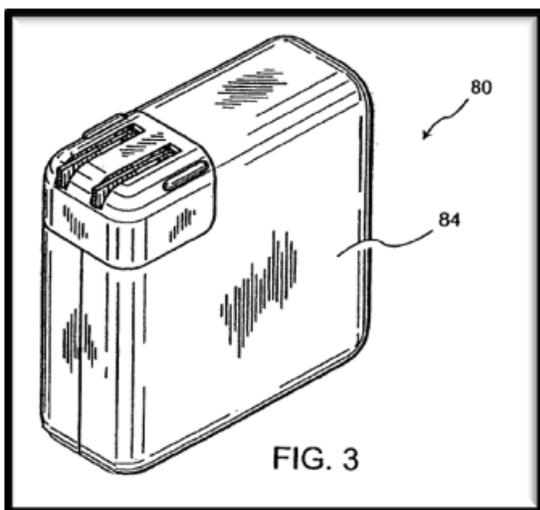
FIG. 3

FIG. 5

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

Kim in turn, discloses an adapter cord that can draw power from a USB port (like that provided by the adatper device of De Iuliis) and use it to supply current to a mobile phone through a mobile phone connector. Kim at 6-2 ("The present invention pertains to a device that charges mobile phones such as PCS and cellular phones. Specifically, the present invention pertains to a device that charges mobile phones, and so on by using the USB port of such devices as computers, and so on.")
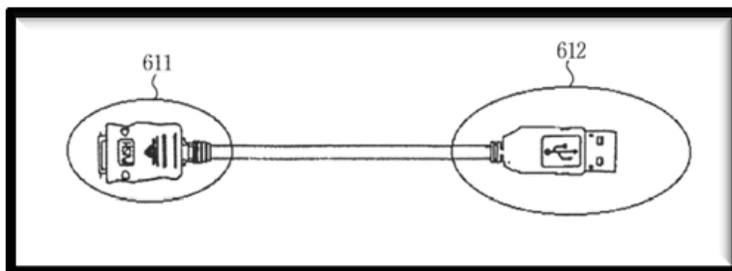
Kim at Figure 2 (showign adapter cord with USB connector (612) and mobile phone connector (611)). A person of ordinary skill in the art would have understood that the USB adapter device of De Iuliis can be connected to the adatper cord of Kim, which can be connected to a mobile phone to charge the phone. Baker Decl., ¶ 278. Indeed, Kim discloses that the USB connection side of the adapter cord can be connected to a computer but also explains—as would be known to a person of ordinary skill in the art—that it can be connected to any device with a USB port:

> The purpose of the present invention is to charge mobile communication devices by connecting mobile communication devices such as PCSs and cellular phones equipped with data communication ports with various types of devices equipped with USB ports such as notebook computers, PCs, printers, *and so on*. The present invention was described by mainly referring to mobile phones and computers. However, any person with an ordinary level of knowledge in the field to which the present invention belongs will be able to implement the present invention by connecting many types of devices equipped with USB ports

Kim at at 6-3 (emphasis added).

Using the adapter device of De Iuliis with the adapter cord of Kim advances the common goal of both references, which is to make it more convenient to charge mobile devices on the go with the least number of charging devices/cords as possible:

> While the system described above works well, it would be desirable to remove the total number of connections made to a peripheral device so as to reduce the number of connectors and cables needed to operate the peripheral device. By reducing the number of connectors and cables, the peripheral size and the cost of the product may be decreased as well as the ease of use of the peripheral device may be improved (less cables to tote around).

De Iuliis at 2:1-8.

> When purchasing a mobile telephone, mobile phone manufacturers supply a separate dedicated charger for the applicable mobile telephone, but this method has the following disadvantages. First, due to the fact that such a mobile phone charger is too large and heavy, it is difficult to carry it comfortably. Therefore, in most cases the charger is left at home or at work for charging purposes. Therefore, when the battery of a mobile phone is completely depleted in a place where there is no charger, it is not possible to use the mobile phone. Second, the price of a mobile phone charger is expensive. Third, different mobile phone types require different charger types. This is due to the fact that the specifications of mobile phone chargers are different for different mobile phone manufacturers. Fourth, due to the fact that commercial electricity is used, if a charger does not support 100V/110V voltage or 200V/220V voltage, it is not possible to use the charger due to the difference is the voltage and the type of the power plug.

Kim at 6-2. Notably, using the adapter device of De Iuliis with one or more adpater cords of Kim would significantly reduce the number of charging devices a person would need to carry even when they have multiple devices with different types of connections. Baker Decl., ¶ 280. Specifically, the user would only need to carry a single wall adatper (De Iuliis) with one or more lightweight adapter cords for his or her various devices. With just the adapter and the cord, for example, the user can charge his or her mobile phone from a wall socket (using the adatper device and the adapter cord) or from any USB device (using only the adaper cord). Baker Decl.,

¶ 280.   The use could also charge other devices with different types of connections by switching out the adapter cord, and still need only carry one adapter device for connecting to a wall socket.

