

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ASCEND ELEMENTS, INC.,
Petitioner,

v.

DUESENFELD GMBH,
Patent Owner.

IPR2024-00948
Patent 11,050,097

Before MEREDITH C. PETRAVICK, CHRISTPHER M. KAISER, and KEVIN
W. CHERRY, *Administrative Patent Judges*.

**PETITIONER'S OPPOSITION TO
PATENT OWNER'S MOTION TO AMEND**

TABLE OF CONTENTS

LISTING OF EXHIBITS.....	III
I. INTRODUCTION.....	1
II. CLAIM CONSTRUCTION	1
III. SUBSTITUTE CLAIMS 22-31 ARE INVALID UNDER 35 U.S.C. § 103	2
A. Ground 1: Substitute Claims 22-31 Would Have Been Obvious in View of Hanisch Alone or in Combination with Dunagan and in View of the Knowledge of a POSITA.....	3
1. Claims 22 and 26 (Substitute for Claims 1 and 12).....	3
2. Claims 23, 25, 27 (Substitute for Claims 2, 8, 13).....	5
3. Claims 24, 28, 29 (Substitute for Claims 3, 10, 19).....	6
4. Claims 30, 31 (Substitute for Claims 7, 9).....	7
B. Ground 2: Substitute Claims 22-31 Would Have Been Obvious in View of Hanisch Alone or in View of Dunagan, and in Further View of the Teachings of Hayashi and/or Shin	10
1. Claims 22 and 26 (Substitute for Claims 1 and 12).....	10
2. Claims 23, 25, 27 (Substitute for Claims 2, 8, 13).....	12
3. Claims 24, 28, 29 (Substitute for Claims 3, 10, 19).....	13
4. Claims 30, 31 (Substitute for Claims 7, 9).....	14
IV. SUBSTITUTE CLAIMS 22-31 ARE INVALID UNDER 35 U.S.C. § 112 FOR INDEFINITENESS.....	14
A. Claims 22-31 - "inactivating the comminuted material" / "an inactivation device comprising a drying device configured to inactivate the comminuted material"	14
B. Claims 30, 31 - "almost no Hydrogen Fluoride is produced"	18

V.	CONCLUSION.....	21
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LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,050,097 ("097 Patent")
1002	Patent Prosecution History for U.S. Patent No. 11,050,097
1003	Declaration of Dr. Walter van Schalkwijk
1004	U.S. Patent No. 9,780,419 ("Hanisch")
1005	U.S. Patent No. 6,447,669 ("Lain")
1006	U.S. Patent No. 9,843,077 ("Hayashi")
1007	PCT Application Publication No. WO 2010/102377 ("Stevens II")
1008	U.S. Patent No. 4,357,215 ("Goodenough")
1009	Dorella G. & Mansur M.B., A study of the separation of cobalt from spent Li-ion battery residues, 170 J. Power Sources 210 (2007) ("Dorella")
1010	U.S. Patent No. 10,396,408 ("Shin")
1011	U.S. Patent No. 5,632,863 ("Meador")
1012	<i>Duesenfeld GMBH v. Ascend Elements, Inc.</i> , Civ. A. No. 1:23-cv-01194-JFM, Scheduling Order, ECF No. 22 (D. Del. Jan. 26, 2024)
1013	Federal Court Management Statistics—Comparison Within Circuit (Dec. 31, 2023), <i>available at</i> https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/12/31-3
1014	U.S. Patent No. 9,509,025 ("Iida")
1015	U.S. Patent No. 3,671,318 ("Moe")
1016	U.S. Patent No. 4,118,219 ("Elmore")
1017	U.S. Patent No. 6,524,737 ("Tanii")
1018	U.S. Patent No. 9,450,277 ("Dunagan")
1019	U.S. Patent No. 8,210,456 ("Stevens I")
1020	Declaration of Josef B. Schenker in Support of Motion for <i>Pro Hac Vice</i> Admission
1021	Declaration of Conor McDonough in Support of Motion for <i>Pro Hac Vice</i> Admission
1022	Declaration of Darlena Subashi in Support of Motion for <i>Pro Hac Vice</i> Admission
1023	Declaration of Walter van Schalkwijk
1024	Deposition transcript of Vani Dantam date March 24, 2025

