IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

GODO KAISHA IP BRIDGE 1, Plaintiff, v. WESTERN DIGITAL CORPORATION, and WESTERN DIGITAL TECHNOLOGIES, INC., Defendants.	**DEMAND FOR JURY TRIAL** Civil Action No. _____

COMPLAINT AND JURY DEMAND

Plaintiff Godo Kaisha IP Bridge 1 ("IP Bridge" or "Plaintiff") brings this civil action against Western Digital Corporation ("WDC") and Western Digital Technologies, Inc. ("WDT") (collectively, "Defendants").

NATURE OF SUIT

1. This is a civil action for patent infringement under the laws of the United States, 35 U.S.C. § 1, et seq.

2. Defendants have infringed and continue to infringe one or more claims of U.S. Patent Nos. 7,884,403 (the "'403 patent"), 8,319,263 (the "'263 patent"), and 11,737,372 (the "'372 patent") (collectively, the "Asserted Patents") at least by making, using, selling, offering for sale, and importing into the United States devices that infringe one or more claims of each of the Asserted Patents.

3. IP Bridge is the legal owner by assignment of the entire right, title, and interest in and to the Asserted Patents, which were duly and legally issued by the United States Patent and

Trademark Office ("USPTO"). IP Bridge seeks monetary damages and injunctive relief to address past and ongoing infringement of its valuable patent portfolio.

THE PARTIES

4. Plaintiff Godo Kaisha IP Bridge 1 is a Japanese entity, with a place of business at c/o Sakura Sogo Jimusho, 1-11 Kanda Jimbocho, Chiyoda-ku, Tokyo, 101-0051 Japan.

5. Western Digital Corporation is a corporation organized under the laws of the State of Delaware, with a place of business at 5601 Great Oaks Parkway, San Jose, California 95119. Western Digital Corporation is a publicly-traded company that may be served through its registered agent for service, Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

6. Western Digital Technologies, Inc. is a corporation organized under the laws of the State of Delaware, with a place of business at 3355 Michelson Dr., Suite 100, Irvine, CA, 92612. Western Digital Technologies, Inc. is wholly-owned subsidiary of Western Digital Corporation, and may be served through Western Digital Technologies, Inc.'s registered agent for service, Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. This Court has personal jurisdiction over Defendants. Defendants are subject to general personal jurisdiction in the State of Delaware because they are incorporated in the State of Delaware.

9. Venue is proper in this District under 28 U.S.C. §§ 1391 and 1400(b). Defendants are incorporated in this District. Upon information and belief, Defendants have transacted

business in this District and have committed acts of direct and indirect infringement in this District by, among other things, making, using, offering to sell, selling, and/or importing products that infringe the Asserted Patents.

BACKGROUND

IP Bridge's Patented Technologies

10. IP Bridge owns a patent portfolio directed to magnetoresistive devices, such as hard disk drives, with a magnetic tunnel junction ("MTJ") ("MTJ Patent Portfolio") based on a magnesium oxide layer ("MgO"). The sole inventor of the patent portfolio, Dr. Shinji Yuasa, is widely recognized as a luminary in the field of MgO-based MTJs because of his fundamental contributions to the field. His patents cover a groundbreaking innovation that dramatically improves the density of information that can be accurately written to and read from a hard disk drive.

11. Dr. Yuasa received a PhD in Physics from Keio University (Yokohama, Japan) in 1996. After receiving his doctorate, he served as a staff scientist at the National Institute of Advanced Industrial Science and Technology ("AIST"). Since 2010, he has been a director of an AIST research center and a professor at University of Tsukuba. Since 2000, he has been studying thin film magnetism and spintronics, more specifically the tunnel magnetoresistance ("TMR") effect and spin-transfer torque ("STT") in magnetic tunnel junctions and their applications to various devices such as magnetic sensors and magnetoresistive random-access-memory ("MRAM"). According to the IEEE Magnetics Society, Dr. Yuasa's most important scientific achievements are the development of MgO-based MTJs and their applications to read/write heads of hard disk drives and STT-MRAM—precisely the subject of this complaint.

12. For his pioneering contribution to the MgO-based MTJs, Dr. Yuasa has been

awarded or co-awarded more than 20 prizes, including:[1]

- The Science and Technology Prize (2016), by the Minister of Education, Culture, Sports, Science and Technology for "Studies on giant tunnel magnetoresistance effect."
- JSPS Prize (2010) on "Development of High Performance Magnetic Tunnel Junction Devices."
- Tsukuba Prize (2009 – 5 million yen) on "Discovery of giant tunnel magnetoresistance in MgO-based magnetic tunnel junctions and its industrial applications."
- Inoue Harushige Prize (2009) on "Magnesium oxide tunnel magnetoresistive element and its mass production technology."
- Prime Minister Prize (2008) on "Development of high-performance magnetic tunnel junctions for ultra-high-density hard disk drives."
- Asahi Award (2008) on ''Studies on development and application of tunnel magnetoresistive effect (TMR)."
- IBM Japan Science Prize (2007) on "Studies on tunnel magnetoresistive effects and their application."
- Tokyo Techno Forum 21 Gold Medal Prize (2006) on "Study on spintronics technology for MRAM."
- Marubun Science Prize (2006) on "Study on tunnel magnetoresistance effect."
- Ichimura Science Prize (2005). A prize of 1 million yen was awarded to S. Yuasa.
- The Young Scientists' Prize (2005) by the Minister of Education, Culture, Sports, Science and Technology on "Development of MgO-based magnetic tunnel junctions."

