UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT TRIAL AND APPEAL BOARD

Topsoe, Inc.

Petitioner,

v.

Casale SA

Patent Owner.

Case No. IPR2025-01454[1]

Patent No. 11,286,168

Petitioner's Ranking and Explanation Of Material Differences Between Multiple Petitions

[1] Petitioner is filing a substantively identical document in IPR2025-01455.

I. Introduction

Petitioner is filing two concurrent Petitions challenging claims of U.S. Patent No. 11,286,168 ("the '168 patent"). Pursuant to the November 2019 Consolidated Trial Practice Guide, Petitioner Topsoe, Inc. submits this notice identifying: (1) a ranking of the Petitions in the order in which it wishes the Board to consider the merits, if the Board uses its discretion to institute any of the Petitions, and (2) a succinct explanation of the differences between the Petitions, why the issues addressed by the differences are material, and why the Board should exercise its discretion to institute the additional Petition.

Here, Petitioner submits that two petitions are required because of the extent of relevant prior art, the number and complexity of the claim limitations found in the challenged claims, the number of claims challenged (14), and the depth of analysis presented in the petitions. As explained below, the multiple petitions are appropriate in this instance and Petitioner respectfully requests that the Board exercise its discretion to institute both petitions.

II. Ranking of the Petitions

Petitioner's two petitions present a strong showing of unpatentability and as explained below, should each be instituted and given full consideration. Notwithstanding, to aid the Board in its initial assessment of the petitions,

Petitioner provides the following ranking of the order in which it wishes the Board to consider the petitions:

1. IPR2025-01454 ("Petition 1"); and
2. IPR2025-01455 ("Petition 2").

III. Explanation of the Differences Between the Petitions

The two petitions present materially different issues and are not redundant. They present alternative approaches to unpatentability, with different primary references applied in different ways to the claims. For this reason, as well as the number and complexity of claims at issue, the Board should exercise its discretion to institute both petitions.

The petitions challenge the same claims over different prior art references:

Petition	Challenged Claims	Grounds
Pet. 1	1, 5-6, 10	1: § 102 over 2007 IFA
	3-4, 8-9, 11, 17-19	1A: § 103 over 2007 IFA
	3, 4, 8, 9	1B: § 103 over 2007 IFA and Rytter
	2, 7, 19	1C: § 103 over 2007 IFA and Price
	11	1D: § 103 over 2007 IFA and Ji
	17	1E: § 103 over 2007 IFA and Licht
	1, 3-4, 8-10, 18	2: §§ 102/103 over Rytter
	2, 5-7, 19	2A: § 103 over Rytter and Price
	11	2B: § 103 over Rytter and Ji
	17	2C: § 103 over Rytter and Licht
	1, 2, 5-6, 10, 19	3: § 102 over Fjellhaug
	3-4, 7, 10	3A: § 103 over Fjellhaug
	1, 3-4, 8-10, 18	3B: § 103 over Fjellhaug and Rytter
	11	3C: § 103 over Fjellhaug, Rytter, and Ji
	17	3D: § 103 over Fjellhaug, Rytter, and Licht
Pet. 2	1, 7, 10	4: § 102 over Terrien
	1, 3-6, 8-9, 18-19	4A: § 103 over Terrien
	1, 2, 5-7, 19	4B: § 103 over Terrien and Price
	11	4C: § 103 over Terrien, Price, and Ji
	17	4D: § 103 over Terrien, Price, and Licht
	3-4, 8-9	4E: § 103 over Terrien, Price, and Rytter
	1-10, 17, 19	5: § 103 over Licht and Price
	11	5A: § 103 over Licht, Price, and Ji
	3-4, 8-9	5C: § 103 over Licht, Price, and Rytter

The ’168 patent claims “[a] process for synthesis of ammonia from natural gas.” EX1001, claim 1. Claim 1 is the only independent claim of the ’168 patent, includes 179 words, and recites a number of discrete, detailed steps in the process: (1) “conversion of a charge of desulphurized natural gas and steam, with oxygen-enriched air or with oxygen, into a synthesis gas containing hydrogen, CO and

CO2, in a conversion section including an autothermal reformer downstream from a pre-reformer and without a primary reformer therebetween"; (2) "treatment of said synthesis gas including at least a shift reaction of the carbon monoxide into CO2, and subsequent separation of CO2 from the gas, thus obtaining a CO2-depleted synthesis gas and a CO2-rich gaseous flow containing the CO2 separated from the gas"; (3) "separation of a part of said CO2-depleted synthesis gas as fuel fraction, wherein said fuel fraction is fed as fuel to at least one furnace"; (4) "and wherein said separation of the fuel fraction includes the split of said CO2-depleted synthesis gas into at least a first stream and a second stream"; (5) "said first and second streams having the same composition"; (6) "wherein the first stream forms the fuel fraction and the second stream is process gas intended for the synthesis of ammonia." In addition to independent claim 1, Petitioner challenges dependent claims 2-11 and 14-19. These dependent claims recite largely disparate elements requiring presentation of additional grounds. Together the independent claim and dependent claims are lengthy and complex in subject matter, as well as detailed and specific requiring more analysis and explanation. Additionally, multiple petitions are necessary to accommodate the word count limit.

Petition 1 includes three different primary references: *2007 IFA, Rytter*, and *Fjellhaug*. Petition 2 includes two different primary references: *Terrien* and *Licht*. Each of these primary references, standing alone, discloses substantially all of at

least independent claim 1. Thus, the two petitions are complementary at least in that they both discuss multiple separate primary references and combinations of primary references with secondary references that disclose each and every element of the challenged claims of the ’168 patent. The differences in the references also lead to differences in the obviousness analysis in each petition, as they have different starting points and they have differences in the motivations to combine and modifications to the respective primary reference’s teachings. The primary references included in Petition 1—*2007 IFA*, *Rytter*, and *Fjellhaug*—each support anticipation arguments for independent claim 1, as well as several dependent claims.

Additional factors support institution of multiple petitions. Because the petitions are filed simultaneously, they will be able to track the same schedule post-institution, maximizing the efficiency of depositions, briefing, and oral argument. In addition, Petitioner uses the same expert witness to support both petitions, meaning a single deposition should be sufficient.

Dated: August 22, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on August 22, 2025, a complete and entire copy of this Petitioner's Explanation and Ranking of Multiple Petitions was provided via Express Mail, postage prepaid, to the Patent Owner by serving the correspondence address of record as follows:

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The undersigned further certifies that a courtesy copy of the complete and entire Petitioner's Explanation and Ranking of Multiple Petitions was provided by electronic service to counsel retained by Patent Owner in the Related Matters identified herein:

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Dated: August 22, 2025

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