IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

M-RED INC.,	Plaintiff,	§	Case No.
v.		§	**JURY TRIAL DEMANDED**
NINTENDO CO., LTD.,	Defendant.	§	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff M-Red Inc. ("M-Red" or "Plaintiff") for its Complaint against Defendant Nintendo Co., Ltd. ("Defendant" or "Nintendo") alleges as follows:

THE PARTIES

1. M-Red is a corporation organized and existing under the laws of the State of Texas, with its principal place of business located at 100 W. Houston Street, Marshall, Texas 75670.

2. Upon information and belief, Defendant Nintendo is a corporation organized and existing under the laws of Japan, with its principal place of business located at 1-1 Hokotate-cho, Kamitoba, Minami-ku, Kyoto, Japan. Nintendo may be served with process pursuant to the provisions of the Hague Convention. Nintendo may also be served with process by serving the Texas Secretary of State at 1019 Brazos Street, Austin, Texas 78701 as its agent for service because it engages in business in Texas but has not designated or maintained a resident agent for service of process in Texas as required by statute.

3. Nintendo is a leading manufacturer and seller of consumer electronics and handheld game consoles in the United States. Upon information and belief, Defendant does business in Texas and in the Eastern District of Texas, directly or through intermediaries.

JURISDICTION

4. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. This Court has personal jurisdiction over Defendant. Defendant regularly conducts business and has committed acts of patent infringement and/or has induced acts of patent infringement by others in this Judicial District and/or has contributed to patent infringement by others in this Judicial District, the State of Texas, and elsewhere in the United States.

6. Defendant is subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to its substantial business in this State and Judicial District, including (a) at least part of its past infringing activities, (b) regularly doing or soliciting business in Texas, and/or (c) engaging in persistent conduct and/or deriving substantial revenue from goods and services provided to customers in Texas.

7. For example, Nintendo has done and continues to do business in Texas; (ii) Nintendo has committed and continues to commit acts of patent infringement in the State of Texas, including making, using, offering to sell, and/or selling Accused Products in Texas, and/or importing Accused Products into Texas, including by Internet sales and sales via retail and wholesale stores, inducing others to commit acts of patent infringement in Texas, and/or committing at least a portion of any other infringements alleged herein; and (iii) Nintendo regularly places its products within the stream of commerce—directly, through subsidiaries, or through third parties—with the expectation and knowledge that such products, such as consoles and accessories, will be shipped to, sold, or used in Texas and elsewhere in the United States. Accordingly, Nintendo has established minimum contacts within Texas and purposefully availed itself of the

benefits of Texas, and the exercise of personal jurisdiction over Nintendo would not offend traditional notions of fair play and substantial justice.

8. Nintendo purposefully directs and controls the sale of the Accused Products into established United States distribution channels, including sales to nationwide retailers and for sale in Texas. Nintendo further places the Accused Products into international supply chains, knowing that the Accused Products will be sold in the United States, including Texas.

9. Venue is proper in this Judicial District pursuant to 28 U.S.C. § 1391 because, among other things, Defendant does not reside in the United States, and thus may be sued in any judicial district pursuant to 28 U.S.C. § 1391(c)(3).

PATENTS-IN-SUIT

10. On February 8, 2005 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,853,259 (the "'259 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '259 Patent is attached hereto as Exhibit A.

11. On June 27, 2006 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,068,557 (the "'557 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '557 Patent is attached hereto as Exhibit B.

12. On April 24, 2007 the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,209,401 (the "'401 Patent") entitled "Ring oscillator dynamic adjustments for auto calibration." A true and correct copy of the '401 Patent is attached hereto as Exhibit C.

13. On January 23, 2001, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,177,843 (the "'843 Patent") entitled "Oscillator circuit controlled

by programmable logic." A true and correct copy of the '843 Patent is attached hereto as Exhibit D.

