United States District Court
Southern District of Texas, Galveston Division

Topsoe, Inc. Plaintiff, vs. **Casale US, Inc.** **Casale SA** Defendants.	Case No.: 3:24-cv-00033 Jury Trial Demanded

FIRST AMENDED COMPLAINT

INTRODUCTION

1. This action arises out of Defendants' bad faith, fraudulent conduct aimed at procuring a patent on technology that they did not invent and then wielding that patent, and making false and misleading statements, to unfairly compete against Plaintiff Topsoe, Inc. ("Topsoe").

2. Topsoe is the U.S. subsidiary of Danish company Topsoe A/S, which has been one of the world's leading suppliers of chemical processing solutions and related technology for over 80 years. It supplies high-performance, proprietary technologies, engineering, and services to the chemical and oil and gas industries. Topsoe helps these industries to get the most out of their process and products using the least possible energy and resources and is at the forefront of developing sustainable technologies.

3. One of Topsoe's key environmentally sustainable technologies is its ammonia processes, currently also referred to as blue or low carbon ammonia processes, which are used to reduce greenhouse gases that are emitted during the process of creating ammonia. Ammonia (NH_3) is critical in the manufacturing of fertilizers and is one of the largest volume synthetic chemicals produced in the world. It is produced through a chemical reaction between hydrogen and nitrogen

at high pressure and temperatures. The process is highly energy-intensive, accounting for up to 2% of energy consumption and 3% of carbon emissions worldwide.

4. Topsoe is a pioneer in the field of ammonia technology, particularly targeting strategies for lowering carbon emissions, and began commercially selling and installing its ammonia technology in manufacturing facilities over 30 years ago. During that time Topsoe has extensively presented and published on its low carbon ammonia process and has obtained multiple patents protecting the technology in the United States and abroad.

5. Defendants Casale US, Inc. and Casale SA (collectively, "Casale") are direct competitors with Topsoe, and market and sell their own ammonia process. As described in more detail below, in 2019 Casale filed for a U.S. patent application claiming to have "invented" features of a low carbon ammonia process that had been used in Topsoe's own process for decades. Casale was well aware of this because, among other things, over the previous four years it had received extensive exposure and access to Topsoe's commercially installed ammonia process while working on revamping a factory in India that utilized the Topsoe process. Casale has also attended presentations where Topsoe had described these features of its ammonia process, including a presentation in 2009, *ten years earlier*. Casale received the pre-print of the Topsoe paper relating to the presentation, and the records from the conference confirm that Casale attended the Topsoe presentation. Casale misued Topsoe's information by including it in a patent application and misrepresenting that it had been developed by Casale.

6. Casale procured the U.S. patent through deception. During prosecution of the patent application Casale failed to disclose as prior art Topsoe's commercial process or the publications describing it, which were clearly material to the process Casale was trying to patent. Casale even failed to disclose its own material prior art disclosures from many years earlier which

publicly disclosed the key feature it impermissibly was trying to patent and therefore precluded Casale from trying to patent the technology.

7. After improperly obtaining the patent, Casale set out to deliberately disrupt Topsoe's customer relationships, falsely claiming that it owns technology that was developed by Topsoe, that Topsoe infringes its patents, and that any customer employing Topsoe's technology would be infringing its patents as well. When Topsoe asked Casale point blank whether it had contacted any of Topsoe's customers, Casale falsely claimed that it had not. Casale has also been wrongfully asserting that Topsoe infringes the patent.

8. Topsoe accordingly brings this action to have the Court declare that Casale's patent is unenforceable because of the fraud Casale committed in procuring the patent from the U.S. Patent and Trademark Office ("US PTO"). More specifically, Topsoe asks the Court to declare that Casale's U.S. Patent No. 11,286,168 (the "'168 Patent") and all related patents and applications of its family (collectively, the "Disputed Patents") are unenforceable, and to enjoin Casale from asserting the Disputed Patents any further. Topsoe further seeks to recover damages and hold Casale accountable for its wrongful acts in asserting the unenforceable patents, making false statements, and engaging in unfair competitive practices.

THE PARTIES

9. Topsoe, Inc. is a Texas corporation, with its principal place of business at 18050 Saturn Lane, Suite 400, Houston, Texas 77058.

10. Defendant Casale US, Inc. is a Texas corporation with a principal place of business at 2925 Richmond Ave, Suite 1218, Houston, Texas 77098.

11. Casale US, Inc. resides in the Southern District of Texas at least because it is incorporated in Texas and its principal place of business is in the Southern District of Texas.