Exhibit	Description
1025	Deposition transcript of Lydia Grote dated April 18, 2025
1026	<i>Duesenfeld GMBH v. Ascend Elements, Inc.</i> , Civ. A. No. 1:23-cv-01194-JFM, Declaration of Lydia Grote, ECF No. 94 (D. Del. Jan. 26, 2024)
1027	DUESENFELD IPR00000131-153
1028	DUESENFELD IPR00000154
1029	<u><i>URT Umwelt und Recyclingtechnik GmbH v. Duesenfeld GmbH</i>, IPR2024-00887, Paper 18 (Patent Owner Response [REDACTED])</u>
1030	Furushima et al., Thermal stability and kinetics of delithiated LiCoO ₂ , <i>J. Power Sources</i> , 196:4 (2011), 2260–2263
1031	<u><i>URT Umwelt und Recyclingtechnik GmbH v. Duesenfeld GmbH</i>, IPR2024-00887, EX2025 (Dantam Declaration)</u>
1032	Julien, C.M.; Mauger, A.; Zaghbi, K.; Groult, H. Comparative issues of cathode materials for Li-ion batteries. <i>Inorganics</i> 2014 , 2, 132–154
1033	U.S. Patent No. 3,448,857
1034	Georgi-Maschler, T.; Friedrich, B.; Weyhe, R.; Heegn, H.; Rutz, M. Development of a Recycling Process for Li-ion Batteries., <i>J. Power Sources</i> 2012, 207, 173–182
1035	Zhang T., He Y., Ge L., Fu R., Zhang X., Huang Y., <i>J. Power Sources</i> 2013, 240, 766
1036	https://icma.org/sites/default/files/305268_www.nfpa.org~_media_Files_Research_Research_Foundation_Research_Foundation_reports_Hazardous_materials_RFLithiumIonBatteriesIIB.pdf
1037	https://www.usfa.fema.gov/a-z/lithium-ion-batteries/risks-and-response-strategies/
1038	https://www.fire.tc.faa.gov/pdf/TC-16-17.pdf

I. INTRODUCTION

Recognizing the deficiencies in the challenged claims of the '097 Patent, Patent Owner Duesenfeld GmbH ("PO") seeks to amend the claims by, *inter alia*, adding the limitation that the drying or drying device is operated in "batch mode." But as explained in the concurrently filed Petitioner's Reply to the Patent Owner Response ("Reply"), the primary prior art reference, U.S. Patent No. 9,780,419 to Hanisch (EX1004), operates in batch mode. Each of PO's other proposed amendments are also disclosed or rendered obvious by the prior art. And, as an independent reason for denial, each of the substitute claims is indefinite under 35 U.S.C. § 112(b). Accordingly, the Contingent Motion to Amend (paper 21, "Motion") should be denied.

II. CLAIM CONSTRUCTION

PO states in its Patent Owner Response (paper 20, "POR") that it disagrees with the Board's proposed construction of "inactivating" as to "require the removal of sufficient amounts of dimethyl carbonate and/or ethyl methyl carbonate from the comminuted material to make an electrochemical reaction either no longer possible or only possible to a negligibly small extent." POR, 8-9. PO argues that, instead, "[t]he Board should adopt the District Court's construction and recognize that inactivation is the endpoint result of drying, but not specify the particular metric of drying that must be reached." POR, 10.

Rather than clarify the scope of "inactivat[ion]," PO's arguments demonstrate the indefiniteness of that term, such that a person of ordinary skill in the art ("POSITA") would not understand with reasonable certainty the full scope of the term, as discussed in Section IV. below. EX1023, ¶¶65-68. The prior art meets the claims under both the Board's preliminary construction and PO's alternative construction as discussed in the concurrently filed Reply.

III. SUBSTITUTE CLAIMS 22-31 ARE INVALID UNDER 35 U.S.C. § 103

PO's only argument that the substitute claims respond to a ground of patentability involved in this trial is that "each of claims 22-31 now contains a limitation requiring a dryer, or drying operating in a batch mode" and that Petitioner's primary art, Hanisch, allegedly does not employ a batch drying device. *See* Motion, 18. As explained herein and in the concurrently filed Reply, Hanisch in fact discloses drying in batch mode. *See, e.g.,* Reply, Section III.A.2, IV.A.2. Accordingly, Patent Owner's proposed amendments fail to overcome the art of record. Patent Owner's other proposed amendments to the claims are also disclosed or rendered obvious by the art, as explained below. The Motion should be denied.¹

¹ Each of the substitute claims includes the limitations of claims 1 or 12. The limitations of claims 1 and 12 are obvious for all of the reasons explained in the

A. Ground 1: Substitute Claims 22-31 Would Have Been Obvious in View of Hanisch Alone or in Combination with Dunagan and in View of the Knowledge of a POSITA

