

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Clean Chemistry, Inc.,
Petitioner,

v.

Enviro Tech Chemical Services, Inc.,
Patent Owner

Review no.: IPR2025-01458

U.S. Patent No. 9,737,072

Issued: August 22, 2017

Filed: March 7, 2016

Inventors: Michael S. Harvey and Jonathan N. Howarth

Title: Methods and Compositions for the Generation of Peracetic Acid on Site
at the Point-of-Use

Petition for *Inter Partes* Review of U.S. Patent No. 9,737,072

TABLE OF CONTENTS

TABLE OF AUTHORITIES.....	v
LIST OF EXHIBITS	vi
I. INTRODUCTION	1
II. MANDATORY NOTICES	1
A. Real Party in Interest Under 37 C.F.R. § 42.8(b)(1)	1
B. Related Matters Under 37 C.F.R. § 42.8(b)(2).....	1
C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3).....	3
D. Service Information Under 37 C.F.R. § 42.8(b)(4).....	3
III. OTHER REQUIREMENTS	4
A. Payment of Fees Under 37 C.F.R. § 42.103	4
B. Power of Attorney	4
IV. REQUIREMENTS FOR <i>INTER PARTES</i> REVIEW UNDER 37 C.F.R. § 42.104	4
A. Grounds for Standing Under 37 C.F.R. § 42.104(a)	4
B. Identification of Challenge Under 37 C.F.R. § 42.104(b) and Relief Requested.....	5
1. Claims for which <i>inter partes</i> review is requested under 37 C.F.R. § 42.104(b)(1).....	5
2. Summary of statutory grounds and prior art on which the challenge is based under 37 C.F.R. § 42.104(b)(2)	5
3. The references on which the challenge is based qualify as prior art.....	6
V. SUMMARY OF THE ‘072 PATENT	6
A. Effective Filing Date of the ‘072 Patent.....	6

B.	Summary of the Technology	7
C.	The '072 Patent	8
D.	The '072 Patent Prosecution History	8
E.	Person of Ordinary Skill in the Art.....	11
F.	Claim construction under 37 C.F.R. § 42.104(b)(3)	11
1.	“Hydrogen peroxide-acetyl precursor solution”	13
2.	“Aqueous hydrogen peroxide”	14
3.	“Triacetin”	15
4.	“Peracetic acid”	15
5.	“Trace amount”	15
VI.	DETAILED EXPLANATION OF THE CHALLENGE UNDER 37 C.F.R. § 42.104(B).....	17
A.	Grounds 1a-1b: Claim 1 is anticipated by and/or obvious over WO 2011/017095 A2.....	17
1.	Ground 1a - WO 2011/017095 A2 anticipates Claim 1	17
2.	Ground 1b - Claim 1 is obvious over WO 2011/017095 A2	18
B.	Grounds 2a-2d: Claim 1 is anticipated by and/or obvious over JP 2006-045147 A	19
1.	Ground 2a - JP 2006-045147 A anticipates Claim 1.....	19
2.	Ground 2b - Claim 1 is obvious over JP 2006- 045147 A	20
3.	Ground 2c - Claims 2 and 3 are anticipated by JP 2006-045147 A.....	21
a.	Molar ratios (mole ratios)	21

b.	Concentrations	22
i.	Hydrogen peroxide concentrations	23
ii.	Triacetin concentrations	23
c.	Molar ratios + concentrations	24
4.	Ground 2d - Claims 2 and 3 are obvious over JP 2006-045147 A.....	27
VII.	CONCLUSION.....	28
	CERTIFICATION UNDER 37 C.F.R. § 42.24(D)	29
	CERTIFICATE OF SERVICE ON THE PATENT OWNER	30

TABLE OF AUTHORITIES

Cases

<i>Genentech, Inc. v. Hospira, Inc.</i> 946 F.3d 1333 (Fed. Cir. 2020)	26
<i>In re ICON Health and Fitness, Inc.</i> 496 F.3d 1374 (Fed. Cir. 2007)	12
<i>Intel Corp. v. Qualcomm Inc.</i> 21 F.4th 801 (Fed. Cir. 2021)	13
<i>Nautilus, Inc. v. Biosig Instruments, Inc.</i> 572 U.S. 898 (2014).....	12
<i>Ormco Corp. v. Align Tech., Inc.</i> 463 F.3d 1299 (Fed. Cir. 2006)	27
<i>Samsung Elecs. Am. Inc. v. Priusa Eng'g Corp.</i> 948 F.3d 1342 (Fed. Cir. 2020)	13
<i>Shenzhen Pincan Technology Co., Ltd v. Ridge Wallet, LLC</i> IPR2024-00340, Paper 18 (PTAB July 12, 2024)	13
<i>UCB, Inc. v. Actavis Laboratories UT, Inc.,</i> 65 F.4th 679 (Fed. Cir. 2023)	26, 27

Statutes

35 U.S.C. § 102	1, 5, 6, 7
35 U.S.C. § 103	1, 5, 7
35 U.S.C. § 112	12
35 U.S.C. § 311	1
35 U.S.C. § 316	6
35 U.S.C. § 319	1