14. On September 30, 2003, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,628,171 (the "'171 Patent") entitled "Method, architecture and circuit for controlling and/or operating an oscillator." A true and correct copy of the '171 Patent is attached hereto as Exhibit E.

15. M-Red is the assignee of all right, title and interest in the '259 Patent, the '557 Patent, the '401 Patent, the '843 Patent, and the '171 Patent, including the exclusive right to seek damages for past, current, and future infringement.

16. The '259, '557, and '401 Patents (the "Norman Patents") generally describe integrated circuits comprising voltage and temperate sensors which output a voltage and temperate and store the output in memory. The technology was developed by Robert D. Norman and Dominik J. Schmidt. The Norman Patents also describe methods for dynamically adjusting clock frequency based on voltage and temperature values. In some embodiments of the inventions, temperature sensors dynamically monitor environmental parameters and store these parameters on a memory. These temperature monitoring and power saving techniques are incorporated into integrated circuits ("ICs") and software utilized in Nintendo Accused Products. For example, this functionality is included and utilized in Nvidia System-on-a-Chips ("SoCs") used in Nintendo Accused Products, such as the Nvidia Tegra X1 included and utilized in the Nintendo Switch. For example, this functionality is included and utilized in Broadcom SoCs used in Nintendo Accused Products, such as the Broadcom BCM4356 used in the Nintendo Switch.

17. For example, Nintendo makes, uses, sells, offers for sale, and imports products with Nvidia SoCs, including the Tegra line of SoCs, and associated software, which adjust a clock

frequency based on variations in voltage and temperature. For example, Nvidia SoCs enable "GPU DVFS [] using the devfreq framework," which adjusts clock speeds based on load.[1] Upon information and belief, Nvidia SoCs further adjust for frequency drift by adjusting clock speeds based on variations in temperature and voltage. [2] According to Nvidia, the DVFS "algorithm has very fine control over the frequency levels . . . ."[3] Additionally, the "[d]uring period of low GPU utilization, GPU clocks and voltage can be dropped to lower levels to greatly reduce idle power consumption. When an incoming task is detected, the frequency and voltage levels are immediately increased to the appropriate operating values to ensure higher performance. The DVFS software intelligently raises the voltage and frequency only up to a level that is required to deliver the performance demanded by the application. ."[4]

18. For example, Nintendo makes, uses, sells, offers for sale, and imports products with Broadcom SoCs including Wireless LAN/Bluetooth Combo chips and embedded processors, which adjust a clock frequency based on variations in voltage and temperature. For example, Broadcom SoCs include "Adaptive Voltage Scaling" ("AVS") functionality which "also supports [dynamic frequency scaling] and DVFS mode".[5] Broadcom's AVS functionality adjusts a clock frequency based on at least variations in temperature and voltage.[6] For example, Broadcom SoCs

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[1]https://docs.nvidia.com/jetson/l4t/index.html#page/Tegra%20Linux%20Driver%20Package%20Development%20Guide/introduction.html; *see also* https://docs.nvidia.com/jetson/l4t/index.html#page/Tegra%20Linux%20Driver%20Package%20Development%20Guide/power_management_nano.html

[2] *See* https://www.nvidia.com/en-us/geforce/forums/gaming-pcs/8/116552/ram-bandwidth-200-bclk-i3-Lenovo-p7h55/

[3] https://www.nvidia.com/docs/IO/116757/Tegra_4_GPU_Whitepaper_FINALv2.pdf

[4] *Id.*
Power vs. Performance Management of the CPU, Qualcomm, (retrieved April 29, 2019), https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu.

