

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

TECHNOLOGY PROPERTIES LIMITED
LLC, et al.,

Plaintiffs,

v.

HUAWEI TECHNOLOGIES CO., LTD., et
al.,

Defendants.

TECHNOLOGY PROPERTIES LIMITED
LLC, et al.,

Plaintiffs,

v.

ZTE CORPORATION, et al.,

Defendants.

TECHNOLOGY PROPERTIES LIMITED
LLC, et al.,

Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD., et
al.,

Defendants.

**ORDER GRANTING MOTIONS FOR
SUMMARY JUDGMENT**

Case No. 12-cv-03865-VC

Re: Dkt. No. 139

Case No. 12-cv-03876-VC

Re: Dkt. No. 143

Case No. 12-cv-03877-VC

Re: Dkt. No. 140

TECHNOLOGY PROPERTIES LIMITED
LLC, et al.,

Plaintiffs,

v.

LG ELECTRONICS, INC., et al.,

Defendants.

Case No. 12-cv-03880-VC

Re: Dkt. No. 157

TECHNOLOGY PROPERTIES LIMITED
LLC, et al.,

Plaintiffs,

v.

NINTENDO CO., LTD., et al.,

Defendants.

Case No. 12-cv-03881-VC

Re: Dkt. No. 141

The defendants' motions for summary judgment of non-infringement are granted.

The plaintiffs ("TPL") stipulated to non-infringement under this Court's prior construction of the phrase "an entire oscillator disposed upon said integrated circuit substrate" as used in the asserted claims of Patent No. 5,809,336. The Federal Circuit then made a "minor modification" to that claim construction, holding that the proper construction of the disputed claim term is: "an oscillator located entirely on the same semiconductor substrate as the central processing unit that does not require a command input to change the clock frequency and whose frequency is not fixed by any external crystal." *Tech. Props. Ltd. LLC v. Huawei Techs. Co.*, 849 F.3d 1349, 1360 (Fed. Cir. 2017). In doing so, the Federal Circuit noted that its change to the prior construction "likely does not affect the outcome in this case." *Id.* The Federal Circuit's prediction was correct.

The parties do not dispute that the oscillators within the accused products operate as part of "phase-locked loop" systems ("PLLs"). The parties agree that, in practice, these PLLs limit the frequencies at which the oscillators at issue oscillate. *See, e.g.*, Decl. of Dr. Vivek Subramanian at 21, Dkt. No. 139-3; Decl. of Dr. Vojin Oklobdzija at 9-10, Dkt. No. 142-1. The parties also essentially agree on how PLLs work: PLLs use a reference frequency, generally

provided by an off-chip crystal oscillator, along with a programmable divisor to set the frequency of the on-chip system clock. As a result, within a functioning PLL, the frequency at which the on-chip oscillator oscillates is a multiple of the off-chip reference frequency. *See* Subramanian Decl. at 17-20; Oklobdzija Decl. at 10; *id.* at 14 ("A PLL proportionally tracks the reference frequency as closely as possible").

TPL argues that, even within the PLL, the accused oscillators infringe because they experience frequency variations resulting from process, voltage, and temperature parameters for which the PLL must correct. *See* TPL Opp'n Br. at 23-26, 30-31, Dkt. No. 142. Because the oscillators are inherently responsive to these parameters, TPL contends, the accused oscillators do not "require a command input to change the clock frequency." But, assuming that some small frequency variations occur while the PLL is operating, these minor fluctuations do not constitute the changes in clock frequency contemplated by the Federal Circuit's claim construction.

The record shows that, within a PLL, the accused oscillators operate at frequencies comparably stable to those of crystal oscillators. *See* Subramanian Decl. at 28-33; Decl. of Erik Fuehrer, Ex. 6 at 1217-26, 1480-83, Dkt. No. 138-16; *see also* TPL Opp'n Br. at 24 ("At most, Defendants' testing shows that PLLs stabilize the output of on-chip oscillators . . . and that those stabilized outputs are roughly similar in stability to a frequency output by a hypothetical crystal."). TPL characterizes crystal oscillators as "fixed." *See* TPL Opp'n Br. at 2 ("A clock signal generated from a crystal is a fixed-frequency signal that does not meaningfully vary based on environmental conditions."); Fuehrer Decl., Ex. 2 at 4, Dkt. No. 139-6, ("Crystals are by design fixed-frequency devices whose oscillation speed is designed to be tightly controlled and to vary minimally due to variations in manufacturing, operating voltage and temperature"). There is thus no reason to consider any minor frequency variations occurring within a locked PLL to be the changes in clock frequency identified in the Federal Circuit's claim construction. *See Tech. Props. Ltd.*, 849 F.3d at 1360.¹

¹ There is also no reason to think that the Federal Circuit intended to refer to differences between the maximum frequency capabilities of one processor versus another in crafting the limitation

The record further shows that the frequency of the on-chip oscillator within the PLL will remain stable, in the sense discussed above, unless and until it is changed by a command input, namely, a change to the crystal that sets the reference frequency or to the value of a programmable divisor within the PLL. *See* Subramanian Decl. at 20; Decl. of Marzio Pedrali-Noy at 3-4, Dkt. No. 138-12; Decl. of Dr. Jaegon Lee at 6, 11, Dkt. No. 138-10. TPL has provided no evidence to the contrary, nor has it provided a definition of "command input" that would exclude inputs of these kinds. *Cf.* Oklobdzija Decl. at 12 (pointing only to the oscillator's "fundamental characteristics . . . determined by physics and nature" as support for the notion that no command input is required to change the clock frequency).