Rules

37 C.F.R. § 1	11
37 C.F.R. § 42	1, 3, 4, 5, 11, 12, 17

LIST OF EXHIBITS

Exhibit 1001	U.S. Patent No. 9,737,072
Exhibit 1002	Graphical Representation of Priority for U.S. 9,737,072
Exhibit 1003	Complaint in <i>Enviro Tech Chemical Services, Inc. v. Clean Chemistry, Inc.</i>
Exhibit 1004	Service of Complaint
Exhibit 1005	Certified File History of U.S. 9,737,072
Exhibit 1006	Claims Pending in Application No. 15/063,306
Exhibit 1007	U.S. 8,546,449
Exhibit 1008	Declaration of Dr. Klibanov in Support of the Petition
Exhibit 1009	U.S. 6,387,238
Exhibit 1010	U.S. 7,919,122
Exhibit 1011	EP 0563460
Exhibit 1012	WO 2011/017095 A2 (Stauffer)
Exhibit 1013	JP 2006-045147 A certified English translation (Okano)
Exhibit 1014	JP 2006-045147 A Certification of Translation
Exhibit 1015	JP 2006-045147 A (original in Japanese)

I. INTRODUCTION

Clean Chemistry, Inc. (“Petitioner”) petitions for *inter partes* review of all claims (Claims 1-3) of U.S. Patent No. 9,737,072 (“the ‘072 Patent,” Exhibit 1001) under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100. The ‘072 Patent lists as the assignee Enviro Tech Chemical Services, Inc. (“Patent Owner”).

This Petition demonstrates that there is a reasonable likelihood that Petitioner will prevail on at least one of the challenged claims. Evidence in this Petition establishes that Claims 1-3 are unpatentable under 35 U.S.C. § 102 and/or §103. Petitioner respectfully requests that this Petition for *inter partes* review be granted and Claims 1-3 of the ‘072 Patent be canceled.

II. MANDATORY NOTICES

As set forth below and pursuant to 37 C.F.R. § 42.8(a)(1), the following mandatory notices are provided as part of this Petition.

A. Real Party in Interest Under 37 C.F.R. § 42.8(b)(1)

For Petitioner, Black Bay Energy, L.P. is Clean Chemistry, Inc.’s parent, owning 10% or more of Clean Chemistry, Inc.’s stock. There is no publicly held corporation owning 10% or more of Clean Chemistry, Inc.’s stock.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

Regarding related matters under 37 C.F.R. § 42.8(b)(2), Petitioner is concurrently filing or will soon file one or more petitions for *inter partes* review of three related patents respectively, specifically U.S. Patent Nos. 8,546,449,

9,363,997, and 9,730,443. U.S. 9,363,997 and 9,730,443 are divisionals of the same patent from which the '072 Patent is divided, and U.S. 8,546,449 is the grandparent patent. *See* the Graphical Representation of Priority, Exhibit 1002. The Patent Owner has filed a lawsuit alleging that Petitioner infringes the '072 Patent, as well as U.S. 8,546,449, U.S. 9,363,997, and U.S. 9,730,443, in *Enviro Tech Chemical Services, Inc. v. Clean Chemistry, Inc.*, Case No. 1:24-cv-1313 (W.D. Tx.), filed on October 29, 2024 (Exhibit 1003, hereinafter the "Parallel Litigation"), and served on January 27, 2025. Exhibit 1004. As already noted, the other patents asserted by the Patent Owner in that lawsuit are related to the '072 Patent. *See* Exhibit 1002, the Graphical Representation of Priority.^{1,2}

¹ The four patents in suit are indicated in blue in Exhibit 1002.

² While Petitioner does not believe it relevant to the Petition, for completeness, it is noted that the continuation-in-part, U.S. 10,912,321, is the subject of an Appeal to the Federal Circuit (*Enviro Tech Chemical Services, Inc. v. Safe Foods Corporation*, Appeal No. 2024-2160 (Fed. Cir.)). A declaratory judgment action on the same patent (*Zeco, LLC v. Enviro Tech Chemical Services, Inc.*, Case No. 1:21-cv-00079-CEA-CHS (E.D. Tenn.)) has been administratively closed pending the outcome of the Appeal to the Federal Circuit. Three reissue applications (Appln. nos. 18/098,525, 19/239,762 and 19/239,865) with respect to U.S.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner provides the following designation of counsel:

Lead Counsel	Backup Counsel
R. Andrew Patty II (Reg. No. 38,992) drew.patty@phelps.com Phone: 225-376-0284	Mary H. Drabnis (Reg. No. 45,909) mary.drabnis@phelps.com Phone: 225-376-7965
Phelps Dunbar LLP 400 Convention Street, Suite 1100 Baton Rouge, LA 70802 Fax: 225-381-9197	

D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Service on Petitioner may be made by electronic service by email at ipdocket@phelps.com, or by mail or hand delivery to 400 Convention Street, Suite 1100, Baton Rouge, LA 70802. The fax numbers for lead and backup counsel are shown above. Petitioner also consents to electronic service by email at n.gardiner@cleanchemi.com.

10,912,321 have been filed, with 18/098,525 suspended by the Office *sua sponte* on May 8, 2025, for six (6) months, in view of the ongoing appeal to the Federal Circuit.

III. OTHER REQUIREMENTS

A. Payment of Fees Under 37 C.F.R. § 42.103

The undersigned authorizes the Office to charge the total of the fees specified by 37 C.F.R. § 42.15(a)(1) and 42.15(a)(2), to Deposit Account No. 604651.

B. Power of Attorney

Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney accompanies this Petition.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW UNDER 37 C.F.R. § 42.104

A. Grounds for Standing Under 37 C.F.R. § 42.104(a)

Petitioner certifies that the '072 Patent is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting *inter partes* review challenging the claims of the '072 Patent on the grounds identified herein. Neither Petitioner, nor any party in privity with Petitioner, (i) has filed a civil action challenging the validity of Claims 1-3 of the '072 Patent; (ii) has been served a complaint alleging infringement of the '072 Patent more than one year prior to the present date; or (iii) is estopped from challenging the claims on the grounds identified in this Petition.