1. Claims 22 and 26 (Substitute for Claims 1 and 12)

Claims 22 and 26 add to independent claims 1 and 12 the requirements of "wherein the drying uses a drying device operated in batch mode" and "a drying device operated in batch mode," respectively. As explained in Petitioner's concurrently filed Reply, Hanisch in fact discloses a drying device operated in batch mode. *See, e.g.*, Reply, Section III.A.2, IV.A.2. Specifically, Hanisch discloses that its "method according to invention is *preferably* performed as continual process and not in batches," EX1004, 3:27-28 (emphasis added), *i.e.*, Hanisch discloses a drying process in batch mode as a non-preferred embodiment. *See In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) ("[E]ven if [the prior art] discusses a preferred embodiment . . . this does not teach away from a non-preferred embodiment."); *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1366 (Fed. Cir. 2012) ("Mere criticism of a particular embodiment encompassed in the plain meaning of a claim term is not sufficient to rise to the level of clear disavowal."); *Novartis Pharms. Corp. v. West-Ward Pharms. Int'l Ltd.*, 923 F.3d 1051, 1059 (Fed. Cir. 2019)

Petition. This Opposition addresses only PO's proposed amendments that narrow the limitations of claims 1 and 12. *See* Motion, 8-11.

(noting that proving obviousness “does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention.”) (quoting *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)). And none of the claims in Hanisch include any limitation to a "continuous" or "continual" process as compared to a batch process. *See Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 796 (Fed. Cir. 2019) (noting that plain language of the claims did not recite supposedly scope-limiting feature). Accordingly, PO is wrong in asserting that the pre-dryer of Hanisch is exclusively "run on a continuous basis, not as a batch process" (*see* POR, 15), and Hanisch in fact discloses batch drying. EX1023, ¶34.

Substitute claims 22 and 26 also add the limitation that "the claim is limited to drying after comminution." The Petition previously explained that Hanisch discloses drying after comminution. *See* Pet., Section VII.A.3, VII.H.3; EX1003, ¶¶87-103, 132; EX1001, cls. 1, 12. Specifically, Hanisch discloses that "[t]he active material separation system preferably possesses a pre-dryer which is set up in the material flow, behind the cell crushing device and before the oven." EX1004, 4:55-57. As explained in the Petition and the Reply, Hanisch's pre-dryer performs the "drying" functions as claimed. *See, e.g.*, Reply, Section III.A.2. Accordingly, Hanisch discloses drying after comminution. EX1023, ¶35.

Substitute claim 26 also adds the limitation that "the drying device operates with a pressure of 300 hPa or less." Independent claim 1 similarly claims that "the drying occurs at a maximum pressure of 300 hPa." EX1001, cl. 1. Hanisch alone or in combination with Dunagan and in view of the knowledge of a POSITA renders obvious this limitation for the reasons previously described in the Petition and the Reply. *See* Pet., Section VII, A.6; EX1004, 3:4-9, 4:6-8, 4:55-59, 5:62-63, cl. 6; EX1003, ¶¶68-70, 110-116; EX1023, ¶¶36-37; Reply, Section III.B, IV.A.

2. Claims 23, 25, 27 (Substitute for Claims 2, 8, 13)

Claims 23, 25, and 27 add the limitation "(d) producing, during the drying, a gaseous electrolyte component recoverable by condensation" / "the drying device configured to produce a gaseous electrolyte component recoverable by condensation." Hanisch discloses this limitation. Specifically, Hanisch discloses that "[t]he pre-dryer 28 comprises a circulation pump 32 and a condenser 34 for condensing electrolyte, which can be removed via the pipe 36." EX1004, 5:59-61; *see also id.* at cl. 5. A POSITA would have understood that the condenser 34 on the pre-dryer is for condensing back to a liquid the gaseous electrolyte that had evaporated from the comminuted batteries in the pre-dryer 28. *See* EX1003, ¶¶74, 92, 93. Accordingly, Hanisch alone or in combination with Dunagan, and in view of the knowledge of a POSITA, discloses this limitation of claims 23, 25, and 27. EX1023, ¶38.

Substitute claim 25 also includes the limitation "wherein the drying occurs at temperature of 80°C or less." Original claim 9 similarly requires "wherein drying occurs at a temperature of less than 80°C," and the Petition previously explained that Hanisch discloses drying at a temperature of less than 80°C. *See* Pet., Section VII.F; EX1003, ¶¶127-28; EX1023, ¶39. Specifically, Hanisch discloses that "[i]t is therefore advantageous for the drying temperature to be below 100°C., in particular below 80°C." EX1004, 3:65-4:5.