[5] https://github.com/torvalds/linux/blob/master/drivers/cpufreq/brcmstb-avs-cpufreq.c

[6] *Id.*

further include both hardware and software based "frequency drift compensation" which calibrates frequency based on variations in temperature and voltage.[7] Broadcom SoCs further include an "advanced WLAN power management unit sequencer. The PMU sequencer provides significant power savings by putting the BCM43569 into various power management states appropriate to the current environment and activities that are being performed. The power management unit enables and disables internal regulators, switches, and other blocks based on a computation of the required resources and a table that describes the relationship between resources and the time needed to enable and disable them. Power up sequences are fully programmable. Configurable, free-running counters (running at 32.768 kHz LPO clock) in the PMU sequencer are used to turn on/turn off individual regulators and power switches. Clock speeds are dynamically changed (or gated altogether) for the current mode."[8] On information and belief, at least all 43xx series Broadcom chips include and utilize WLAN power management units substantially similar to that of the BCM43569.

19. The '843 and '171 Patents (the "Chou Patents") generally describe methods and apparatuses to present an output signal having a frequency from an oscillator, including and/or utilizing (i) a reference signal, (ii) a control signal and (iii) the output signal. The technology was developed by Richard Chou, Pidugu L. Narayana, and Paul H. Scott. In some embodiments of the invention, a logic circuit may be configured to present the control signal in response to (i) the output signal and (ii) the reference signal. For example, the logic circuit may disable the oscillator when the output signal oscillates outside a predetermined range. In some embodiments of the invention, the oscillator may be implemented as a phase-locked loop (PLL) with reference signal

[7] https://docs.broadcom.com/doc/12398471 at 2; *see also* https://docs.broadcom.com/doc/1211168567832 at 8.
[8] https://www.cypress.com/file/310246/download at 20.

or as a voltage controlled oscillator (VCO). The signal may prevent the VCO from "running" away by maintaining the frequency of the oscillation of the signal VCO_OUT within a number of predefined criteria that may avoid the runaway condition. These techniques are incorporated into IC and software utilized in Nintendo Accused Products. For example, this functionality is included and utilized in Nvidia System-on-a-Chips ("SoCs") used in Nintendo Accused Products, such as the Nvidia Tegra X1 included and utilized in the Nintendo Switch. For example, this functionality is included and utilized in Broadcom SoCs used in Nintendo Accused Products, such as the Broadcom BCM4356 used in the Nintendo Switch.

20. For example, Nintendo makes, uses, sells, offers for sale, and imports products using Broadcom and Nvidia SoCs with "watchdog" functionality that infringes the Chou Patents. For example, the Accused Products use Linux-based SoCs that implement watchdog functionality through hardware (*e.g.*, a hardware circuit corresponding with a device node in a /dev/watchdog directory), and software (*e.g.*, a kernel timer in a /dev/watchdog directory and/or other platform-specific implementations).[9]

21. For example, Nvidia SoCs include watchdog functionality that "when turned on, has a timer that starts decrementing… When the timeout condition occurs, the WDT1 hardware sends a reset signal to the CPU that causes it to reset."[10] The reset signal comprises a control signal in response to an output signal (*e.g.* an oscillation frequency) and a reference signal (*e.g.* a reference clock frequency):

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[9] https://www.programmersought.com/article/16015070422/; https://www.programmersought.com/article/96024752062/#:~:text=Watchdog%20is%20mainly%20used%20in,CPU%20runaway%2C%20etc.); https://www.programmersought.com/article/42626850394/

[10] https://docs.nvidia.com/drive/active/5.1.0.2L/nvvib_docs/index.html#page/DRIVE_OS_Linux_SDK_Development_Guide/Interfaces/WDT.html

Watchdog Timer Controller Settings

These settings specify watchdog timer controller register values. These values will be configured by MB1.