2.   Claim 1

Patent owner disclaimed Claim 1 on April 23, 2021. PAT-B ('550 File History) at 440 (April 23, 2021 Disclaimer). Because Claims 3-6 depend on Claim 1, however, Requestor sets forth the reasons that De Iuliis in view of Matsumoto renders obvious the limitations of Claim 1 under 35 U.S.C § 103.

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 1 of the '550 Patent under 35 U.S.C. § 103**

a.   *Preamble: An adapter comprising*

The preamble of Claim 1 describes "An adapter." To the extent this preamble is limiting, it is satisfied by De Iuliis in view of Kim. Specifically, De Iuliis discloses an adapter device that can draw power from a wall socket and provide it to a USB port. De Iuliis at Title ("Power Adapters for Powering and/or Charging Peripheral Devices"); *id.* at Abstract ("A power adapter for a peripheral device such as portable electronics device is disclosed.") (emphasis added); *id.* at 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.").

FIG. 3

FIG. 5
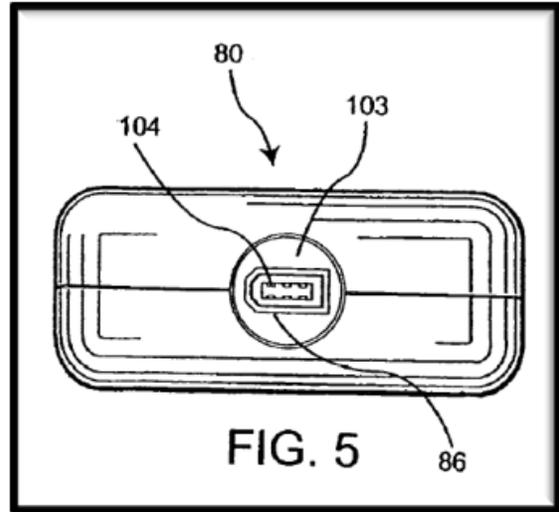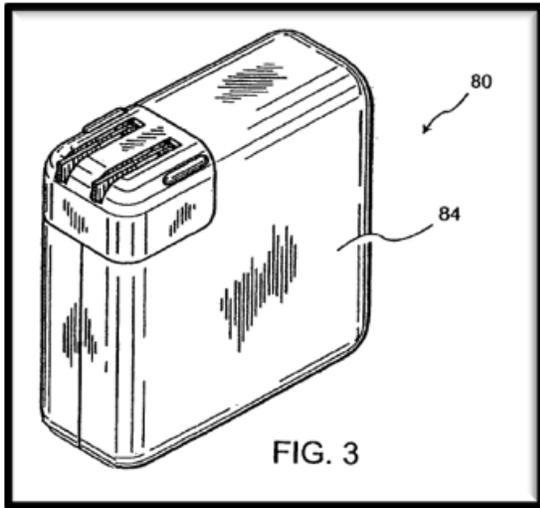
De Iuliis at Figure 3.

Kim discloses an adapter cord that can draw power from a USB port (like that provided

by the adatper device of De Iuliis) and use it to supply current to a mobile phone through a

mobile phone connector. Kim at 6-2 ("The present invention pertains to a device that charges

mobile phones such as PCS and cellular phones. Specifically, the present invention pertains to a

device that charges mobile phones, and so on by using the USB port of such devices as

computers, and so on.")
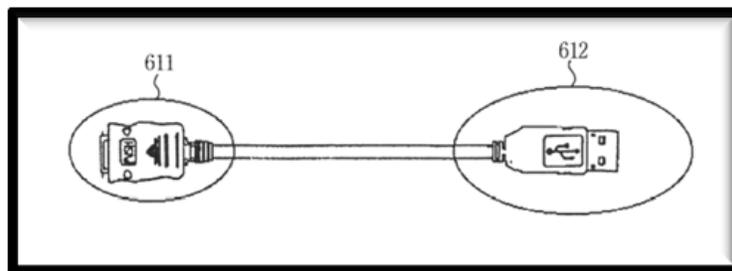
Kim at Figure 2 (showign adapter cord with USB connector (612) and mobile phone connector

(611)).

The adapter device of De Iuliis is an adapter (adapts A/C all outlet power to USB). Baker

Decl., ¶ 283. The adpater cord of Kim is also an adapter (adapts USB power to mobile phone

connection). Baker Decl., ¶ 283. And, when connected together the combined device and cord is also an adapter (adapts A/C Outlet to mobile phone connection). Baker Decl., ¶ 283.

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Kim discloses an "adapter" as claimed by Claim 1 of the '550 Patent.
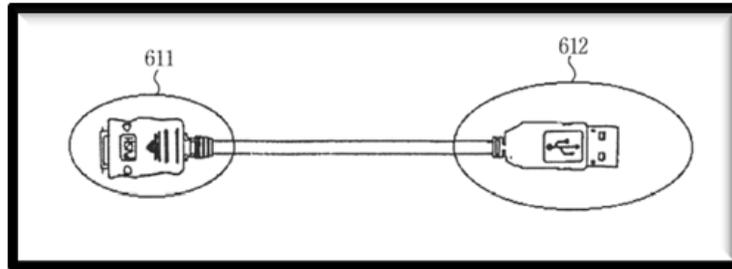
b. ***a USB VBUS line and a USB communication path***

The first element of Claim 1 requires "a USB VBUS line and a USB communication path." De Iuliis in view of Kim discloses this element. Specifically, De Iuliis in view of Kim discloses an adapter device and adapter cord that connect to each other via a USB connection. A person of ordinary skill in the art would have understood (and De Iuliis and Kim expressly disclose) that the devices thus comprise four connecting lines: (1) a power/voltage line, (2) a D+ data line, (3) a D- data line, and (4) a Ground line. A person of ordinary skill in the art would have understood that the voltage line constitutes a "USB VBUS line" and that the data lines collectively comprise a "USB communication path." Baker Decl., ¶ 284.

