

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TOPSOE INC.,
Petitioner

v.

CASALE SA,
Patent Owner

Case IPR2025-01454
U.S. Patent No. 11,286,168

PATENT OWNER'S CONTINGENT MOTION TO AMEND
UNDER 37 C.F.R. § 42.121 INCLUDING
REQUEST FOR PRELIMINARY GUIDANCE

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	REQUEST FOR PRELIMINARY GUIDANCE FROM THE BOARD.....	1
III.	STATEMENT OF RELIEF REQUESTED	1
IV.	LEGAL STANDARD	2
V.	BACKGROUND OF PROPOSED AMENDMENTS	2
VI.	PATENT OWNER PROPOSES A REASONABLE NUMBER OF SUBSTITUTE CLAIMS	4
VII.	THE PROPOSED CLAIMS DO NOT ENLARGE THE CLAIM SCOPE	6
VIII.	THE PROPOSED CLAIMS DO NOT ADD NEW SUBJECT MATTER.....	7
IX.	THE PROPOSED CLAIMS RESPOND TO THE GROUNDS OF UNPATENTABILITY	13
X.	CONCLUSION.....	24

TABLE OF AUTHORITIES

Page(s)

Cases

<i>Brown v. 3M</i> , 265 F.3d 1349, 60 USPQ2d 1375 (Fed. Cir. 2001)	4
<i>Kustom Signals, Inc. v. Applied Concepts, Inc.</i> , 264 F.3d 1326 (Fed. Cir. 2001)	4
<i>Lectrosonics, Inc. v. Zaxcom, Inc.</i> , Case IPR2018-01129 (PTAB Feb. 25, 2019)	<i>passim</i>
<i>Metalcraft of Mayville, Inc. v. Toro Co.</i> , 848 F.3d 1358 (Fed. Cir. 2017)	22
<i>Quantum Corp. v. Rodime, PLC</i> , 65 F.3d 1577 (Fed. Cir. 1995)	6
<i>Schumer v. Lab. Computer Sys.</i> , 308 F.3d 1304 (2002)	4, 5
<i>In re Stepan Co.</i> , 868 F.3d 1342 (Fed. Cir. 2017)	23

Statutes

35 U.S.C. § 316(d)	2
35 U.S.C. § 316(d)(1)(B)	4
35 U.S.C. § 316(d)(3)	6, 7

Other Authorities

37 C.F.R. § 37.121(a)(2)(i)	2
37 C.F.R. § 37.121(a)(2)(ii)	2
37 C.F.R. § 37.121(a)(3)	2
37 C.F.R. § 42.6(e)(4)	27

37 C.F.R. §§ 42.24(a)(1)(vi), (b)(3).....	26
37 C.F.R. § 42.24(d), I.....	26
37 C.F.R. § 42.121	2, 27
37 C.F.R. § 42.121(a)(2)(i)	13
37 C.F.R. § 42.121(a)(2)(i) and (ii)	13
37 C.F.R. § 42.121(a)(2)(ii)	6, 7
37 C.F.R. § 42.121(a)(3)	4
37 C.F.R. § 42.121(b)	2
(37 C.F.R. § 42.121(b)(1))	2
37 C.F.R. § 42.121(e).....	1
MPEP § 2131	4

TABLE OF EXHIBITS

Exhibit No.	Description
2007	Expert Declaration of Colin A. Wolden, Ph.D., in Support of Patent Owner Response
2008	Transcript from April 30, 2026 Deposition of James Ritter, Ph.D.
2012	EP 17195305.2 (“EP ’305.2”)

I. INTRODUCTION

Patent Owner Casale SA (“Casale” or “Patent Owner”) hereby submits this Patent Owner’s Motion to Amend (“MTA”) to substitute Challenged Claim 10 of U.S. Patent No. 11,286,168 (the “’168 Patent”) (EX1001) with Proposed Substitute Claims 24, 25, and 26, or in the alternative, a single Proposed Substitute Claim 27¹. Patent Owner’s MTA is contingent as to Claims 1 and 10.

II. REQUEST FOR PRELIMINARY GUIDANCE FROM THE BOARD

Patent Owner respectfully requests preliminary guidance from the Board under 37 C.F.R. § 42.121(e).

III. STATEMENT OF RELIEF REQUESTED

Patent Owner respectfully requests that the Board grant entry of the Proposed Substitute Claims 24, 25, and 26, or in the alternative, Proposed Substitute Claim 27. Patent Owner’s request is contingent with respect to challenged Claims 1 and 10 (*i.e.*, Patent Owner only seeks to substitute original Claim 10 for Proposed Substitute Claims 24, 25, and 26, or in the alternative, Proposed Substitute Claim 27, if the Board finds Claims 1 *and* 10 to be

¹ Proposed as Claim 27 for clarity in this motion, but if the alternative option is selected this would be presented as Substitute Claim 24 for consecutive numbering.

unpatentable). Pursuant to 37 C.F.R. § 42.121(b), a listing of the Proposed Substitute Claims is attached hereto as Appendix A.