Field	Description	Configuration Example
bpmp_wdtcr	Contains the bpmp processer watchdog timer register value	wdt.bpmp_wdtcr = 0x710640; configures for 100sec
Sce_wdtcr	Contains the SCE processer watchdog timer register value	wdt.sce_wdtcr = 0x707103;
aon_wdtcr	Contains aon's watchdog timer register value	wdt.aon_wdtcr = 0x700000;
rtc2_ao_wdtcr	Contains rtc2_ao watchdog timer register value	wdt.rtc2_ao_wdtcr = 0x700000;
top_wdt0_wdtcr	Contains top_wdt0 watchdog timer register value	wdt.top_wdt0_wdtcr = 0x715016;
top_wdt1_wdtcr	Contains top_wdt1 watchdog timer register value	wdt.top_wdt1_wdtcr = 0x710640;
top_wdt2_wdtcr	Contains top_wdt2 watchdog timer register value	wdt.top_wdt2_wdtcr = 0x707103;

[11]

22. For example, upon information and belief, the Broadcom 43xx series WiFi SoCs include and utilize at least an external reference clock and a low power oscillator to implement watchdog functionality, such as by comparing an output signal to a reference clock and activating a control signal when certain parameters are violated. [12] For example, similar Broadcom chips used in Android devices further implement watchdog functionality as described above.[13]

23. Nintendo has infringed and is continuing to infringe the '259, '557,'401, '843, and '171 Patents (the "Asserted Patents") by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell and/or import, products that utilize semiconductors including, but not limited to Broadcom, and Nvidia ICs (the "Accused Products"). The Accused Products infringe the Norman and Chou Patents at least because they include ICs including Broadcom SoCs such as, but not limited to, all versions, generations and models of BCM Bluetooth SoCs (*e.g.* BCM20xx), BCM GNSS/GPS SoCs (*e.g.* BCM477x, BCM477xx), BCM

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[11] https://docs.nvidia.com/jetson/l4t/index.html#page/Tegra%20Linux%20Driver%20Package%20Development%20Guide/mb1_platform_config_tx2.html

[12] *See e.g.* https://www.cypress.com/file/310246/download at 23-25.

[13] https://android.googlesource.com/kernel/bcm/+/android-wear-5.0.2_r0.5/drivers/watchdog/Kconfig

Wireless LAN/Bluetooth Combo chips (BCM43xxx, BCM43xx), BCM embedded processors (*e.g.* BCM11xx, BCM11xxx), Broadcom Communications Processors (*e.g.* BCM587xx, BCM58xx, BCM5301x, XLPxxx), Broadcom Knowledge-Based Processors (*e.g.* BCM15K, NL/NLAxxxx/xxxxx), Broadcom Multicore Processors (*e.g.* XLSxxx), Broadcom Ethernet Network Adapters, Stingray SmartNIC Adapters and IC ("Exemplary Broadcom SoCs"); and all Nvidia SoCs such as, but not limited to, all versions, generations, and models of Tegra series chips (*e.g.* Tegra APX, Tegra 6xx, Tegra 2, Tegra 3, Tegra 4, Tegra K1, Tegra X1) ("Exemplary Nvidia SoCs").

24. M-Red has at all times complied with the marking provisions of 35 U.S.C. § 287 with respect to the patents-in-suit. On information and belief, prior assignees and licensees have also complied with the marking provisions of 35 U.S.C. § 287.

COUNT I
(Infringement of the '259 Patent)

25. Paragraphs 1 through 24 are incorporated by reference as if fully set forth herein.

26. M-Red has not licensed or otherwise authorized Nintendo to make, use, offer for sale, sell, or import any products that embody the inventions of the '259 Patent.

27. Defendant has and continues to directly infringe the '259 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '259 Patent. Upon information and belief, Nintendo Accused Products include Nvidia SoCs, such as the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

28. For example, Defendant has and continues to directly infringe at least claim 1 of the '259 Patent by making, using, offering to sell, selling, and/or importing into the United States

products that include an apparatus to compensate for voltage and temperature variations on an integrated circuit, such as, for example, the thermal controller components and associated software utilized with the Accused Products such as Nintendo Accused Products that incorporate Exemplary Nvidia SoCs. The Exemplary Nvidia SoCs, such as the SoCs utilized in the Nintendo Switch includes a voltage sensor. The Exemplary Nvidia SoCs each operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

29. Defendant has and continues to directly infringe at least claim 1 of the '259 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an apparatus to compensate for voltage and temperature variations on an integrated circuit, comprising: a voltage sensor having a digital voltage output; a temperature sensor having a digital temperature output; a register coupled to the voltage sensor and the temperature sensor, the register adapted to concatenate the digital voltage output and the temperature output into an address output; and a memory device having an address input coupled to the address output of the register, the memory device being adapted to store one or more corrective vectors.