De Iuliis discloses, for example, that the adapter device includes a standard data port that can be used to supply both power as well as data and specifically states that this can be a USB connection. De Iuliis, Abstract ("The power adapter also includes a data port provided at a surface of the housing. The data port is configured to provide external power to the peripheral device."); *id.*, 2:22-29 ("The power adapter also includes a data connector assembly electrically coupled to the power connection, the data connector assembly providing at least one combined power [USB VBUS Line] and data connection [USB communication path], wherein the power provided by the combined data and power connection is used to operate or charge a peripheral device."); *id.* at 4:51-53 ("The data transmission line 58 is preferably a data transmission line having both data [USB Communication Path] and power transmitting [USB VBUS line] capabilities. As was stated earlier, the power transmitting capabilities are associated with data

transmissions."); *id.* at 4:55-56 ("By way of example, the data transmission line 58 may be a universal serial bus (USB)").

Similarly, Kim discloses that the adapter cord comprises a USB connector that can connect to the USB port of the adapter device of De Iuliis.

Kim at Figure 2 (showign adapter cord with USB connector (612)).

Moreover, Kim expressly discloses that such USB connections comprise a USB communication path (D+ and D- lines) and a VBUS line:
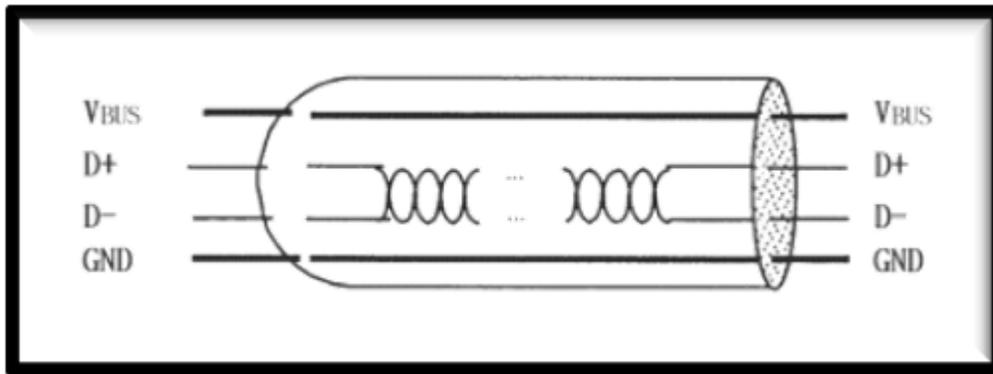
Kim, Figure 2.

Accordingly, De Iuliis in view of Kim discloses that the adapter device of De Iuliis, the adapter cord of Kim, and the combined adapter of the device and cord each comprise a USB VBUS line and a USB Communication path as required by Claim 1.

   c. ***said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification***

The second element of Claim 1 requires "said adapter configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification." De Iuliis in view of Kim discloses this element.

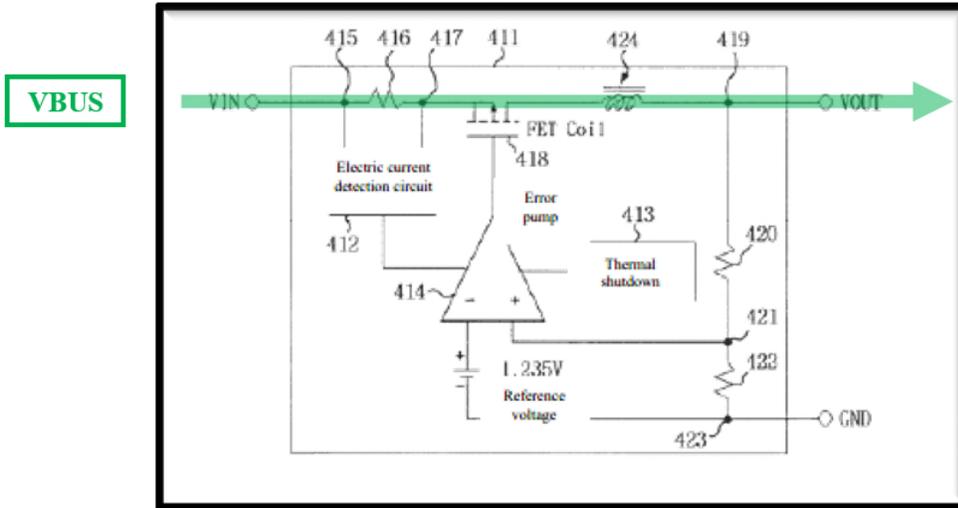First, De Iuliis in view of Kim discloses that (1) the adapter device of De Iuliis supplies current to the adapter cord on the VBUS line and (2) the adapter cord of Kim supplies current to the mobile device on the VBUS line. De Iuliis, for example, discloses that the adapter device is configured to draw power (current) from the wall socket an output power (current) on the power line of the connector (i.e., the VBUS line for USB implementations):