12. Casale US, Inc. is a wholly owned subsidiary of Casale SA.

13. Casale SA is a privately owned Swiss company with headquarters in Lugano, Switzerland.

JURISDICTION AND VENUE

14. This is an action arising under the Lanham Act, 15 U.S.C. § 1125(a) and the patent laws of the United States, 35 U.S.C. §§ 271, *et seq*, and the Declaratory Judgement Act 18 U.S.C. §§ 2202 and 2202. Accordingly, this Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

15. Topsoe's unfair competition claim arises under Texas state law. This Court has subject matter jurisdiction over that claim pursuant to 28 U.S.C. § 1367, because it is so related to other claims in the action within the Court's original jurisdiction that it forms part of the same case or controversy. This Court also has jurisdiction under 28 U.S.C. § 1338(b) because Topsoe's unfair competition claim derives from a common nucleus of operative facts.

16. This Court has general personal jurisdiction over Casale US, Inc. due to its incorporation in Texas, and its principal place of business being located in the Southern District of Texas.

17. This Court has specific personal jurisdiction over Casale SA because this lawsuit arises out of and relates to Casale SA's affirmative acts in the Southern District of Texas. Among other things, Casale SA contacted representatives of Topsoe located in the Southern District of Texas repeatedly through its attorneys in an attempt to enforce its improperly obtained and unenforceable U.S. patent, insisting that Topsoe's ammonia process cannot be used without its written consent. Casale SA also purposefully directed its wrongful activities, including its false advertising and misleading statements, to at least one potential Topsoe customer to dissuade that

customer from installing Topsoe's ammonia technology at its facilities in Texas. Given the facilities location in Texas, Casale US would have been aware of and involved in the pursuit of potential Topsoe customers and would have been aware of and participated in these wrongful activities. Casale SA, in collaboration with Casale US, is actively and forcefully using its U.S. patent in a competitive context within the form of this suit. Casale SA purposefully directed its unlawful conduct to this district, has substantial business conducted in this district, and published false advertising and misleading statements and other unlawful acts in this district or affecting residents of this district.

18. Moreover, Casale SA controls the day to day activity of its wholly owned subsidiary, Casale US, Inc., which it holds out as its agent. Both share a website (https://www.casale.ch/contacts/casale-in-the-world) and share email domains (casale.ch). Casale's website includes no mention of specific activities or individuals associated with Casale US only.

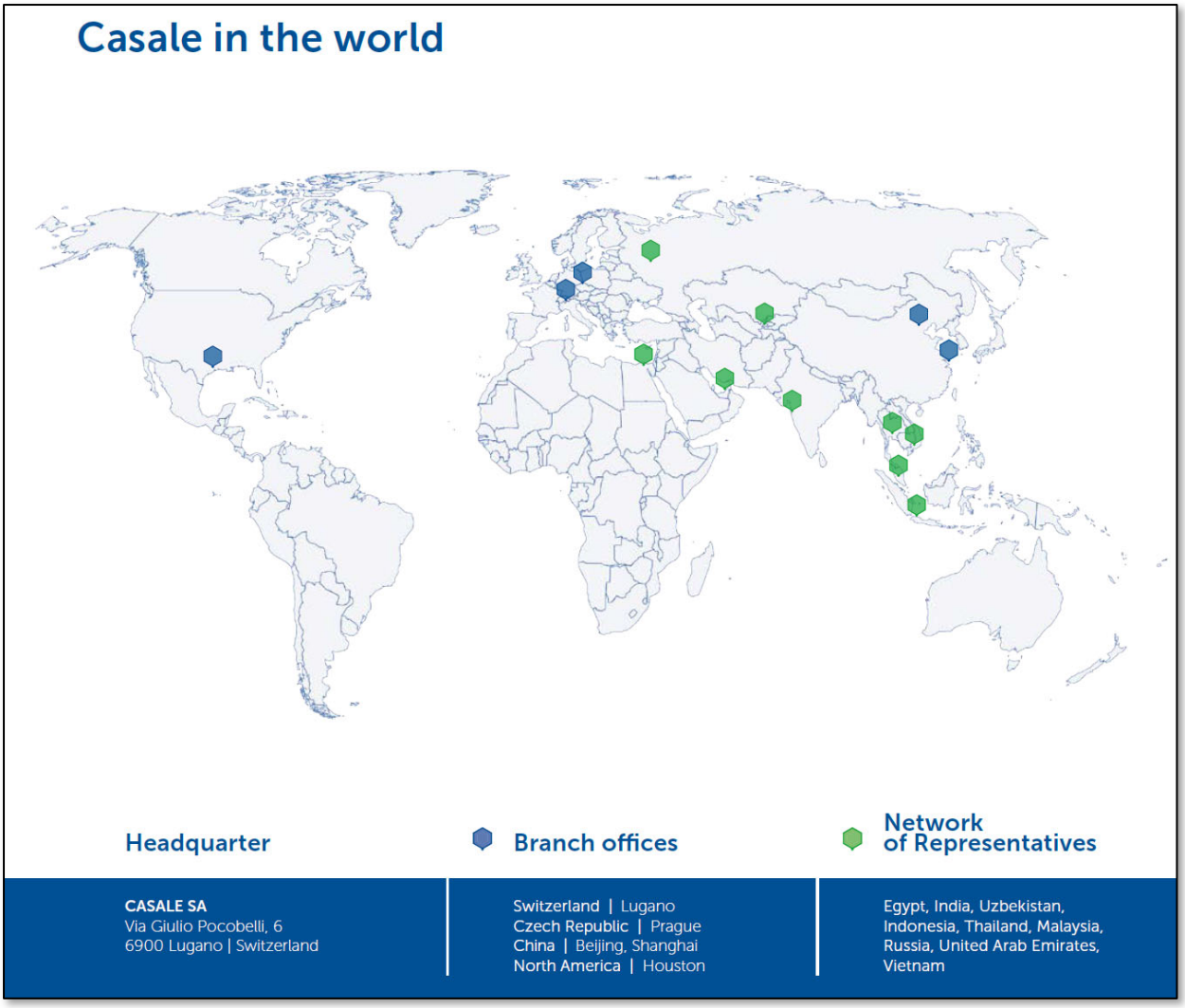
19. Consistent with this, Topsoe can find no reference to Casale US business activity online and can find no individuals online holding themselves out as employees of Casale US. Rather, employees of Casale US, including its sole officer, hold themselves out as employees of Casale SA. The current President of Casale US is Mr. Chris Mancinelli who is employed "full time" by Casale SA as "Sales Manager - Americas at Casale SA" and located in Houston. *See* https://www.linkedin.com/in/chris-mancinelli-922b82/. Casale US thus appears to have no significant employees of its own.

