UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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MICRON TECHNOLOGY, INC., MICRON SEMICONDUCTOR
PRODUCTS, INC., MICRON TECHNOLOGY TEXAS LLC,
DELL TECHNOLOGIES INC., DELL INC., and HP INC.,
Petitioner,

v.

UNIFICATION TECHNOLOGIES LLC,
Patent Owner.

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IPR2021-00344
Patent 8,762,658 B2

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Before JUSTIN T. ARBES, TERRENCE W. McMILLIN, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.[1]

ARBES, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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[1] Katherine K. Vidal, Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office (Director),
is recused from this proceeding and took no part in this decision. *See*
Director's Memorandum, Procedures for Recusal to Avoid Conflicts of
Interest and Delegations of Authority (Apr. 20, 2022) (Recusal Procedure
Memo), *available at* https://go.usa.gov/xJjch; Interim Process for Director
Review (§ 20), *available at* https://go.usa.gov/xJjce.

I.   INTRODUCTION

A.   *Background and Summary*

Petitioners Micron Technology, Inc., Micron Semiconductor Products, Inc., Micron Technology Texas LLC, Dell Technologies Inc., Dell Inc., and HP Inc. (collectively, "Petitioner") filed a Petition (Paper 4, "Pet.") requesting *inter partes* review of claims 1–5, 8–12, and 22–26 of U.S. Patent No. 8,762,658 B2 (Ex. 1001, "the '658 patent") pursuant to 35 U.S.C. § 311(a). On July 9, 2021, we instituted an *inter partes* review as to all challenged claims on all grounds of unpatentability asserted in the Petition. Paper 9 ("Decision on Institution" or "Dec. on Inst."). Patent Owner Unification Technologies LLC subsequently filed a Patent Owner Response (Paper 21, "PO Resp."), Petitioner filed a Reply (Paper 28, "Reply"), and Patent Owner filed a Sur-Reply (Paper 34, "Sur-Reply"). An oral hearing was held on April 13, 2022, and a transcript of the hearing is included in the record (Paper 37, "Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5 and 8–12 of the '658 patent are unpatentable, and we cannot reach a decision on the merits with respect to whether Petitioner has established the unpatentability of claims 22–26.

B.   *Related Matters*

The parties indicate that the '658 patent is the subject of the following district court cases: *Unification Technologies LLC v. Dell Technologies, Inc.*, Case No. 6:20-cv-499-ADA (W.D. Tex.), *Unification Technologies LLC v. HP Inc.*, Case No. 6:20-cv-501-ADA (W.D. Tex.), and *Unification*

Technologies LLC v. Micron Technology, Inc., Case No. 6:20-cv-500-ADA
(W.D. Tex.) ("the district court case"). Pet. 66; Paper 6, 2–3. Petitioner also
filed petitions challenging claims of patents related to the '658 patent in
Cases IPR2021-00343 and IPR2021-00345.

C. The '658 Patent

The '658 patent discloses techniques for "managing data in a storage
device using an empty data segment directive." Ex. 1001, col. 1, ll. 25–27.
"Typically, when data is no longer useful it may be erased. In many file
systems, an erase command deletes a directory entry in the file system while
leaving the data in place in the storage device containing the data," such that
the storage device is unaware that the data is now invalid. *Id.* at col. 1,
ll. 29–33. "Another method of erasing data is to write zeros, ones, or some
other null data character to the data storage device to actually replace the
erased file," but doing so is inefficient because "valuable bandwidth is used
while transmitting the data" and "space in the storage device is taken up by
the data used to overwrite invalid data." *Id.* at col. 1, ll. 33–39. The
'658 patent attempts to overcome these issues by having the storage device
"receive a directive that data is to be erased" and store a "data segment
token" that represents erased data, rather than performing either of the
typical erase methods. *Id.* at col. 1, ll. 60–65.
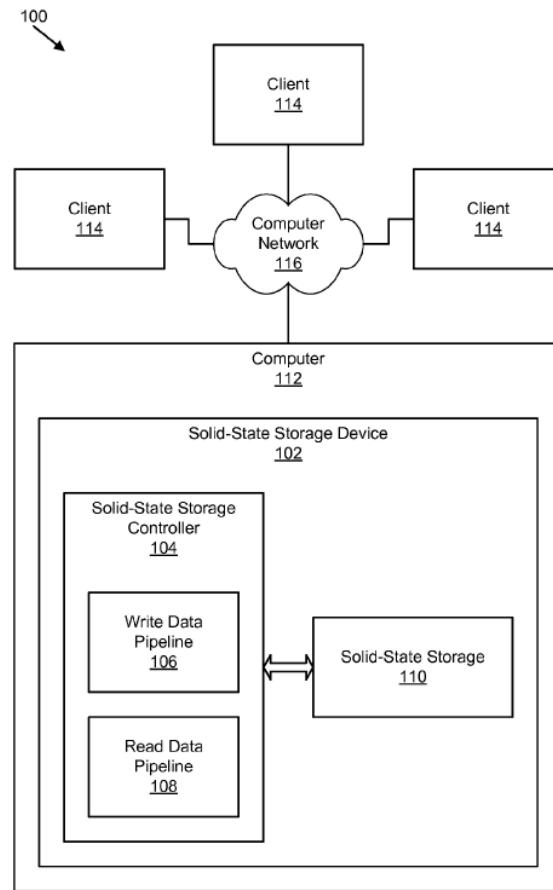
Figure 1A of the '658 patent is reproduced below.

FIG. 1A

Figure 1A depicts clients 114 in communication over computer network 116 with computer 112 having solid-state storage device 102.[2] *Id.* at col. 7, ll. 29–36. Solid-state storage device 102 comprises solid-state storage 110 (e.g., flash memory) and solid-state storage controller 104 for writing to solid-state storage 110 (via write data pipeline 106), reading from solid-state storage 110 (via read data pipeline 108), and performing other operations on

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[2] A solid-state storage device is a type of non-volatile memory that stores data in pages within blocks, where each page is identified by a unique physical address. Data in a solid-state storage device cannot be directly overwritten with new data, but instead must first be erased (at the block level) and then written (to pages). *See* Ex. 1001, col. 1, ll. 40–47.

solid-state storage 110. *Id.* at col. 7, ll. 37–44. When a "data packet is stored and the physical address of the data packet is assigned," the solid-state storage controller creates an entry in an index that maps a "logical identifier" of the object to "one or more physical addresses corresponding to where the storage controller" stored the data packet and any object metadata packets. *Id.* at col. 12, ll. 38–44.

Write data pipeline 106 includes garbage collector bypass 316 that "receives data segments from the read data pipeline 108 as part of a data bypass in a garbage collection system." *Id.* at col. 27, l. 65–col. 28, l. 1, Fig. 3. According to the '658 patent,

> [a] garbage collection system typically marks packets that are no longer valid, typically because the packet is marked for deletion or has been modified and the modified data is stored in a different location. At some point, the garbage collection system determines that a particular section of storage may be recovered. This determination may be due to a lack of available storage capacity, the percentage of data marked as invalid reaching a threshold, a consolidation of valid data, an error detection rate for that section of storage reaching a threshold, or improving performance based on data distribution, etc. Numerous factors may be considered by a garbage collection algorithm to determine when a section of storage is to be recovered.

Id. at col. 28, ll. 1–13. The '658 patent discloses an apparatus comprising a "request receiver module" and "storage module." *Id.* at col. 2, l. 11–col. 4, l. 45.

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