> In most cases, the power adapter 50 is arranged to receive a first power from a power source <u>and to output a second power to the peripheral device</u>. <u>The second power corresponds to the power needed to operate and/or charge the peripheral device</u>. In some cases, the first power has characteristics that are different than the characteristics of the second power while in other cases the first power has characteristics that are similar to the characteristics of the second power. For example, the first power may provide AC current while the second power may provide DC current. In addition, the first power may provide DC current while the second power may also provide DC current, which may or may not be the same as the source current.

De Iuliis at 4:1-13 (emphasis added); *id.* at 6:34-40 ("The ground and power [VBUS] contacts, on the other hand, generally couple to separate conducting wires of the data transmission line. The power contact [VBUS] provides power that is capable of being transmitted to a peripheral device through the data transmission line. The power is configured to either operate and/or charge the peripheral device during normal use of the peripheral device.").

Kim similarly discloses that the adapter cord will draw up to 500 mA from the USB connector connected to the adapter device of De Iuliis and then supply that current to the mobile device. Kim at 6-3 ("The USB power supply line is connected to the power input (VIN) of the

circuit, and the charging power line of a mobile phone's data communication port is connected to the power output (VOUT).")

Kim, Figure 4 (annotated) (showing "module" (411) use to "charge mobile phones by using USB's power supply line"). Accordingly, (1) the adapter device of De Iuliis supplies current on the VBUS line, (2) the adapter cord of Kim supplies current on the VBUS line, and (3) the combined adapter device and cord supplies current on the VBUS line. Baker Decl., ¶¶ 290-291.

Moreover, De Iuliis in view of Kim discloses that the adapter is configured to supply current "without regard to at least one associated condition specified in a USB specification." Specifically, De Iullis in view of Kim discloses that the De Iuliis device supplies current to the cord of Kim, which supplies the current to a non-USB mobile phone. Because current is being supplied to a non-USB device pursuant to a non-USB standard, it is supplied without regard to the USB Specification (or any conditions/limits stated therein) and, instead, is supplied in order to whatever standard applies to the mobile phone. Baker Decl., ¶ 292. As one example, the adapter will supply current at an upstream port which is contrary to the conditions/limits of the USB Specification. As a second example, the adapter will supply up to 500mA of current without entering the "Default" state of enumeration which is contrary to the condition/limit on

the amount of current that can be supplied at that time under the USB Specification (0 mA). As a third example, the adapter will supply up to 500 mA without entering into the "Configured" state of USB enumeration which is contrary to the condition/limit on the amount of current that can be supplied at that time under the USB Specification (100 mA).

(1) Supplying Current at an Upstream Port

As discussed in section III.A.2, *supra*, the USB specification dictates that an upstream port is the port closest to the host. USB 2.0 at 10 ("An upstream port is the port on a device electrically closest to the host . . . ."); *id.* at 298 (Section 11.1.2.1 Packet Signaling Connectivity) ("Upstream connectivity is defined as being towards the host, and downstream connectivity is defined as being towards the device."). As also disclosed in section III.A.3, *supra*, it is a condition of the USB specification that no device *supply* current on the VBUS at its upstream facing port. USB 2.0 at 171 (Section 7.2.1) ("No device shall supply (source) current on VBUS at its upstream facing port at any time.").

De Iuliis in view of Kim teaches an adapter that supplies current without regard to this condition. Specifically, a person of ordinary skill in the art would have understood that the USB port of De Iuliis is an upstream port. This is because the adapter device of De Iuliis does not have any of the components required for a host (e.g., a CPU and a USB controller) but the peripheral devices to which it is connected (e.g., a mobile phone) do have those components. De Iuliis at 6:55-63 ("The peripheral device 122 generally represents a portable computing device such as a portable computer, personal digital assistant, cellular phone, a media player, and the like. As such, the peripheral device 122 includes a battery 132 that allows the peripheral device 122 to operate without using the external power source 126. The peripheral device 122 also includes internal circuitry 134 for processing data. By way of example, the internal circuitry may correspond to processors, controllers, bridges, memory, buses and the like."). Moreover, De

Iuliis specifically states that peripheral devices can act as the host when connected to the adapter. *Id.* at 12:31-34 ("Furthermore, referring to FIG. 10, the second data port may be electrically coupled to the power connection so as to provide power to a second peripheral device (<u>which acts as the host device</u>).")