20. Upon information and belief, Casale US appears to be undercapitalized, and does not have operations separate from Casale SA. Casale US's certificate of formation shows that it has authority to issue 10,000 shares with no value., Casale US has no separate website and is

indistinguishable from Casale SA in public press releases and announcements. Casale US appears to exist for purposes of marketing, promoting, and selling Casale SA technology in the US.

21. On information and belief, Casale SA uses Casale US's property as its own. For at least these reasons, Casale US and Casale SA have failed to observe corporate formalities and, accordingly, Casale US's jurisdictional contacts may be imputed to Casale SA.

22. Additionally, Casale SA holds itself out as a global company with "a network of representative offices and agents all over the world." *See* https://www.linkedin.com/company/casale-sa/about/. One of Casale SA's global offices is located in Houston, Texas, and Casale SA has at least one managing agent based out of Houston, Texas.In fact, in promotion materials for blue ammonia Casale SA represents that it has a branch office located in Houston.



23. Defendants, via themselves and/or their subsidiaries or affiliates, regularly conduct and transact business throughout the United States, in the State of Texas, and within the Southern District of Texas. In addition, Casale SA is the assignee of the '168 Patent and Casale prosecuted the '168 Patent before the USPTO through its attorney representatives as described below.

24. Casale SA has also filed a lawsuit asserting claims in the Southern District of Texas in at least one prior litigation: *Ammonia Casale S.A. v M/V Skanderborg, et al.* No. 4:00-cv-2121 (S. D. Tex.).[1]

25. Casale SA's website (https://casale.ch/about/) states: "Casale is a private Group with over 400 professionals, headquartered in Switzerland and present in the Czech Republic, China, and the United States. Casale Holding is the sole owner of the Group Casale."

26. Casale SA has employees that work in Houston, Texas. These employees include at least one senior process engineer currently working in Houston. https://www.linkedin.com/in/robertfsmithpe/. Casale SA also advertises to hire employees in Houston. *See* https://casale.ch/people-careers/job-opportunities/?_sft_job_locations=houston-texas-united-states.

27. Casale SA has imported ammonia process equipment into the U.S. and into this district through the Port of Houston.

28. In addition, Casale SA has licensed low-carbon ammonia technology (Flexiblue®) for use at a facility located in this district, including, on information and belief, the '168 patent technology, which impose enforcement obligations with a party residing in Texas. https://www.casale.ch/news/casale-8-rivers-capital-on-the-forefront-of-chemical-industrys-energy-transition.