IV. LEGAL STANDARD

Under *Lectrosonics, Inc. v. Zaxcom, Inc.*, Case IPR2018-01129 (Paper 15) (PTAB Feb. 25, 2019) (precedential) (“*Lectrosonics*”), Patent Owner has the burden to demonstrate that “the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” A motion to amend must: (1) propose a reasonable number of substitute claims (37 C.F.R. § 37.121(a)(3)); (2) propose substitute claims that do not enlarge the scope of the claims or introduce new subject matter (37 C.F.R. § 37.121(a)(2)(ii)); (3) respond to a ground of unpatentability involved in the trial (37 C.F.R. § 37.121(a)(2)(i)); and (4) set forth written description support for each substitute claim (37 C.F.R. § 42.121(b)(1)). “[A] PO does not bear the burden of persuasion to demonstrate the patentability of substitute claims presented in a motion to amend.” *Lectrosonics* at 4. Instead, “the burden of persuasion ordinarily will lie with the petitioner to show that any proposed substitute claims are unpatentable by a preponderance of the evidence.” *Id.*

V. BACKGROUND OF PROPOSED AMENDMENTS

Patent Owner proposes substituting Claim 10 with Proposed Substitute Claims 24, 25, and 26, or in the alternative, Proposed Substitute Claim 27. Original

Claim 10 describes “wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses. . .” and goes on to describe further alternate limitations directed to different apparatuses claimed, separated with “or.” The alternate limitations are referred to here as Options A, B, and C.

Option A is “a steam production and/or superheating furnace,” Option B is “or one or more furnaces for pre-heating the charge of the autothermal reformer,” and Option C is “or natural gas desulphurization section.”

In Proposed Substitute Claims 24, 25, and 26, Patent Owner proposes amendments to separate the alternative “or” limitations in Claim 10 into three individual dependent claims. Specifically, Claim 24 recites Option A, “a steam production and/or superheating furnace.” Claim 25 recites Option B, “said at least one furnace for pre-heating the charge of the autothermal reformer.” Claim 26 recites Option C, “said at least one furnace of a natural gas desulphurization section.” Proposed Claim 25 is further amended to clarify the referred to “one or more furnace” is the same as the “at least one furnace” referred to in Claim 1 and Claim 26 is amended similarly.

In the alternative, Patent Owner proposes substituting Original Claim 10 with Proposed Substitute Claim 27. Proposed Substitute Claim 27 is similar to Proposed Substitute Claim 25, and recites, *inter alia*, “said at least one furnace for pre-heating the charge of the autothermal reformer.”

VI. PATENT OWNER PROPOSES A REASONABLE NUMBER OF SUBSTITUTE CLAIMS

Under 35 U.S.C. § 316(d)(1)(B) and 37 C.F.R. § 42.121(a)(3), Patent Owner must propose a reasonable number of substitute claims. While the “presumption is that only one substitute claim will be needed to replace each challenged claim,” that presumption “may be rebutted by a demonstration of need.” 37 C.F.R. § 42.121(a)(3).

Absent indication of a unique construction, “or” and “either” are construed “in their common usage as designating alternatives.” *Kustom Signals, Inc. v. Applied Concepts, Inc.*, 264 F.3d 1326, 1331 (Fed. Cir. 2001). “When a claim covers several structures or compositions. . . as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.” *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001), *see also* MPEP § 2131. And when “or” is given its plain meaning and is used to separate claim elements, “infringement occurs if any one. . . is performed.” *Schumer v. Lab. Computer Sys.*, 308 F.3d 1304, 1312 (2002). As originally recited,² Claim 10 encompasses three alternatives, Options A, B, and C, separated by “or.”

² Claim 10 was previously amended during reexamination. *See* EX1001 at 20. “Originally recited” here refers to the current version of Claim 10. *See id.*

Patent Owner proposes three substitute claims in place of original Claim 10. While this proposal adds three new claims for a single original claim, the scope has not changed—the same number of alternatives as originally presented in Claim 10 are now just recited independent of each other, making it easier and clearer to address each of the Options during these Proceedings.

More specifically, the fuel fraction received in Claim 10 may feed any of the recited Options, and as such, the Options are not dependent on one another. A process can infringe by practicing just one of the recited alternative limitations. *Schumer*, 308 F.3d at 1311-12, 1314. For example, if a process practiced all limitations and therefore infringed Proposed Substitute Claim 25, it would infringe Original Claim 10 as well. Breaking these alternatives in Original Claim 10 into three separate dependent claims is reasonable because the Proposed Substitute Claims do not impact the scope of the patent.

In the event that the Board finds that three new claims is an unreasonable number, Patent Owner proposes replacing Original Claim 10 with a single option – Proposed Substitute Claim 27. Given the presumption that one substitute claim will be needed to replace each challenged claim, a one-to-one substitution of Claim 27 for Claim 10 satisfies the presumption.

VII. THE PROPOSED CLAIMS DO NOT ENLARGE THE CLAIM SCOPE

Pursuant to 35 U.S.C. § 316(d)(3) and 37 C.F.R. § 42.121(a)(2)(ii), a motion to amend may not present substitute claims that enlarge the scope of the claims.