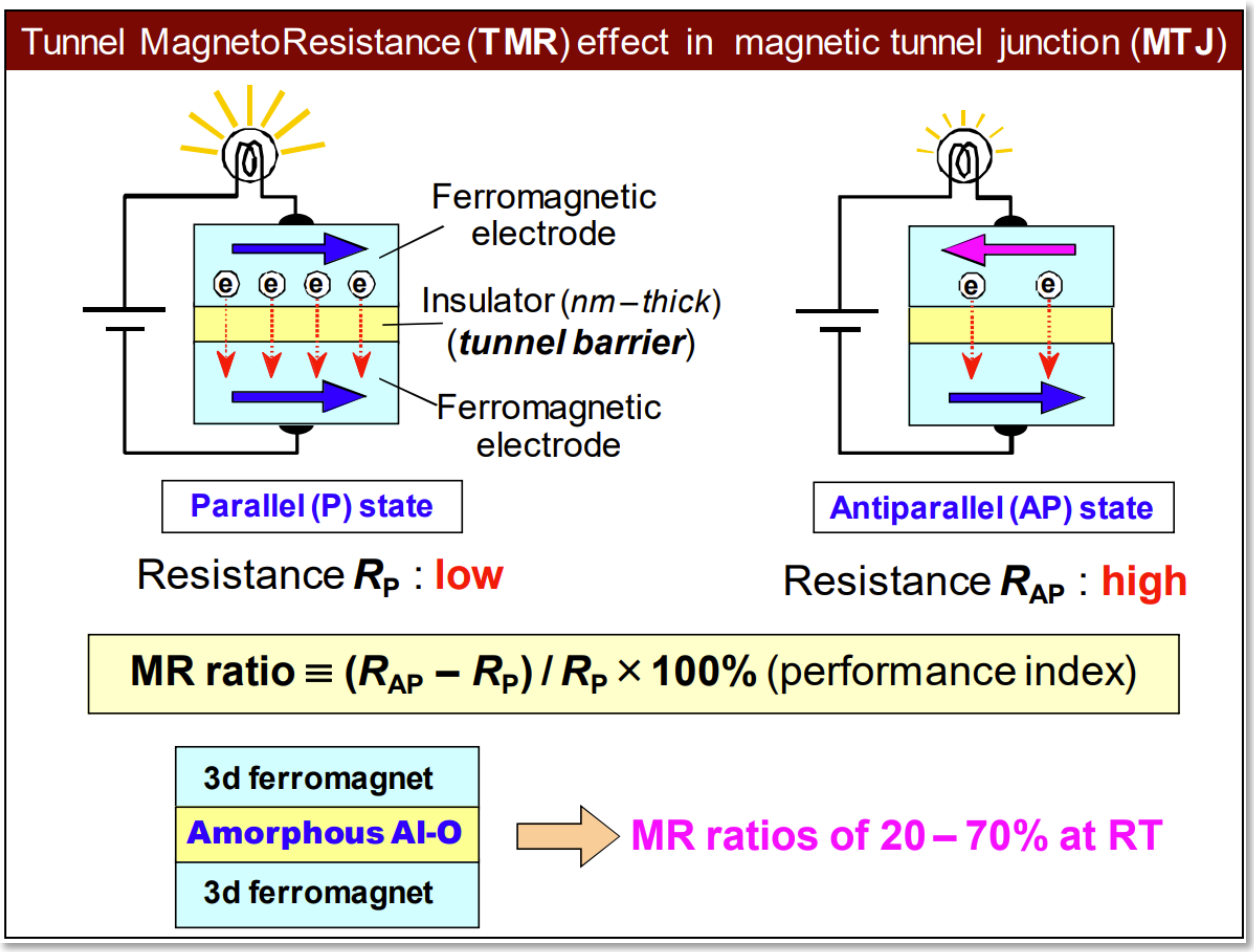
13. Dr. Yuasa is the sole inventor on the Asserted Patents, which resulted from his award-winning development of MgO-based MTJs in and before 2004. IP Bridge obtained ownership of the MTJ Patent Portfolio in 2021 by assignment from its previous owners (AIST and Japan Science and Technology Agency).

14. The Asserted Patents are directed to a particular structure for the read/write heads of hard disk drives ("HDD") that improves the density of information that can be accurately written to and read from an HDD. More specifically, the Asserted Patents are directed to a MTJ

[1] https://www.jst.go.jp/impact/sahashi/en/system/index.html

structure comprising a thin insulating layer (a tunnel barrier layer) sandwiched between two ferromagnetic metal electrodes.

15. The concept of a "tunnel barrier" is illustrated in the slide below.[2] The two electrodes produce electrical resistance. When the magnetization directions of the two ferromagnetic electrodes are aligned (as shown on the left below), the electrical resistance in the direction perpendicular to the interface between the layers is smaller than the electrical resistance when the two ferromagnetic electrodes have anti-parallel magnetization.[3]



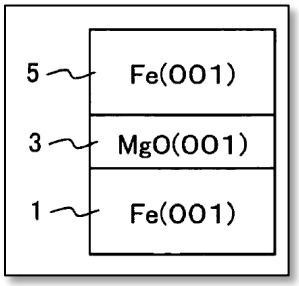
[2] Dr. Yuasa's IEEE Distinguished Lecturer presentation, accessible at https://www.ewh.ieee.org/r6/scv/mag/MtgSum/Meeting2012_05_Presentation.pdf, pg. 12.

[3] *See* Exhibit A, '403 Patent, 1:21-41, Figs. 8(A)-(B).

16. Based on this principle, magnetoresistive devices can use a MTJ structure to detect a change in magnetization by measuring electrical resistance. The percentage ratio of the different electrical resistances at the two magnetization alignments (parallel vs. anti-parallel) is referred to as a magnetoresistance ("MR") ratio, which is a known performance metric of magnetoresistive devices. The higher the MR ratio, the more sensitive the device is to detect changes in magnetization.

17. Dr. Yuasa's work improved MTJs in multiple respects. ('403 patent at 9:15-24 "In accordance with the invention, a larger magnetoresistance than in the conventional MTJ device can be obtained, and the output voltage of the MTJ device can be increased. At the same time, the resistance value of the MTJ device can be reduced so that it is optimized for MRAM. The invention thus enables the level of integration of MRAM using the MTJ device to be readily increased. In accordance with the invention, the output voltage value of the MRAM roughly doubles over prior art, making the MTJ device of the invention suitable for very large scale integrated MRAMs of gigabit class."). For example, the MTJs can exhibit an increased MR ratio. ('403 patent at 9:15-17 "In accordance with the invention, a larger magnetoresistance than in the conventional MTJ device can be obtained, and the output voltage of the MTJ device can be increased."). Further, they can exhibit lower resistance and therefore can support higher electrical currents. ('403 patent at 6:52-56 "When there are oxygen vacancy defects, the potential barrier height of the MgO tunnel barrier is thought to decrease (such as in the range of 0.10 to 0.85 eV; more specifically, 0.2 to 0.5 eV), which is thought to result in an increase in the tunneling current.").

