

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QD OXFORD UK LIMITED, and
QUANTUM DESIGN INTERNATIONAL INC.,
Petitioner,

v.

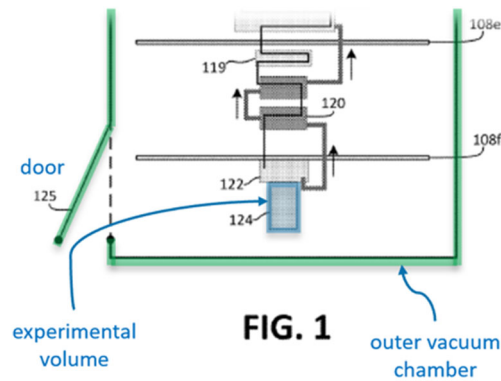
MAYBELL QUANTUM INDUSTRIES, INC.,
Patent Owner.

Case No. IPR2026-00291
Patent No. 12,313,320

PATENT OWNER'S PRELIMINARY SUR-REPLY

Petitioners argue that “*an opening ... configured to provide access to an experimental volume*” can be **any** opening—even one for a probe rather than a user—leading to **any** volume within the refrigerator. That overbroad interpretation is inconsistent with the intrinsic record. Because the ’320 Patent nowhere discloses an opening for probe-access to an experimental volume, Petitioners’ construction would improperly encompass an approach not supported in the specification. *Vanderlande Indus. Nederland BV v. Int’l Trade Comm’n*, 366 F.3d 1311, 1322 (Fed. Cir. 2004) (rejecting overly broad construction that “could conceivably embrace “no-contact” technologies far beyond the patent’s disclosure”); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (“claims must be construed so as to be consistent with the specification”).

Instead, the ’320 Patent explains that an experimental volume is “accessed **by the user** when the dilution refrigerator [] is not in operation through an opening in the vacuum chamber [] and door [].” EX1001, 13:6–13. The door provides “access through all of the inner radiation shields ... to allow **a user to access the experimental volume.**” EX1001, 19:21–25; *see also id.*, 19:25–30, 19:56–20:3, 20:13–23, Figs. 1 (excerpted below), 10A, 11, 12A. This improves over prior art arrangements requiring large amounts of space and expensive supporting infrastructure such as high ceilings and/or access pits conventionally needed to remove the vacuum chamber to achieve user access. EX1001, 16:50–53, 18:10–16.



The file history also clearly demonstrates that probe-access is insufficient. Mikheev, which discloses an apparatus that allows a sample to be inserted into the experimental volume via insertion of a probe, but provides no *user* access to the experimental volume, was distinguished by the Applicants. POPR, 10–14. In explaining an initial position that Mikheev discloses “an opening configured to provide access to the sample stage,” the Examiner cited Column 5, lines 29-42 of Mikheev, which describe “a *probe* access path.” EX1004, 112; EX2009, 5:34. Applicants specifically distinguished Mikheev because its experimental volume “is accessible *only through ... a probe access path.*” EX1004, 71. Applicants’ explanation that “tube 60 is not an opening in outer wall 2” (quoted, Reply at 2) simply confirms that the claimed “opening” is not as broad as Petitioners argue. It also does not detract from Applicants’ primary distinction that a probe opening fails to provide the claimed access to the experimental volume. *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1374 (Fed. Cir. 2007) (“An applicant’s invocation of multiple grounds for distinguishing a prior art reference does not immunize each of them from being used to construe the claim language.”).

Tellingly, Petitioners make no attempt to distinguish between Mikheev's probe-access and the probe-access of the Petition's Batey, Chow, or Garside.

Regarding Wikus (Ground 5), Petitioners again misconstrue the significance of the access phrase. Wikus describes a dark matter detection experiment where the dark matter detector is located remotely from a cryostat. POPR, 40–47. Petitioners equated the cryostat to the claimed vacuum chamber but fail to account for the fact that the experiment is conducted in the detector unit. The Petition offered only conclusory assertions that the cryostat opening provides access to an “*experimental volume*” solely because the cryostat contains an individually sealed 1K pot, 4K pot, and still. Pet., 85–86; EX1005, Fig. 56. That is not sufficient nor consistent with the specification of the '320 patent.

Petitioners argue that *any volume* could theoretically be configured for experimentation (which is not correct), effectively giving no weight to the word “experimental” and violating the basic principle that all claim terms should be given weight. The '320 specification describes an “*experimental volume*” as distinct from other thermal stages. EX1001, 3:25–29, 4:30–52, 12:66–13:42, 15:10–24, 19:21–32, 20:13–23, Fig. 1, 10A, 11, 12. Thus, a POSA would not confuse warmer stages that contain no samples, sample stages, or experiments for the claimed “*experimental volume*.” Again, Petitioners improperly divorce the claim language from the specification contrary to basic claim construction canons.

Respectfully submitted,

Date: August 7, 2026

/Michael N. Rader/

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CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (e)(4)

I certify that on August 7, 2026, a copy of the foregoing document, including any exhibits filed therewith, is being served via electronic mail, as previously consented to by Petitioner, upon the following:

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Date: August 7, 2026

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