B. Identification of Challenge Under 37 C.F.R. § 42.104(b) and Relief Requested**1. Claims for which *inter partes* review is requested under 37 C.F.R. § 42.104(b)(1)**

Petitioner requests *inter partes* review and cancellation of Claims 1-3 of the '072 Patent under 37 C.F.R. § 42.104(b)(1).

2. Summary of statutory grounds and prior art on which the challenge is based under 37 C.F.R. § 42.104(b)(2)

All claims of the '072 Patent are challenged on grounds of anticipation and/or obviousness. Petitioner requests cancellation of the challenged claims of the '072 Patent on the grounds listed in the table below.

Grounds	Bases	Claim(s)	Prior art
1a-1b	35 U.S.C. §102 and/or §103	1	WO 2011/017095 A2
2a-2d	35 U.S.C. §102 and/or §103	1-3	JP 2006-045147 A

The references deemed to have been cited in the present case were, upon information and belief from the prosecution history, cited in Information Disclosure Statements filed only in the '072 Patent's grandparent, U.S. 8,546,449 (Exhibit 1007).

The Office has not previously considered WO 2011/017095 A2 or JP 2006-045147 A in prosecution of the '072 Patent.

Each of the specific statutory grounds on which the challenge is based under 37 C.F.R. § 42.104(b)(2) are discussed in detail in Section VIII below. This Petition

demonstrates at least a reasonable likelihood, based on a preponderance of the evidence (35 U.S.C. § 316(e)), that Petitioner will prevail in establishing that one or more of the claims of the '072 Patent are unpatentable.

3. The references on which the challenge is based qualify as prior art

Publication WO 2011/017095 A2 is prior art to the '072 Patent. WO 2011/017095 A2, published on February 10, 2011, is an international patent application that was filed on July 27, 2010. WO 2011/017095 claims an earliest priority date of July 27, 2009, and qualifies as prior art under 35 U.S.C. § 102. This reference was not cited or applied during the pendency of the application that matured into the '072 Patent.

Publication JP 2006-045147 A is prior art to the '072 Patent. JP 2006-045147 A was filed on August 6, 2004, and was published on February 16, 2006. This reference was not cited or applied during the pendency of the application that matured into the '072 Patent.

V. SUMMARY OF THE '072 PATENT

A. Effective Filing Date of the '072 Patent

The '072 Patent issued from U.S. Patent Application No. 15/063,293, filed on March 7, 2016. The '293 Application is a divisional of U.S. Patent Application No. 14/019,296, filed on September 5, 2013, now U.S. Patent No. 9,370,180, which in turn is a divisional of U.S. Patent Application No. 13/065,553, filed on March 26,

2011, now U.S. Patent No. 8,546,449. A Graphical Representation of the relationship of these patents is set forth in Exhibit 1002.

For the purposes of this proceeding, Petitioner has assumed that the earliest effective filing date of the '072 Patent is March 26, 2011. Therefore, Petitioner believes pre-AIA statutes should apply to this proceeding.

Petitioner notes that although the box on the Application Data Sheet for the “Statement under 37 CFR 1.55 or 1.78 for AIA Transition Application” for the present patent (the '293 Application) was not checked, and that both the Filing Receipt and Corrected Filing Receipt indicated “No” for the Statement under 37 CFR 1.55 or 1.78 for AIA Transition Application purposes, the Image File Wrapper and the Office Actions in the application indicate that the application that matured into the '072 Patent was an AIA application. This was not challenged in the Responses to the Office Actions.

The prior art applied in this Petition qualifies as prior art under both pre-AIA and post-AIA 35 U.S.C. §§ 102 and 103.

B. Summary of the Technology

By way of background, peroxyacetic acid, commonly called peracetic acid, is a known disinfectant with application in many areas, including for example food processing and medical equipment. Exhibit 1009, column 1, lines 20-28. Unlike

hypochlorite biocides, peracetic acid does not corrode metals. Exhibit 1010, column 1, lines 23-24.

Peracetic acid can be prepared from acetic acid and hydrogen peroxide. Exhibit 1009, column 1, lines 29-31. Other preparation methods include oxidation of acetaldehyde. Exhibit 1010, column 1, lines 47-51. Another method is to react hydrogen peroxide with an organic peracid precursor selected from glycol esters and glycerin esters. *See* Exhibit 1011, Page 2, lines 23-25, wherein triacetin is also listed as one of the glycol esters. Exhibit 1011, Page 3, lines 55-56.

C. The ‘072 Patent

The ‘072 Patent describes methods for generating peroxyacetic acid from aqueous hydrogen peroxide, triacetin, water, and an aqueous source of an alkali metal or earth alkali metal hydroxide. Exhibit 1001, abstract. The claims of the ‘072 Patent recite a hydrogen peroxide-acetyl precursor solution. Exhibit 1001.

There are three claims in the ‘072 Patent. Claim 1 is the only independent claim. Claim 2 depends from Claim 1 and Claim 3 depends from Claim 2. Exhibit 1001, column 34, line 57, to column 35, line 5.

D. The ‘072 Patent Prosecution History

The ‘072 Patent as originally filed had six claims. Exhibit 1005, Pages 81-82. On November 4, 2016, the Examiner issued an Office Action setting forth a Restriction Requirement which placed the claims into four Groups. Exhibit 1005,

Pages 121-122. The Restriction Requirement from the Office Action is summarized in the table below, with the characterizations of the subject matter from the Office Action.