18. Before Dr. Yuasa's invention, conventional MTJ structures used an amorphous aluminum oxide ("Al-O") tunnel barrier layer with a small MR ratio of 70%.[4] Dr. Yuasa recognized that when atoms in the tunnel barrier are arranged in an orderly fashion (e.g., using a crystalline MgO layer), as opposed to the amorphous Al-O layer, electrons are not scattered. This lack of scattering causes coherent tunneling to occur, which improves the MTJ device's performance.[5] To that end, embodiments of the Asserted Patents are directed to the formation of a tunnel barrier that comprises a highly-ordered MgO tunnel barrier layer sandwiched between two ferromagnetic electrodes, as depicted below and in Figure 1(B) of the '403 Patent.[6] The Asserted Patents disclose an MR ratio as high as 146% when measured at a temperature of 20 degrees Kelvin ("K"), and 88% at a temperature of 293K (i.e., room temperature), which "represent the highest MR ratios that have so far been obtained at room temperature."[7]



19. In some embodiments, the MgO layer is also formed with oxygen vacancy defects, such that the atomic ratio of Mg and O are no longer stoichiometric (that is, 1:1), but instead 1:x, where x < 1. The inventor recognized that when there are oxygen vacancy defects, a potential barrier height Φ of the MgO tunnel barrier is reduced from 3.6 electron volts ("eV")

[4] *See* '403 Patent, 2:21-31.

[5] *See* '403 Patent, 5:9-14.

[6] *See* '403 Patent, Fig. 1(B).

[7] *See* '403 Patent, 7:46-51.

(for an ideal MgO crystal) to a range of 0.10 to 0.85 eV, and more specifically 0.2 to 0.5 eV, which lowers the resistance of the tunnel barrier.[8] The patents describe a method (Simmons' formula) of how the tunnel barrier is determined.[9]

20. Shortly after making this discovery, Dr. Yuasa filed the first priority Japanese patent application to the MTJ patent portfolio on March 12, 2004. Dr. Yuasa first published his research finding of a "giant MR ratio" based on MgO tunnel junctions in the *Japanese Journal of Applied Physics*, and in *Nature Materials* on April 2 and October 31 of the same year, respectively.[10] The *Nature Materials* paper has been cited almost 4,000 times according to Google Scholar.

21. Defendants were well-aware of Dr. Yuasa's' groundbreaking work. For example, a 2013 presentation by Zhen Gao at HGST's[11] Read Head Development team describes a "Thin Film Read Magnetic Sensor" with a structure comprising a MgO layer between ferromagnetic layers including two CoFeB layers. That presentation cites Dr. Yuasa's *Nature Materials* paper in a slide titled "TMR Barrier from Year 2004." *See* https://nccavs-usergroups.avs.org/wp-content/uploads/PAG2013/2013_4gao.pdf at 10:

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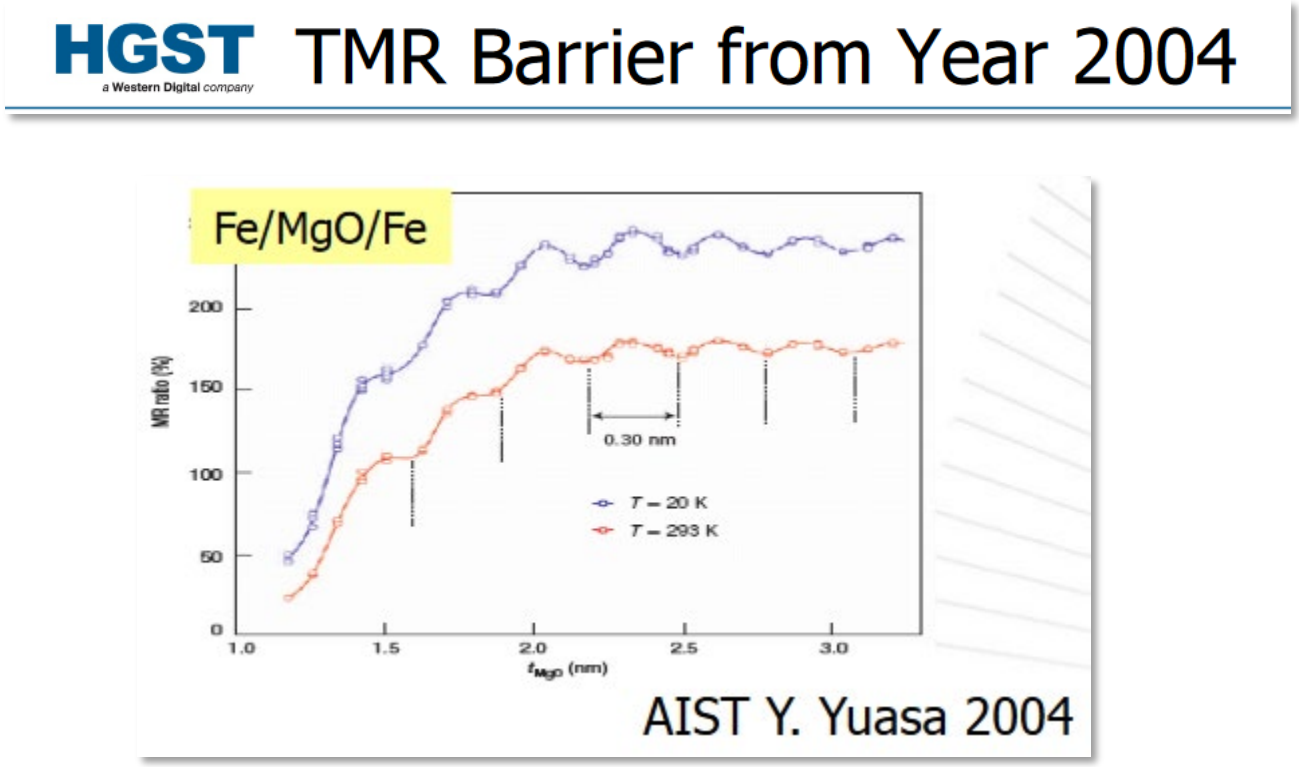
[8] *See* '403 Patent, 6:47-7:2.

