



July 13, 2020

Via Email (Jason.engel@klgates.com)

Jason A. Engel
K&L Gates
70 W. Madison St., Ste. 3100
Chicago, IL 60602

Re: Apple Products—Infringement of U.S. Patent No. 8,013,568

Dear Jason,

I write in response to your February 26, 2020 letter, including the claim chart LS Cable & System Ltd. ("LS C&S") provided, and as a follow up to our prior letter of March 7, 2019, regarding U.S. Patent No. 8,013,568. LS C&S asserts that the "wireless charging" feature in Apple iPhone 8, 8 Plus, X, XR, XS, XS Max, 11, 11 Pro, and 11 Pro Max, in the Apple Watch (First Generation and Series 1 to 5), and the Apple AirPods/AirPods Pro with Wireless Charging Case infringes claims 1, 2, 3, 5, 7, 8, and 9 the '568 patent. LS C&S provided only one claim chart which is of the '568 patent to Apple's iPhone 11 Pro Max based exclusively on the alleged operation of a third-party component, ST Micro's STPMB0. This is the first time LS&C has relied on third-party component ST Micro STPMB0 in its infringement allegations. We understand that LS C&S is no longer asserting infringement based on the third party components previously identified in its March 4, 2019 letter.

Your February 26, 2020 letter asks that we let you know if Apple is interested in obtaining a license to the '568 patent.

Apple respects the valid intellectual property rights of others and takes very seriously allegations of infringement. However, we do not believe Apple requires a license to LS C&S's patent for at least the reasons explained below.

First, Apple does not infringe the '568 patent. LS C&S's claim chart attempts to map claim 7 of the '568 patent to the wireless charging feature of iPhone 11 Pro Max. The claims do not cover the feature. Multiple limitations required by the claims are not present. For example, claims 7 and 1 of the '568 patent requires "an overvoltage monitoring unit for

Apple
One Apple Park Way
MS 169-3IPL
Cupertino, CA 95014

T 408 974 5376
E kgrewal@apple.com
www.apple.com



monitoring voltages at both ends of the constant voltage/constant current supplier." With reference to this limitation, the chart appears to point to the "STPMB0 integrated circuit" and specifically notes that "both VRECT and VOUT are constantly monitored in the STPMB0 integrated circuit." The chart goes on to state:

The STPMB0 integrated circuit uses voltage measurement(s) to create a Control Error Value, part of the Control Error Packet that is wirelessly transmitted from the PRx to the PTx. The Control Error Packet therefore includes a charging power adjustment request signal (i.e., a monitoring result).

However, the chart provides no support for these assertions. The only reference provided in the chart with respect to this claim limitation points to the "Qi Specification Parts 1 and 2, Version 1.2.3 pages 46, 134."

A review of the Qi Specification, as quoted in the claim chart, shows that the specification does not in fact require any "overvoltage monitoring unit for monitoring voltages at both ends of the constant voltage/constant current supplier" as required by the claims of the '568 patent nor does the claim chart identify any such monitoring unit. In the claim chart, with respect to the "constant voltage/constant current supplier" limitation, LS C&S points to "circuitry" in "the STPMB0 integrated ... that provides post regulation of the output of the rectification circuit to supply charging power to the iPhone 11 Pro Max battery in a constant voltage/constant current mode." But the claim chart does not identify any circuitry in the STPMB0 that monitors "voltages **at both ends**" of this alleged "post regulation" circuitry.

While the Qi standard does specify a "Control Error Value" transmitted from the Power Receiver to the Power Transmitter, which uses it to determine a new Primary Cell current, the standard does not specify what the Control Error Value must be based on. See Qi Specification Parts 1 and 2, Version 1.2.3, pp. 46-47. For example, the standard notes that the "Power Receiver may use any approach to determine a Control Point, ... [and] may change this approach at any time during the *power transfer* phase." *Id.* at 46. "Using a desired Control Point and an actual Control Point, the Power Receiver calculates a Control Error Value." *Id.* Thus, the standard does not require "a monitoring result" from a "overvoltage monitoring unit for **monitoring voltages at both ends** of the constant



voltage/constant current supplier” as required by the claims. Thus, the ’568 patent is not essential to practice the Qi wireless charging standard.

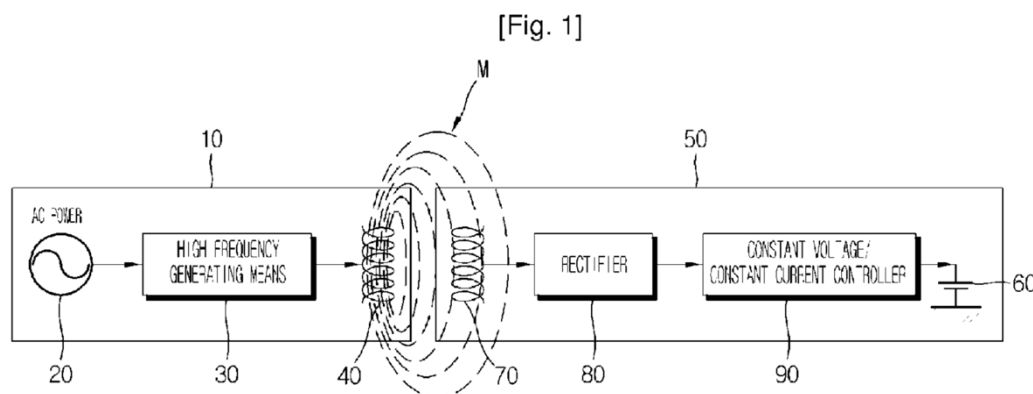
Given this gap in its analysis, LS C&S’s claim chart also refers to a totally unrelated feature of the Qi standard, the “Foreign Object Detection.” *Id.* at 133. However, the claim chart also lacks any support for its assertion that “both VRECT and VOUT are constantly monitored in the STPMB0 integrated circuit” nor does it show any “monitoring result” from this alleged monitoring in the STPMB0 that “induce[s] a change of intensity of the magnetic field” as is required by the claims.

