Trials@uspto.gov
571-272-7822

Paper 40
Entered: August 19, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COOLIT SYSTEMS, INC.,
Petitioner,

v.

ASETEK DANMARK A/S,
Patent Owner.

IPR2020-00522
Patent 10,078,355 B2

Before MICHAEL P. TIERNEY, *Vice Chief Administrative Patent Judge*, KEVIN W. CHERRY, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

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

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I. INTRODUCTION

CoolIT Systems, Inc. ("Petitioner") filed a Petition (Paper 2, "Pet.") requesting institution of *inter partes* review of claims 1, 2, 5, 6, 8, 10, 11, and 13 of U.S. Patent No. 10,078,355 B2 (Ex. 1001, "the '355 patent"). Asetek Danemark A/S ("Patent Owner") filed a Preliminary Response. Paper 6. We authorized Petitioner to file a Preliminary Reply (Paper 8). Paper 7. We instituted review. Paper 9 ("Institution Decision" or "Inst.").

Patent Owner filed a Response. Paper 23 ("PO Resp."). Petitioner filed a Reply. Paper 28 ("Pet. Reply"). Patent Owner filed a Sur-Reply. Paper 34 ("PO Sur-Reply").[1] We held a hearing on May 24, 2021, and a transcript appears in the record. Paper 39 ("Tr.").

This is a final written decision as to the patentability of the challenged claims. For the reasons discussed below, we determine Petitioner has shown by a preponderance of the evidence that each of the challenged claims is unpatentable.

A. REAL PARTIES IN INTEREST

The Petition identifies CoolIT Systems, Inc., as the real party in interest for Petitioner. Pet. 1. Patent Owner identifies Asetek Danmark A/S, Asetek USA, Inc., Asetek A/S, and Asetek Holdings, Inc., as the real parties in interest for Patent Owner. Paper 4, 1 (Patent Owner's Mandatory Notices).

[1] Patent Owner filed a Motion to Amend (Paper 22), which Petitioner opposed (Paper 30). After we provided the requested Preliminary Guidance (Paper 32), Patent Owner withdrew the Motion (Paper 33).

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B. Related Matters

The parties identify *Asetek Danmark A/S v. CoolIT Systems, Inc.*, Case No. 3:19-cv-00410-EMC (N.D. Cal.) (complaint served on February 7, 2019, currently pending) as a related co-pending district court litigation. Pet. 1; Paper 4, 1. The parties also identify the following *inter partes* reviews involving patents that are related to the '355 patent: IPR2020-00523, *Inter Partes* Review of U.S. Patent No. 10,078,354 B2, filed on February 7, 2020; and IPR2020-00524, *Inter Partes* Review of U.S. Patent No. 9,733,681 B2, filed on February 7, 2020. Pet. 1; Paper 4, 1.

C. The '355 Patent

The '355 patent is titled "Cooling System for a Computer System." Ex. 1001, Code (54). It issued from an application filed June 19, 2017, as a continuation of application No. 13/861,593, which issued as Patent No. 9,733,681 B2 and claims priority to a PCT application filed May 6, 2005. *Id.* at Code (63).

The '355 patent relates to a liquid-cooling system for a computer system. *Id.* at Code (57). The specification explains that, at the time of the invention, air cooling arrangements were the most-used cooling system for cooling central processing units (CPUs) in computer systems. *Id.* at 1:17–33. An alternative design known at the time of the invention was to use a cooling liquid circulating inside a closed system by means of a pumping unit with a heat exchanger past which the cooling liquid circulates. *Id.* at 1:34–38. The specification contends that liquid cooling is generally more efficient and quieter than air cooling, but that a liquid cooling design consists of "many components," which increases the total installation time, size, and risk of leakage of the cooling liquid from the system. *Id.* at 1:39–49. Thus,

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one object of the invention is to provide a small and compact liquid-cooling solution that is more efficient than existing air-cooling arrangements, can be produced at low cost enabling high production volumes, is easy to use and implement, can be used with existing CPU types and computer systems, and requires a low level of maintenance or no maintenance at all. *Id.* at 1:53–63.