[9] *See* '403 Patent, 7:3-45.

[10] Yuasa, S., Fukushima, A., Nagahama, T., Ando, K., & Suzuki, Y. (2004). "High tunnel magnetoresistance at room temperature in fully epitaxial Fe/MgO/Fe tunnel junctions due to coherent spin-polarized tunneling." *Japanese Journal of Applied Physics*, 43(4B), L588.; Yuasa, S., Nagahama, T., Fukushima, A., Suzuki, Y., & Ando, K. (2004). "Giant room-temperature magnetoresistance in single-crystal Fe/MgO/Fe magnetic tunnel junctions." *Nature Materials*, 3(12), 868-871.

[11] HGST was acquired as a subsidiary of WDC in 2012, and since 2018 WDC has transitioned away from hard disk drive products using the "HGST" branding into the "WD" branding.



22. Defendants have further praised Dr. Yuasa's achievements in journals published by their researchers. For example, in a 2006 journal, Chando Park at WDC described how Dr. Yuasa's *Nature Materials* paper was one of "two independent experimental investigations [that] showed greater than 180% and 220% TMR ratios at room temperature," and that "[e]ncouraged by these two studies, a surge in research quickly followed," one that "continues to this day."[12]

23. In 2020, Laddawan Supadee of Western Digital (Thailand) co-authored a paper saying that work in "MgO (001) thin film has received a great deal of attention" as it is "a crucial part of read head sensors or hard disk drives," citing Dr. Yuasa's work.[13] Mr. Supadee similarly

[12] Zhu, J., Park, C., "Magnetic tunnel junctions." *Materialstoday*, Volume 9, Issue 11, November 2006, Pages 36-45.

[13] Tigunta, S., Sando, D., Chanlek, N., Supadeed, L., Pojprapai, S, "Effect of gas atmospheres on degradation of MgO thin film magnetic tunneling junctions by deionized water." *Thin Solid Films*, Volume 709, 1 September 2020, 138185.

cited Dr. Yuasa's work in other journals as showing how "Magnetic tunneling junctions (MTJs) is the heart of… the read head sensors of hard disk drives (HDDs),"[14] and as disclosing how "MgO single crystal has a very high tunnelling magnetic resistance (TMR) ratio compared to amorphous barriers."[15]

24. In 2009, a journal article by seven WDC employees cited Dr. Yuasa's *Nature Materials* paper, and said his paper explained how "to obtain high MR ratio in amorphous CoFeB/crystalline MgO/amorphous CoFeB MTJs."[16]

25. In 2013, a journal article by four WDC employees likewise cited Dr. Yuasa's *Nature Materials* paper, and said it explained how MgO is "[t]ypically… used as the tunnel barrier material which allows for high values of tunneling magnetoresistance (TMR) to be achieved."[17]

26. Defendants have also repeatedly cited Dr. Yuasa's work in their own patents and patent applications. For example, they cited Dr. Yuasa's *Nature Materials* paper in at least the following United States patents and published patent applications: (1) 8,254,067 at 3:3-6 (noting that "Yuasa et al. disclosed that MgO (001) is grown conformably on single-crystal Fe (001) by using the MBE method, exhibited 180% at room temperature, the highest MR ratio at that time.")

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[14] Tigunta, S., Khlikhum, P., Kidkhunthod, P., Chanlek, N., Supadee, L., Pojprapai, S., "Dissolution behavior of MgO thin film-barrier magnetic tunneling junctions." *Journal of Materials Science: Materials in Electronics* (2019) 30:6718-6724.

[15] Kongtungmon, M., Supadee, L., et al., "Effect of annealing atmosphere on MgO thin film for tunneling magnetoresistance sensor." *Materials Research Bulletin*, Volume 167, November 2023, 112397.

[16] Park, C., Miloslavsky, L., Lim, I., Oh, S., Kaiser, C., Leng, Q., Pakala, M., "Influence of Boron Diffusion on Transport and Magnetic Properties in CoFeB/MgO/CoFeB Magnetic Tunnel Junction." *IEEE Transactions on Magnetics*, Vol. 45, No. 10, October 2009.

[17] Kaiser, C.; Maddex, D., Pakala, M., Leng, Q., "Optimization of tunneling magnetoresistance of MgO based tunnel junctions by tuning the stage impedance for radio frequency sputtering of the barrier." *Applied Physics Letters*, 103, 232404 (December 2013).

(2) 8,336,194 (listing *Nature Materials* paper as first non-patent publication on patent's face), and (3) 9,287,494 (same; examiner also cited a patent application by Dr. Yuasa in prosecution titled "Magnetic Tunnel Junction Device and Method of Manufacturing the Same"). Defendants have also cited Dr. Yuasa's other work in the field in their other patents. *See, e.g.,* U.S. Patent No. 6,650,513 at 7:58-63 ("An experimental example for longitudinal biasing without loop-shift are $FeRh_{0.95}Ir_{0.5}$/NiFe bilayers studied by S. Yuasa, M. Nyvlt, T. Katayama, and Y. Suzuki, J. Appl. Phys. 83, 6813 (1998).").

IP Bridge's Asserted Patents

27. This complaint focuses on three IP Bridge patents.

28. IP Bridge is the current owner by assignment of the entire right, title, and interest in and to the '403 patent titled "Magnetic Tunnel Junction Device and Memory Device Including the Same." The '403 patent issued on February 8, 2011. The patent is generally directed to a particular structure of magnetoresistive devices, such as the read/write heads of HDDs that improves the density of information that can be accurately written to and read from an HDD. A copy of the '403 patent is attached as Exhibit A.

29. IP Bridge is the current owner by assignment of the entire right, title, and interest in and to the '263 patent titled "Magnetic Tunnel Junction Device." The '263 patent issued on November 27, 2012. The patent is generally directed to a particular structure for magnetoresistive devices, such as the read/write heads of HDDs that improves the density of information that can be accurately written to and read from an HDD. A copy of the '263 patent is attached as Exhibit B.

