

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTRI-PLEX TECHNOLOGIES, INC. and MMI HOLDINGS, LTD.,
Petitioner

v.

SAINT-GOBAIN PERFORMANCE PLASTICS RENCOL LIMITED,
Patent Owner

Case IPR2014-00309
Patent 8,228,640 B2

Before MICHAEL W. KIM, WILLIAM A. CAPP, and
FRANCES L. IPPOLITO, *Administrative Patent Judges*.

CAPP, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

Petitioner Intri-Plex Technologies, Inc. and MMI Holdings, Ltd. (collectively, “Intri-Plex”) filed a Petition requesting *inter partes* review of claims 1–10 of U.S. Patent No. 8,228,640 B2 (Ex. 1001, “the ’640 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 1 (“Pet.”). On June 10, 2014, we instituted an *inter partes* review of claims 1–10 on certain grounds of unpatentability alleged in the Petition. Paper 15 (“Dec.”). After institution of trial, Patent Owner Saint-Gobain Performance Plastics Rencol Limited (“Saint-Gobain”) filed a Patent Owner Response (Paper 37, “PO Resp.”), and Intri-Plex filed a Reply (Paper 47, “Pet. Reply”). This case is before the Board for a Final Written Decision following an Oral Hearing on the merits conducted January 15, 2015, the transcript for which is entered as Paper 82 (“Tr.”). Also before the Board are the following matters:

1. Saint-Gobain’s Motion to Exclude [Papers 51–53, 55, 66, 74];¹
2. Intri-Plex’s Motion to Exclude Evidence [Papers 59, 65, and 73];
3. Motion to Seal Deposition Transcript of Ryan Schmidt [Paper 56]; and
4. Motion to Seal Deposition Transcripts of Woodhead and Slayne [Papers 77, 80, and 81].²

After considering the evidence and arguments of counsel and for the reasons set forth below, we determine that Intri-Plex has NOT met its burden of showing, by a preponderance of the evidence, that claims 1–10 of the

¹ In Paper 51, we directed the parties to file abbreviated lists of materials in the record related to Saint-Gobain’s objection that Intri-Plex’s Reply and supporting evidence exceeded the proper scope of a Reply. We will consider Saint-Gobain’s objection to the scope of Intri-Plex’s Reply together with Saint-Gobain’s Motion to Exclude.

² In rendering our decision, we also have considered Patent Owner’s Motion for Observation on the Cross-Examination of Mr. Ryan Schmidt and Dr. Michael McCarthy (Paper 54) and Petitioner’s response thereto (Paper 67) and have accorded the testimony the appropriate weight.

'640 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Admitted Prior Art and Wing. In addition we GRANT-IN-PART Saint-Gobain's Motion to Exclude; DENY Intri-Plex's Motion to Exclude; DENY the Motion to Seal the Schmidt Deposition Transcript; and GRANT the Motion to Seal the Woodhead and Slayne Deposition Transcripts.

1. BACKGROUND

A. Background of the Related Technology

The '640 patent is directed primarily to improving Winchester disc hard drives. Representative drawings of a Winchester disc drive and the key sub-components thereof that are of interest in this case are shown side-by-side below. Ex. 2001, Figs. 1, 2.

