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11 Attorneys for Plaintiff

12 UNITED STATES DISTRICT COURT
 13 SOUTHERN DISTRICT OF CALIFORNIA

14
 15 Power Density Solutions, LLC, a
 16 California limited liability company,

17 Plaintiff,

18 vs.

19
 20 Google LLC, a Delaware limited
 21 liability company,

22 Defendants.
 23

24 Case No.: '24CV2122 BEN VET

25 COMPLAINT FOR PATENT
26 INFRINGEMENT

27 DEMAND FOR JURY TRIAL

1 Plaintiff Power Density Solutions, LLC (hereinafter referred to as "*PDS*" or
2 "*Plaintiff*") hereby complains of Google LLC (hereinafter collectively referred to
3 as "*Google*" or "*Defendant*") and alleges as follows:

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5 **NATURE OF ACTION**

6 1. This is an action for patent infringement under the laws of the United States
7 of America, 35 U.S.C. § 271 *et seq.*

8
9 **THE PARTIES**

10 2. Plaintiff Power Density Solutions, LLC is a California limited liability
11 company with its principal place of business in San Diego County. PDS is the
12 owner, by assignment from James Hildebrandt, the inventor, of the patent asserted
13 herein.

14 3. Google LLC, a subsidiary of Alphabet Inc., is a Delaware limited liability
15 company, registered and licensed to do business in California, and having its
16 corporate offices at 1600 Amphitheatre Parkway, Mountain View, California and
17 other offices and office space within this judicial district.

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19 **JURISDICTION AND VENUE**

20 4. This Court has original and exclusive subject matter jurisdiction over this
21 action under 28 U.S.C. §§ 1331 and 1338(a) because PDS's claim for patent
22 infringement arises under the laws of the United States, 35 U.S.C. § 271, *et seq.*

23 5. This Court has personal jurisdiction over Google because it resides in this
24 District and has a continuous, systematic and substantial presence in this District,
25 because it regularly conducts business and/or solicits business within this District,
26 because it has committed and continues to commit patent infringement in this
27 District, including without limitation by using infringing products in this District,
28 by purposefully directing activities at residents of this District, and by placing

1 infringing products into the stream of commerce with the knowledge that such
2 infringing products would be sold in California and this District, which acts form a
3 substantial part of the events giving rise to PDS's claims.

4 6. Venue is proper in this District under 28 U.S.C. § 1400(b) because Google
5 has a regular and established place of business in this District and has committed
6 and continues to commit acts of patent infringement in this District.

7 8 **FACTUAL BACKGROUND**

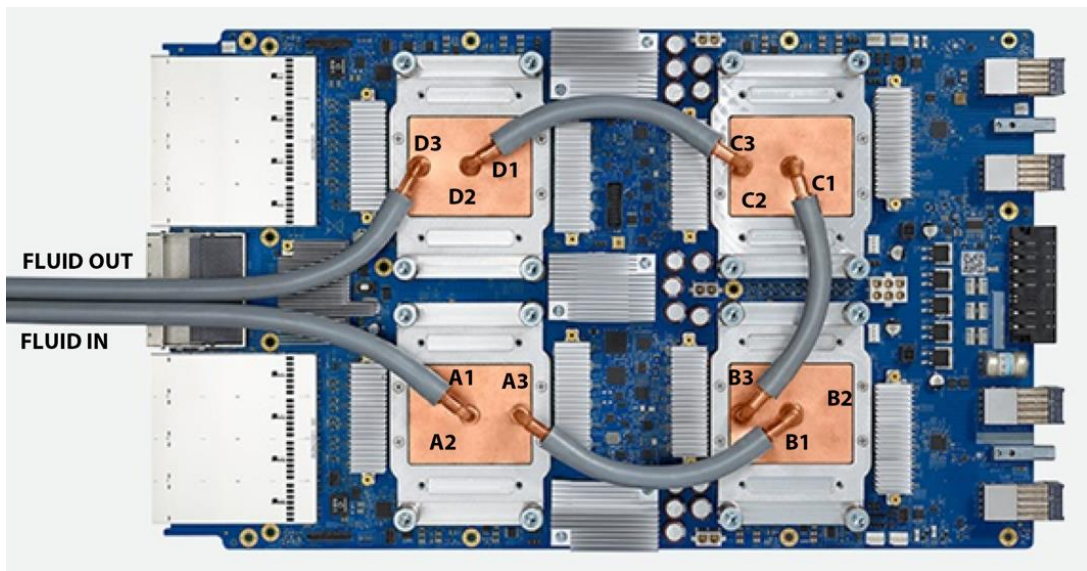
9 7. On April 22, 2003, the United States Patent and Trademark Office (PTO)
10 duly and lawfully issued United States Patent No. 6,552,901, entitled "Apparatus
11 and System for Cooling Electronic Circuitry, Heat Sinks, and Related Components"
12 ("the '901 patent"). PDS is the owner of all rights, title and interest in and to the
13 '901 patent, and holds all substantial rights therein, including the right to grant
14 licenses, to exclude others, and to enforce and recover past damages for
15 infringement. A copy of the '901 patent is attached hereto as **Exhibit 1** and made
16 part of this Complaint.