It's worth noting that, because PLLs inhibit frequency changes of any significance in the absence of a command input, PLLs prevent the oscillators in the accused devices from acting in the advantageous manner touted in the relevant part of the patent and recognized by the Federal Circuit. The proposed benefit of locating the claimed oscillator on the same substrate as the CPU is that the clock and the CPU can "automatically vary together," without requiring a command input to change the clock frequency. *Tech. Props. Ltd.*, 849 F.3d at 1360 (citation omitted); Fuehrer Decl., Ex. 3 at 7, Dkt. No. 139-7 ("[T]he operational speed of the microprocessor and ring oscillator clock are designed to vary similarly as a function of variation in temperature, processing and other parameters affecting circuit performance"); *see also* Oklobdzija Decl. at 7. The effectively simultaneous, corresponding changes in the frequencies of the clock and CPU allow the CPU to run "at the maximum frequency possible, but never too fast" given the process, voltage, and temperature conditions affecting the CPU. '336 Patent at 17:1-2, Dkt. No. 139-5; *see also* Fuehrer Decl., Ex. 3 at 7-9. Rather than allow the frequency of the oscillator to vary freely with process, voltage, and temperature parameters as in the claimed

regarding command inputs and changes in clock frequency. Therefore, to the extent TPL contends that the practice of "binning," in which manufacturers sort processors based on their performance capabilities, is evidence that the accused oscillators can change frequency as a result of fabrication process parameters, not just command inputs, the argument is not persuasive.

invention, the PLL controls the frequency at which its component oscillator oscillates so that its frequency does not track changes in these parameters. And, as mentioned, the undisputed evidence shows that the PLL does so very effectively, such that any changes in frequency resulting from operational parameters are all but imperceptible.


In its papers and through its experts, TPL makes an alternative argument (although counsel for TPL seemed – wisely – to disavow it at oral argument). The argument is that what matters is not how the accused oscillators operate within a PLL, but whether the accused oscillators in isolation meet all the claim limitations. *See, e.g.,* Oklobdzija Decl. at 13 (stating that the relevant testing to determine infringement "would need to measure the [voltage-controlled oscillator's] frequencies with PLL circuitry disabled so that the VCO frequency changes in response to temperature were not masked by PLL intervention."). But the accused oscillators don't operate in isolation in the accused devices, they operate within the tightly controlled framework of the PLL. Given the claim limitations at issue and the construction provided by the Federal Circuit, TPL cannot defeat the defendants' summary judgment motions simply by asserting that the accused devices hypothetically could infringe if altered. In other words, that the accused products all situate the on-chip oscillator within a PLL matters for purposes of determining whether those products infringe, because the PLLs affect how the on-chip oscillator's frequency is determined; the PLL circuitry is not simply an extra element added on to an infringing device. *See Outside the Box Innovations, LLC v. Travel Caddy, Inc.*, 695 F.3d 1285, 1305 (Fed. Cir. 2012) (per curiam) (concluding that the addition of plywood to a fabric panel was not merely a feature added on to an infringing device but a "material change" such that the accused product did not infringe the claimed "flexible fabric . . . panel"); *High Tech Med. Instrumentation, Inc. v. New Image Indus., Inc.*, 49 F.3d 1551, 1555 (Fed. Cir. 1995) (holding that a patentee was unlikely to succeed in proving infringement where, to infringe, "[t]he original and intended operating configuration of the device must be altered" by loosening screws fixing the accused camera in place); *see also Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1327 (Fed. Cir. 2013). The question is not whether the accused oscillators

could infringe in theory, but whether there is any dispute about whether they do in fact.

In sum, TPL has not put forth evidence sufficient to raise a question about whether the oscillators in the accused products require a command input to change the frequencies at which they oscillate. The record shows that, unlike the free-running oscillators described in the patent, the accused oscillators are situated within PLLs that hold their frequencies effectively steady until they are changed by a command input. Because it is clear that the accused devices require a command input to change the clock frequency, they do not meet "each and every limitation" of the asserted claims. *Cross Med. Prod., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1310 (Fed. Cir. 2005). Summary judgment for the defendants is appropriate, and there's no need to discuss whether the accused oscillators are "fixed by any external crystal," although it seems likely that TPL would lose on that question as well. *Tech. Props. Ltd.*, 849 F.3d at 1360.

IT IS SO ORDERED.

Dated: December 13, 2017



VINCE CHHABRIA
United States District Judge