30. IP Bridge is the current owner by assignment of the entire right, title, and interest in and to the '372 patent titled "Method of Manufacturing a Magnetoresistive Random Access Memory (MRAM)." The '372 patent issued on August 22, 2023. The patent is generally

directed to a particular structure for magnetoresistive devices, such as the read/write heads of HDDs that improves the density of information that can be accurately written to and read from an HDD. A copy of the '372 patent is attached as Exhibit C.

31. IP Bridge has complied with its obligations under 35 U.S.C. § 287 for each of the Asserted Patents.

Defendants' Incorporation of IP Bridge's Patented Technologies Into Their Devices

32. The allegations provided below are exemplary and without prejudice to IP Bridge's infringement contentions. In providing these allegations, IP Bridge does not convey or imply any particular claim constructions or the precise scope of the claims. IP Bridge's claim construction contentions regarding the meaning and scope of the claim terms will be provided under the Court's scheduling order and local rules.

33. The infringing products include without limitation: read/write heads for hard disk drives ("HDDs"); hard disk drives incorporating read/write heads, whether internal or external drives; and all Defendants' hardware made, used, offered for sale, sold, or imported from March 2018 going forward that incorporate such read/write heads and/or hard disk drives.

34. The infringing products thus also include without limitation: WD Blue HDDs; WD Purple HDDs; WD Purple Pro HDDs; WD Red HDDs; WD Red Plus WD Red Pro HDDs; WD_BLACK HDDs; WD Gold HDDs; Ultrastar HDDs; HGST HDDs; My Passport HDDs; My Passport Ultra HDDs; My Book HDDs; My Cloud HDDs; My Cloud Pro HDDs; WD Elements HDDs; WD Drive HDDs; Easystore HDDs; SanDisk Professional G-RAID HDDs; SanDisk Professional G-RAID Mini HDDs; SanDisk Professional G-SPEED HDDs; SanDisk Professional G-SPEED eS HDDs; SanDisk Professional G-SAFE HDDs; SanDisk Professional G-DRIVE HDDs; SanDisk Professional G-DRIVE Mini HDDs; SanDisk Professional G-DRIVE Q HDDs; SanDisk Professional G-DRIVE Mobile HDDs; Atomos HDDs; ArmorATD

HDDs; G-Technology HDDs; and all HDDs offered under the WD, Ultrastar HGST, My Passport, My Book, My Cloud, Elements, Drive, Easystore, SanDisk Professional, G-Technology, Atomos, and Armor brands (all together with the prior paragraph, the "Accused Products").

35. The Accused Products are non-limiting examples that were identified based on publicly available information, and IP Bridge reserves the right to identify additional infringing activities and products, including, for example, on the basis of information obtained during discovery.

36. As detailed below and in Exhibits D-F, each limitation of at least one claim of each of the Asserted Patents is literally present in the Accused Products, or is literally practiced by Defendants' personnel, agents, or customers who use the Accused Products. To the extent that any limitation is not literally present or practiced, each such limitation is present or practiced under the doctrine of equivalents.

37. In WDT's answer in *MR Technologies, GmbH v. Western Digital Technologies, Inc.*, No. 8:22-cv-01599-JVS-DFM, Dkt. No. 110, ¶ 3 (C.D. Cal. Aug. 16, 2023), WDT admitted that it "designs and manufactures, among other things, magnetic recording media such as hard disk drives."

38. According to WDC's 2023 10-K statement, WDC and WDT have manufactured and continue to manufacture read heads at their facility in San Jose, California. https://investor.wdc.com/static-files/9468af6f-967f-4709-bcaf-c0e9510264dd, p. 27.

39. WDT has imported and continues to import the Accused Products into the United States.

40. Defendants have made extensive use of IP Bridge's patented technologies, including the technology described and claimed in the Asserted Patents. IP Bridge requests that this Court award it damages sufficient to compensate for Defendants' infringement of the Asserted Patents, find this case exceptional and award IP Bridge its attorneys' fees and costs, and grant an injunction against Defendants to prevent ongoing infringement of the Asserted Patents.

COUNT I

(Infringement of U.S. Patent No. 7,884,403)

41. IP Bridge incorporates by reference and realleges all the foregoing paragraphs of the Complaint as if fully set forth herein.

WDC and WDT's Direct Infringement

42. WDC and WDT have directly infringed and continue to directly infringe, literally and/or equivalently, one or more claims of the '403 patent, including at least claim 5, including by making, importing, using, selling, and offering for sale in the United States the Accused Products.

43. For example, and without limitation, WDC and WDT's devices including their hard disk drives meet each and every limitation of claim 5 either literally or under the doctrine of equivalents, as set forth in Exhibit D and incorporated here.

WDC and WDT's Knowledge of the '403 Patent

44. Since at least 2022 WDT has known of the '403 patent.

45. As discussed above, Defendants were well-aware of Dr. Yuasa's foundational work, having discussed and excerpted his *Nature Materials* paper in presentations, journals, and repeatedly cited it in patents and patent applications assigned to WDT, as well as other Dr. Yuasa work.

46. WDT is also the applicant and assignee of a Patent Cooperation Treaty ("PCT") application, PCT/US2022/028238, titled "Tunneling Magnetoresistive (TMR) Device With Improved Seed Layer" (the "'238 PCT application"). WDT filed the '238 PCT application in May 2022, and an international search report was conducted in September 2022, later published as WO 2023/038680. Such search reports identify prior art relevant to the PCT application.

47. The very first prior art reference listed in the search report is the published patent application number US 2007-0195592 that later issued as Dr. Yuasa's '403 patent:

INTERNATIONAL SEARCH REPORT	International application No. PCT/US2022/028238

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007-0195592 A1 (SHINJI YUASA) 23 August 2007 (2007-08-23) paragraph [0033]; claim 1; and figures 2(A)-2(D)	1,3,9-14
A		2,4-8,15-25

48. In addition to being the first-listed prior art reference, the search report classified it in category "Y," which means it is a document of "particular relevance" such that the claimed invention would be "obvious to a person of skill in the art":

* Special categories of cited documents:

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

49. Later that same month, WDT later submitted a copy of this same search report to the USPTO during prosecution of the national phase entry of the '238 PCT application, U.S. Application No. 17/472,019 (the "'019 application").