29. In the alternative, this Court has personal jurisdiction over Casale SA under Federal Rule of Civil Procedure 4(k)(2)(A) because: (a) Topsoe's claims arise under federal law; (b) Casale

[1] Ammonia Casale SA is predecessor to Casale SA. *See* June 19, 2014 press release https://casale.ch/harmonized-skills-to-serve-you-best/#:~:text=We%20are%20pleased%20to%20announce,the%20name%20of%20Casale%20SA ("We are pleased to announce that, Ammonia Casale, Urea Casale, Methanol Casale and Casale Chemicals have merged into a single entity, which will trade under the name of Casale SA.").

SA is a foreign defendant not subject to personal jurisdiction in the courts of any State; and (c) Casale SA has sufficient contacts with the United States as a whole, including, but not limited to, filing lawsuits in the United States and licensing and designing plants located within the United States, such that this Court's exercise of jurisdiction over Casale SA satisfies due process and comports with the Constitution and laws of the United States.

30. Additionally, Casale SA has sought patent protection in the U.S. and filed the '168 patent application at the U.S. PTO. Similarly, Casale SA has registered a trademark at the U.S. PTO for its low-carbon blue ammonia technology, Flexiblue®, which Casale SA has described as covering goods/services directed to "Licensing of patents; legal services, namely, licensing of trademarks; licensing of intellectual property rights."

31. Venue is proper in the Southern District of Texas pursuant to 28 U.S.C. §§ 1391, at least because Casale US is incorporated in the State of Texas, has its principal place of business in the Southern District of Texas and at least because Defendants have committed acts of false advertising and unfair competition in the Southern District of Texas and attempted to enforce their unenforceable patent in the Southern District of Texas. Venue is also proper in the Southern District of Texas pursuant to 28 U.S.C. § 1391(c)(3), as Casale SA is not a resident of the United States and, accordingly, they may be sued in any judicial district.

FACTUAL ALLEGATIONS

Topsoe's Contributions to the Field of Low Carbon Ammonia Technology

32. Topsoe Inc. was incorporated in 1961 and is a wholly owned subsidiary of Topsoe A/S. Topsoe A/S was founded in 1940 by chemical engineer Dr. Haldor Topsoe and is headquartered in Ravnholm, Kgs. Lyngby, Denmark. It has been a provider of industry-leading chemical processing solutions and related technologies in the over 80 years since its founding.

33. Topsoe, Inc. employs approximately 220 full time employees, including 128 at its catalyst manufacturing facilities located at Pasadena, Texas, and approximately 90 at its principal corporate offices in Houston, Texas.

34. Topsoe has long been a leader in the development and commercial implementation processes to produce ammonia. Topsoe has worked to develop ammonia processes, particularly targeting low carbon emissions, which it currently markets commercially under the name SynCOR™ ammonia, low carbon, or blue ammonia, to reduce CO_2 emissions for more than two decades.

35. Topsoe A/S owns numerous United States patents in the field of low carbon ammonia technology, and Topsoe, Inc. is the exclusive licensee (with rights to license to its clients) of those patent rights in the United States.

36. Apart from its patents, Topsoe's low carbon ammonia technology has been presented at industry conferences and implemented commercially in ammonia plants around the world.

37. An example is the 2009 Fertilizer Association of India (FAI) Annual Seminar where Topsoe described aspects of its low carbon ammonia process in a presentation and companion paper both titled "Energy efficiency and CO_2 reduction potential in ammonia plants based on lean gas." Of particular relevance here, the presentation and paper both describe as part of Topsoe's process splitting the synthesis gas stream into two streams one of which is used as fuel—a key feature that Casale would claim to have invented a decade later.

38. Another, much more recent example, is Topsoe's presentation and publication about its blue ammonia process at the AICHE Ammonia Safety Conference on September 13, 2022. Topsoe's paper entitled "Decarbonize with blue ammonia," and authored by Ameet Kakoti

and Per Juul Dahl, noted that "[m]ore than 20 years ago, i.e. before the decarbonization took off, Topsoe introduced the foundations for the SynCOR™ concept."

39. Topsoe's ammonia technology also has been used in commercial ammonia plants. Topsoe designed an ammonia plant for the Indian Farmers Fertilizer Cooperative Ltd. (IFFCO), Aonla, India. The first unit at IFFCO was commissioned in May 1988 and the second unit in December 1996. Both units are based on Topsoe's low carbon ammonia technology, including the splitting of a synthesis gas stream into two streams of the same composition in which one of the streams is used as fuel.