“An amended or new claim has been enlarged if it includes within its scope any subject matter that would not have infringed the original patent.” *Quantum Corp. v. Rodime, PLC*, 65 F.3d 1577, 1580 (Fed. Cir. 1995). “[A] proposed substitute claim adding a novel and nonobvious feature or combination to avoid the prior art in an instituted ground of unpatentability will not enlarge the scope of the claims of the patent.” *Lectrosonics* at 7.

None of the Proposed Substitute Claims enlarge the scope of the subject matter in original Claim 10. As described in Section V above, the scope of original Claim 10 includes alternative Options A, B, or C for what apparatus(es) the fuel fraction feeds. In each Proposed Substitute Claim, Patent Owner includes one of the alternative apparatus(es) the fuel fraction may feed, as well as all other limitations of original Claim 10. A process that infringes original Claim 10 would infringe at least one of Proposed Substitute Claims 24, 25, or 26 and a process that would not infringe original Claim 10 would still not infringe any of Proposed Substitute Claims 24, 25, and 26. Therefore, the Proposed Substitute Claims do not enlarge the scope of original Claim 10.

Similarly, Proposed Substitute Claim 27 would also not enlarge the scope of original Claim 10. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25 and recites only alternative Option B. Since there would be no process that would infringe Proposed Substitute Claim 27, but not infringe Original Claim 10, the proposed claim does not enlarge the claim scope.

Moreover, the scope of Proposed Substitute Claims 25 and 26 (and Proposed Substitute Claim 27) are narrower than the original Claim 10 (by clarifying that “one or more furnace” is the same as the “at least one furnace” referred to in Claim 1). The Proposed Substitute Claims do not capture more scope than original Claim 10, even in the aggregate. As explained below, these Proposed Substitute Claims distinguish over the Grounds presented in the Petition. Because the Proposed Substitute Claims do not enlarge the claim scope, they comply with 35 U.S.C. § 316(d)(3) and 37 C.F.R. § 42.121(a)(2)(ii).

VIII. THE PROPOSED CLAIMS DO NOT ADD NEW SUBJECT MATTER

Pursuant to 35 U.S.C. § 316(d)(3) and 37 C.F.R. § 42.121(a)(2)(ii), a motion to amend may not present substitute claims that introduce new subject matter.

“New matter is any addition to the claims without support in the original disclosure.” *Lectrosonics* at 7. An MTA must “set forth written description support in the originally filed disclosure of the subject patent for each proposed substitute

claim and also set forth support in an earlier filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” *Id.*

The Proposed Substitute Claims do not change the substantive limitations of original Claim 10. Rather, the Proposed Substitute Claims break out the designated alternatives of original Claim 10. Petitioner has not asserted that Claim 10 is not supported. By virtue of these Proposed Substitute Claims reciting the same subject matter as original Claim 10, these substitute claims are also supported.

Solely for completeness of this motion, Patent Owner has provided specific support for the Proposed Substitute Claims. The Proposed Substitute Claims are supported by priority European applications EP 17156256.4 (“EP ’256.4”) and EP 17195305.2 (“EP ’305.2”) (EX2012), filed on February 15, 2017 and October 6, 2017 respectively, PCT application WO 2018/149641 (“WO ’641”), filed on January 31, 2018, and the US application 16/485,695 (“US ’695”), filed on August 13, 2019 which led to the ’168 Patent.³

³ All of the asserted prior art references in the Grounds predate the European priority applications and therefore Patent Owner’s entitlement to the earlier priority date is immaterial for the Grounds. Patent Owner includes the support in these applications merely for completeness.

Patent Owner sets forth support for the Proposed Substitute Claims in the tables below.

Table 1	
Claim and limitations	EP '305 Support⁴
24 “wherein said fuel fraction of the synthesis gas feeds a steam production and/or superheating furnace.”	¶¶ [0012] – [0014], [0020], [0053], [0057], [0065], [0108], [0113] – [0114], [0124], [0126], claim 7, FIGs. 1, 3
25 “wherein said fuel fraction of the synthesis gas feeds said at least one furnace for preheating the charge of the autothermal reformer.”	¶¶ [0012] – [0014], [0020], [0053], [0108], [0113] – [0114], [0124], [0126], claim 7, FIGs. 1, 3
26 “wherein said fuel fraction of the synthesis gas feeds said at least one furnace of a natural gas desulphurization section.”	¶¶ [0004], [0010] – [0012], [0022], [0053], [0077], [0113], [0129], [0130], claim 7

⁴ EP '305.2 includes all of the subject matter of EP '256.4. As described in footnote 3, all of the cited references predate the European priority applications and the priority date is immaterial to the question of written support. Therefore, reference is made to EP '305.2 alone.