Claims 23, 25, and 27 also include one or more of the following limitations, all of which are disclosed or rendered obvious for the reasons described in the preceding sections: "wherein the drying uses a drying device operated in batch mode" / "a drying device operated in batch mode" (Section III.A.1); "and the claim is limited to drying after comminution" (Section III.A.1); "the drying device operates with a pressure of 300 hPa or less" (Section III.A.1). *See* EX1023, ¶¶40-41.

3. Claims 24, 28, 29 (Substitute for Claims 3, 10, 19)

Claims 24, 28, and 29 add the limitations of "wherein the drying is such that the comminuted material is dried until an electrolyte content in the comminuted material is so low that an electrochemical reaction is impossible or only to a negligibly small extent" / "by drying such that the comminuted material is dried until an electrolyte content in the comminuted material is so low that an electrochemical reaction is impossible or only to a negligibly small extent." Original claim 2 of the

'097 Patent similarly claims: "wherein the comminuted material is dried until an electrolyte content in the comminuted material is so low that an electrochemical reaction is impossible." PO does not advance any new arguments regarding this limitation, and accordingly, Hanisch alone or in combination with Dunagan, in view of the knowledge of a POSITA renders obvious this limitation for the reasons described in the Petition. *See* Pet., Section VII.B., VIII.B; EX1003, ¶¶117-21, 138, 153, 170; EX1023, ¶42.

Claims 24, 28, and 29 also include one or more of the following limitations, all of which are disclosed or rendered obvious for the reasons described in the preceding sections: "wherein the drying uses a drying device operated in batch mode" / "a drying device operated in batch mode" (Section III.A.1); "and the claim is limited to drying after comminution" (Section III.A.1); "the drying device operates with a pressure of 300 hPa or less" (Section III.A.1); "the drying device configured to produce a gaseous electrolyte component recoverable by condensation" (Section III.A.2); "the drying occurs at temperature of 80°C or less" (Section III.A.2). *See* EX1023, ¶¶43-44.

4. Claims 30, 31 (Substitute for Claims 7, 9)

Claims 30 and 31 add the limitations of "wherein the drying occurs at a temperature such that almost no Hydrogen Fluoride is produced." Hanisch renders this limitation obvious. A POSITA would have understood that drying at low

temperatures would prevent the production of Hydrogen Fluoride. *See* EX1003, ¶68 ("Lower temperatures during LiPF_6 evaporation, for example, have long been known to be desirable given the reduction of hydrogen fluoride formation from the electrolyte. . . . Thus, lower temperatures reduce the rate of the LiPF_6 hydrolysis reaction that forms toxic HF, thereby slowing HF formation."); ¶114 ("A POSITA would also have understood that the formation of toxic hydrogen fluoride during hydrolysis of LiPF_6 is an endothermic reaction and the reaction rate and rate of heat generation due to hydrolysis is therefore reduced at lower temperatures. A POSITA would, in my opinion, conclude that use of reduced pressure when drying comminuted material would be desirable, as it would allow the use of lower temperatures to evaporate organic solvents in the electrolyte."). *See* EX1023, ¶45.

The '097 Patent and PO also recognize the scientific principle that drying electrolyte at low temperatures prevents the formation of HF. For example, PO acknowledges that "[t]he specification [of the '097 Patent] emphasizes drying under low pressure, while avoiding high temperatures," (POR, 5), quoting the '097 Patent where it states that "[t]he drying preferably occurs at a maximum temperature of 80°C .: this produces almost no hydrogen fluoride." EX1001, 5:7-8; *see also* POR, 5 ("These conditions contribute to safe inactivation of electrolytes and associated solvents without forming hydrogen fluoride."). Accordingly, a POSITA would have

been familiar with the concept that drying electrolyte at lower temperatures prevents the formation of HF. *See* EX1003, ¶¶68, 114; EX1023, ¶46.

Understanding this principle, Hanisch discloses that "[t]he method preferably comprises the step that, before heating the cell fragments up to the decomposition temperature, the cell fragments are dried at a drying temperature, so that dry cell fragments and drying vapours are formed, whereby the drying vapours are at least partly condensed. This has the advantage that the electrolyte solvent can be retrieved. It is therefore advantageous for the drying temperature to be below 100°C, in particular below 80°C." EX1004, 3:65-4:5. By teaching drying at temperatures "below 100°C, in particular below 80°C," a POSITA would have understood that almost no Hydrogen Fluoride is produced in the drying process of Hanisch, as explicitly acknowledged by the '097 Patent. *See* EX1003, ¶¶68, 114; EX1001, 5:7-8 ("The drying preferably occurs at a maximum temperature of 80°C.: this produces almost no hydrogen fluoride."); EX1023, ¶47.