30. On information and belief, the Accused Products include SoCs that include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, the Nvidia SoC used in the Nintendo Switch includes a voltage sensor. For example the Exemplary Nvidia SoCs, each include one or more temperature and voltage sensors that provide outputs stored in one or more registers.

31. On information and belief, the Nvidia SoCs used in the Nintendo Switch include a register coupled to the voltage sensor and the temperature sensor, the register adapted to concatenate the voltage output and the temperature output into an address output. On information and belief, the Nvidia SoC used in the Nintendo Switch includes one or more registers including

registers that store voltage and temperature information related to the performance of the temperature sensors, the thermal controller, and the voltage states of the SoC and its cores. For example, upon information and belief, the one or more registers of the Exemplary Nvidia SoCs are adapted to combine the digital voltage and temperature in order to determine whether to alter the performance of the processor.

32. On information and belief, the Nvidia SoCs used in the Nintendo Switch include a memory device having an address input coupled to the address output of the register, the memory device being adapted to store one or more corrective vectors. On information and belief, the Nvidia SoC used in the Nintendo Switch include RAM, cache memory, and buffer memory to store corrective vectors, such as commands to increase or decrease the frequency and/or voltage of the SoC via, for example, dynamic voltage and frequency scaling (DVFS). For example, the Exemplary Nvidia SoCs each include a DVFS "algorithm [with] very fine control over the frequency levels . . . ."

33. Upon information and belief, and as discussed above, Nintendo Accused Products including the Exemplary Broadcom SoCs practice the claimed limitations of the '259 Patent in a substantially similar manner to Nintendo Accused Products including the Exemplary Nvidia SoCs.

34. Defendant has and continues to indirectly infringe one or more claims of the '259 Patent by knowingly and intentionally inducing others, including Nvidia customers and end-users of the Accused Products and products that include the Accused Products, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such as the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

35. Defendant, with knowledge that these products, or the use thereof, infringe the '259 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '259 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products.

36. Defendant induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '259 Patent, but while remaining willfully blind to the infringement.

37. M-Red has suffered damages as a result of Defendant's direct and indirect infringement of the '259 Patent in an amount to be proved at trial.

38. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '259 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT II
(Infringement of the '557 Patent)

39. Paragraphs 1 through 24 are incorporated by reference as if fully set forth herein.

40. M-Red has not licensed or otherwise authorized Nintendo to make, use, offer for sale, sell, or import any products that embody the inventions of the '557 Patent.

41. Defendant has and continues to directly infringe the '557 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '557 Patent. Upon information and belief, these products include Nintendo SoCs and products that incorporate Nintendo SoCs, including at least

the Exemplary Nintendo SoCs, which are sold in the United States and incorporated by others into products sold in the United States. Upon information and belief, these products further include Nintendo Accused Products incorporating Nvidia SoCs, including at least the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

42. For example, Defendant has and continues to directly infringe at least claim 1 of the '557 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an integrated circuit comprising a voltage sensor having a voltage input; a temperature sensor having a temperature input; and a memory capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. On information and belief, such integrated circuits include, by way of example, the Accused Products that include thermal controller components and associated software such as the Exemplary Nintendo SoCs, products that incorporate the Exemplary Nintendo SoCs, and Nintendo Accused Products that incorporate Exemplary Nvidia SoCs. For example, the Accused Products operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors. On information and belief, such integrated circuits include, by way of example, Nvidia SoCs included in Nintendo Accused Products such as the Nintendo Switch that include thermal controller components and associated software, such as the Exemplary Nvidia SoCs. For example, Nvidia SoCs operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

43. On information and belief, the Accused Products include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, the Nvidia SoCs used in Nintendo Products such as the Exemplary Nvidia

SoCs utilized in the Nintendo Switch, include one or more temperature and voltage sensors that provide outputs.