Table 2	
Claim and limitation	'168 Patent Support
24 “wherein said fuel fraction of the synthesis gas feeds a steam production and/or superheating furnace.”	2:30-32, 2:47-49, 3:26-29, 3:44-46, 6:22-24, 6:50-54, 7:41-43, 12:51-56, 13:14-16, 13:18-20, 14:01-04, 14:09-13, claim 10, FIG. 1, 3.
25 “wherein said fuel fraction of the synthesis gas feeds said at least one furnace for preheating the charge of the autothermal reformer.”	2:30-32, 2:47-49, 3:26-29, 3:44-46, 6:22-24, 12:51-56, 13:14-16, 13:18-20, 14:01-04, 14:09-13, claim 10, FIG. 1, 3.
26 “wherein said fuel fraction of the synthesis gas feeds said at least one furnace of a natural gas desulphurization section.”	1:24-26, 2:06-32, 3:44-46, 6:22-24, 9:10-18, 13:14-16, 14:33-35, 14:39-44, claim 10

A. Support for Substitute Claim 24

The '168 Patent claims priority to foreign application EP '305, filed on October 6, 2017. EP '305 explicitly supports all claim limitations of Proposed Substitute Claim 24. For example, EP '305 describes “a process for synthesis of ammonia from natural gas. . . characterized by. . . obtaining a fuel fraction of the synthesis gas, wherein said fuel fraction is fed as fuel to at least one furnace.” EP '305, ¶ [0012]. The fuel fraction of the synthesis gas is clearly described in the application. EP '305 goes on to describe “[t]he term “furnace” is understood as meaning an apparatus chosen from among: a steam reformer or a charge preheater

or **a steam generator or a steam superheater.**” *Id.* at ¶ [0014] (emphasis added).

Therefore, the fuel fraction feeding a steam production and/or superheating furnace are also explicitly supported. In another example, EP ’305 describes “[a] part of the fuel fraction may be allocated. . . to furnaces for the production and/or superheating of steam.” *Id.* at [0065]. The ’168 Patent includes substantially similar language and also supports all limitations of Proposed Substitute Claim 24. *See* Tables 1 and 2.

B. Support for Substitute Claim 25

EP ’305 also explicitly supports all claim limitations of Proposed Substitute Claim 25. As described above for Proposed Substitute Claim 24, EP ’305 explicitly supports “wherein said fuel fraction of the synthesis gas feeds said at least one furnace” of Proposed Substitute Claim 25. For example, EP ’305 describes “a process for synthesis of ammonia from natural gas... characterized by. . . obtaining a fuel fraction of the synthesis gas, wherein said fuel fraction is fed as fuel to at least one furnace.” *Id.* at ¶ [0012]. EP ’305 also explicitly supports “one or more furnaces for preheating the charge of the autothermal reformer.” EP ’305 states “[t]he term “furnace” is understood as meaning an apparatus chosen from a steam reformer or **a charge preheater** or a steam generator or a steam superheater.” *Id.* at ¶ [0014] (emphasis added). Additionally, EP ’305 states “at least a part of the synthesis gas fuel fraction feeds a furnace for pre-heating the gas prior to

autothermal reforming.” *Id.* at ¶ [0053]. Therefore, all claim limitations of Proposed Substitute Claim 25 are fully supported by EP ’305. The ’168 Patent includes substantially similar language and also supports all limitations of Proposed Substitute Claim 25. *See supra* Tables 1 and 2.

C. Support for Substitute Claim 26

EP ’305 also explicitly supports all claim limitations of Proposed Substitute Claim 26. As described above for Proposed Substitute Claims 24 and 25, EP ’305 explicitly supports “wherein said fuel fraction of the synthesis gas feeds one or more furnaces” of Proposed Substitute Claim 26. For example, EP ’305 describes “a process for synthesis of ammonia from natural gas. . . characterized by. . . obtaining a fuel fraction of the synthesis gas, wherein said fuel fraction is fed as fuel to at least one furnace.” *Id.* at ¶ [0012].

EP ’305 also supports “. . . of a natural gas desulphurization section.” EP ’305 describes a procedure to “revamp” existing ammonia production facilities to apply the H₂ fuel recycling aspect of the disclosure. *Id.* at ¶ [0010]-[0011]. EP ’305 states “revamping does not require costly modifications. . . of the front end,” which supports that the revamping procedure is performed on the front end of the ammonia plant. *Id.* at ¶ [0130]. The procedure includes “revamping the existing section for desulphurization of the natural gas.” *Id.* at ¶ [0129]. As described in EP ’305, the front end may include the existing section for desulphurization. EP ’305

goes on to describe “[a] part 14 of said CO₂-depleted syngas 12 is used as fuel in a furnace in the front end, for example in a charge heater (AUX block). *Id.* at ¶ [0113]. The CO₂-depleted syngas fuel feeds a furnace in the front end, which may include the desulphurization section, supporting all limitations of Proposed Substitute Claim 26. The ’168 Patent includes substantially similar language and also supports all limitations of Proposed Substitute Claim 26. *See supra* Tables 1 and 2.

D. Support for Substitute Claim 27

Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25, reciting the same elements and without including any additional elements. Therefore, the support for Proposed Substitute Claim 27 is the same as for Proposed Substitute Claim 25, shown *supra* in Tables 1 and 2.