Casale's Knowledge of and Access to Topsoe Technology

40. Casale has long been aware of Topsoe's low carbon ammonia technology.

41. Casale is a regular attendee and presenter at Fertilizer Association of India ("FAI") meetings, attended the 2009 FAI meeting, and received preprints of the seminar papers, including the ammonia paper authored by Topsoe. Materials from the conference show that Casale attended the Topsoe presentation.

42. Casale circulated information from industry meetings and events within the company. For example, US 7,465,324, which lists Ermanno Filippi as sole inventor, refers to prior art processes of competitors that were presented at an industry meeting. US 7,465,324 col. 1, ll. 58-63. ("Processes of this type have been described for example in the following papers: "Synetix's advanced gas heated reformer, P. W. Farnell" and "New Kellogg Brown & Root ammonia process, Jim Gosnell"; both expounded at the "44th AIChE Annual meeting on safety in ammonia plants and related facilities", Seattle, USA, 27-30 Sep. 1999."). Another example is US 2002/0151749, which lists as a co-inventor Federico Zardi, and refers to "AIChE Ammonia Safety Symposium, Boston September 1996." US 2002/0151749 ¶ 9.

43. Additionally, Ermanno Filippi, Francesco Baratto, and Raffaele Ostuni regularly present at industry events, including events in the United States. For example, Ostuni presented on blue ammonia at the 2022 Ammonia Energy Association meeting in Phoenix, Arizona, Baratto presented on blue ammonia at the 2021 Arab Fertilizer Association, and Filippi was a panelist for low-carbon ammonia plants at the 2023 Ammonia Energy Association Annual Conference in Atlanta (for which Casale was a sponsor).

44. On information and belief, Filippi, Baratto and Ostuni maintain a close working relationship in which technical information is shared between them. For example, they are listed as co-inventors in US 2019/0023565. Indeed, in this application Filippi, Baratto and Ostuni attempted to claim "a method for revamping of an ammonia plant" and Casale's work on the IFFCO plant in India described above was a revamp.

45. Casale also gained access to the IFFCO plant in which Topsoe's low carbon ammonia technology had been installed. Casale gained detailed information about Topsoe's ammonia technology as part of a revamp project at IFFCO in 2014. Casale was responsible for the design and supply of equipment for the revamp.

46. As part of Casale's work on the IFFCO ammonia units, it was given access to Topsoe's design for the ammonia units and learned—similar to what had been described in Topsoe's 2009 paper—that Topsoe's design included splitting a synthesis gas stream into two streams of the same composition so one stream could be used as a fuel.

47. Casale's knowledge of Topsoe's work in ammonia synthesis is further evidenced by Casale's citation to Topsoe processes in prior patent applications, including citation by Casale's Chief Technology Officer, Ermanno Filippi. *See, e.g.*, US2012/0279033 (referring to and providing a diagram of a Topsoe ammonia synthesis loop); US2019/0023565 (naming as inventors

Ermanno Filippi, Francesco Baratto, and Raffaele Ostuni, based upon a PCT application filed by Marco Zardi, and rejected by the PTO over Topsoe prior art references including a PCT application entitled "Process for the production of ammonia").

48. Accordingly, Casale has had access to, and detailed information about, Topsoe's low carbon ammonia process since as early as 2009, if not earlier.

Casale's Application for and Prosecution of the '168 Patent

49. Casale filed the application for the '168 Patent with the US PTO on August 13, 2019, shortly after completing its work on revamping the IFFCO plant where Topsoe's technology had been installed.

50. The '168 Patent issued on March 29, 2022.

51. The '168 Patent is related to EP 3,583,067 (the "'067 Patent"), filed on January 31, 2018. Both the '168 Patent and the '067 Patent are related to EP 3,363,770 (the "'770 Patent"), filed on October 6, 2017.

52. Attorneys of Dorsey & Whitney LLP, including Marcus S. Simon (Reg. No. 50,258) represented Casale in the prosecution of the '168 patent.

53. The claims of the '168 patent require, among other things, splitting a synthesis gas stream into two streams of the same composition so one stream could be used as a fuel, just as was done by Topsoe's technology that had been in use at the IFFCO plant. Specifically, claim 1 of the '168 patent requires "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 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, said first and second streams having the same composition." *See* claim 1.