Because the mobile device is the host, the USB port of the adapter that connects to the mobile device is an "upstream" port. Baker Decl., ¶¶ 297-298. Because the adapter supplies power at that port, it supplies current without regard to at least one condition of the USB Specification, *i.e.*, that a device should not provide power at its upstream port. *Id.*
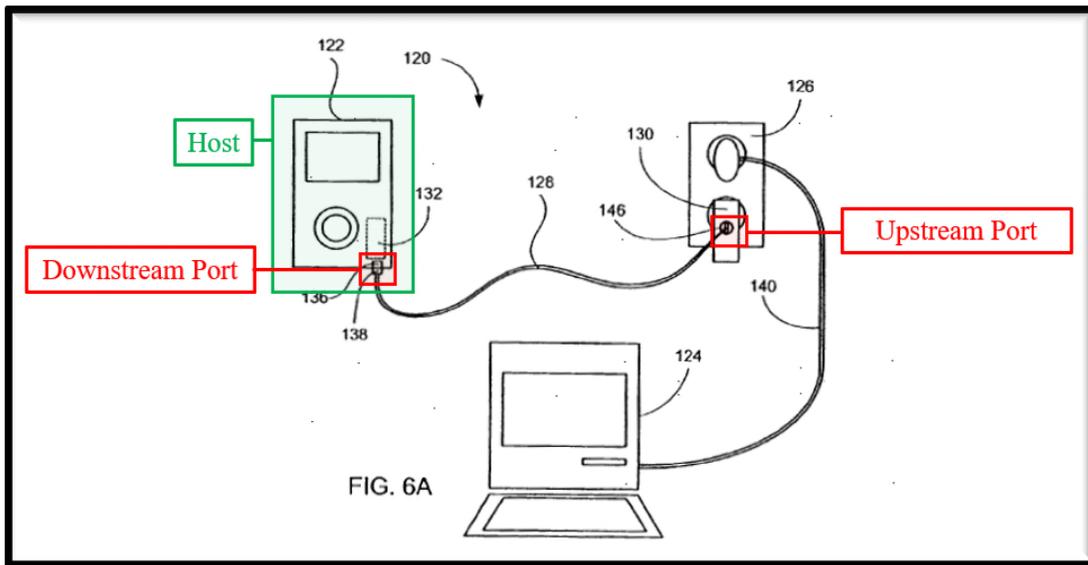
De Iuliis, Figure 6A (annotated). Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Kim discloses an adapter "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

(2) Supplying more current than Specified in the USB Specification

As discussed in section III.A.3, *supra*, the USB specification dictates a device shall not supply any current until the "Default" state and shall not supply more than 100 mA of current until the "Configured" state:

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 (annotated).

De Iuliis in view of Kim renders obvious an adapter that supplies current without regard to these conditions. Specifically, as noted below with respect to Claim 3, De Iuliis in view of Kim discloses that the adapter device and the adapter cord supply current without engaging in enumeration or any other USB communication. *See* Section IV.E.3, *infra*. Rather, the devices

connect to each other and begin drawing and supplying current pursuant to the mobile phone connection standard (not any USB standard communication). *Id.* As explained in Section III.A.4, *supra*, because the adapter of De Iuliis in view of Kim is "self-powered" the USB specification requires that it supply 500mA of current. *See* Section III.A.4. Accordingly, at a minimum, the adapter must be capable of supplying (i.e., "configured to supply") 500 mA current in case it is used with a high power device that draws such current. Moreover, Kim specifically discloses that the adapter cord will draw up to 500 mA from the USB connection (i.e., the adapter device of De Iuliis will supply up to 500 mA) and supply 500 mA of current to the mobile device. Kim at 6-3 (disclosing that "[t]he electric current detection circuit (412) . . . maintain[s] the output electric currents to 500mA or less" and will turn the circuit off only if "the output electric currents of the USB power line are 500mA or higher.") Baker Decl., ¶ 301.

Accordingly, the adapter device of De Iuliis supplies more than 0 mA of current (up to 500 mA) without any devices entering the "Default" state of enumeration and the adapter cord of Kim supplies more than 0 mA of current (up to 500 mA) without any device entering the "Default" state of enumeration. The adapter(s) thus supply current without regard to the condition/limit of the USB Specification that no current be supplied or drawn until the "Default" state of enumeration. Baker Decl., ¶ 302.

Similarly, the adapter device of De Iuliis supplies more than 100 mA of current (up to 500 mA) without any devices entering the "Configured" state of enumeration and the adapter cord of Kim supplies more than 100 mA of current (up to 500 mA) without any device entering the "Configured" state of enumeration. The adapter(s) thus supply current without regard to the condition/limit of the USB Specification that no more than 100 mA current be supplied or drawn until the "Configured" state of enumeration. Baker Decl., ¶ 303.

Under the broadest reasonable interpretation, De Iuliis in view of Kim thus discloses an adapter that is "configured to supply current on the VBUS line without regard to at least one associated condition specified in a USB specification" as required by Claim 1.

3.   Claim 3

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

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 3 of the '550 Patent under 35 U.S.C. § 103**

Claim 3 requires the adapter of Claim 1. As noted in Section IV.E.2, De Iuliis in view of Kim discloses or renders obvious the adapter of Claim 1.

Claim 3 further requires "wherein said current is supplied without USB enumeration." As explained in Section III.A.4, *supra*, "enumeration" "is the activity that identifies and assigns unique addresses to the devices attached to a bus." USB 2.0 at 20 (Section 4.6.3 Bus Enumeration); *id.* at 243-244 (Section 9.1.2 Bus Enumeration) (listing the steps of enumeration).