50. WDT also submitted the written opinion that accompanied the PCT search report, which described the published application US 2007-0195592 of Dr. Yuasa's '403 patent as "the closest prior art to the subject matter of claim 1" of the '238 PCT application and identified specific portions of the specification disclosing a MgO-based magnetic tunnel junction device:

2. Citations and explanations:

Reference is made to the following documents:

D1: US 2007-0195592 A1 (SHINJI YUASA) 23 August 2007
D2: US 2017-0213957 A1 (INDUSTRY-UNIVERSITY COOPERATION FOUNDATION HANYANG UNIVERSITY) 27 July 2017
D3: KR 10-2013-0008929 A (SK HYNIX INC.) 23 January 2013
D4: US 7859034 B2 (YIMING HUAI et al.) 28 December 2010
D5: US 2018-0138397 A1 (JOONMYOUNG LEE et al.) 17 May 2018

I. Novelty and Inventive Step (PCT Article 33(2) and (3))

1. Claims 1-14

1.1. Claims 1, 13-14

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a magnetic tunnel junction device comprising: a substrate (11); a MgO(001) seed layer (15) (see paragraph [0033]; figures 2(A)-2(D)); a first ferromagnetic material layer of a BCC structure formed on a first side of a tunnel barrier layer (see claim 1); a tunnel barrier layer, wherein the tunnel barrier layer is formed by a single-crystalline MgOx (001) layer or a poly-crystalline MgOx (0<x<1) layer in which a (001) crystal plane is preferentially oriented (see claim 1); and a second ferromagnetic material layer of the BCC structure formed on a second side of said tunnel barrier layer (see claim 1).

51. WDT also submitted a separate Information Disclosure Statement ("IDS"), again listing Dr. Yuasa's '403 application as the first patent application prior art reference:

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	17472019
	Filing Date	2021-09-10
	First Named Inventor	
	Art Unit	2827
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	WESD/0778US(WDA-5776-US)

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070195592	A1	2007-08-23	Yuasa	

52. Given the prominent citation of the ’403 application in this PCT search report and accompanying written opinion spelling out the key details of Dr. Yuasa’s MgO-based magnetic tunnel junction, WDT’s submission of it to the USPTO and then its own prominent citation of that same application in an IDS later that same month, WDT was aware of the ’403 application no later than September 2022. On information and belief, WDT was also aware of the issued ’403 patent no later than September 2022. The ’403 patent issued in February 2011, more than 11 years before. At any point during that period, one could use the USPTO’s website, Public PAIR, or other third-party services to search for the US 2007-0195592 publication number and determine that the ’403 patent had issued from that application.

53. In addition, since at least as early as the service of this Complaint, WDC and WDT have known of the ’403 patent.

WDC and WDT’s Induced Infringement

54. Since at least as early as September 2022 for WDT and no later than the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 5 of the ’403 patent.

55. Since at least as early as September 2022 for WDT and no later than the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 5 of the ’403 patent when used by customers or other users, when imported by others, and when sold or offered for sale by third parties, such as Best Buy. *See, e.g.*,

https://www.bestbuy.com/site/brands/western-digital/pcmcat1502482335874.c and https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c. For example, a search of Best Buy's website of sales locations in or near the 19702 ZIP code for Newark, Delaware with available external hard drives returns 15 results, with results 2, 4, and 6 located in Delaware. *See* https://www.bestbuy.com/site/store-locator.

56. Since at least as early as September 2022 for WDT and no later than the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging customers and/or other users to directly infringe at least claim 5 of the '403 patent. WDC and WDT have provided materials that induce customers or others to use, offer for sale, and sell the Accused Products in a manner that infringes at least claim 5 of the '403 patent. They have done so, for example, on their websites, in their user manuals, in their product documentation, and in other advertising materials. For example, WDC and WDT's website touts their hard drives. *See, e.g.,* https://www.westerndigital.com/products/hdd. WDC and WDT's website also contains detailed documentation and product manuals on how to use their hard drives. *See* https://www.westerndigital.com/support/search-support?q=HDD and https://www.westerndigital.com/support/search-support?q=Hard%20drive.

57. Since at least as early as September 2022 for WDT and no later than the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging third-party resellers to directly infringe at least claim 5 of the '403 patent by facilitating resellers' sales and offers for sale of the Accused Products and have actively encouraged such sales and offers for sale. For example, WDC says in its 2023 10-K that it sells its products to "computer manufacturers and OEMs, cloud service providers, resellers, distributors and retailers throughout the world," that it performs "marketing and advertising

functions both internally and through outside firms utilizing both consumer media and trade publications targeting various reseller and end-user markets," and that it provides "distributors, resellers and OEMs" with "with limited price protection" and "other sales incentive programs." https://investor.wdc.com/static-files/9468af6f-967f-4709-bcaf-c0e9510264dd, at 9. The Accused Products are available at such resellers, for example Best Buy. *See, e.g.*, https://www.bestbuy.com/site/brands/western-digital/pcmcat1502482335874.c, https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c, and https://lifehacker.com/tech/wd-easystore-18tb-hard-drive-sale.

WDC and WDT's Contributory Infringement

58. Since at least as early as September 2002 for WDT and no later than the service of this Complaint, WDC and WDT have contributorily infringed at least claim 5 of the '403 patent by importing, selling and offering to sell their Accused Products within the United States.

59. The Accused Products are not staple articles or commodities of commerce with substantial noninfringing uses. The Accused Products are designed, configured, and adapted to work with both other WDC and WDT devices and other third-party devices, such as personal computers, laptops, servers, server farms, and other computer systems. The Accused Products have no substantial purpose other than as part of infringing devices and accordingly are not staple articles or commodities of commerce.

60. The Accused Products are a material part of the invention of at least claim 5 of the '403 patent.

61. Since at least as early as September 2022 for WDT and no later than the service of this Complaint, WDC and WDT have known of the '403 patent and have known that the Accused Products are made or adapted for use in a manner that infringes at least claim 5 of the '403 patent.

Willful Infringement

62. Since at least 2022, WDT knew or should have known, or at a minimum acted with willful blindness to the fact that, its Accused Products infringe one or more claims of the ’403 patent, including at least claim 5.

