

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AKERMIN, INC.,
Petitioner,

v.

CO₂ SOLUTIONS INC.,
Patent Owner.

Case IPR2015-00880
Patent 8,329,458 B2

Before MICHAEL P. TIERNEY, JON B. TORNQUIST, and
ELIZABETH M. ROESEL, *Administrative Patent Judges*.

ROESEL, *Administrative Patent Judge*.

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

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Akermis, Inc. (“Petitioner”) challenges the patentability of claims 1–4, 15–19, 22–28, and 40–43 of U.S. Patent No. 8,329,458 B2 (Ex. 1001, “the ’458 patent”), owned by CO₂ Solutions Inc. (“Patent Owner”).

We have jurisdiction under 35 U.S.C. § 6(c). This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 15, 16, 22–26, and 40–43 of the ’458 patent are unpatentable, but has not shown that claims 3, 4, 17–19, 27, and 28 of the ’458 patent are unpatentable.

I. BACKGROUND

A. *Procedural History*

On March 20, 2015, Petitioner filed a Corrected Petition requesting *inter partes* review of claims 1–4, 15–19, 22–28, and 40–43 of the ’458 patent. Paper 5 (“Pet.”). On June 17, 2015, Patent Owner filed a Preliminary Response. Paper 9 (“Prelim. Resp.”)

On September 15, 2015, we instituted *inter partes* review of claims 1–4, 15–19, 22–28, and 40–43. Paper 10 (“Decision to Institute” or “Dec.”).

On December 15, 2015, Patent Owner filed a Patent Owner Response. Paper 14 (“PO Resp.”) On March 17, 2016, Petitioner filed a Reply To Patent Owner’s Response. Paper 17 (“Pet. Reply”).

Petitioner submitted a Declaration of Dr. Louis DeFilippi with the Petition. Ex. 1003 (“DeFilippi Decl.”). Patent Owner cross-examined Dr. DeFilippi and filed a transcript of the deposition testimony as Exhibit 2017 (“DeFilippi Dep.”). Patent Owner submitted a Declaration of Dr. Louis Fradette with the Patent Owner Response. Ex. 2004 (“Fradette

Decl.”). Petitioner cross-examined Dr. Fradette and filed a transcript of the deposition testimony as Exhibit 1027 (“Fradette Dep.”).

An oral hearing was held June 9, 2016. A transcript of the hearing was entered in the record. Paper 24 (“Tr.”).

B. Related Proceedings

No proceedings involving the ’458 patent have been identified by the parties. *See* Pet. 1; Paper 7, 2. Petitioner asserts that, on March 1, 2016, Patent Owner filed and served a complaint against Petitioner for infringement of patents involving “similar subject matter” and asserts that the lawsuit, captioned *CO₂ Solutions Inc. v. Akermin, Inc.*, Civil Action No. 1:15-cv-01123 (D. Del.), “may be affected by a decision in this proceeding.” Paper 19, 2.

C. The ’458 Patent (Ex. 1001)

The ’458 patent relates to a triphasic bioreactor and process using carbonic anhydrase for treating carbon dioxide (CO₂)-containing gas for purposes of gas effluent treatment and air purification. Ex. 1001, Abstract, 1:19–23. The triphasic bioreactor comprises a reaction chamber with a liquid and biocatalysts in suspension in the liquid, for catalyzing a reaction between the gas and the liquid to obtain a treated gas and a solution containing a reaction product. *Id.* at Abstract.