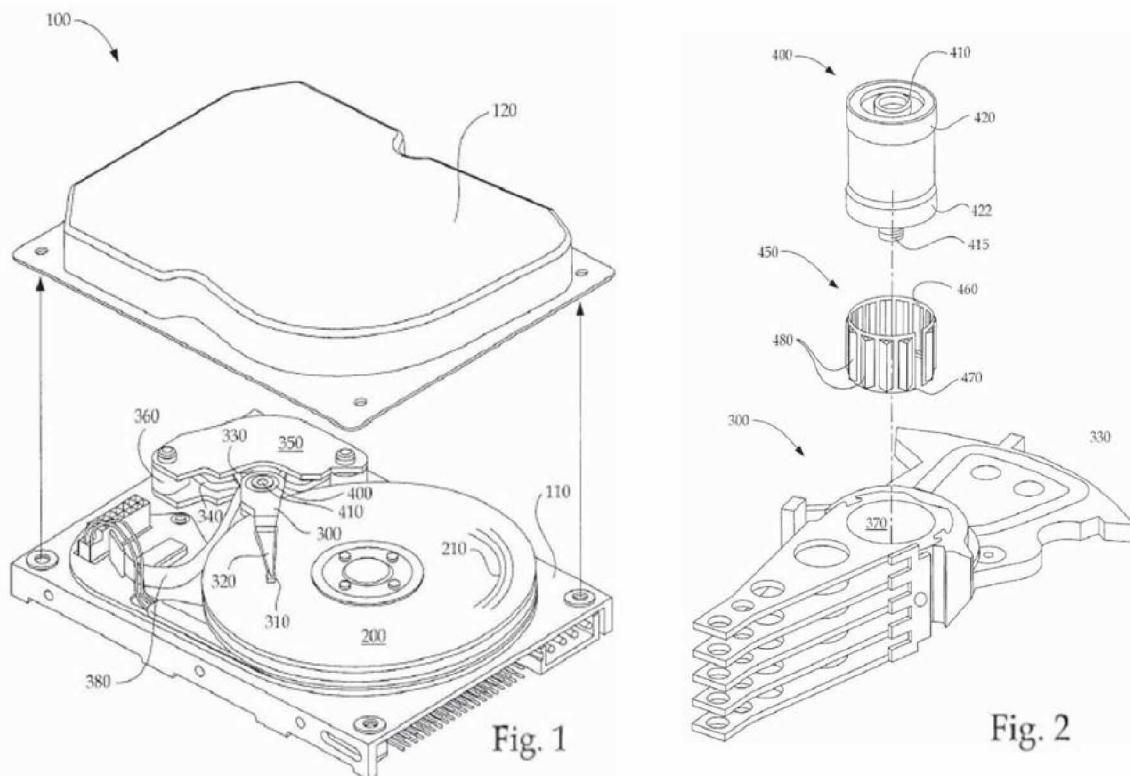


Figure 1 of Exhibit 2001, depicted above left, shows an exploded view of a typical disc drive. Disc drive 100 includes a plurality of discs 200 that are

mounted for rotation on a spindle motor. Ex. 2001, 3:43–44. Actuator 300 is mounted to bearing assembly 400, which includes stationary pivot shaft 410 about which actuator 300 rotates. *Id.* at 3:49–51. Figure 2 of Exhibit 2001, depicted above right, shows a partially exploded view of actuator 300. Actuator 300 has bore 370 that receives a bearing assembly. *Id.* at 4:1–2. The bearing assembly includes bearing cartridge 400 and tolerance ring 450 that is interposed between bearing cartridge 400 and bore 370. *Id.* at 4:3–10.

Of paramount interest in the instant dispute is the design of the tolerance ring that is interposed between the bearing cartridge and the bore. In certain instances, a tolerance ring is not formed into a continuous, unbroken circle. *See, e.g.*, Ex. 1021, Fig. 2. Rather, a gap is created that allows the tolerance ring to expand or contract radially. Ex. 2018, ¶ 34, Ex. 2008. Such radial expansion or contraction facilitates assembly of the tolerance ring onto the bearing or, alternatively, into the bore. *Id.* For purposes of this Decision, a “Shaft Variable” tolerance ring is first placed over the bearing assembly, and then the bearing assembly, with the Shaft Variable tolerance ring placed thereon, is inserted into the bore. A “Housing Variable” tolerance ring, for purposes of this Decision, is first placed inside the bore and then the bearing assembly is inserted into the tolerance ring and bore.

B. The '640 patent (Ex. 1001)

The '640 patent discloses and claims a hard disk drive with a pivot bearing assembly located in a bore of an actuator arm. Ex. 1001, claim 1. A tolerance ring is positioned between an interior surface of the bore and an

external surface of the pivot bearing assembly. *Id.* A funnel shaped guide portion is positioned at one axial end of the tolerance ring. *Id.* at Fig. 4.

The Specification describes problems that can occur during assembly of disk drive actuator arms that use tolerance rings. *Id.* at 2:5–6. As tolerance rings require a tight fit, abrasion between the tolerance ring and other parts of the apparatus during assembly may dislodge small fragments or “particles” from surfaces of the affected parts. *Id.* at 2:6–10. These particles can affect the function of hard disk drives adversely, where cleanliness is essential. *Id.* at 2:13–17.

Another issue relative to the design of tolerance rings is a phenomenon referred to as torque ripple. *Id.* at 2:30–36, 7:8–18. Contact points between the tolerance ring and the bearing assembly create micro-indentations that influence rolling elements in the bearing assembly as they pass over them. Ex. 2020 ¶ 29. This causes unwanted vibration and torque variations. *Id.* Torque variation is undesirable because it can cause errors in reading and writing data to and from the disc. *Id.*

According to Saint-Gobain’s expert, Dr. Slocum, a Shaft Variable ring, with outwardly facing protrusions and a smooth inner surface, distributes its load more evenly around the circumference of the bearing assembly than a Housing Variable tolerance ring. Ex. 2020 ¶ 29. For this reason, Shaft Variable tolerance rings outperform Housing Variable tolerance rings with respect to torque ripple. *Id.* Nevertheless, Housing Variable tolerance rings outperform Shaft Variable tolerance rings in terms of minimizing the generation of undesirable particles during assembly. *Id.* ¶¶ 27– 28.

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