Group	Claims	Subject matter
I	1-3	hydrogen peroxide-acetyl precursor solution
II	4	method of preparing a hydrogen peroxide-acetyl precursor solution
III	5	a non-equilibrium solution of peracetic acid made by a specified method
IV	6	an on-site non-equilibrium peracetic acid generation system

In a Response filed on November 30, 2016, the Applicant elected Group I, Claims 1-3. Exhibit 1005, Pages 130-131. No arguments were presented, and no claim amendments were made.

On February 13, 2017, the Examiner issued a nonfinal Office Action, provisionally rejecting Claims 1-3 for obviousness-type double patenting over Claims 1-3³ of co-pending Application No. 15/063,306. Exhibit 1005, Pages 136-

³ A Response filed on March 7, 2017, indicates that per a telephonic communication with the Examiner, reference to Claim 5 or 6 of the '306 application in the Office Action was an error; Claims 1-3 were intended. Exhibit 1005, Page 147.

138; Exhibit 1006.⁴

The rejection stated that the conflicting claims were not patentably distinct, reasoning that the rejected claims are directed to “a hydrogen peroxide-acetyl precursor solution comprising hydrogen peroxide, peracetic acid, triacetin, and water,” while the ‘306 application claims “a non-equilibrium solution of peracetic acid comprising peracetic acid, hydrogen peroxide, triacetin, 1,2,3-propanetriol and alkali metal or earth alkali metal hydroxide, and water.” Exhibit 1005, Page 137 (emphasis in original).

The Office Action stated that “The difference between instant claims and Harvey et al. ‘306 is that the instant claims are silent on the element 1,2,3-propanetriol of Harvey et al. ‘306.” Exhibit 1005, Page 138. In a Response filed on March 7, 2017, the Applicant filed a Terminal Disclaimer over Application No. 15/063,306. Exhibit 1005, Pages 148-149. No arguments were presented in the Response to address the Examiner’s reasoning.

⁴ Application No. 15/063,306 is now U.S. Patent No. 9,730,443. Claims 1-3 of the ‘306 application as filed and as issued in the ‘443 Patent are the same. See Exhibit 1002 for the relationship between the ‘072 Patent and the ‘443 Patent.

On May 9, 2017, the Examiner issued a Notice of Allowance, allowing Claims 1-3 and cancelling Claims 4-6 (the non-elected Groups) by an Examiner's Amendment. Exhibit 1005, Pages 178-179.

The '072 Patent issued on August 22, 2017.

E. Person of Ordinary Skill in the Art

A person of ordinary skill in the art in the field of the '072 Patent on March 26, 2011, would have been one having at least a bachelor's degree in chemistry, chemical engineering, or the equivalent, and a couple of years of practical experience in chemical syntheses, or equivalent knowledge and work experience. Exhibit 1008, paragraph 16.

Dr. Alexander M. Klibanov meets at least these criteria and concurrently submits a Declaration (Exhibit 1008) under 37 C.F.R. § 1.68 in support of this Petition.

F. Claim construction under 37 C.F.R. § 42.104(b)(3)

How the challenged claim(s) are to be construed under 37 C.F.R. § 42.104(b)(3) is detailed herein.⁵

⁵ Construction of the claims is currently the subject of briefing prior to the *Markman* hearing in the parallel litigation pending in *Enviro Tech Chemical Services, Inc. v. Clean Chemistry, Inc.*, Case No. 1:24-cv-1313 (W.D. Tx.)

In this proceeding, the claims must be construed in accordance with their ordinary and customary meaning as understood by one of ordinary skill in the art and the prosecution history. 37 C.F.R. § 42.100(b). Inventors can also be their own lexicographers. *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007).

Per the Memorandum setting forth an “Approach to Indefiniteness in Under 35 U.S.C. § 112 in AIA Post-Grant Proceedings” issued by the Director of the U.S. Patent and Trademark Office on January 6, 2021, available at <https://www.uspto.gov/sites/default/files/documents/IndefinitenessMemo.pdf> (the “Indefiniteness Memorandum”), the claims are to be construed as they are in district courts, using the standard set forth by the Supreme Court in its decision in *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898 (2014). Indefiniteness Memorandum, 1-2. Under the *Nautilus* standard, claims are considered to be definite when “a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable clarity.” *Nautilus* at 910.

However, the constructions proposed herein are believed to be no broader than is reasonably possible and, in any event, the analyses of patentability set forth herein would continue to apply under any reasonable alternative constructions.

Indefiniteness ”does not necessarily preclude the Board from addressing the patentability of the claims on section 102 and 103 grounds.” *Samsung Elecs. Am. Inc. v. Priusa Eng’g Corp.*, 948 F.3d 1342, 1355 (Fed. Cir. 2020); *see also Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 813 (Fed. Cir. 2021) (“The indefiniteness of a limitation ... precludes a patentability determination only when the indefiniteness renders it logically impossible for the Board to reach such a decision.”). *Shenzhen Pincan Technology Co., Ltd v. Ridge Wallet, LLC*, IPR2024-00340, Paper 18, 16 (PTAB July 12, 2024).

The claim term “water” as used in the ‘072 Patent is not separately defined in the ‘072 Specification and for purposes of this proceeding Petitioner has considered “water” in the ‘072 Patent to have its plain and ordinary meaning.