44. On information and belief, the Accused Products further include storage capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. For example, on information and belief, the Nvidia SoCs used in Nintendo Accused Products, such as the Exemplary Nvidia SoCs utilized in the Nvidia Switch, include RAM, cache memory, and buffer memory capable of receiving an input address based upon the voltage output and temperature output, and are configured to store compensation data, such as commands to increase or decrease the frequency and/or voltage of the SoCs. For example, upon information and belief, the Nvidia SoCs incorporated in the Accused Products each include further scale frequency and voltage based on temperature, and apply a frequency calibration to compensate for frequency drift based on changes in temperature.

45. Upon information and belief, and as discussed above, Nintendo Accused Products including the Exemplary Broadcom SoCs practice the claimed limitations of the ‘557Patent in a substantially similar manner to Nintendo Accused Products including the Exemplary Nvidia SoCs.

46. Defendant has and continues to indirectly infringe one or more claims of the ’557 Patent by knowingly and intentionally inducing others, including Nintendo customers and end-users of the Accused Products and products that include the Accused Products, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such as the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

47. Defendant, with knowledge that these products, or the use thereof, infringe the ’557 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues

to knowingly and intentionally induce, direct infringement of the '557 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products,

48. Defendant induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '557 Patent, but while remaining willfully blind to the infringement.

49. M-Red has suffered damages as a result of Defendant's direct and indirect infringement of the '557 Patent in an amount to be proved at trial.

50. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '557 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT III
(Infringement of the '401 Patent)

51. Paragraphs 1 through 24 are incorporated by reference as if fully set forth herein.

52. M-Red has not licensed or otherwise authorized Nintendo to make, use, offer for sale, sell, or import any products that embody the inventions of the '401 Patent.

53. Defendant has and continues to directly infringe the '401 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '401 Patent. Upon information and belief, these products include Nintendo SoCs and products that incorporate Nintendo SoCs, including at least the Exemplary Nintendo SoCs, which are sold in the United States and incorporated by others into products sold in the United States. Upon information and belief, these products further include

Nintendo Accused Products incorporating Nvidia SoCs, including at least the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

54. For example, Defendant has and continues to directly infringe at least claim 1 of the '401 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an integrated circuit comprising: a voltage sensor having a voltage output; a temperature sensor having a temperature output; an analog-to-digital converter ("ADC") coupled to the voltage sensor and the temperature sensor, the ADC to convert the voltage output and the temperature output to digital values; and a storage coupled to receive an input address based upon at least one of the voltage output and temperature output, the storage configured to store compensation data, for example, the thermal controller components and associated software utilized with the Accused Products, such as the Exemplary Nintendo SoCs, products that incorporate the Exemplary Nintendo SoCs, and Nintendo Accused Products that incorporate Exemplary Nvidia SoCs. For example, on information and belief, the Exemplary Nvidia SoCs each include a voltage sensor having a digital voltage output. For example, the Exemplary Nvidia SoCs incorporated in Nintendo Accused Products operate at different voltages and frequencies and dynamically adjust these voltages and frequencies based on outputs from sensors.

55. On information and belief, the Nvidia SoCs used in the Nintendo Switch include a voltage sensor having a voltage output, and a temperature sensor having a temperature output. For example, on information and belief, Nvidia SoCs such as the Exemplary Nvidia SoCs, incorporated in the Nintendo Switch, include one or more temperature and voltage sensors that provide outputs.

56. On information and belief, the Nvidia SoCs used in the Nintendo Switch include an analog-to-digital converter coupled to the voltage sensor and the temperature sensor, the ADC

to convert the voltage output and the temperature output to digital values. For example, on information and belief, Nvidia SoCs such as the Exemplary Nvidia SoCs, incorporated in the Nintendo Switch, include sensors which output analog signals which are converted to digital signals prior to storage.