De Iuliis in view of Kim discloses an adapter that meets this limitation. Specifically, De Iuliis in view of Kim discloses an adapter device and adapter cord that do not engage in USB enumeration at all. Baker Decl., ¶ 304. The adapter device of De Iuliis does not have means for engaging in such enumeration and, in fact, specifically discloses that the adapter does not send any signals over the data lines of the USB connector. *See* De Iuliis at 6:5-8 ("For example, the electrical components [of the adapter device] may include a transformer for converting electrical power from one voltage-current level to another voltage current level and a rectifier that converts

alternating current AC to direct current DC."); *id.* at 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).") (emphasis added); Baker Decl., ¶ 304.

Similarly, the adapter cord of Kim does not have such means and, in fact, connects to the

mobile device through a non-USB connection and, thus, would not engage in USB enumeration

even if it had such means:
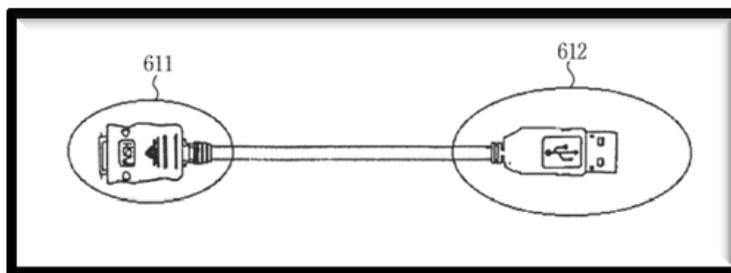
Kim at Figure 6 (showing that the mobile device end (611) of the cable is connected via a non-

USB connection); *id.* at 6-3 ("Figure 6 illustrates a connector (611) for mobile phones and a USB

connector (612) . . ."); Baker Decl., ¶ 305.

Accordingly, the adapter device of De Iuliis supplies current to the adapter cord of Kim

without enumeration and the adapter cord of Kim supplies current to the mobile device without

enumeration. As noted above, each will supply up to 500 mA of current on the VBUS line

(before turning off). Kim at 6-3 (disclosing that "[t]he electric current detection circuit (412) . . .

maintain[s] the output electric currents to 500mA or less" and will turn the circuit off only if "the

output electric currents of the USB power line are 500mA or higher."); Baker Decl., ¶ 306.

Accordingly, De Iuliis in view of Kim discloses an adapter(s) that supplies current

without engaging in enumeration as required by Claim 3.

4.   Claim 4

De Iuliis in view of Kim renders Claim 4 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 4 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart
> comparing De Iuliis in view of Kim with Claim 4 of
> the '550 Patent under 35 U.S.C. § 103**

Claim 4 requires the adapter of Claim 1. As noted in Section IV.E.2, De Iuliis in view of

Kim discloses or renders obvious the adapter of Claim 1.

Claim 4 further requires "wherein said current is supplied in response to an abnormal data

condition on said USB communication path." De Iuliis in view of Kim discloses this element.

Specifically, as explained with respect to Claim 3, De Iuliis in view of Kim discloses an adapter

that does not send any signals over the data lines to the adapter cord or the mobile phone. *See*

Section IV.E.3. Accordingly, a person of ordinary skill in the art would have understood that,

upon attachment, neither of the devices sends the typical signals that would be expected by USB

devices engaging in enumeration. Baker Decl., ¶ 308. After attachment for example, the data

lines will remain low for an extended period of time. 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).").

Generally, a short low/low signal is not an abnormal data condition. Baker Decl., ¶ 309.

However, an extended SE0 signal (e.g., for more than 100ms) would be an abnormal data

condition, particularly under the broadest reasonable interpretation of the term. Baker Decl.,

¶ 309.   A typical "idle" signal is either a high/low or low/high signal on the D+ and D- lines

(depending on the speed of the device). Baker Decl., ¶ 309. Sending an SE0 signal for 10-20 ms is used to reset a device. Baker Decl., ¶ 309. Accordingly, sending an SE0 signal for more than 100ms upon attachment, under the broadest reasonable interpretation, would be an "abnormal data condition" on the data lines because it is not defined as a valid data condition after connecting a device. Indeed, the USB Specification requires that a connecting device signal that it is connected within 100ms of detecting voltage on the VBUS line by pulling either D+ or D- positive (i.e., signaling an "attach").

Table 7-14. Device Event Timings

Parameter	Symbol	Conditions	Min	Max	Units
Time from internal power good to device pulling D+/D- beyond V$_{IHZ}$ (min) (signaling attach)	T$_{SIGATT}$	Figure 7-29		100	ms

USB 2.0 at 188 (Table 7-14 Device Event Timings) (annotated); *see also* 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.)").