Thus, the wireless charging feature in Apple’s iPhone 11 Pro Max does not include an “overvoltage monitoring unit for monitoring voltages at both ends of the constant voltage/constant current supplier” as required by the claims. Further, LS C&S’s allegations of infringement by other Apple products based on this claim chart are completely baseless. The February 26 letter states that the analysis provided in this claim chart “would be substantially similar for Apple’s other products that are capable of wireless charging.” However, as we stated previously LS C&S’s claim chart is exclusively based on the alleged operation of a third-party component, ST Micro’s STPMB0. But LS C&S has not even identified similar components in any of the other Apple products. Thus, LS C&S’s conclusion that their operation would be “substantially similar” is clearly unfounded.

Moreover, at least as LS C&S appears to be asserting the claims of the ’568 patent, they are invalid over the prior art. The specification acknowledges that most of the elements claimed in the ’568 patent are “well-known” in the art. For example, the specification notes that “FIG. 1 is a schematic view showing a battery and a charger adopting the **conventional**



contact-less charging method." '568 patent, 1:64-65 (emphasis added).



Id. at Fig. 1. The specification goes on to acknowledge that these conventional chargers included "a secondary coil 70 to which a high frequency AC current is induced according to the linkage of the magnetic field M generated in the primary coil 40, a rectifier 80 for converting the high frequency AC current induced in the secondary coil 70 into a DC current, and a constant voltage/constant current supplier 90 for applying the AC current rectified in the rectifier 80 to the battery cell 60." *Id.* at 5-12. Specifically, "the constant voltage/constant current supplier 90 is a well-known circuit element widely used in a battery charging device." *Id.* at 13-15. Similarly, "the high frequency power driving unit 210 employs a known SMPS (Switching Mode Power Supply)." *Id.* at 6:25-27. Thus, all the elements of claims 1 and 7, except the "overvoltage monitoring unit" were known "conventional" components in prior art contact-less charging systems. LS C&S alleges that the sending of the "Control Error Value," regardless of what it may be based on, from the Power Receiver to the Power Transmitter according to the Qi Specification meets "overvoltage monitoring unit" claim limitation. But this type of control feedback in contact-less charging systems was not new even as early as the Korean priority applications LS C&S relies upon in the '568 patent.

For example, international publication no. WO 02/15320 A1, published on February 21, 2002, more than three years before the earliest Korean application referenced in the '568 patent, describes a battery charging system with a battery pack and a charging apparatus that invalidates the claims of the '568 patent. WO 02/15320 A1, Abstract. The WO 320

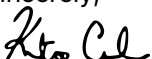


publication describes that its "battery pack includes a power receiver, a battery, a controller having a microcontroller programmed to **monitor a voltage and a current supplied to the battery**, and **a signal generator** generating a **control signal** based on the charging status of the battery to facilitate supply of a constant voltage and a constant current to the battery for proper charging." *Id.* The charging apparatus includes a "power controller 16 [that] comprises a microcontroller with a built-in algorithm programmed to effect proper charging based on the signal received through the signal receiver 17, i.e., a control signal generated from the controller 3 of the battery pack." *Id.* at 8:5-8. The WO 320 specification describes different approaches for wirelessly transmitting the control signal from the battery pack to the charging apparatus, including "a light-emitting optical sensor and a light-receiving optical sensor, a light-emitting ultrasonic sensor and a light-receiving ultrasonic sensor, or an RF-transmitting circuit and an RF-receiving circuit." *Id.* at 3:20-24. Thus, the WO 320 publication is illustrative of how the claims of the '568 patent are invalid.

We also note that LS C&S has based its infringement assertions primarily on the Qi Specification. However, LS C&S has not asserted that the '568 patent (or any of its patents) is a "Standard Essential Patent" nor has LS C&S indicated whether this patent is subject to any RAND/FRAND obligations. Apple does not understand LS C&S' correspondence to date as providing a RAND/FRAND offer. If Apple's understanding is incorrect, please clarify if LS C&S' patent is subject to RAND/FRAND obligations and if so, let us know what LS C&S may allege is its RAND/FRAND offer.

In sum, the '568 patent is not infringed by Apple and, as LS C&S asserts it, is invalid over prior art. Therefore, for at least these reasons, Apple believes that it does not need a license to the LS C&S's patent. The reasons discussed above are merely examples of why Apple does not need a license, and are not exhaustive. If LS C&S disagrees with our assessment, please provide a detailed explanation of its position. Otherwise, we will consider this matter closed.

Sincerely,


Krista Grewal

Counsel, IP Transactions