54. All patent applicants and persons involved with the substantive preparation of a patent application have a duty of candor to disclose to the US PTO all known prior art or other information that may be material to the patentability of the invention. This prior art information is disclosed in the form of an Information Disclosure Statement ("IDS") Casale filed one IDS during prosecution of the '168 Patent on August 13, 2019. In this IDS, Casale disclosed only a limited number of prior art references.[2] Casale did not disclose any prior art references, including prior uses, that were attributed to Topsoe, despite being aware of Topsoe's low carbon ammonia technology since at least as early as 2009 and having been extensively exposed to it as part of its work at the IFFCO plant.

55. Casale's inclusion in its claims of the requirement of splitting the synthesis gas into two streams having the same composition so one stream could be used as fuel—the concept which it knew Topsoe was already using and had repeatedly published—played a crucial part in Casale's ability to procure the patent. To overcome a rejection by the US PTO of its claim, Casale argued to the Examiner that the "distinguishing feature of the 'first and second streams having the same composition,'…plays a substantial role in the solution of the technical problem underlying the claimed subject matter. Due to the fact that a stream of CO2-depleted synthesis gas (i.e., a gas very poor in CO2 and rich in nitrogen and hydrogen) is used as a fuel in the furnace, instead of a methane rich stream as suggested by [the prior art] it is advantageously possible to reduce the CO2 emissions of the process if compared to [the prior art]." Reply to Office Action dated April 28, 2021.

[2] Casale disclosed only the following prior art references: (1) U.S. Pub. No. 2004/0234426; (2) U.S. Pub. No. 2014/0248205; (3) U.S. Pub. No. 2015/0031916; (4)WIPO Pub. No. 2010/018550; (5) International Preliminary Report on Patentability for International Application No. PCT/EP2018/052358 completed May 10, 2019; and (6) International Search Report from International Application No. PCT/EP2018/052358 mailed July 31, 2018.

56. At the time Casale and its lawyers made these statements, Casale knew that the Topsoe ammonia technology included this same "same distinguishing feature" but intentionally hid this information from the Examiner in order to secure allowance of the patent.

57. Casale's strategy worked, and the Examiner withdrew the rejection. The Examiner's reason for allowing the claims was the "distinguishing feature of the first and second streams having the same composition." Notice of Allowance dated Nov. 18, 2021.

Casale's European Patent

58. As noted above, the European counterpart to the '168 Patent, is the '067 Patent.

59. European Patent Office ("EPO") procedure allows for any member of the public to file an opposition to any patent granted by the EPO within the first nine months after the patent issues. Almost immediately after it was granted, Casale's '067 Patent was in jeopardy. An opposition to the '067 Patent was filed by Linde AG and Thyssenkrupp Industrial Solutions AG (the "European Opposition"), bringing to the attention of the EPO additional prior art that Casale had not put before the EPO that called the viability of Casale's patent into serious question.

60. Casale recognized the severity of the challenge to its patent from the prior art included in the European Opposition. Casale had not disclosed this prior art to the US PTO either. As discussed in more detail below, Casale filed a "supplemental examination" in the US PTO and submitted the prior art from the European Opposition to the US PTO.

61. Both the '067 Patent and the related '770 patent were prosecuted on behalf of Casale by European law firm M. Zardi & Co. SA ("Zardi").

62. Zardi was founded in 1999 by Marco Zardi and is a Swiss law firm specializing in intellectual property.

63. Both the US and European patents are based on the same PCT application filed by Zardi, and specifically, Marco Zardi.

64. Zardi also is representing Casale in the European Opposition.

65. Zardi, including Marco Zardi and Riccardo Biazzi, also were substantively involved in the prosecution of the '168 Patent.

66. The current Chief Executive Officer of Casale is Frederico Zardi.

67. On information and belief, Marco Zardi and Federico Zardi (CEO of Casale) are blood relatives.

68. On information and belief, Casale engaged Zardi, rather than a law firm with no affiliation with Casale or its officers, to assist it in its wrongful scheme to prosecute the U.S. patent without disclosing the material prior art, and to attempt to improperly enforce it by corresponding directly with Topsoe to demand a license, and to assist with correspondence to at least one Topsoe potential customer.

Casale's Communications with Topsoe Customers

69. Unbeknownst to Topsoe at the time, Casale began communicating with Topsoe customers about the Disputed Patents and Topsoe's low carbon (blue) ammonia technology beginning in the Fall of 2022.

70. Casale raised the Disputed Patents, including the '168 Patent, in a November 2022 letter to at least one Topsoe customer who is planning to develop low carbon (blue) ammonia projects in Texas and Louisiana. The letter was an effort by Casale to license the '168 patent for use in the United States and specifically for use in this forum.