63. WDT has willfully infringed at least claim 5 of the ’403 patent. WDT’s making, using, offering for sale, selling, and importing the Accused Products, and WDT’s promotion of the Accused Products with provision of manuals and instruction to purchasers that encourage use that WDT knew would infringe the ’403 patent demonstrate the willful nature of WDT’s infringement.

64. WDT’s infringement of the ’403 patent has been willful since at least 2022. WDT’s ongoing infringement of the ’403 patent continues to be willful. WDT has chosen to manufacture, offer to sell and/or sell the Accused Products, even after having notice of the ’403 patent, knowing that such products would infringe the ’403 patent.

65. The foregoing description of WDC and WDT’s infringement is based on publicly available information. IP Bridge reserves the right to modify this description, including, for example, on the basis of information about the Accused Products that it obtains during discovery.

66. IP Bridge has been and is being irreparably harmed, and has incurred and will continue to incur damages, as a result of WDC and WDT’s infringement of the ’403 patent. WDC and WDT’s infringement of the ’403 patent has damaged and continues to damage IP Bridge in an amount yet to be determined, but no less than a reasonable royalty.

COUNT II

(Infringement of U.S. Patent No. 8,319,263)

67. IP Bridge incorporates by reference and realleges all the foregoing paragraphs of the Complaint as if fully set forth herein.

WDC and WDT's Direct Infringement

68. WDC and WDT have directly infringed and continue to directly infringe, literally and/or equivalently, one or more claims of the '263 patent, including at least claim 1, including by making, importing, using, selling, and offering for sale in the United States the Accused Products.

69. For example, and without limitation, WDC and WDT's devices including their hard disk drives meet each and every limitation of claim 1 either literally or under the doctrine of equivalents, as set forth in Exhibit E and incorporated here.

WDC and WDT's Knowledge of the '263 Patent

70. Since at least as early as the service of this Complaint, WDC and WDT have known of the '263 patent.

WDC and WDT's Induced Infringement

71. Since at least as early as the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 1 of the '263 patent.

72. Since at least as early as the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 1 of the '263 patent when used by customers or other users, when imported by others, and when sold or offered for sale by third parties, such as Best Buy. *See, e.g.*, https://www.bestbuy.com/site/brands/western-digital/pcmcat1502482335874.c and https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c. For example, a search of Best Buy's website of sales locations in or near the 19702 ZIP code for Newark, Delaware with available external hard drives returns 15 results, with results 2, 4, and 6 located in Delaware. *See* https://www.bestbuy.com/site/store-locator.

73. Since at least as early as the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging customers and/or other users to directly infringe at least claim 1 of the '263 patent. WDC and WDT have provided materials that induce customers or others to use, offer for sale, and sell the Accused Products in a manner that infringes at least claim 1 of the '263 patent. They have done so, for example, on their websites, in their user manuals, in their product documentation, and in other advertising materials. For example, WDC and WDT's website touts their hard drives. *See, e.g.,* https://www.westerndigital.com/products/hdd. WDC and WDT's website also contains detailed documentation and product manuals on how to use their hard drives. *See* https://www.westerndigital.com/support/search-support?q=HDD and https://www.westerndigital.com/support/search-support?q=Hard%20drive.

74. Since at least as early as the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging third-party resellers to directly infringe at least claim 1 of the '263 patent by facilitating resellers' sales and offers for sale of the Accused Products and have actively encouraged such sales and offers for sale. For example, WDC says in its 2023 10-K that it sells its products to "computer manufacturers and OEMs, cloud service providers, resellers, distributors and retailers throughout the world," that it performs "marketing and advertising functions both internally and through outside firms utilizing both consumer media and trade publications targeting various reseller and end-user markets," and that it provides "distributors, resellers and OEMs" with "with limited price protection" and "other sales incentive programs." https://investor.wdc.com/static-files/9468af6f-967f-4709-bcaf-c0e9510264dd, at 9. The Accused Products are available at such resellers, for example Best Buy. *See, e.g.*, https://www.bestbuy.com/site/brands/western-

digital/pcmcat1502482335874.c, https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c, and https://lifehacker.com/tech/wd-easystore-18tb-hard-drive-sale.

75. The foregoing description of WDC and WDT's infringement is based on publicly available information. IP Bridge reserves the right to modify this description, including, for example, on the basis of information about the Accused Products that it obtains during discovery.

76. IP Bridge has been and is being irreparably harmed, and has incurred and will continue to incur damages, as a result of WDC and WDT's infringement of the '263 patent.

77. WDC and WDT's infringement of the '263 patent has damaged and continues to damage IP Bridge in an amount yet to be determined, but no less than a reasonable royalty.

WDC and WDT's Contributory Infringement

78. Since at least as early as the service of this Complaint, WDC and WDT have contributorily infringed at least claim 1 of the '263 patent by importing, selling and offering to sell their Accused Products within the United States.

79. The Accused Products are not staple articles or commodities of commerce with substantial noninfringing uses. The Accused Products are designed, configured, and adapted to work with both other WDC and WDT devices and other third-party devices, such as personal computers, laptops, servers, server farms, and other computer systems. The Accused Products have no substantial purpose other than as part of infringing devices and accordingly are not staple articles or commodities of commerce.

80. The Accused Products are a material part of the invention of at least claim 1 of the '263 patent.

81. Since at least as early as the service of this Complaint, WDC and WDT have known of the '263 patent and have known that the Accused Products are made or adapted for use in a manner that infringes at least claim 1 of the '263 patent.

82. The foregoing description of WDC and WDT's infringement is based on publicly available information. IP Bridge reserves the right to modify this description, including, for example, on the basis of information about the Accused Products that it obtains during discovery.

83. IP Bridge has been and is being irreparably harmed, and has incurred and will continue to incur damages, as a result of WDC and WDT's infringement of the '263 patent.

84. WDC and WDT's infringement of the '263 patent has damaged and continues to damage IP Bridge in an amount yet to be determined, but no less than a reasonable royalty.

COUNT III

(Infringement of U.S. Patent No. 11,737,372)

85. IP Bridge incorporates by reference and realleges all the foregoing paragraphs of the Complaint as if fully set forth herein.