Claims 30 and 31 also include the following limitations, all of which are disclosed or rendered obvious for the reasons described in the preceding sections: "wherein the drying uses a drying device operated in batch mode" / "a drying device operated in batch mode" (Section III.A.1); "and the claim is limited to drying after comminution" (Section III.A.1); "the drying device operates with a pressure of 300 hPa or less" (Section III.A.1); "(d) producing, during the drying, a gaseous

electrolyte component recoverable by condensation" / "the drying device configured to produce a gaseous electrolyte component recoverable by condensation" (Section III.A.2); "by drying such that the comminuted material is dried until an electrolyte content in the comminuted material is so low that an electrochemical reaction is impossible or only to a negligibly small extent" (Section III.A.3). *See* EX1023, ¶¶48-49.

B. Ground 2: Substitute Claims 22-31 Would Have Been Obvious in View of Hanisch Alone or in View of Dunagan, and in Further View of the Teachings of Hayashi and/or Shin

While Hanisch alone or in combination with Dunagan and in view of the knowledge of a POSITA render obvious substitute claims 22-31, Hanisch in view of Dunagan and Hayashi or Shin also renders obvious the substitute claims.

1. Claims 22 and 26 (Substitute for Claims 1 and 12)

As explained above, substitute claims 22 and 26 add to independent claims 1 and 12 the requirements of "wherein the drying uses a drying device operated in batch mode" and "a drying device operated in batch mode," respectively.

As explained above in Section III.A.1, Hanisch discloses a batch process. Further, PO admits that each of Hayashi and Shin is directed to batch processes. For example, PO states that "Hayashi teaches processing a single cell of a battery at a time (i.e., *in a batch process*, not a continuous process)." POR, 28 (citing EX1006, 9:37-40) (emphasis added). PO's expert also admits that Hayashi discloses a batch

process. EX2022, ¶162 ("Hayashi is a batch process."). Hayashi states, as one example, that "[t]he large-sized battery cell for an automobile (the lithium ion battery, 1.66 kg) was discharged, the packaging sheet was peeled off, the safety valve was opened, and 18 g of water was added," indicating that Hayashi's method may be performed with a single cell of a battery at a time, as a batch process. *See* EX1006, 9:37-40. Accordingly, Hayashi discloses a batch process, and for the reasons explained in the Petition and the Reply, the batch process of Hayashi would have been combined with the disclosures of Hanisch. *See* Pet., Section VIII, A.6.; EX1003, ¶¶145-52; EX1023, ¶¶50-51; *See, e.g.*, Reply, Section IV.A.

PO further admits that Shin operates as a batch process. *See* POR, 51. For example, PO states that Shin's process "is all done in the context of a single batch, after which the accumulated battery material is removed from the reaction reservoir and transferred to a crusher" and "[t]hus, Shin's approach is essentially performed on a batch basis, not a continuous process." POR, 51-52. For the reasons explained in the Petition and the Reply, the batch process of Shin would have been combined with the disclosures of Hanisch. *See* Pet., Section VIII, A.6.; EX1003, ¶¶145-52; EX1023, ¶52; Reply, Section IV.A.

Substitute claim 26 also adds the limitation that "the drying device operates with a pressure of 300 hPa or less." Independent claim 1 similarly claims that "the drying occurs at a maximum pressure of 300 hPa." EX1001, cl. 1. Hanisch alone

or in view of Dunagan, and in further view of the teachings of Hayashi and/or Shin renders obvious this limitation for the reasons explained in the Petition and the Reply. *See* Pet. Section VII.A.6., VIII.A.6.; EX1003, ¶¶110-116, 145-152; EX1023, ¶53, Reply, Section III.B, IV.A.

All other limitations of claims 22 and 26 are disclosed or rendered obvious as described above in Section III.A. EX1023, ¶54.

2. Claims 23, 25, 27 (Substitute for Claims 2, 8, 13)

As explained above, claims 23, 25, and 27 add the limitation "(d) producing, during the drying, a gaseous electrolyte component recoverable by condensation" / "the drying device configured to produce a gaseous electrolyte component recoverable by condensation."

