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Paper 49
Date: June 4, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COOLER MASTERS CO., LTD.,
Petitioner,

v.

AAVID THERMALLOY LLC,
Patent Owner.

IPR2019-00337
Patent 7,066,240 B2

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

HORNER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)
Denying-in-Part, Dismissing-in-Part, Patent Owner's Motion to Exclude
37 C.F.R. § 42.64(c)

I. INTRODUCTION

A. Background and Summary

Cooler Masters Co., Ltd., ("Petitioner")[1] filed a Petition requesting *inter partes* review of U.S. Patent No. 7,066,240 B2 ("the '240 patent," Ex. 1001). Paper 2 ("Pet."). The Petition challenges the patentability of claims 9–13 of the '240 patent ("the challenged claims") on the grounds of obviousness under 35 U.S.C. § 103. Petitioner asserts four grounds of unpatentability. *Id.* at 5. Aavid Thermalloy LLC ("Patent Owner")[2] filed a Preliminary Response to the Petition. Paper 6 ("Prelim. Resp."). On June 23, 2019, the Board instituted *inter partes* review of all the challenged claims on all of the asserted grounds. Paper 7 ("Inst. Dec."), 45.

Subsequently, Patent Owner filed a Response (Paper 23, "PO Resp.") to the Petition, Petitioner filed a Reply (Paper 28, "Pet. Reply") to the Patent Owner Response, and Patent Owner filed a Sur-Reply (Paper 34, "PO Sur-Reply"). An oral hearing was held on March 5, 2020, and a transcript of the hearing is included in the record. Paper 48 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). After consideration of the parties' arguments and evidence, and for the reasons discussed below, we determine that Petitioner has not shown by a preponderance of the evidence that claims 11 and 12 of the '240 patent are unpatentable, but Petitioner has shown by a preponderance of the evidence that claims 9, 10

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[1] Petitioner identifies itself and CMI USA, Inc. as the real parties in interest. Pet. 1.

[2] Patent Owner identifies itself as the real party in interest and states that it is "wholly owned by LTI Holdings Inc. (d/b/a Boyd Corporation), which is wholly owned by Basilisk Holdings Inc." Paper 4, 2.

and 13 of the '240 patent are unpatentable. We also deny, in part, Patent Owner's Motion to Exclude and dismiss as moot the remainder of the motion.

B. Related Matters

One or both parties identify, as matters involving or related to the '240 patent, *Aavid Thermalloy LLC v. Cooler Master Co.*, Case No. 4:17-cv-05363 (N.D. Cal.), and Patent Trial and Appeal Board cases IPR2019-00144, IPR2019-00145, IPR2019-00146, IPR2019-00147, IPR2019-00333, IPR2019-00334, IPR2019-00337, and IPR2019-00338. Pet. 1–2; Paper 4, 2. IPR2019-00144 was filed by Petitioner and involves a challenge to claims 9–13 of the '240 patent. The remaining *inter partes* reviews were filed by Petitioner and involve challenges to patents related to the '240 patent. The Board instituted each of these *inter partes* reviews, except for IPR2019-00145, IPR2019-00147, and IPR2019-00333.

C. The '240 Patent

The '240 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 1:10–13.

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 1:57–60. 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 circuit mounting board." *Id.* at 1:61–65.

"[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 1:67–2:2. The heat pipe further includes spacers:

> 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 2:3–11. 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 2:18–21. Through holes are provided through the heat pipe via the spacers:

> 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 2:29–40.

Figure 1 is reproduced below.

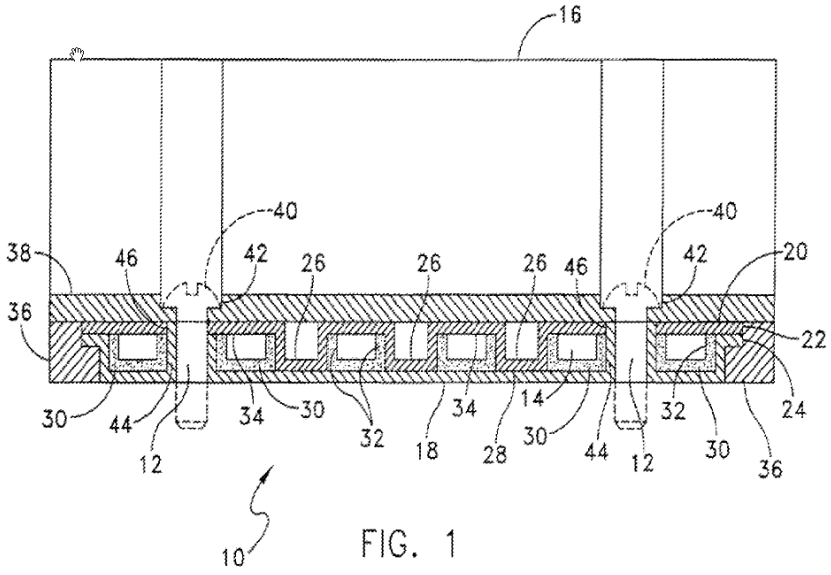

FIG. 1

Figure 1 shows "a cross section view of the preferred embodiment of a flat plate heat pipe 10 of the invention with through holes 12 through its vapor chamber 14 and in contact with finned heat sink 16." *Id.* at 3:21–24. "When heat pipe 10 is used to cool an integrated circuit chip (not shown) which is held against contact plate 18, cover plate 20 is held in intimate contact with fin plate 38, to which fins 16 are connected." *Id.* at 4:9–12. "Heat pipe 10 is constructed by forming a boundary structure by sealing together two formed plates, contact plate 18 and cover plate 20." *Id.* at 3:25–27. "Contact plate 18 and cover plate 20 are sealed together at their peripheral lips 22 and 24 by conventional means, such as soldering or brazing, to form heat pipe 10." *Id.* at 3:27–30. The components are assembled as follows:

> The entire assembly of heat pipe 10, frame 34, and fin plate 38 is held together and contact plate 18 is held against an integrated circuit chip by conventional screws 40, shown in dashed lines, which are placed in holes 42 in fin plate 38 and through holes 12 in heat pipe 10, and are threaded into the mounting plate (not shown) for the integrated circuit chip.

Id. at 4:12–18. The holes lie within sealed structures of the heat pipe:

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