An illustrative embodiment of such a system is depicted in Figures 7 and 8, reproduced below.

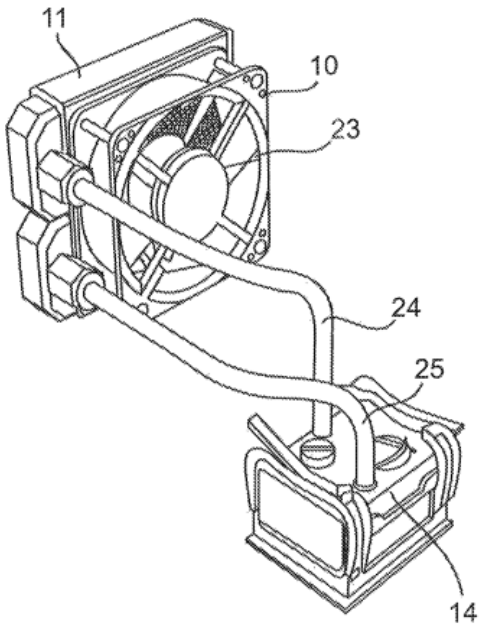

FIG. 7

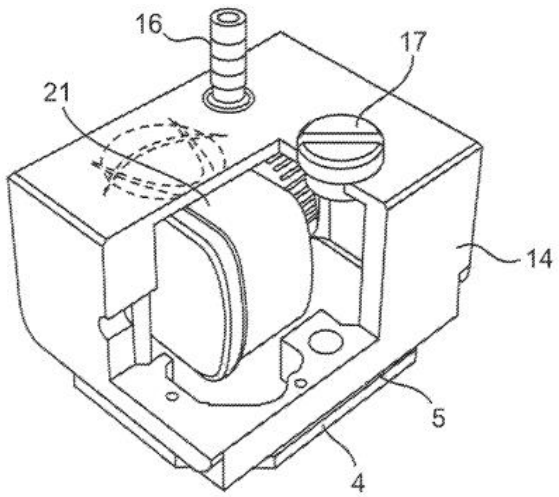

FIG. 8

Figure 7[2] is a perspective view of the cooling system showing reservoir housing 14 with heat exchanging surface 5 (shown in Figure 8) and pump 21

[2] We agree with Petitioner that it appears that the specification transposes the description of Figure 7 with that of Figure 8. Pet. 6 n.1. We refer to the description of "Figure 8" in the specification in our discussion of Figure 7, and we refer to the specification's discussion of "Figure 7" in our discussion of Figure 8.

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(shown in Figure 8) inside the reservoir. *Id.* at 16:16–19. Figure 8 is a cut-out view into reservoir housing 14, when the reservoir, pump 21, and heat exchanging surface 4 are situated inside the reservoir. *Id.* at 15:49–51. The reservoir has tube inlet connection 15 (not shown in Figure 8) through which the cooling liquid enters the reservoir. *Id.* at 15:51–53. From the tube inlet connection, the cooling liquid flows through the reservoir passing heat exchanging surface 4 and enters the inlet of the pump. *Id.* at 15:54–56. After the cooling liquid flows through the pump, the cooling liquid passes out of the outlet of the pump and further out through tube outlet connection 16. *Id.* at 15:56–58. As shown in Figure 7, tube inlet connection 15 and tube outlet connection 16 are connected to heat radiator 11 by means of connecting tubes 24 and 25. *Id.* at 16:19–21. Cooling liquid flows into and out of the reservoir and the heat radiator through connecting tubes 24 and 25, respectively. *Id.* at 16:21–23. Heat radiator 11 (shown in Figure 7) cools the cooling liquid before it passes back into the reservoir. *Id.* at 16:26–30.

The reservoir may be provided with channels or segments for establishing a certain flow-path for the cooling liquid through the reservoir to prevent the cooling liquid from passing the reservoir too quickly to take up a sufficient amount of heat from the heat exchanging surface. *Id.* at 16:51–62.

Figures 17 and 20 show the internal structures of a preferred embodiment of the reservoir according to the invention and are reproduced below. *Id.* at 21:48–50.

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