As explained above in Section III.A.2, Hanisch discloses producing a gaseous electrolyte component recoverable by condensation. Further, Hayashi discloses this limitation. For example, Hayashi's claim 7 recites a gasification step wherein the "electrolyte solution is heated at 80 C. to 150 C. under the reduced pressure of less than or equal to 1 kPa, thereby the volatile components are gasified." EX1006, cl. 7. Hayashi further explains that, after heating battery cells and vaporizing the generated gas, "[t]he generated gas was condensed in the cooling pipe (4° C.), and was captured in a capturing bottle." EX1006, 10:27-44; *see also* 9:37-10:26, 10:50-11:7. Accordingly, Hayashi discloses gasification of electrolyte and condensing the

generated gas with a cooling pipe, and therefore Hayashi discloses this limitation. EX1023, ¶¶55-57.

To the extent that Hanisch does not disclose this limitation, a POSITA would have been motivated to incorporate Hayashi's teachings regarding condensation of the gaseous electrolyte. EX1023, ¶¶58-60. Condensing the gaseous electrolyte would be beneficial for reuse and resource recovery, as well as for supporting environmental and safety objectives. *Id.* Condensing the electrolyte would prevent electrolyte solvents from accumulating in the air and contributing to explosion hazards and hazards from the potential production of hydrofluoric acid and other toxins. *Id.* Further, a POSITA would know how to combine Hayashi's condensation method and equipment with Hanisch, where Hanisch discloses that "[t]he pre-dryer 28 comprises a circulation pump 32 and a condenser 34 for condensing electrolyte, which can be removed via the pipe 36." EX1004, 5:59-61; EX1023, ¶¶58-60.

All other limitations of claims 23, 25, and 27 are disclosed or rendered obvious for the reasons described above in Section III.A and/or further above in Section III.B. *See* EX1023, ¶¶61-62.

3. Claims 24, 28, 29 (Substitute for Claims 3, 10, 19)

The limitations of claims 24, 28, and 29 are disclosed or rendered obvious for the reasons described above in Section III.A and/or further above in Section III.B.

See also Pet., Section VII.B., VIII.B; EX1003, ¶¶117-21, 138, 153, 170; EX1023, ¶63.

4. Claims 30, 31 (Substitute for Claims 7, 9)

The limitations of claims 30 and 31 are disclosed or rendered obvious for the reasons described above in Section III.A and/or further above in Section III.B. *See also* EX1003, ¶¶68, 114; EX1004, 3:65-4:5; EX1001, 5:7-8; EX1023, ¶64.

IV. SUBSTITUTE CLAIMS 22-31 ARE INVALID UNDER 35 U.S.C. § 112 FOR INDEFINITENESS

A patent's specification must 'conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.' 35 U.S.C. § 112(b). In particular, "a patent's claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instr., Inc.*, 572 U.S. 898, 910 (2014). PO's Motion to Amend should be denied because Patent Owner's proposed claims are indefinite, ambiguous, and open to multiple interpretations.

A. Claims 22-31 - "inactivating the comminuted material" / "an inactivation device comprising a drying device configured to inactivate the comminuted material"

The meaning of the "inactivating" limitations in substitute claims 22-31 is not reasonably clear because a POSITA would not have understood from the '097 Patent the outer boundaries of when comminuted material is considered "inactivated."

EX1023, ¶¶65-68. PO compounds this confusion through its statements to the Patent Office regarding "inactivating" in this proceeding and other proceedings relating to the '097 Patent.²

The Board rejected PO's preliminary response arguments that inactivation required a particular percentage of electrolyte removed and that inactivation required the ability to recover removed electrolyte by condensation. Institution Decision

² PO's arguments notwithstanding, as discussed in the Reply, the prior art meets the claims under both the Board's preliminary construction and PO's alternative, and cancellation of the claims is therefore appropriate. *See Hilti Aktiengesellschaft v. Specified Techs. Inc.*, IPR2024-00192, pap. 16, at 12-13 (P.T.A.B. May 14, 2024) (granting institution despite alleged indefiniteness of terms because "we do not discern an indefiniteness issue that renders it logically impossible to adjudicate the prior-art challenges in the Petition"); *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 813 (Fed. Cir. 2021) (citing *Samsung Electronics America, Inc. v. Prisia Eng'g Corp.*, 948 F.3d 1342, 1353 (Fed. Cir. 2020)) ("[I]t is not always impossible to adjudicate a prior-art challenge, one way or the other, just because some aspect of a claim renders the claim indefinite" rather indefiniteness "precludes a patentability determination only when the indefiniteness renders it logically impossible for the Board to reach such a decision").