1. “Hydrogen peroxide-acetyl precursor solution”

Claim 1 recites “A hydrogen peroxide-acetyl precursor solution” in the preamble. The phrase “hydrogen peroxide-acetyl precursor” refers to two of the components of the solution, hydrogen peroxide and a liquid acetyl precursor that is soluble in aqueous hydrogen peroxide. Exhibit 1001, column 5, lines 25-29. The ‘072 Specification states that “When triacetin is used as the liquid acetyl precursor, the solution that is formed is a hydrogen peroxide-triacetin solution.” Exhibit 1001, column 9, lines 39-41. Therefore, triacetin is a liquid acetyl precursor, and the preamble phrase “hydrogen peroxide-acetyl precursor solution” can be interpreted

to read as “hydrogen peroxide-triacetin solution” in the claims under consideration here, since triacetin is the only liquid acetyl precursor mentioned in the Specification of the ‘072 Patent.

2. “Aqueous hydrogen peroxide”

Claims 1 and 2 recite “aqueous hydrogen peroxide.” This phrase by itself, given its plain and ordinary meaning, refers to an aqueous solution of hydrogen peroxide. In the context of the claimed hydrogen peroxide-acetyl precursor solution, the phrase “aqueous hydrogen peroxide” appears in the ‘072 Patent at column 5, lines 25-29:

These hydrogen peroxide-acetyl precursor solutions comprise a solution of aqueous hydrogen peroxide, a liquid acetyl precursor that is soluble in aqueous hydrogen peroxide, a trace amount of peracetic acid, and water.

Exhibit 1001, column 5, lines 25-29. Further discussion of the hydrogen peroxide-acetyl precursor solutions is found in the ‘072 Patent at column 9, lines 48-50: “A preferable hydrogen peroxide-triacetin solution comprises about 27.15% hydrogen peroxide (from 50% aqueous hydrogen peroxide).” Exhibit 1001. From what is set forth, the phrase appears to mean hydrogen peroxide in the claimed solution.

Petitioner submits that the interpretation of the phrase “aqueous hydrogen peroxide” to mean “hydrogen peroxide” in the claimed solution that also lists

“water” as an ingredient is clear enough to permit the Board to review the claims of the ‘072 Patent on the grounds set forth below. Petitioner is willing to adopt the construction of the phrase “aqueous hydrogen peroxide” to mean that hydrogen peroxide is present in the claimed solution for the purposes of *inter partes* review only.

3. “Triacetin”

Triacetin is not defined in the Specification. Triacetin is a common name for a known molecule and is “synonymous with glycerin triacetate; glycerol triacetate; glyceryl triacetate; 1,2,3-triacetoxypropane; 1,2,3-propanetriol triacetate; and all other synonyms of CAS Registry Number 102-76-1.” Exhibit 1012, Page 7, lines 26-28.

4. “Peracetic acid”

Peracetic acid has the meaning noted above, peroxyacetic acid. The Specification of the ‘072 Patent states that “The terms ‘PAA’ and ‘peracetic acid’ mean peroxyacetic acid or peracetic acid, and/or the conjugate base of peracetic acid (the peracetate ion).” Exhibit 1001, column 7, lines 55-57.

5. “Trace amount”

Claim 1 recites “a trace amount of peracetic acid.”

Since Claim 1 uses the open transitional phrase “comprises,” Claim 1 encompasses solutions having *more* than a “trace amount” of peracetic acid; such

solutions comprise a trace amount of peracetic acid within the larger amount of peracetic acid in the solution.

Although the phrase “trace amount” is not clearly defined in the Specification of the ‘072 Patent, the discussion of peracetic acid concentrations in the Specification may be considered to imply a meaning for a trace amount of peracetic acid. At column 6, lines 42-43, the ‘072 Patent’s Specification states, “a high level of PAA, from about 1% to about 7.1%,” which is reiterated at column 18, lines 13-14: “high levels of PAA, from about 1% to about 7.1%.”^{6,7} Exhibit 1001. From these statements in the Specification, it can be inferred that if an amount of about 1% or more is a “high level” of peracetic acid, then a trace, low, or moderate amount of peracetic acid must be an amount that is less than about 1% peracetic acid.

Petitioner submits that the interpretation that some amount less than about 1% by weight is a “trace amount” of peracetic acid (as long as at least some peracetic acid is present) is clear enough to permit the Board to review the claims of the ‘072

⁶ PAA is an abbreviation for peroxyacetic acid. Exhibit 1001, column 1, lines 27-28.

⁷ The Specification of the ‘072 Patent defines “%” as meaning weight percent, except when referring to the percent converted.” Exhibit 1001, column 7, lines 58-59. Since the quoted phrases do not refer to percent converted, the “%” therein is weight percent.

Patent on the grounds set forth below. Petitioner is willing to adopt the construction of the phrase “trace amount” to mean that the amount of peracetic acid in solution is less than about 1% for the purposes of *inter partes* review only.

VI. DETAILED EXPLANATION OF THE CHALLENGE UNDER 37 C.F.R. § 42.104(B)

The construed claims are unpatentable under 37 C.F.R. § 42.104(b)(4), for at least the grounds detailed below.

A. Grounds 1a-1b: Claim 1 is anticipated by and/or obvious over WO 2011/017095 A2

1. Ground 1a - WO 2011/017095 A2 anticipates Claim 1

WO 2011/017095 A2 (“Stauffer”), a reference not previously cited in the ‘072 Patent file history, is directed to enzymatic preparation of peracid-based antimicrobial coating compositions. Exhibit 1012, Abstract. Example 4 of Stauffer teaches mixtures of triacetin and hydrogen peroxide with small amounts of peracetic acid. Exhibit 1012, Pages 63-64. In Example 4, several ingredients were combined: a sodium bicarbonate buffer, deionized **water**, Turpinal[®] SL, **triacetin**, an aqueous solution of Elvanol[®] 51-04,⁸ **aqueous hydrogen peroxide** (30%), and *T. neapolitana* perhydrolase enzyme. Exhibit 1012, Page 63, lines 8-17. Three runs were performed:

⁸ Elvanol[®] 51-04 is a partially hydrolyzed polyvinyl alcohol, 88% grade. Exhibit 1012, Page 56, lines 24-25.

one run with the Elvanol[®] 51-04 and the enzyme present, one without Elvanol[®] 51-04, and one with neither the enzyme nor Elvanol[®] 51-04. Exhibit 1012, Page 63, lines 26-32. In all three runs, **peracetic acid** was detected after 1 minute, with 114 ppm being the minimum amount detected. Exhibit 1012, Page 64, Table 1.