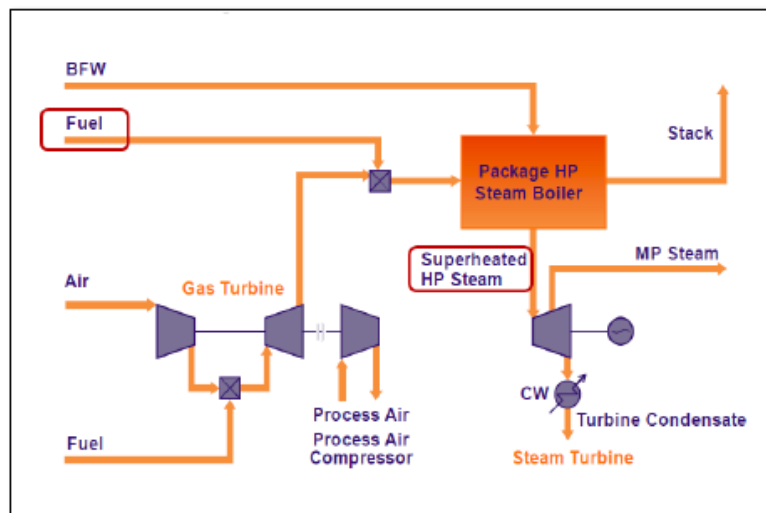
IX. THE PROPOSED CLAIMS RESPOND TO THE GROUNDS OF UNPATENTABILITY

Under 37 C.F.R. § 42.121(a)(2)(i), “[a] motion to amend may be denied where. . . [t]he amendment does not respond to a ground of unpatentability involved in the trial.” “[A] proposed substitute claim adding a novel and nonobvious feature or combination to avoid the prior art in an instituted ground of unpatentability” will meet the requirements of 37 C.F.R. § 42.121(a)(2)(i) and

(ii).” *Lectrosonics* at 6-7. As shown in the following sections, the Proposed Substitute Claims are patentable over the Grounds in the Petition.⁵

A. Ground 1

Ground 1 asserts that *2007 IFA* anticipates Claim 10. *See* Petition at 1-2, 19-20. Specifically, the Petition asserts that “*2007 IFA* discloses feeding the fuel fraction to “combustion air preheat to reduce fuel firing” and “*2007 IFA* also discloses feeding fuel to a steam production furnace (“steam boiler”) to generate superheated high-pressure steam,” citing *2007 IFA* at 8 and reproducing an annotated figure from the same:



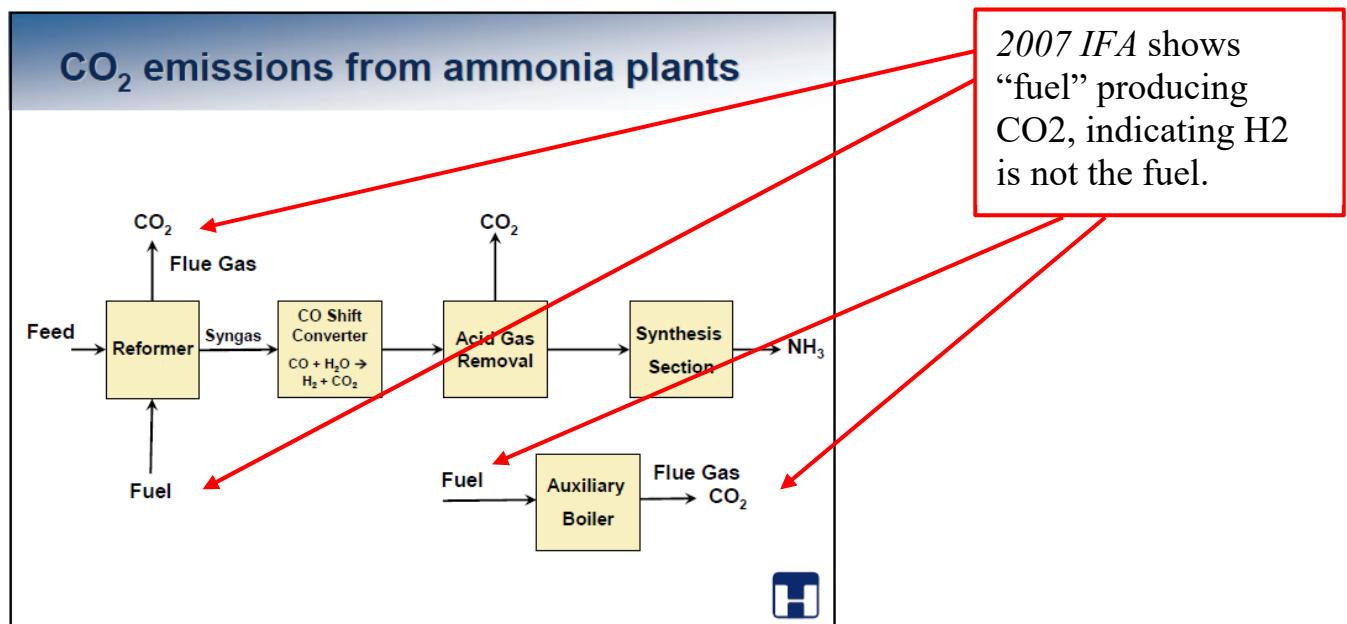
⁵ The Petition challenges Claim 10 in Grounds 1, 2, 3, 3A, and 3B. *See* Petition at 1-2.

