

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COOLER MASTER CO., LTD.,
Petitioner,

v.

AAVID THERMALLOY LLC,
Patent Owner.

IPR2019-00334
Patent 7,100,680 B2

Before LINDA E. HORNER, KEN B. BARRETT, and
ROBERT A. POLLOCK, *Administrative Patent Judges*.

BARRETT, Administrative Patent Judge.

JUDGMENT

Final Written Decision

Determining Some Challenged Claims Unpatentable

Denying-in-Part, Dismissing-in-Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a); 37 C.F.R. § 42.64

I. INTRODUCTION

A. Background and Summary

Cooler Master Co., Ltd. (“Petitioner”)¹ filed a Petition requesting *inter partes* review of U.S. Patent No. 7,100,680 B2 (“the ’680 patent,” Ex. 1001). Paper 2 (“Pet.”). The Petition challenges the patentability of claims 1–3 of the ’680 patent. We instituted an *inter partes* review of all challenged claims on all proposed grounds of unpatentability. Paper 7 (“Dec. to Inst.”), 38. Aavid Thermalloy LLC (“Patent Owner”)² filed a Response to the Petition. Paper 27 (“PO Resp.”). Petitioner filed a Reply (Paper 34, “Pet. Reply”) and Patent Owner filed a Sur-Reply (Paper 40, “PO Sur-Reply”). The parties filed papers addressing Patent Owner’s identification of allegedly improper arguments and evidence in Petitioner’s Reply. Papers 40 (PO Sur-Reply Appendix listing allegedly new theories and new evidence in the Reply), 43 (Petitioner’s Response to the same), Paper 49 (Petitioner’s Notice of Supplemental Authority), Paper 50 (Patent Owner’s Notice of Supplemental Authorities).

Additionally, Patent Owner filed a Motion to Exclude (Paper 46, “PO Mot. Excl.”), to which Petitioner filed an Opposition (Paper 48, “Pet. Opp. Mot. Excl.”), and Patent Owner filed a Reply (Paper 51).

An oral hearing was held on March 5, 2020, and a transcript of the hearing is included in the record. Paper 54 (“Tr.”).

¹ Petitioner identifies Cooler Master Co., Ltd. and CMI USA, Inc. as real parties-in-interest. Paper 37.

² Patent Owner identifies Aavid Thermalloy LLC as the real party-in-interest, and further states that “Aavid is wholly owned by LTI Holdings Inc. (d/b/a Boyd Corporation), which is wholly owned by Basilisk Holdings Inc.” Paper 4, 2.

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claim 3 of the '680 patent is unpatentable, but Petitioner has *not* shown by a preponderance of the evidence that claims 1 and 2 of the '680 patent are unpatentable. We also *deny* Patent Owner's Motion to Exclude.

B. Related Proceedings

One or both parties identify, as matters involving or related to the '680 patent, *Aavid Thermalloy LLC v. Cooler Master Co.*, Case No. 4:17-cv-5363 (N.D. Cal.), and Patent Trial and Appeal Board cases IPR2019-00144, IPR2019-00145, IPR2019-00146, IPR2019-00147, IPR2019-00333, IPR2019-00337, and IPR2019-00338. Papers 4; 37.

C. The '680 Patent

The '680 patent is titled "Integrated Circuit Heat Pipe Heat Spreader with Through Mounting Holes." Ex. 1001, code (54). According to the Specification, "[t]his invention relates generally to active solid state devices, and more specifically to a heat pipe for cooling an integrated circuit chip, with the heat pipe designed to be held in direct contact with the integrated circuit." *Id.* at 1:18–21.

The disclosed heat pipe "is constructed to assure precise flatness and to maximize heat transfer from the heat source and to the heat sink, and has holes through its body to facilitate mounting." *Id.* at 1:66–2:2. The heat pipe "requires no significant modification of the circuit board or socket because it is held in intimate contact with the integrated circuit chip by conventional screws attached to the integrated mounting board." *Id.* at 2:3–7. "[T]he same screws which hold the heat spreader against the chip can

also be used to clamp a finned heat sink to the opposite surface of the heat spreader.” *Id.* at 2:9–11.

The internal structure of the heat pipe is an evacuated vapor chamber with a limited amount of liquid and includes a pattern of spacers extending between and contacting the two plates or any other boundary structure forming the vapor chamber. The spacers prevent the plates from bowing inward, and therefore maintain the vital flat surface for contact with the integrated circuit chip. These spacers can be solid columns, embossed depressions formed in one of the plates, or a mixture of the two.

Id. at 2:12–20. The spacers “support the flat plates and prevent them from deflecting inward and distorting the plates to deform the flat surfaces which are required for good heat transfer.” *Id.* at 2:26–29.

The spacers also make it possible to provide holes into and through the vapor chamber, an apparent inconsistency since the heat pipe vacuum chamber is supposed to be vacuum tight. This is accomplished by bonding the spacers, if they are solid, to both plates of the heat pipe, or, if they are embossed in one plate, bonding the portions of the depressions which contact the opposite plate to that opposite plate. With the spacer bonded to one or both plates, a through hole can be formed within the spacer and it has no effect on the vacuum integrity of the heat pipe vapor chamber, from which the hole is completely isolated.

Id. at 2:36–46.

Figure 1 is reproduced below.

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