Accordingly, under the broadest reasonable interpretation of this claim, because De Iuliis in view of Kim teaches that no voltage is applies to the data lines (SE0) prior to supplying current, they disclose supplying said current "in response to an abnormal data condition on said USB communication path" as required by Claim 4.
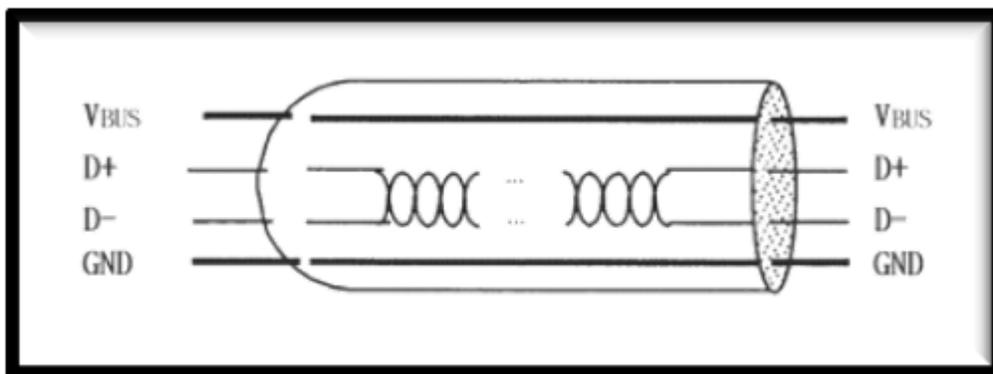
5.   Claim 5

De Iuliis in view of Kim renders Claim 5 obvious under 35 U.S.C. § 103. Below,

Requestor provides a concise statement of the substantial new question of patentability for

Claim 5 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 5 of the '550 Patent under 35 U.S.C. § 103**

Claim 5 requires the adapter of Claim 4. As noted in Section IV.E.4, De Iuliis in view of

Kim discloses or renders obvious the adapter of Claim 4.

Claim 5 further requires "wherein said USB communication path includes a D+ line and a

D-line." De Iuliis in view of Kim discloses this element. Specifically, as noted with respect to

Claim 1, De Iuliis in view of Kim discloses an adapter device that connects to an adapter cord

via a USB Connector. As further noted with respect to Claim 1, a person of ordinary skill in the

art would have understood—and Kim expressly discloses—that such a port comprises a

communication path comprising a D+ and D- line.

Kim, Figure 2.

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Kim discloses that the adapter comprises a USB communication path "wherein said USB communication path includes a D+ line and a D-line" as required by Claim 5.

6.   Claim 6

De Iuliis in view of Kim renders Claim 6 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 6 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 6 of the '550 Patent under 35 U.S.C. § 103**

Claim 6 requires the adapter of Claim 5. As noted in Section IV.E.5, De Iuliis in view of Kim discloses or renders obvious the adapter of Claim 5.

Claim 6 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." De Iuliis in view of Kim discloses this element. Specifically, as disclosed in claim 4, De Iuliis in view of Kim discloses that the adapter device of De Iuliis sends to the adapter cord of Kim an SE0 signal (low/low) for an extended period of time after the charger is connected. *See* Section IV.E.4. This constitutes an "abnormal data line condition" on the D+ line and D- line.

Accordingly, under the broadest reasonable interpretation, De Iuliis in view of Kim discloses an adapter(s) that supplies current in response to an abnormal data condition "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line" as required by Claim 6.

7. Claim 10

Patent owner disclaimed Claim 10 on April 23, 2021. PAT-B ('550 File History) at 440
(April 23, 2021 Disclaimer). Because Claims 12-16 depend on Claim 10, however, Requestor
sets forth below the reasons that De Iuliis in view of Kim renders the limitations of Claim 10
obvious under 35 U.S.C § 103.

> **Please see attached Exhibit CC-E for a claim chart
> comparing De Iuliis in view of Kim with Claim 10
> of the '550 Patent under 35 U.S.C. § 103**

a. *Preamble: An adapter comprising*

The preamble of Claim 10 describes "An adapter." As discussed with respect to Claim 1,
De Iuliis in view of Kim discloses at least one adapter. *See* Section IV.E.2.a. Specifically, De
Iuliis discloses an adapter device that adapts power from an A/C outlet to a USB format. *Id.*
Kim discloses an adapter cord that can be connected to the USB port of the adapter device of De
Iuliis in order to adapt power from a USB connection to a mobile phone connector. *Id.* Each
device is individually an adapter and together they comprise an adapter. *Id.*

b. *a USB VBUS line and a USB communication path*

The first element of Claim 10 requires "a USB VBUS line and a USB communication
path." As explained with respect to Claim 1, De Iuliis in view of Kim discloses this element.
See Section IV.E.2.b.

Specifically, De Iuliis discloses an adapter device that can draw current from a wall outlet
and convert it to be supplied at a USB connection. *Id.* Kim discloses an adapter cord that can
connect to the adapter device of De Iuliis through a USB connector. *Id.* According, a person of
ordinary skill in the art would have understood that the adapter device of De Iuliis and the

adapter cord of Kim (and the combination of the two) comprises a USB VBUS line and a USB Communication path (D+ and D- lines). *Id.*

<p style="text-align:center;">c. said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit.</p>

The second element of Claim 10 requires "said adapter configured to supply current on the VBUS line without regard to at least one USB Specification imposed limit." De Iuliis in view of Kim discloses this element. *See* Section IV.E.2.c.