Petition at 19-20. The Petition then summarily concludes: “Accordingly, *2007 IFA* teaches feeding one or more of (1) a steam production and/or superheating furnace and (2) one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section. *2007 IFA* also discloses feeding the fuel fraction to a steam production furnace. *Id.* at 8-9; EX1005 ¶ 205.” Petition at 20.

The Petition is presumably pointing to “Package HP Steam Boiler” on Page 8 of *2007 IFA* as the referenced “a steam production furnace (“steam boiler”) to generate superheated high-pressure steam” for the “steam production and/or superheating furnace” claimed in Claim 10. Petition at 19-20. Proposed Substitute Claim 24 reads: “The process of claim 1, wherein said fuel fraction of the synthesis gas feeds a steam production and/or superheating furnace.”

The ’168 Patent requires that the relevant “said fuel fraction” is the CO₂-depleted synthesis gas (*i.e.*, hydrogen-rich synthesis gas) of Claim 1, from which Proposed Substitute Claim 24 depends. The “Fuel” shown on page 8 of *2007 IFA* is not CO₂-depleted syngas. Rather, the “Fuel” disclosed on page 8 is not labeled as hydrogen (or H₂) and instead, based on the prior slide, refers to “hydrocarbon” fuel (namely, the most common fuel, natural gas). EX1006 at 7-8; EX2007 ¶68. This is clear from Page 9 of *2007 IFA*, which appears to be discussing an entirely different system, and is the only place where “H₂ Fuel” is referenced in *2007 IFA*. EX1006 at 9; EX2007 ¶71. The order of the slides matters here – slide 7 would be

introduced before slide 8, and slide 9 would follow both slides 7 and 8. EX2007 ¶¶67-71. The slides on page 7 and 8 do not address, and have nothing to do with, the use of “H2 fuel.” EX2007 ¶76. When 2007 IFA disclosed using H2 fuel on the slide on page 9, it was labeled as such. *Id.* Moreover, the “fuel” shown on slide 7 of 2007 IFA is shown to produce CO₂, which is produced when natural gas fuel is combusted. See EX1006 at 7 (top slide) (annotated below); EX2007 ¶68. The combustion of H₂ fuel will not produce CO₂. See EX2007 ¶71.



Further, the referenced “use combustion air preheat to reduce fuel firing” appears in a bullet point on page 8 of 2007 IFA, but there is no reference to a “fuel fraction,” let alone the required “CO₂-depleted synthesis gas,” and no connection of that bullet point to any figure in 2007 IFA. EX1006 at 7-8; EX2007 ¶77.

Thus, the “Package HP Steam Boiler” on page 8 of 2007 IFA cannot be the

“steam production and/or superheating furnace” claimed in Proposed Substitute Claim 24 because it is not fed the required CO₂-depleted synthesis gas. Therefore, Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 1.

The Petition further asserts that “*2007 IFA* also discloses feeding the fuel fraction to a steam production furnace,” citing to pages 8 and 9 of *2007 IFA*. Petition at 20. It is not clear what “steam production furnace” the Petition is pointing to here. If it is the “Package HP Steam Boiler” on slide 8, the same arguments presented above apply. If, on the other hand, the Petition is pointing to the “Steam and Power Production” component shown in the top slide on page 9, *2007 IFA* shows that that component is fed with “Natural Gas,” not a “CO₂-depleted synthesis gas.” EX1006 at 9. Finally, if the Petition is pointing to the “GT” and/or “HRSG” on the bottom slide on page 9, the “GT” is not a “furnace” as explicitly defined by the specification of the ’168 Patent (EX1001 at 2:47-52) and the “HRSG” is fed the exhaust from the “GT,” not a “CO₂-depleted synthesis gas.” EX2006 at 9. Accordingly, the purported “steam production furnace” on page 8 and/or page 9 of *2007 IFA* is not either fed “said fuel fraction of the synthesis gas” and/or is not a “furnace” as properly construed and thus Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 1.

Proposed Substitute Claim 25 reads: “The process of claim 1, wherein said fuel fraction of the synthesis gas feeds said at least one furnace(s) for pre-heating the

charge of the autothermal reformer.” Proposed Substitute Claim 26 reads: “The process of claim 1, wherein said fuel fraction of the synthesis gas feeds said at least one furnace(s) for pre-heating the charge of a natural gas desulphurization section.” The same issues related to the “fuel fraction” as addressed with respect to Proposed Substitute Claim 24 apply to both Proposed Substitute Claims 25 and 26.