57. On information and belief, the Nvidia SoCs incorporated in the Nvidia Switch further include a storage capable of receiving an input address based upon the voltage output and the temperature output, the memory configured to store compensation data. For example, on information and belief, Nvidia SoCs such as the Exemplary Nvidia SoCs, incorporated in the Nvidia Switch, include ram, cache memory, and buffer memory capable of receiving an input address based upon the voltage output and temperature output, and are configured to store compensation data, such as commands to increase or decrease the frequency and/or voltage of the SoC. For example, Nvidia SoC's include a DVFS "algorithm [with] very fine control over the frequency levels . . . ."

58. Upon information and belief, and as discussed above, Nintendo Accused Products including the Exemplary Broadcom SoCs practice the claimed limitations of the '401 Patent in a substantially similar manner to Nintendo Accused Products including the Exemplary Nvidia SoCs.

59. Defendant has and continues to indirectly infringe one or more claims of the '401 Patent by knowingly and intentionally inducing others, including Nintendo customers and end-users of the Accused Products and products that include the Accused Products, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States products that include infringing technology, such as the Nintendo Switch incorporating a Nvidia SoC such as the Exemplary Nvidia SoCs.

60. Defendant, with knowledge that these products, or the use thereof, infringe the '401 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '401 Patent by providing these products to customers and ultimately to end users for use in an infringing manner in the United States including, but not limited to, end users of products that incorporate Accused Products.

61. Defendant induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '401 Patent, but while remaining willfully blind to the infringement.

62. M-Red has suffered damages as a result of Defendant's direct and indirect infringement of the '401 Patent in an amount to be proved at trial.

63. M-Red has suffered, and will continue to suffer, irreparable harm as a result of Defendant's infringement of the '401 Patent, for which there is no adequate remedy at law, unless Defendant's infringement is enjoined by this Court.

COUNT IV
(Infringement of the '843 Patent)

64. Paragraphs 1 through 24 are incorporated by reference as if fully set forth herein.

65. M-Red has not licensed or otherwise authorized Nintendo to make, use, offer for sale, sell, or import any products that embody the inventions of the '843 Patent.

66. Defendant has and continues to directly infringe the '843 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '843 Patent. Upon information and belief, these

products include at least the Nintendo Accused Products incorporating Nvidia, and/or Broadcom SoCs, such as at least the Nintendo Switch incorporating the Exemplary Nvidia SoCs.

67. For example, Defendant has and continue to directly infringe at least claim 1 of the '843 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include an apparatus comprising: an oscillator circuit configured to present an output signal having a frequency in response to (i) a reference signal, (ii) a control signal and (iii) said output signal; and a logic circuit configured to present said control signal to a phase frequency detector in response to (i) said output signal and (ii) said reference signal.

68. For example, the Accused Products comprise an oscillator circuit configured to present an output signal having a frequency, such as a processor, a clock, and/or a phase-locked loop of an SoC.

69. For example, the Accused Products output a frequency, such as from a processor, a clock, and/or a phase-locked loop of an SoC based on a reference signal (e.g. a reference clock), a control signal (e.g. a watchdog signal), and said output signal.

70. For example, the Accused Products further comprise a logic circuit, such as a logic circuit of a phase locked loop, configured to present a watchdog signal to a phase frequency detector in response to an output signal and reference signal, such as when a difference between the output signal and reference signal exceeds a parameter.

71. Upon information and belief, and as discussed above, Nintendo Accused Products including the Exemplary Broadcom SoCs practice the claimed limitations of the '843 Patent in a substantially similar manner to Nintendo Accused Products including the Exemplary Nvidia SoCs.

72. M-Red has suffered damages as a result of Defendant's direct infringement of the '843 Patent in an amount to be proved at trial.