(paper 10, "ID"), 11-12. The Board concluded, at least preliminarily, that inactivation should mean “the removal of sufficient amounts of dimethyl carbonate and/or ethyl methyl carbonate from the comminuted material to make an electrochemical reaction either no longer possible or only possible to a negligibly small extent.” ID, 12.

PO responds that the Board’s construction is too limiting because it chooses a single metric for inactivation, “to the exclusion of the other.” POR, 9-10. PO contends that inactivation is merely “the endpoint result of drying, but not specif[ic] [to] the particular metric of drying that must be reached.” POR, 10. PO's framing means there is no limitation on how one knows material has been inactivated, other than whether it is finished drying.³ This circular logic was both contradicted and parroted by PO’s expert at deposition, where he opined both “for it to be inactive there are metrics” and that one knows drying is complete when one has extracted a sufficient amount of electrolyte for drying. EX1024, 87:14-89:6. In particular, Mr. Dantam confirmed that the relationship of "drying" to "inactivation" is circular and dependent on the whims of the party performing the drying:

³ To be sure, the patent's lexicography of the active verb “drying” as used in the claims does not and should not change the plain and ordinary definition of the term adjective “dry” as used throughout the prior art.

Q. What do you mean by is the drying complete?

A. Have you extracted sufficient amount of electrolyte.

Q. Sufficient amount of electrolyte for what?

A. For drying.

Q. So material is inactivated when drying is complete which means you've extracted sufficient amount of electrolyte for drying?

A. Yes, it depends on the specifications you establish.

Q. Depends on the specifications who establishes?

A. The entity that is performing the drying.

EX1024, 88:7-89:6. In the face of such circular logic, it is hard to imagine how one would determine with reasonable certainty the outer boundaries between drying that results in inactivation and drying that does not result in inactivation.

Indeed, by PO's own admission there are there are various metrics by which **drying** may be measured, including whether there is a build-up of heat in the material (*see* EX1001, 4:19-27); the maximum value by weight of the electrolyte (*see* EX1001, 4:28-32); whether the content of the dimethyl carbonate reaches a certain threshold by volume (*see* EX1001, 4:37-40); or whether an electrolyte content is so low that an electrochemical reaction is impossible (EX1001, 4:5-18), but none of these various metrics indicate the boundaries of whether the material is **inactivated**. *See* POR, 9-10. Rather, as PO and its expert seem to indicate, material

is inactivated if it has been dried per the specifications of the party doing the drying. This type of arbitrary and subjective metric fails to provide any reasonable certainty as to the outer bounds of the claim. *See* EX1023, ¶¶66-67.

PO's position here is further at odds with its construction for the same term in a separate concurrent proceeding for the '097 patent. *See URT Umwelt und Recyclingtechnik GmbH v. Duesenfeld GmbH*, IPR2024-00887, paper 18 at 9 (Duesenfeld POR) (EX1029). There, PO argued that "inactivated" should *not* be defined synonymously with drying but that it must be understood as "safe for transport." *Id.* Given all the inconsistencies in PO's position before the Patent Office, and the '097 Patent's specification's lack of meaningful guidance, a POSITA would have no reasonable certainty as to the outer bounds of when comminuted material is considered "inactivated." EX1023, ¶¶65-68. Accordingly, a POSITA would not have been able to ascertain the scope of this claim with reasonable certainty, and therefore, substitute claims 22-31 are invalid for indefiniteness.

B. Claims 30, 31 - "almost no Hydrogen Fluoride is produced"

The meaning of the limitation "almost no Hydrogen Fluoride is produced" as recited in substitute claims 30 and 31 is not reasonably clear because a POSITA would not understand when "*almost* no Hydrogen Fluoride is produced." EX1023, ¶¶69-74. The claims and the specification of the '097 Patent do not provide guidance to a POSITA regarding the bounds of when "almost no Hydrogen Fluoride is

produced," and accordingly, the claims fail to define the scope of the alleged invention with reasonable certainty.