Beyond conclusory asserting that “[a]ccordingly, *2007 IFA* teaches feeding one or more of (1) a steam production and/or superheating furnace [corresponding to Proposed Substitute Claim 24—discussed above] ***and (2) one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section***” [corresponding to proposed claim 25 and 26] (emphasis added), the Petition and cited expert testimony do not address this claim limitation. That is, the Petition and cited expert testimony (EX1005 ¶ 205) do not identify any furnace “for pre-heating the charge of the autothermal reformer” or “for pre-heating the charge of a natural gas desulphurization section.” Moreover, Petitioner’s expert, Dr. Ritter, agrees that *2007 IFA* does not disclose “one or more furnaces for pre-heating the charge of the ATR.” EX2008 at 116:18-20 (“Q. Okay. Does this show using fuel to pre-heat the charge of an autothermal reformer? A. No.”). Put differently, there is no analysis at all by Petitioner related to *IFA 2007* that would apply to Proposed Substitute Claims 25 or 26, and Dr. Ritter actually agrees that *2007 IFA* would not apply to proposed Claim 25. Thus, Proposed Substitute Claims 25 and 26 are responsive to, and

patentable over, Ground 1. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25 and is patentable for the same reasons. Because different arguments are used by the Petition with respect to each subpart of current Claim 10, permitting the amendment of Claim 10 would allow those arguments to be evaluated independently.

B. Ground 2

Ground 2 asserts that *Rytter* anticipates or renders obvious Claim 10. *See* Petition at 1-2, 45. Specifically, the Petition asserts that “*Rytter* discloses feeding the fuel fraction to use as fuel in a furnace, including to “steam producing electrical power.” EX1008, 6:8-13.” Petition at 45. It then summarily concludes, “[a]ccordingly, *Rytter* teaches feeding one or more of (1) a steam production and/or superheating furnace and (2) one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section,” citing Dr. Ritter’s declaration at ¶ 206. *Id.* That paragraph of the declaration is identical to the Petition’s two sentences on Claim 10 in Ground 2. *Compare* Petition at 45 *with* EX1005 ¶ 206.

Petitioner points to the *Rytter* disclosure of a “hydrogen power station 7.” EX1008 at 6:8-12 (“The surplus of the hydrogen, which is separated in the separator 6, may be passed to a hydrogen power station 7, which is also supplied with air for the combustion of the hydrogen gas to steam producing electrical power.”); *see also id.* at 1:33-36 (“A possible new use is as fuel for gas turbines of heat generating

stations to thus considerably reduce the emission of CO in the production of electrical power”). *Rytter*’s hydrogen power station 7 is not a “furnace” as explicitly defined by the specification of the ’168 Patent (EX1001 at 2:47-52). The Petition offers no other support for the conclusory assertion that “[a]ccordingly, *Rytter* teaches feeding one or more of (1) a steam production and/or superheating furnace and (2) one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section.” Petition at 45. Petitioner seems to be pointing to the hydrogen power station of *Rytter* for this limitation because it discusses steam production, but because *Rytter* does not disclose or suggest “feeding a steam production and/or superheating furnace,” Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 2.

Further, there is no support at all for the Petitioner and cited expert testimony’s assertion that “[a]ccordingly, *Rytter* teaches (2) *one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section*” (emphasis added). See Petition at 45. That is, unlike the argument regarding steam generation, the Petition and cited expert testimony (EX1005 ¶ 205) do not identify any furnace “for pre-heating the charge of the autothermal reformer” or “for pre-heating the charge of a natural gas desulphurization section.” See *id.* Therefore, Proposed Substitute Claims 25 and 26 are responsive to, and patentable over, Ground 2. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim

25 and is patentable for the same reason.

C. Grounds 3, 3A, and 3B

Ground 3 asserts that *Fjellhaug* anticipates Claim 10, Ground 3A asserts that *Fjellhaug* renders obvious Claim 10, and Ground 3B asserts that *Fjellhaug* in view of *Rytter* renders obvious Claim 10. *See* Petition at 1-2, 57, 58, 61.

Specifically, for Ground 1, the Petition asserts “*Fjellhaug* discloses the fuel fraction being suitable for combustion in gas turbines and the combustion exhaust heat is used to produce steam. EX1010, 3:14-15, 4:38-50. The Petition continues: “A POSA would have understood gas turbines to be within the scope of a superheating furnace. EX1005 ¶ 208. Further, the ’168 Patent defines the furnace using the fuel to include gas turbines. EX1001, 7:44-53; EX1005 ¶¶ 60, 208.”

The Petition again ignores the express definition of furnace in the ’168 Patent and is also pointing only to “ways” “to produce the electricity necessary for the synthesis of ammonia,” including “expansion in a turbo generator of a flow of steam produced in a steam generator or steam superheater” (*i.e.*, the turbo generator is using the steam produced by the “steam generator or steam superheater”) or “combustion in a gas turbine or in a gas engine.” EX1001 at 7:44-53. The “combined cycle gas turbine for the production of electric energy” disclosed by *Fjellhaug* is not “a steam production and/or superheating furnace.” EX1010 at 3:15-16. Thus, Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 3.

Ground 3 does not assert that *Fjellhaug* discloses one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section. Petition at 57. Moreover, Petitioner's expert agrees. *See* EX2008 at 157:9-19 ("Q: Does Fjellhaug disclose one or more furnaces for pre-heating the charge of an autothermal reformer? A. I don't believe so, no. Q. Okay. Does *Fjellhaug* disclose one or more furnaces for pre-heating the charge of the natural gas desulfurization section? A. I believe the only furnace is in the cogen combined cycle turbine. Q. So not --A. So 'no' to your question."). Based on Petitioner's expert's admission which relates only Proposed Substitute Claims 25 and 26, those claims are responsive to, and patentable over, Ground 3. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25 and is patentable for the same reason.