First, De Iuliis in view of Kim discloses that the adapter device of De Iuliis supplies current at an upstream port. This disregards the USB Specification which limits the types of ports that can supply power to downstream ports. *Id.* The adapter cord subsequently supplies current to the mobile device at an upstream port which, again, disregards this limit. *Id.*

Second, De Iuliis in view of Kim discloses that the adapter device of De Iuliis (and then the adapter cord of Kim) supplies more than 0 mA (up to 500 mA) of current prior to entering the "Default" state of enumeration. *Id.* This disregards the USB Specification which limits the amount of current at this time to 0 mA. USB 2.0 at 243-244 ("When the reset signal is released, the port has been enabled. The USB <u>is now in the Default state and can craw no more than 100 mA from VBUS</u>.") (emphasis added).

Third, De Iuliis in view of Kim discloses that the adapter device of De Iuliis (and then the adapter cord of Kim) supplies more than 100 mA (up to 500 mA) of current prior to entering the "Configured" state of enumeration. *See* Section IV.E.2.c. This disregards the USB Specification which limits the amount of current supplied/drawn at this time to 100 mA.

Table 7-7. DC Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Max.	Units
Supply Voltage:					
High-power Port	V$_{BUS}$	Note 2, Section 7.2.1	4.75	5.25	V
Low-power Port	V$_{BUS}$	Note 2, Section 7.2.1	4.40	5.25	V
Supply Current:					
High-power Hub Port (out)	I$_{CCPRT}$	Section 7.2.1	500		mA
Low-power Hub Port (out)	I$_{CCUPT}$	Section 7.2.1	100		mA
High-power Function (in)	I$_{CCHPF}$	Section 7.2.1		500	mA
Low-power Function (in)	I$_{CCLPF}$	Section 7.2.1		100	mA
Unconfigured Function/Hub (in)	I$_{CCINIT}$	Section 7.2.1.4		100	mA
Suspended High-power Device	I$_{CCSH}$	Section 7.2.3; Note 15		2.5	mA
Suspended Low-power Device	I$_{CCSL}$	Section 7.2.3		500	µA

USB 2.0 at 178 (Table 7-7) (annotated) (showing maximum current amounts that can be supplied).

8. <u>Claim 12</u>

De Iuliis in view of Kim renders Claim 12 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 12 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 12 of the '550 Patent under 35 U.S.C. § 103**

Claim 12 requires the adapter of Claim 10. As noted in Section IV.E.7, De Iuliis in view of Kim discloses or renders obvious the adapter of Claim 10.

Claim 12 further requires "wherein said current is supplied without USB enumeration." As explained with respect to Claim 3, De Iuliis in view of Kim discloses this element. *See* Section IV.E.3.

9.   Claim 13

De Iuliis in view of Kim renders Claim 13 obvious under 35 U.S.C. § 103. Below,
Requestor provides a concise statement of the substantial new question of patentability for
Claim 13 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart
> comparing De Iuliis in view of Kim with Claim 13
> of the '550 Patent under 35 U.S.C. § 103**

Claim 13 requires the adapter of Claim 10. As noted in Section IV.E.7, De Iuliis in view
of Kim discloses or renders obvious the adapter of Claim 10.

Claim 13 further requires "wherein said current is supplied in response to an abnormal
data condition on said USB communication path." As explained with respect to Claim 4, De
Iuliis in view of Kim discloses this element. *See* Section IV.E.4.

10.   Claim 14

De Iuliis in view of Kim renders Claim 14 obvious under 35 U.S.C. § 103. Below,
Requestor provides a concise statement of the substantial new question of patentability for
Claim 14 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart
> comparing De Iuliis in view of Kim with Claim 14
> of the '550 Patent under 35 U.S.C. § 103**

Claim 14 requires the adapter of Claim 13. As noted in Section IV.E.9, De Iuliis in view
of Kim discloses or renders obvious the adapter of Claim 13.

Claim 14 further requires "wherein said USB communication path includes a D+ line and a D-line." As explained with respect to Claim 5, De Iuliis in view of Kim discloses this element. *See* Section IV.E.5.

> 11.   Claim 15

De Iuliis in view of Kim renders Claim 15 obvious under 35 U.S.C. § 103. Below, Requestor provides a concise statement of the substantial new question of patentability for Claim 15 based on De Iuliis in view of Kim under 35 U.S.C. §103.

> **Please see attached Exhibit CC-E for a claim chart comparing De Iuliis in view of Kim with Claim 15 of the '550 Patent under 35 U.S.C. § 103**

Claim 15 requires the adapter of Claim 14. As noted in Section IV.E.10, De Iuliis in view of Kim discloses or renders obvious the adapter of Claim 14.

Claim 15 further requires "wherein said abnormal data condition is an abnormal data line condition on said D+ line and said D-line." As explained with respect to Claim 6, De Iuliis in view of Kim discloses this element. *See* Section IV.E.6.

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 3-8 and 12-17 of the '550 Patent and requests that *ex parte* reexamination be ordered.

Dated: October 20, 2021

Respectfully submitted,

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