WDC and WDT's Direct Infringement

86. WDC and WDT have directly infringed and continues to directly infringe, literally and/or equivalently, one or more claims of the '372 patent, including at least claim 1, including by making, importing, using, selling, and offering for sale in the United States the Accused Products.

87. For example, and without limitation, WDC and WDT's devices including their hard disk drives meet each and every limitation of claim 1 either literally or under the doctrine of equivalents, as set forth in Exhibit F and incorporated here.

WDC and WDT's Knowledge of the '372 Patent

88. Since at least as early as the service of this Complaint, WDC and WDT have known of the '372 patent.

WDC and WDT's Induced Infringement

89. Since at least as early as the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 1 of the '372 patent.

90. Since at least as early as the service of this Complaint, WDC and WDT have known that the Accused Products infringe at least claim 1 of the '372 patent when used by customers or other users, when imported by others, and when sold or offered for sale by third parties, such as Best Buy. *See, e.g.*, https://www.bestbuy.com/site/brands/western-digital/pcmcat1502482335874.c and https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c. For example, a search of Best Buy's website of sales locations in or near the 19702 ZIP code for Newark, Delaware with available external hard drives returns 15 results, with results 2, 4, and 6 located in Delaware. *See* https://www.bestbuy.com/site/store-locator.

91. Since at least as early as the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging customers and/or other users to directly infringe at least claim 1 of the '372 patent. WDC and WDT have provided materials that induce customers or others to use, offer for sale, and sell the Accused Products in a manner that infringes at least claim 1 of the '372 patent. They have done so, for example, on their websites, in their user manuals, in their product documentation, and in other advertising materials. For example, WDC and WDT's website touts their hard drives. *See, e.g.,* https://www.westerndigital.com/products/hdd. WDC and WDT's website also contains detailed documentation and product manuals on how to use their hard drives. *See* https://www.westerndigital.com/support/search-support?q=HDD and https://www.westerndigital.com/support/search-support?q=Hard%20drive.

92. Since at least as early as the service of this Complaint, WDC and WDT have induced infringement and continue to induce infringement by actively encouraging third-party resellers to directly infringe at least claim 1 of the '372 patent by facilitating resellers' sales and offers for sale of the Accused Products and have actively encouraged such sales and offers for sale. For example, WDC says in its 2023 10-K that it sells its products to "computer manufacturers and OEMs, cloud service providers, resellers, distributors and retailers throughout the world," that it performs "marketing and advertising functions both internally and through outside firms utilizing both consumer media and trade publications targeting various reseller and end-user markets," and that it provides "distributors, resellers and OEMs" with "with limited price protection" and "other sales incentive programs." https://investor.wdc.com/static-files/9468af6f-967f-4709-bcaf-c0e9510264dd, at 9. The Accused Products are available at such resellers, for example Best Buy. *See, e.g.*, https://www.bestbuy.com/site/brands/western-digital/pcmcat1502482335874.c, https://www.bestbuy.com/site/brands/sandisk/pcmcat163600050056.c, and https://lifehacker.com/tech/wd-easystore-18tb-hard-drive-sale.

93. The foregoing description of WDC and WDT's infringement is based on publicly available information. IP Bridge reserves the right to modify this description, including, for example, on the basis of information about the Accused Products that it obtains during discovery.

94. IP Bridge has been and is being irreparably harmed, and has incurred and will continue to incur damages, as a result of WDC and WDT's infringement of the '372 patent.

95. WDC and WDT's infringement of the '372 patent has damaged and continues to damage IP Bridge in an amount yet to be determined, but no less than a reasonable royalty.

WDC and WDT's Contributory Infringement

96. Since at least as early as the service of this Complaint, WDC and WDT has contributorily infringed at least claim 1 of the '372 patent by importing, selling and offering to sell their Accused Products within the United States.

97. The Accused Products are not staple articles or commodities of commerce with substantial noninfringing uses. The Accused Products are designed, configured, and adapted to work with both other WDC and WDT devices and other third-party devices, such as personal computers, laptops, servers, server farms, and other computer systems. The Accused Products have no substantial purpose other than as part of infringing devices and accordingly are not staple articles or commodities of commerce.

98. The Accused Products are a material part of the invention of at least claim 1 of the '372 patent.

99. Since at least as early as the service of this Complaint, WDC and WDT have known of the '372 patent and have known that the Accused Products are made or adapted for use in a manner that infringes at least claim 1 of the '372 patent.

100. The foregoing description of WDC and WDT's infringement is based on publicly available information. IP Bridge reserves the right to modify this description, including, for example, on the basis of information about the Accused Products that it obtains during discovery.

101. IP Bridge has been and is being irreparably harmed, and has incurred and will continue to incur damages, as a result of WDC and WDT's infringement of the '372 patent.

102. WDC and WDT's infringement of the '372 patent has damaged and continues to damage IP Bridge in an amount yet to be determined, but no less than a reasonable royalty.

REQUEST FOR RELIEF

Plaintiff respectfully requests that this Court enter judgment as follows:

a. Declaring that Defendants have infringed the ’403, ’263, and ’372 patents;

b. Granting a permanent injunction, enjoining Defendants and their officers, agents, employees, attorneys, and all other persons acting in concert or participation with them, from further infringement of the ’403, ’263, and ’372 patents, including but not limited to the enjoining the manufacture, sale, offer for sale, importation, or use of the Accused Products and any further development of the Accused Products;

c. Awarding Plaintiff damages adequate to compensate it for Defendants’ infringing activities, including supplemental damages for any post-verdict infringement up until entry of the final judgment with an accounting as needed, together with pre-judgment and post-judgment interest on the damages awarded;

d. Declaring that Defendants’ infringement has been willful;

e. Awarding enhanced damages in an amount up to treble the amount of compensatory damages as justified under 35 U.S.C. § 284;

f. Finding this to be an exceptional case and awarding Plaintiff its attorneys’ fees and costs under 35 U.S.C. § 285 as a result of Defendants’ infringement of the Asserted Patents; and

g. Awarding Plaintiff any such other and further relief as the Court deems just and proper.

DEMAND FOR JURY TRIAL

IP Bridge demands a trial by jury on all issues so triable.

Date: March 15, 2024

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