With respect to Ground 3A, the Petition asserts that "[t]o the extent that *Fjellhaug* does not disclose the furnace being a steam production and/or superheating furnace, a POSA would have understood that *Fjellhaug* could have been modified to use a steam production and/or superheating furnace, which was well-known in the art." Petition at 58. But the Petition and cited expert testimony (¶¶ 56, 60, 208) say nothing about *how* *Fjellhaug* could have been modified to use a steam production and/or superheating furnace or *why* a POSA would have modified *Fjellhaug* to use a steam production and/or superheating furnace. *See Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) ("Without any

explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against.”); *In re Stepan Co.*, 868 F.3d 1342, 1346 (Fed. Cir. 2017) (“Stating that a person of ordinary skill in the art would have arrived at the claimed invention through routine optimization falls short....Missing from the Board’s analysis is an explanation as to *why* it would have been routine optimization to arrive at the claimed invention. Similar to cases in which the Board found claimed inventions would have been ‘intuitive’ or ‘common sense,’ the Board must provide some rational underpinning explaining why a person of ordinary skill in the art would have arrived at the claimed invention through routine optimization.”).

Considering the Petition’s insufficient conclusory assertion regarding modifying *Fjellhaug* to “to use a steam production and/or superheating furnace,” Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 3A.

Ground 3A does not assert that *Fjellhaug* discloses one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section (and as discussed above, Petitioner’s expert admits that). Petition at 58. Thus, Proposed Substitute Claims 25 and 26 are responsive to, and patentable over, Ground 3A. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25 and is patentable for the same reason.

With respect to Ground 3B, the Petition further adds that “[f]urther, *Rytter*

discloses using a steam production and/or superheating furnace.” Petition at 61. As explained above, Rytter does not. Moreover, the Petition does not explain why a POSA would modify *Fjellhaug* to add “a steam production and/or superheating furnace” from *Rytter* or how a POSA would do so. The Petition merely generally states that “each discloses processes with substantial overlap” and “a POSA would have known that one process that discloses, *e.g.*, conversion of natural gas in a conversion section, a CO-shift reaction, and CO₂ removal, could be modified by applying process steps used in another process that discloses the same overlapping steps.” Petition at 64. The cited expert testimony (EX1005 ¶ 284) does not add any further explanation. Thus, Proposed Substitute Claim 24 is responsive to, and patentable over, Ground 3B.

For the reasons discussed in detail above, Ground 3B does not assert that *Fjellhaug* or *Rytter* disclose one or more furnaces for pre-heating the charge of the ATR or natural gas desulphurization section. Petition at 61. Thus, Proposed Substitute Claims 25 and 26 are responsive to, and patentable over, Ground 3B. Proposed Substitute Claim 27 is substantially the same as Proposed Substitute Claim 25 and is patentable for the same reason.

X. CONCLUSION

For the foregoing reasons, if the Board finds that Claim 1 and original Claim 10 are unpatentable, the Board should grant this MTA, cancel Claim 10 and

substitute Proposed Substitute Claims 24, 25, and 26 or, in the alternative, the single Proposed Substitute Claim 27, in accordance with the claim listing in Appendix A.

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CERTIFICATE OF COMPLIANCE WITH PAGE LIMITS

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Motion to Amend complies with the page limit requirements of 37 C.F.R. §§ 42.24(a)(1)(vi), (b)(3) because it contains 25 pages, excluding the parts of that are exempted.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on May 11, 2026, a complete and entire copy of this PATENT OWNER'S CONTINGENT MOTION TO AMEND UNDER 37 C.F.R. § 42.121 INCLUDING REQUEST FOR PRELIMINARY GUIDANCE was served on the Petitioner via electronic mail at the following addresses:

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APPENDIX A

Original Claim	Proposed Amendments
<p>10. The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; or one or more furnaces for pre-heating the charge of the autothermal reformer or natural gas desulphurization section.</p>	<p>10<u>24</u>. The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; or one or more furnaces for pre-heating the charge of the autothermal reformer or natural gas desulphurization section.</p>
	<p>10<u>25</u>. The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; <u>or said at least one</u> or more furnace[[s]] for pre-heating the charge of the autothermal reformer or natural gas desulphurization section.</p>
	<p>10<u>26</u>. The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; <u>or said at least one</u> or more furnace[[s]] for pre-heating the charge of the <u>a</u> autothermal reformer or natural gas desulphurization section.</p>

Original Claim	Proposed Alternative Amendment
<p>10. The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; or one or more furnaces for pre-heating the charge of the autothermal reformer or natural gas desulphurization section.</p>	<p>1027 The process of claim 1, wherein said fuel fraction of the synthesis gas feeds one or more of the following apparatuses: a steam production and/or superheating furnace; or <u>said at least one or more</u> furnace[[s]] for pre-heating the charge of the autothermal reformer or natural gas desulphurization section.</p>