17 8. Defendant is and has been making, using, selling, offering for sale, importing
18 and/or exporting servers that infringe the '901 patent, including without limitation
19 the Google version 3 Tensor Processing Units ("TPU" or "TPUv3") featuring server
20 motherboards with tubing connected to chip heat sinks to facilitate liquid cooling
21 of Google data centers and cloud servers (the "Accused Devices"). Google
22 eventually recognized the limitations of its conventional server architecture to
23 facilitate the power of AI computing. This was a daunting situation for Google
24 because new AI programs required far more computational power per period of
25 time, requiring increased computing power. This increased computation power
26 required faster, more powerful chips which generated more heat. Thus, Google
27 finally realized the need to introduce liquid cooling to its TPU servers.
28 (<https://cloud.google.com/tpu/docs/system-architecture-tpu-vm>)

1 9. In or about May 2018, Google began using eight-rack pods of liquid-cooled
2 TPU servers for artificial intelligence workloads. Each of these pods is eight times
3 more powerful than previous versions because of the use of liquid cooling as
4 enabled by the '901 patent. Further, the liquid cooling allows Google to run its
5 processors at 100% capacity versus 50% capacity for AI processing.



13 10. Plaintiff is informed and believes, and thereupon alleges, that Google
14 achieves this improvement by bringing dielectric liquid to the four chips on each
15 motherboard, each having a heat sink sitting atop each TPUv3 ASIC chip, allowing
16 the coolant to circulate through the tubing and heat sinks to remove heat from the
17 chips.
18



1 *said heat sink having at least one interior passageway within said heat*
2 *sink and at least one secondary passageway in fluid communication with*
3 *said at least one interior passageway connecting said interior*
4 *passageway to an exterior surface of said heat sink;*
5 *means for supplying cooling fluid capable of phase change to said*
6 *interior passageway;*
7 *means for adjusting the rate at which said cooling fluid passes through*
8 *said interior passageway so that substantially no cooling fluid is*
9 *vaporized within said interior passageway; and*
10 *means for collecting and recycling said cooling fluid.*

11 16. Google has directly infringed, and continues to directly infringe,
12 literally and/or by the doctrine of equivalents, at least claim 16 of the ‘901 patent
13 by making, using, testing, selling, offering for sale and/or importing Accused
14 Devices, which provides a significant market advantage to Google and its users. A
15 chart identifying specifically where each limitation of claim 16 is found in the
16 Google TPUv3 is attached hereto as **Exhibit 2**. This infringement chart is based on
17 PDS’s current understanding of the TPUv3, which only considers publicly available
18 information. The chart does not set forth all of PDS’s infringement theories. The
19 Google TPUv3, and later iterations, also embody other claims set forth in the ‘901
20 patent.

21 17. PDS reserves the right to amend or supplement its infringement
22 theories upon more information becoming available through formal discovery
23 and/or this Court completing its claim construction proceedings.

24 18. Defendants’ acts of infringement were undertaken without permission
25 or license from PDS.

26 19. PDS is informed and believes and based thereon alleges that Google’s
27 infringement of the ‘901 patent will continue unless enjoined by this Court.

28 20. Plaintiff is informed and believes and thereupon alleges that the
extensive scope and scale of commercial use and sale of the Accused Devices has
resulted in lost sales and license fees, reduced the business and profit of Plaintiff,

1 and greatly injured the general reputation of Plaintiff, all to Plaintiff's damage in an
2 amount not yet fully determined. The exact amount of profits realized by
3 Defendants as a result of its infringing activities, are presently unknown to Plaintiff,
4 as are the exact amount of damages suffered by Plaintiff as a result of said
5 activities. These profits and damages cannot be accurately ascertained without an
6 accounting.

7 21. In addition, Plaintiff is entitled to reasonable attorneys' fees incurred
8 in this action under 35 U.S.C. § 285.

9 22. Because of the aforesaid infringing acts, Plaintiff has suffered and
10 continues to suffer great and irreparable injury for which there is no adequate
11 remedy at law.

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PRAYER FOR RELIEF

14 WHEREFORE, Plaintiff Power Density Solutions, LLC prays for judgment
15 against Defendant as follows:

16 (a) An order adjudging Google to have directly infringed the '901 patent
17 under 35 U.S.C. § 271;

18 (b) That Defendant be required to account to Plaintiff for any and all
19 profits derived by them associated with their use and/or sale of the Accused
20 Devices, and all damages sustained by Plaintiff by reason of Defendant's patent
21 infringement;

22 (c) For an assessment and award of patent damages against Defendants in
23 an amount no less than lost profits or a reasonable royalty, pursuant to 35 U.S.C. §
24 284;

25 (d) That an award of reasonable costs, expenses, and attorneys' fees be
26 awarded against Defendant pursuant to 35 U.S.C. § 285;

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1 (e) An award of pre-judgment and post-judgment interest and costs of this
2 action against Defendants; and

3 (f) For such other and further relief as the Court deems just and proper.
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5 DATED: November 13, 2024

WEEKS NELSON

7 /s/ Gregory K. Nelson

8 Gregory K. Nelson

9 Attorney for Plaintiff
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11 **JURY DEMAND**

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13 Plaintiff hereby requests a trial by jury in this matter.
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15 DATED: November 13, 2024

WEEKS NELSON

17 /s/ Gregory K. Nelson

18 Gregory K. Nelson

19 Attorney for Plaintiff
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