Figure 1 of the ’458 patent is reproduced below:

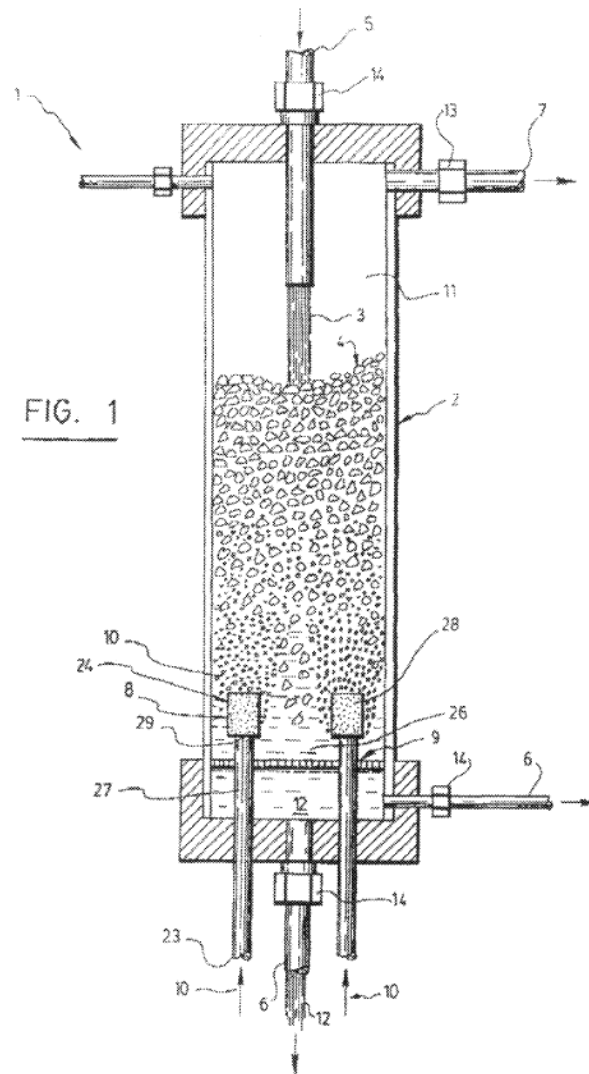


Figure 1 is a cross-sectional side view of a triphasic bioreactor. Ex. 1001, 4:66–67. The bioreactor includes reaction chamber 2 filled with biocatalysts 4 in suspension in liquid 3, and liquid inlet 5, liquid outlet 6, and gas outlet 7 in fluid communication with reaction chamber 2. *Id.* at 5:25–30. Gas 10 to be treated is bubbled via means 8 into the liquid. Biocatalysts 4 biocatalyze a reaction between the gas to be treated and the liquid to obtain treated gas 11 and solution 12 containing a reaction product. Solution 12 is released through liquid outlet 6, while retention device 9 retains the biocatalysts

within the reaction chamber. Treated gas 11 is released through gas outlet 7.
Id. at 5:39–52.

The triphasic bioreactor is used for removing carbon dioxide from gas effluent 10 containing carbon dioxide. In such a case, liquid 3 is an aqueous solution, and biocatalysts 4 are preferably carbonic anhydrase enzymes, which are capable of catalyzing the conversion of dissolved carbon dioxide into an aqueous solution 12 containing hydrogen ions and bicarbonate ions.
Id. at 8:30–38.

D. Illustrative Claims

Claims 1 and 25 are illustrative of the challenged claims and are reproduced below, with bold emphasis added to identify phrases that are the focus of the parties' arguments:

1. A carbonic anhydrase bioreactor for treating a CO₂-containing gas, comprising:
 - a reaction chamber for receiving a liquid;
 - carbonic anhydrase provided on or in substrates that are **in suspension within the liquid** for catalyzing a reaction of CO₂ into bicarbonate and hydrogen ions to obtain a treated gas and an ion-rich solution, wherein the substrates comprise porous substrates and the carbonic anhydrase are **entrapped in the porous substrates**;
 - a liquid inlet in fluid communication with the reaction chamber for providing the reaction chamber with the liquid;
 - a gas inlet connected to the reaction chamber for providing the CO₂-containing gas to be treated into the reaction chamber in order to contact the liquid;
 - a liquid outlet in fluid communication with the reaction chamber for releasing the ion-rich solution; and
 - a gas outlet in fluid communication with the reaction chamber to release the treated gas.

25. A process using carbonic anhydrase for treating a CO₂-containing gas, comprising:

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.