COUNT V
(Infringement of the '171 Patent)

73. Paragraphs 1 through 24 are incorporated by reference as if fully set forth herein.

74. M-Red has not licensed or otherwise authorized Nintendo to make, use, offer for sale, sell, or import any products that embody the inventions of the '171 Patent.

75. Defendant has and continues to directly infringe the '171 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '171 Patent. Upon information and belief, these products include at least the Nintendo Accused Products incorporating Nvidia, and/or Broadcom SoCs, such as at least the Nintendo Switch incorporating the Exemplary Nvidia SoCs.

76. For example, Defendant has and continues to directly infringe at least claim 1 of the '171 Patent by making, using, offering to sell, selling, and/or importing into the United States products that include a circuit comprising: an oscillator circuit having (i) first, second and third input terminals and (ii) an output terminal coupled to the second input terminal; and a logic circuit configured to present a control signal to a phase frequency detector, the logic circuit having (i) input terminals coupled to the first and second input terminals of said oscillator circuit, respectively, (ii) a counter circuit coupled to the first and second input terminals of said oscillator circuit input terminals, and (iii) a first decoder circuit coupled to the counter circuit through a first plurality of terminals and having a first output terminal coupled to the third input terminal of said oscillator circuit.

77. For example, upon information and belief, the Accused Products comprise an SoC with a processor, PLL, and/or clock that comprises a first, second, and third input terminal, such as input terminals of a phase frequency detector, logic trap, and/or a divider.

78. For example, upon information and belief, the Accused Products comprise an SoC with an output terminal coupled to the first and second input terminals, such as a frequency output (e.g. VCO_OUT), coupled to a plurality of divider and/or phase frequency detector inputs.

79. For example, upon information and belief, the Accused Products comprise an SoC with a logic circuit (*e.g.* a watchdog circuit) configured to present a control signal (*e.g.* a reset signal) to a phase frequency detector. Upon information and belief, the watchdog circuit has input terminals coupled to the first and second input terminals of the oscillator circuit (*e.g.* clock, PLL, and/or processor), such as the divider and phase frequency detector circuits of the oscillator circuit.

80. For example, upon information and belief, the watchdog circuit of the Accused Products further comprises a counter coupled to the first and second input terminals of the oscillator circuit, and a decoder circuit coupled to the counter circuit having a first output terminal coupled to the third input terminal of said oscillator circuit.

81. For example, the Accused Products comprise an oscillator circuit configured to present an output signal having a frequency, such as a processor, a clock, and/or a phase-locked loop of an SoC.

82. For example, the Accused Products output a frequency, such as from a processor, a clock, and/or a phase-locked loop of an SoC based on a reference signal (e.g. a reference clock), a control signal (e.g. a watchdog signal), and said output signal.

83. For example, the Accused products further comprise a logic circuit, such as a logic circuit of a phase locked loop, configured to present a watchdog signal to a phase frequency detector in response to an output signal and reference signal, such as when a difference between the output signal and reference signal exceeds a parameter.

84. Upon information and belief, and as discussed above, Nintendo Accused Products including the Exemplary Broadcom SoCs practice the claimed limitations of the '171 Patent in a substantially similar manner to Nintendo Accused Products including the Exemplary Nvidia SoCs.

85. M-Red has suffered damages as a result of Defendant's direct infringement of the '171 Patent in an amount to be proved at trial.

DEMAND FOR JURY TRIAL

Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, M-Red prays for relief against Defendant as follows:

a. Entry of judgment declaring that Defendant has directly infringed one or more claims of each of the Asserted Patents;

b. An order awarding damages sufficient to compensate M-Red for Defendant's infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, together with interest and costs;

c. Entry of judgment declaring that this case is exceptional and awarding M-Red its costs and reasonable attorney fees under 35 U.S.C. § 285; and

d. Such other and further relief as the Court deems just and proper.

Dated: March 5, 2021

Respectfully submitted,

/s/ Alfred R. Fabricant

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