

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*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

Petitioner, Akerman, Inc., filed a Corrected Petition seeking *inter partes* review 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”). Paper 5 (“Pet.”). Patent Owner, CO₂ Solutions Inc., filed a Preliminary Response. Paper 9 (“Prelim. Resp.”) Pursuant to 35 U.S.C. § 314(a), we determine that the information presented in the Petition and the Preliminary Response shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition. For the reasons and on the grounds set forth below, we institute an *inter partes* review of claims 1–4, 15–19, 22–28, and 40–43 of the ’458 patent.

Our findings of fact and conclusions of law are based on the record developed thus far, before the filing of Patent Owner’s Response. This is not a final decision as to the patentability of any challenged claim. Our final decision will be based on the full record developed during the trial.

I. BACKGROUND

A. *Related Proceedings*

The parties represent that they are not aware of any other judicial or administrative matter that would affect, or be affected by, a decision in this proceeding. Pet. 1; Paper 7, 2.

B. *Evidence Relied Upon*

Petitioner’s patentability challenges are based on the following references:

Reference	Patent/Pub. No.	Date	Exhibit No.
Bonaventura '416	US 4,427,416	issued Jan. 24, 1984	Ex. 1005
Bonaventura '987	US 4,602,987	issued Jul. 29, 1986	Ex. 1004
Rau	WO 00/10691	published Mar. 2, 2000	Ex. 1007

Douglas N. Dean et al., *Batch Absorption of CO₂ by Free and Microencapsulated Carbonic Anhydrase*, 16 INDUS. ENG'G & CHEMISTRY FUNDAMENTALS 260 (1977) ("Dean"), Ex. 1006.

Arthur Kohl & Richard Nielsen, *Gas Purification* (5th ed. 1997) ("Kohl"), Ex. 1008.

Jovica D. Badjic & Nenad M. Kostic, *Effects of Encapsulation in Sol-Gel Silica Glass on Esterase Activity, Conformational Stability, and Unfolding of Bovine Carbonic Anhydrase II*, 11 CHEMISTRY MATERIALS 3671 (1999) ("Badjic"), Ex. 1009.

In addition, Petitioner relies on the Declaration of Louis DeFilippi, Ex. 1003.¹

C. Asserted Grounds of Unpatentability

Reference(s)	Basis	Claims
Bonaventura '987	§ 102	1–3, 15, 17, 24–27, 40, 41, and 43
Bonaventura '987 and Bonaventura '416	§ 103	1–3, 15–17, 24–27, and 40–43
Bonaventura '987 and Badjic	§ 103	1, 4, 25, and 28

¹ Citations exhibits, other than Exhibit 1002, are to the original page or paragraph numbers, not the page numbers added by Petitioner or Patent Owner.

Reference(s)	Basis	Claims
Bonaventura '987 and Kohl	§ 103	1, 18, and 19
Dean and Rau	§ 103	1, 2, 15, 16, 22–26, and 40–43

II. ANALYSIS

A. *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, claims 1, 25. 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:

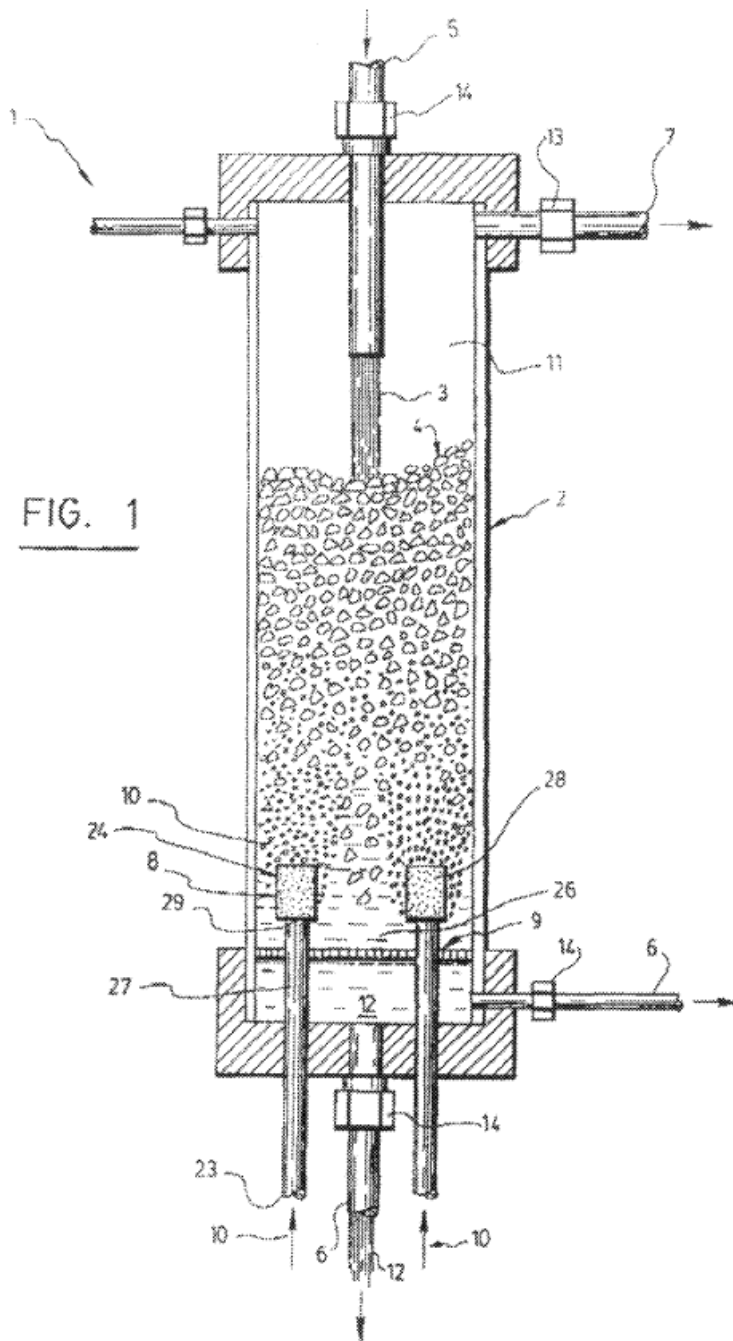


Figure 1 is a cross-sectional side view of a triphasic bioreactor. Ex. 1001, 4:66–67. The bioreactor includes reaction chamber 2 filled with biocatalysts 4 in suspension in liquid 3, liquid inlet 5, liquid outlets 6, and gas outlet 7, in fluid communication with reaction chamber 2. *Id.* at 5:25–30. Gas 10 to be

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