In Example 5 of Stauffer, another set of three runs performed with similar ingredients, including water, triacetin, and aqueous hydrogen peroxide (30%), except that the polyol was a mixture of Elvanol[®] 51-04, PEG-300, and Silwet[®] L-77. Exhibit 1012, Page 64, lines 14-24. In all three runs, peracetic acid was detected in solution after 1 minute, with 114 ppm being the minimum amount detected. Exhibit 1012, Page 65, Table 2.

The runs in Examples 4 and 5 of Stauffer contain all of the components listed in Claim 1: aqueous hydrogen peroxide, triacetin, water, and 114 ppm or more of peracetic acid, which is at least a trace amount of peracetic acid. Exhibit 1008, paragraph 70. Under the interpretation of “a trace amount of peracetic acid” as being something less than about 1% of the solution, 114 ppm is significantly less than 1%. Exhibit 1008, paragraph 70. Therefore, Stauffer clearly anticipates Claim 1.

2. Ground 1b - Claim 1 is obvious over WO 2011/017095 A2

While the disclosures of Stauffer described above show that Claim 1 is anticipated, Claim 1 is also obvious in view of the teachings in Stauffer. Exhibit 1008, paragraph 71. Stauffer renders obvious the presence of peracetic acid in a

solution comprising water, triacetin, and aqueous hydrogen peroxide. A person of ordinary skill in the art would have understood that peracetic acid will be present, and in amounts of less than about 1%, in such a solution because Stauffer shows that peracetic acid is formed in hydrogen peroxide-triacetin aqueous compositions that contain an enzyme and a polyol, or contain an enzyme but not a polyol, as well as in runs in which neither an enzyme nor a polyol were present. Exhibit 1012, Pages 63-65 (Examples 4 and 5; Tables 1 and 2); Exhibit 1008, paragraph 71.

B. Grounds 2a-2d: Claim 1 is anticipated by and/or obvious over JP 2006-045147 A

1. Ground 2a - JP 2006-045147 A anticipates Claim 1

Another reference not cited in the '072 Patent, JP 2006-045147 A ("Okano"), states:

[T]he sterilizing detergent composition for hard surfaces of the present invention is obtained by reacting the components (A) and (B1) in water at a specific molar ratio and a pH of 8-12.

Exhibit 1013, paragraph 0015.⁹ Okano further states that "the component (A), an ester of glycerin and an aliphatic monocarboxylic acid having 1 to 8 carbon atoms is preferably triacetin." Exhibit 1013, paragraph 0014 (Page 5).

⁹ A Certification of the translation is provided as Exhibit 1014. The original reference in Japanese is provided as Exhibit 1015.

In Example 1, Okano discloses combining **triacetin**, **aqueous hydrogen peroxide** (60%), and **water**. Exhibit 1013, paragraph 0057 (Page 19). Three of the four components listed in Claim 1 are thus present in the solution of Example 1 of Okano. In the mixture formed by combining triacetin, aqueous hydrogen peroxide, water, and alkaline aqueous sodium hydroxide, an organic peracid was formed. Exhibit 1013, paragraph 0057. Because component (A) is triacetin, the organic peracid is necessarily **peracetic acid**. Paragraph 0057 is entitled “Preparation of Sterilizing Cleaner Composition (I).” Paragraph 0059 of Okano is directed to “Measurement of Organic Peroxy Acid Concentration” for sterilizing cleanser composition (I), and states that “an organic peroxy acid concentration (as peracetic acid concentration) was found using the following formula.” Exhibit 1013, Page 20.

The solution in Example 1 of Okano contains all of the components listed in Claim 1: aqueous hydrogen peroxide, triacetin, water, and peracetic acid, which is at least a trace (some) amount of peracetic acid. Exhibit 1008, paragraphs 74-75. Therefore, Okano anticipates Claim 1 of the ‘072 Patent.

2. Ground 2b - Claim 1 is obvious over JP 2006-045147 A

While the disclosures of Okano described above do show that Claim 1 is anticipated, Claim 1 is also obvious in view of the teachings in Okano. Okano renders obvious the presence of peracetic acid in a solution comprising water, triacetin, and aqueous hydrogen peroxide. Exhibit 1008, paragraph 76. A person of

ordinary skill in the art would have understood that peracetic acid will be present in such a solution in at least a trace amount because Okano shows that peracetic acid is necessarily formed in hydrogen peroxide-triacetin aqueous solutions. Exhibit 1013, paragraphs 0057 and 0059 (Pages 19-20); Exhibit 1008, paragraph 77.

3. Ground 2c - Claims 2 and 3 are anticipated by JP 2006-045147 A

Claim 2 recites a hydrogen peroxide:triacetin molar ratio range, and concentration ranges for hydrogen peroxide and triacetin in the claimed solution. Claim 3 recites a specific hydrogen peroxide:triacetin molar ratio, and specific concentrations for hydrogen peroxide and triacetin in the claimed solution.

a. Molar ratios (mole ratios)

Okano teaches that

The sterilizing cleaner composition for hard surfaces of the present invention contains water and an organic peracid obtained by reacting component (A) and component (B1) in water in a molar ratio of $(A)/(B1) = 1/10$ to $20/1$.

