IN THE UNITED STATES DISTRICT COURT

FOR THE WESTERN DISTRICT OF TEXAS

WACO DIVISION

DEMARAY LLC,

Plaintiff,

v.

INTEL CORPORATION,

Defendant.

Case No. 6:20-cv-00634

JURY TRIAL DEMANDED

DEMARAY LLC'S COMPLAINT FOR INFRINGEMENT OF U.S. PATENT NOS. 7,544,276 AND 7,381,657

Plaintiff Demaray LLC ("Demaray"), by and through its undersigned counsel, pleads the following against Intel Corporation ("Intel") and alleges as follows:

THE PARTIES

1. Dr. Richard Ernest Demaray, a named inventor on both of the patents at issue in this case, has been working in and with the semiconductor industry for more than forty years. Dr. Demaray began his training in chemical physics, studying ultraviolet photoconductivity of materials. His doctoral work focused on cross-supersonic molecular and atomic beams with which he demonstrated lossless conversion of molecular vibration to light in vacuum. During his post-doctoral fellowship, he designed and built some of the first pulsed xcimer laser driven tunable dye lasers for resonant multiphoton photoionization in the cooled beam. That work became instrumental to understanding the photo-physics of the high lying states of small and aromatic molecules.

2. Much of Dr. Demaray's work in industry has involved advances in thin film technology. In the 1980s, he worked as a senior physicist at BOC Group on electron beam evaporation technology used to deposit thermal barrier coatings. His work on adherent electron beam evaporation thermal barrier coatings revolutionized high-temperature jet engine performance, efficiency and longevity. Dr. Demaray's zirconia coatings are in worldwide production today on military, commercial and power generation turbine hot section blades and vanes. Later that decade and continuing into the early 1990s, Dr. Demaray worked at Varian Associates. He served as Varian's R&D Director for thin film systems, and developed full-face erosion and sputter physical vapor deposition technology now used extensively in semiconductor manufacturing worldwide. In the late 1990s, he helped form Applied Komatsu, where he served as General Manager of the PVD division and developed wide-area magnetron sputter machines. Thereafter, he managed several additional companies in the thin film space, including Symmorphix Inc., where he served as Chief Technology Officer and Chairman of the Board.

3. After serving in senior management roles at some of the more prominent companies in the industry, he founded Demaray in order to focus on research, development, and commercialization of new product applications based on technologies he had developed, including technologies protected by the patents at issue in this case. Much of that work—which remains ongoing—relates to the production of low-defect thin films for advanced electronic devices. In the course of his work, Dr. Demaray discovered that his patented technology was being used by Intel, without authorization, to manufacture thin films in Intel electronic devices with which Intel is generating many tens of billions of dollars per year.

4. Demaray is a Delaware limited liability company duly organized and existing under the laws of the State of Delaware. The address of the registered office of Demaray is 9 East

Loockerman Street, Suite 202, Dover, DE 19901. The name of Demaray's registered agent at that address is Spiegel & Utrera, P.A.

5. Demaray is the assignee and owns all right, title, and interest to U.S. Patent Nos. 7,544,276 ("the '276 Patent") and 7,381,657 ("the '657 Patent") (collectively, the "Asserted Patents"). A true and correct copy of the '276 Patent is attached hereto as Exhibit 1. A true and correct copy of the '657 Patent is attached hereto as Exhibit 2.

6. On information and belief, Defendant Intel is a corporation duly organized and existing under the laws of the State of Delaware, having a regular and established place of business in the Western District of Texas, including at 1300 South Mopac Expressway, Austin, Texas 78746.[1]

JURISDICTION AND VENUE

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

8. Intel is subject to this Court's specific and general personal jurisdiction consistent with the principles of due process and/or the Texas Long Arm Statute.

9. Personal jurisdiction exists generally over Intel because Intel has sufficient minimum contacts with the forum as a result of business conducted within the State of Texas and the Western District of Texas and/or has engaged in continuous and systematic activities in the Western District of Texas, and Intel is registered with the Secretary of State to do business in the State of Texas. Personal jurisdiction also exists over Intel because it makes, uses, sells, offers for

[1] https://www.intel.com/content/www/us/en/location/usa.html; https://www.intel.com/content/www/us/en/corporate-responsibility/intel-in-texas.html.

sale, imports, advertises, makes available, and/or markets products or processes within the State of Texas and the Western District of Texas that infringe one or more claims of the Asserted Patents, as alleged more particularly below.

10. Venue in this District is proper under 28 U.S.C. §§ 1400(b) and 1391(b) and (c) because Intel is subject to personal jurisdiction in this District and has committed acts of infringement in this District. Intel makes, uses, sells, and/or offers to sell infringing products or processes within this District, has a continuing presence within the District, and has the requisite minimum contacts with the District such that this venue is a fair and reasonable one. Upon information and belief, Intel has transacted, and at the time of the filing of the Complaint, is continuing to transact business within this District.

TECHNOLOGY BACKGROUND

11. Semiconductor devices are generally manufactured using a series of process steps applied to a substrate. A particularly important portion of typical semiconductor manufacturing processes involves the deposition of thin films used to form structures in the final product. One of the most practical and effective approaches to thin film deposition used to make modern semiconductor devices, and which is often used a dozen or more times in manufacturing even a single semiconductor product, is called "magnetron sputtering."

12. Magnetron sputtering is a physical vapor deposition ("PVD") technique. It can be carried out in a reactor that applies power to a target, *e.g.,* a metal such as tantalum (Ta) or titanium (Ti), to deposit a thin film onto a substrate, *e.g.,* silicon.

13. Magnetron sputtering, as practiced in modern commercial operations, generally involves the use of magnets behind the negative cathode in the reactor to create magnetic and electrical fields superimposed on the metal target. *See also, e.g.,* Ex. 1 at 8:38-60. An inert gas,

e.g., argon, can be introduced into the chamber to create a magnetically confined ionized plasma. The plasma may be located near the surface of the metal target such that the positively charged plasma ions collide with the negatively charged metal target material ejecting atoms from the metal target, which then deposit on the substrate. *See also, e.g., id.* at 5:24-27.

14. One form of magnetron sputtering is bias pulsed DC ("BPDC") sputtering. As that process is practiced in semiconductor industry today, a DC power supply that provides alternating negative and positive voltages is generally applied to the metal target while an RF voltage is generally applied to the substrate. *See also, e.g., id.* at 2:45-3:7, 5:60-67.

15. Reactive magnetron sputtering ("RMS"), as used currently for industrial scale semiconductor fabrication, generally includes the addition of a reactive gas, *e.g.,* nitrogen, as a process gas while sputtering from a metal target. *See also, e.g., id.* at 8:61-67. As an example, RMS using nitrogen gas can be used for depositing dielectric barrier layers of tantalum nitride (TaN) or titanium nitride (TiN) for copper interconnects on silicon wafers for semiconductor devices. BPDC sputtering systems are now being used for RMS sputtering.

FIRST CLAIM

(Infringement of U.S. Patent No. 7,544,276)

16. Demaray re-alleges and incorporates herein by reference Paragraphs 1-15 of its Complaint.

17. The '276 Patent, entitled "Biased pulse DC reactive sputtering of oxide films," was duly and lawfully issued on June 9, 2009. Ex. 1.

18. The '276 Patent names Hongmei Zhang, Mukundan Narasimhan, Ravi B. Mullapudi, and Richard E. Demaray as co-inventors.

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