The term "almost no" is an example of a subjective term of degree regularly held to be indefinite. "When a 'word of degree' is used, the court must determine whether the patent provides some standard for measuring that degree." *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1335 (Fed. Cir. 2010). For example, in *J.R. Simplot Co. v. McCain Foods USA, Inc.*, 713 F. Supp. 3d 904, 944-45 (D. Idaho 2024), the court held the claim terms "almost zero" and "sufficiently low" as indefinite. The patent challenger argued that those terms were "subjective and, therefore, indefinite," and the court agreed. *Id.* at 944. The court pointed out that "[t]here is nothing within the [relevant patent] distinguishing whether 'almost zero' and/or 'sufficiently low' is a matter of degrees or hundredths of degrees" and that although "[a] POSA could run tests, presumably numerous ranges . . . could be considered 'almost zero.'" *Id.* at 945. The court concluded by stating that "[n]ot to belabor the point, but the word 'almost' itself is relative: a temperature increase of 'almost zero' in one type of vegetable could be completely different than what constitutes 'almost zero' for another. . . . A POSA is then left to guess whether any increase in temperature is permissible or not." *Id.*

As another example, in *Core Wireless Licensing S.A.R.L. v. Apple Inc.*, No. 15-cv-05008-PSG, 2016 U.S. Dist. LEXIS 72935, at *12 (N.D. Cal. June 3, 2016),

the court held that the term "substantially impair the quality of user information" was indefinite because the specification was "essentially silent" as to the number of frames that would constitute a "sufficiently low number" so as not to "substantially impair" the quality of user information. *Id.* at **35-36. The court explained that while the specification seemed clear on "[a]t least one" circumstance that "would fall within the claimed invention," "the edges of the claim are murkier." *Id.* The court concluded that "[i]n short, the claims leave a 'zone of uncertainty' – which *Nautilus* bars." *Id.*

Here, the term "almost no Hydrogen Fluoride" is similarly indefinite. Like in *Core Wireless*, the specification is "essentially silent" as to the boundaries of the term "almost no Hydrogen Fluoride." PO points to three portions of the specification as supporting its amendment, but none of those citations provide a POSITA with any way to understand whether "almost no" Hydrogen Fluoride has been formed. For example, PO's first citation merely states: "The drying preferably occurs at a maximum temperature of 80°C: this produces almost no hydrogen fluoride." EX2054, 7:33-8:1. This is a mere restatement of the claim language itself and does not provide any guidance to a POSITA on the bounds of the claim term. *See* EX1023, ¶¶69-74. PO's second citation that "[t]he organic carbonate content is preferably so small that the formation of a significant amount of fluorophosphates can be ruled out" is no more helpful. EX2054, 2:21-3:4. At most, the specification merely

substitutes one ambiguity with another by indicating that the formation of a "significant amount" of fluorophosphates can be "ruled out." There still is no guidepost, however, from which a POSITA can determine what a "significant amount" of fluorophosphates is. EX1023, ¶¶72. PO's final citation is of no relevance to determining the scope of this term of degree, stating only that "formation of hydrogen fluoride is hindered" and that it is "beneficial to prevent the development of hydrogen fluoride." EX2054, 4:18-25.

Like in *J.R. Simplot*, there is nothing in the '097 Patent from which to determine the appropriate metric for measuring whether "almost no" Hydrogen Fluoride has formed, particularly where, as the Court explained in *J.R. Simplot*, "almost" is itself a relative term. *J.R. Simplot*, 713 F. Supp. 3d at 944-45. "Without some clear, concise language, the term is subjective and does not provide clear notice of what is being protected." *Id.* at 945. The Board should hold substitute claims 30 and 31 invalid as indefinite. *See* EX1023, ¶¶69-74.

V. CONCLUSION

Substitute claims 22-31 are unpatentable for the reasons discussed above, and accordingly, Patent Owner's Contingent Motion to Amend should be denied.

Respectfully submitted,

Dated: May 9, 2025

/s/Andrew D. Gish

*Attorney for Petitioner, Ascend
Elements, Inc.*

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing PETITIONER'S OPPOSITION TO PATENT OWNER'S MOTION TO AMEND was served by filing these documents through the Patent Trial and Appeal Board End to End (PTAB E2E) as well as providing a courtesy copy via e-mail to the following attorneys of record for the Patent Owner listed below:

Steven C. Carlson
ROBBINS KAPLAN LLP
555 Twin Dolphin Drive, Suite 310
Redwood City, CA 94065
(650) 784-4040
SCarlson@RobinsKaplan.com

Samuel J. LaRoque
ROBBINS KAPLAN LLP
800 LaSalle Avenue, Suite 2800
Minneapolis, MN 55402
(612) 349-8500
SLaRoque@RobinsKaplan.com

Matthew A. Smith
Reg. No. 49,003
SMITH BALUCH LLP
700 Pennsylvania Ave. SE, 2nd floor
Washington, DC 20003
(202) 669-6207
smith@smithbaluch.com

Elizabeth Laughton
Reg. No. 70,484
SMITH BALUCH LLP
(703) 585-8839
laughton@smithbaluch.com

Date: May 9, 2025

/s/ Andrew D. Gish