Exhibit 1013, paragraph 0015 (Page 6). As mentioned above, Okano states that component (A) is preferably triacetin and component (B1) is an aqueous solution of hydrogen peroxide. Claim 2 of the '072 Patent recites that a "mole ratio of said hydrogen peroxide to said triacetin is about 2.98:1 to about 12.84:1." To make the values in Okano directly comparable to Claims 2 and 3, the ratios in Okano need to

be inverted to (B1)/(A), which are then 10/1 to 1/20. To make the comparison easier, the 1/20 numerical ratio in Okano is converted to be on an x:1 basis; here, $x = 0.05$.¹⁰ Thus, in Okano the molar ratio of hydrogen peroxide (B1) to triacetin (A) is 0.05:1 to 10:1, which significantly overlaps the molar ratio range in Claim 2. Exhibit 1008, paragraph 82. Claim 3 of the '072 Patent recites that the “mole ratio of said hydrogen peroxide to said triacetin is about 3.8:1.” This molar ratio value is encompassed by the molar ratio range taught in Okano. Exhibit 1008, paragraph 83.

b. Concentrations

Claims 2 and 3 additionally require certain concentrations for both hydrogen peroxide and triacetin. Okano, in paragraph 0035, states that

The amount of component (A) in the composition for producing sterilizing cleaner is preferably 20 to 90 wt%, further 30 to 90 wt%, and even more preferably 40 to 80 wt%, and the amount of component (B1) is preferably 1 to 30 wt%, more so 5 to 25 wt%, and even more preferably 10 to 25 wt%.

Exhibit 1013, Pages 11-12.

¹⁰ This conversion is performed by dividing both 20 and 1 by 20; $20 \div 20 = 1$; $1 \div 20 = 0.05$.

i. Hydrogen peroxide concentrations

The broadest concentration range in the above-quoted passage from Okano for hydrogen peroxide, component (B1), 1 to 30% by weight, overlaps the concentration range in Claim 2 of the '072 Patent: "said aqueous hydrogen peroxide is about 23% to about 40%."¹¹ Exhibit 1008, paragraph 88. Similarly, the more preferable hydrogen peroxide concentration ranges in the above-quoted passage from Okano, 5 to 25 wt% and 10 to 25 wt%, also overlap the concentration range in Claim 2 of the '072 Patent. Exhibit 1008, paragraph 88.

The broad range recited in Okano for hydrogen peroxide concentration encompasses the hydrogen peroxide concentration value in Claim 3 of the '072 Patent, which specifies: "said aqueous hydrogen peroxide is about 27%." Exhibit 1008, paragraph 88.

ii. Triacetin concentrations

The broadest concentration range taught in Okano in the above-quoted passage for component (A), triacetin, 20 to 90% by weight, encompasses the concentration range in Claim 2, which specifies: "said triacetin is about 20% to about 53%." Exhibit 1008, paragraph 92. The more preferable triacetin concentration

¹¹ "The terms 'percent' and '%' mean weight percent, except when referring to the percent converted." Exhibit 1001, column 7, lines 58-59.

ranges in the above-quoted passage from Okano, 30 to 90 wt%, and 40 to 80 wt%, overlap the triacetin concentration range in Claim 2.

The broad range recited in Okano for triacetin concentration encompasses the triacetin concentration value in Claim 3, which specifies: “said triacetin is about 46%.” Exhibit 1008, paragraph 92.

c. Molar ratios + concentrations

For ease of reference, the ranges and values discussed are set forth in the Table below. In the Table, all percentages are weight percent, and the word “about” has been omitted from the ranges and values of Claims 2 and 3 for clarity.

	Molar ratio H ₂ O ₂ :triacetin	H ₂ O ₂ concentration	Triacetin concentration	Water content
Okano	0.05:1 to 10:1	1% to 30%	20% to 90%	1% to 25%
Claim 2	2.98:1 to 12.84:1	23% to 40%	20% to 53%	7% to 57%*
Claim 3	3.8:1	27%	46%	27%*

* Calculated as the remainder to 100% from the amounts of triacetin and H₂O₂.

A water content for the first composition of Okano for producing a sterilizing cleaner is taught:

In order to suppress reaction between component (A) and component (B) during storage and maintain stability when the composition is in a liquid form, the water content in the liquid composition is preferably 1

to 25 wt%, more preferably 5 to 20 wt%, and even more preferably 5 to 15 wt%.

Exhibit 1013, paragraph 0051. While not explicitly claimed in the '072 patent, the water content can be calculated from the concentration values recited for hydrogen peroxide and triacetin; the results are shown above in the last column of the Table. Exhibit 1008, paragraph 96. The broadest water content range taught in Okano overlaps with the range implicit in Claim 2 of the '072 Patent, and the water content value implicit in Claim 3 of the '072 Patent is quite close to the upper end of the broadest water content range taught in Okano. Exhibit 1008, paragraph 96. (The water content calculations for Claims 2 and 3 of the '072 Patent assume that the trace amount of peracetic acid is less than 1 wt%, i.e., small enough to have only a negligible effect on the calculations. Exhibit 1008, paragraph 96.)

The ranges and values listed in the Table are for the first composition of Okano for producing a sterilizing cleaner. The values for the second composition of Okano for producing a sterilizing cleaner are quite similar: the molar ratio ranges are the same, and the concentration ranges are broader (0.1% to 50% for H₂O₂ and 0.1% to 90% for triacetin). Exhibit 1013, paragraphs 0037 and 0038 (Pages 12-13). While Okano recommends packaging components (A) and (B1) separately for the second composition, the similar molar ratios and concentrations indicate that a solution formed from components (A) and (B1) will have the same or similar

characteristics. Exhibit 1013, paragraph 0043 (Pages 14-15). Exhibit 1008, paragraph 97.

As established above for Claim 1 of the '072 Patent, Okano teaches solutions containing triacetin, hydrogen peroxide, water, and peracetic acid. Okano also teaches that these solutions can contain the triacetin and the hydrogen peroxide at particular molar ratios and particular concentration ranges that overlap the ranges in Claim 2 and encompass the values in Claim 3. Exhibit 1008, paragraph 98. Therefore, Okano anticipates Claims 2 and 3 of the '072 Patent.

Because the ranges in Okano overlap the ranges in Claim 2 and encompass the values in Claim 3, a *prima facie* case of anticipation exists, which can only be rebutted by the patentee establishing that the claimed range or value is critical to the operability of the claimed invention. *UCB, Inc. v. Actavis Laboratories UT, Inc.*, 65 F.4th 679, 687 (Fed. Cir. 2023) (“[O]nce the patent challenger has established, through overlapping ranges, its *prima facie* case of anticipation, ‘the court must evaluate whether the patentee has established that the claimed range is critical to the operability of the claimed invention.’ “ *Genentech, Inc. v. Hospira, Inc.*, 946 F.3d. 1333, 1338 (Fed. Cir. 2020).) Nothing in the '072 Patent can establish such criticality with respect to the specified ranges or values in Claims 2 and 3, respectively.

4. Ground 2d - Claims 2 and 3 are obvious over JP 2006-045147 A

While the disclosures of Okano described above do show that Claims 2 and 3 are anticipated, Claims 2 and 3 are also obvious in view of the teachings in Okano. Okano renders obvious the presence of peracetic acid in a solution comprising water, triacetin, and aqueous hydrogen peroxide. Exhibit 1008, paragraph 100. As noted above for Claim 1, a person of ordinary skill in the art would have understood that peracetic acid will be present in such a solution in at least a trace amount because Okano shows that peracetic acid is necessarily formed in hydrogen peroxide-triacetin aqueous solutions. Exhibit 1013, paragraphs 0057 and 0059 (Pages 19-20).

Further, the ranges for the molar ratios of hydrogen peroxide to triacetin, the hydrogen peroxide concentration ranges, and the triacetin concentration ranges in Okano overlap the ranges in Claim 2 and encompass the values in Claim 3. Exhibit 1008, paragraph 101; also *see UCB, Inc. v. Actavis Laboratories UT, Inc.*, 65 F.4th 679, 689 (Fed. Cir. 2023) (“A presumption of obviousness applies “[w]here a claimed range overlaps with a range disclosed in the prior art.” *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311 (Fed. Cir. 2006).)

For at least the foregoing reasons, Claims 2 and 3 of the ‘072 Patent are also obvious in view of Okano.

VII. CONCLUSION

Claims 1-3 of the '072 Patent are anticipated or rendered obvious for the reasons set forth above. There is a reasonable likelihood that Petitioner will prevail as to each of these claims. *Inter partes* review of Claims 1-3 of the '072 patent is accordingly requested.

This Petition meets the minimum threshold of a reasonable likelihood that at least one claim of the '072 Patent is unpatentable. Petitioner, therefore, requests that an *inter partes* review trial be ordered and that Claims 1-3 of the '072 Patent be canceled.

Dated: August 27, 2025

Respectfully submitted,

/s/R. Andrew Patty II

R. Andrew Patty II (Reg. No. 38,992)

Phelps Dunbar LLP

225-376-0284

drew.patty@phelps.com

Mary H. Drabnis (Reg. No. 45,909)

Phelps Dunbar LLP

225-376-7965

mary.drabnis@phelps.com

Fax: 225-381-9197

400 Convention Street, Suite 1100

Baton Rouge, LA 70802

Attorneys for Clean Chemistry, Inc.

CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

To comply with the provisions of 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this Petition for *Inter Partes* Review of U.S. Patent 9,370,443 has 4,848 words (excluding the sections exempted under 37 C.F.R. § 42.24(a)(1)) as counted by a word processing system, which is less than the maximum of 14,000 words permitted by 37 C.F.R. § 42.24.

Dated: August 27, 2025

/s/ R. Andrew Patty II

R. Andrew Patty II (Reg. No. 38,992)
Phelps Dunbar LLP
225-376-0284
drew.patty@phelps.com

Mary H. Drabnis (Reg. No. 45,909)
Phelps Dunbar LLP
225-376-7965
mary.drabnis@phelps.com

Fax: 225-381-9197
400 Convention Street, Suite 1100
Baton Rouge, LA 70802

CERTIFICATE OF SERVICE ON THE PATENT OWNER

The undersigned certifies service pursuant to 37 C.F.R. §§ 42.6(e) and 42.105 on the Patent Owner (by Priority Mail Express) of a copy of this Petition for *Inter Partes* Review and supporting materials at the correspondence address of record for the 9,737,072 Patent:

Timothy A. Cassidy
Dority & Manning, P.A.
P.O. Box 1449
Greenville, SC 29602

Dated: August 27, 2025

/s/ R. Andrew Patty II
R. Andrew Patty II
(Reg. No. 38,992)