71. Casale's communications to that customer referred to Casale's rights in the Disputed Patents, including the '168 Patent, and expressly represented that the Disputed Patents were enforceable.

72. The one feature of the patented technology that is mentioned in the letter is the technique that, as Casale knew, has been used by Topsoe in its commercial installations and disclosed in its publications since at least 2009 of splitting the synthesis gas stream into two streams one of which is used as fuel. Specifically, Casale stated that the patent concerns "a process for the synthesis of ammonia wherein part of the hydrogen-containing process gas is used as a fuel fraction to reduce the consumption of hydrocarbon fuel and, consequently, to reduce emissions of carbon dioxide." Casale represented that, according to its evaluation, without the use of this technique, "the result would anyway be a higher plant cost and a lower efficiency."

73. Casale's letter to the customer referred to Topsoe's blue ammonia technology and Topsoe's 2022 AICHE paper and presentation and attached a copy of the Topsoe's paper claiming that it fell within the scope of the patent.

74. Casale's communications were made to disparage and malign Topsoe by characterizing Topsoe as an infringer, as well as to threaten customers with patent infringement should they choose to do business with Topsoe. Casale was hoping to scare customers away from doing business with Topsoe now, and in the future.

75. The European Opposition, filed on June 8, 2022, predates Casale's communications to Topsoe's customer. Casale's communications did not include any information related to the European Opposition of the '607 Patent, however, nor did Casale reveal that the prior art raised in those opposition proceedings raised significant concerns about the enforceability and validity of the Disputed Patents.

76. The European Opposition, in which the validity of the '607 Patent is being disputed, was relevant to the contents of Casale's communications at the time sent. The prior art references cited in the European Opposition are material to patentability and enforceability of the Disputed Patents.

77. Casale knew that the European Opposition was relevant to the contents of the Casale's communications to customers at the time sent. Casale knew that the prior art references cited in the European Opposition are material to patentability and enforceability of the Disputed Patents at the time Casale sent its communications to Topsoe's customer.

78. In addition, no reference was made in Casale's communications to any of Topsoe's prior art publications to which Casale had access, many of which predate the '168 Patent or to the fact that Topsoe had been using the accused technology many years before the patent was filed. And no reference was made to the fact that Casale had failed to put any of the Topsoe prior art or the prior art raised in the European Opposition when it obtained the patent from the US PTO.

79. Casale knew that its patent was invalid and unenforceable but engaged in these communications regardless. Casale knew that these statements were objectively baseless for the many reasons described above.

80. Casale's statements were also false, misleading and objectively baseless because Casale represented that it was the only legitimate source for low carbon ammonia technology that uses a portion of the synthesis gas stream as fuel. Casale was fully aware that this was not true.

Casale's Communications with Topsoe

81. On February 24, 2023, after Casale began sending its false and misleading communications to customers, Casale, through Riccardo Biazzi of Zardi, sent its first correspondence ("First Letter to Topsoe") to Topsoe.

82. The First Letter to Topsoe stated that Casale was "of the opinion that the SynCOR™ process with hydrogen firing includes all the features recited, at least, in the independent claims of the [Disputed Patents]."

83. The First Letter to Topsoe did not include a claim chart or other detailed infringement analysis and instead again emphasized that the synthesis gas is split into two streams, one of which is used as fuel. Specifically, the First Letter to Topsoe states that the Disputed Patents "protect a process for synthesis of ammonia from natural gas comprising the conversion of desulphurized natural gas and steam with oxygen-enriched air or oxygen, and further comprising that a part of CO2-depleted synthesis gas (i.e. hydrogen-rich gas) is fed as fuel to at least one furnace."

84. In a second letter to Topsoe dated June 1, 2023 ("Second Letter to Topsoe") Casale pointed to the Topsoe September 13, 2022 paper that was presented at the AICHE Ammonia Safety Conference, alleging its "opinion that the SynCOR process appears to include features patented by Casale is based on the following diagram from the paper by Kakoti and Dahl." This diagram is as follows:

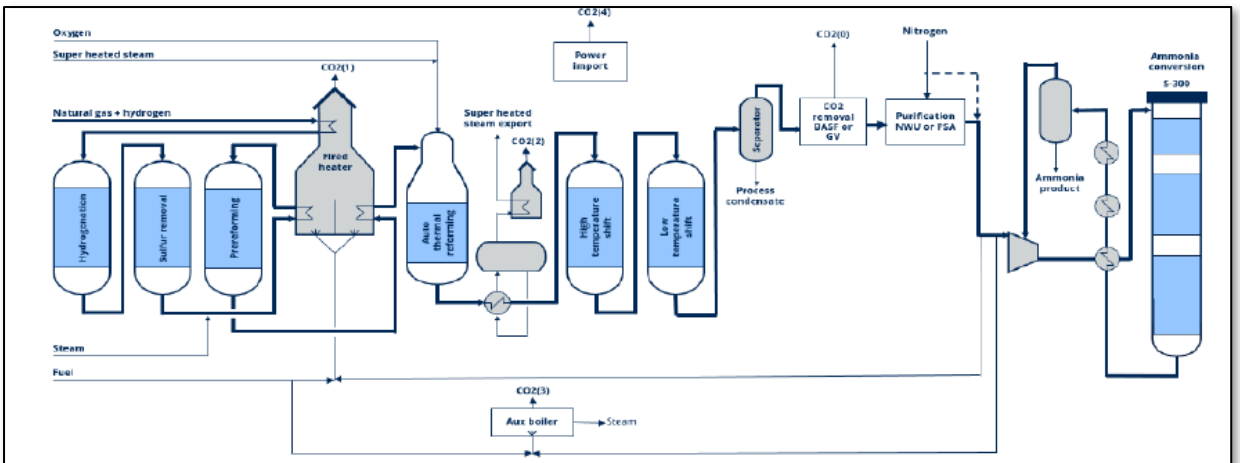


Figure 3. Schematic diagram of SynCOR™ Blue NH_3 process for 90% carbon recovery

85. Casale explained: "If we compare the above diagram with claim 1 of US 11,286,168 we find self-evident that the SynCOR process includes all features of the claim."

86. Neither The First Letter or Second Letter to Topsoe disclosed that Casale already had communicated false, misleading, and disparaging statements to customers. Instead, Casale concealed that information.

87. Topsoe responded to the Second Letter to Topsoe on June 13, 2023 ("Second Letter to Casale"). Topsoe pointed out that the Topsoe's SynCOR™ ammonia process "was using the features purportedly claimed by Casale long before Casale filed its patents" and that a process identical to the one described in the diagram Casale had included in its second letter was described in at least the presentation and accompanying paper at the 2009 FAI meeting that Casale had attended. Topsoe noted that Casale had access to at least the "2009 FAI meeting, and received preprints of the seminar papers, including the paper authored by Topsoe . . . [which] Casale did not disclose . . . to the patent office." Topsoe also noted that that Casale had direct access to Topsoe's technology implemented at the IIFCO plant when "Casale began a revamp of [Topsoe's technology implemented at IFFCO's Aonla Fertilizer plant] in 2014 and completed the revamp in 2018" and that despite this revamp being started and completed before the filing date of the '168 Patent, the technology implemented by Topsoe in the plant was not disclosed to the PTO. Topsoe closed the letter by asking Casale to advise whether it had communicated its infringement allegation to customers and if so, to identify those customers and provide copies of any written communications.

88. On September 15, 2023, representatives from Casale and Topsoe briefly discussed verbally Casale's allegations. Casale's US attorneys and attorneys Marco Zardi and Riccardo Biazzi from Zardi participated on the call, as did officers of Casale, Ermanno Filippi, Chief

Technical Officer, and Raffaele Ostuni, Head of Gas Technologies (who also is named as an inventor on the '168 patent). Topsoe asked whether Casale had communicated to customers its infringement allegations about Topsoe's SynCOR™ ammonia technology. Casale's Chief Technical Officer, Ermanno Filippi, stated unequivocally that it had not done so. This was a lie.

Casale's Request for Supplemental Examination of the '168 Patent

89. On February 16, 2023, shortly before its initial correspondence with Topsoe and significantly after becoming aware of the Oppositions filed in the European counterpart '067 patent, Casale filed a request for supplemental examination of the '168 Patent at the USPTO.

90. Casale's request for supplemental examination presented to the U.S. Patent Office eleven prior art references that were raised in the European Opposition proceedings stating:

> the European counterpart (EP Patent No. 3583067Bl) to U.S. Patent No. 11,286,168 was challenged via two Notices of Opposition both filed before the European Patent Office on June 8, 2022. These opposition proceedings remain pending before the European Patent Office, with the Patent Owner having filed a reply to the Notice of Opposition on November 3, 2022. Out of an abundance of caution, the Patent Owner is submitting this Request, which includes as the items of information to be considered the references cited in the Notice of Opposition.

Corrected Request for Supplemental Examination dated April 16, 2023.

91. A supplemental examination is a process brought by the patent owner to reconsider a patent that was issued by the US PTO. It is an *ex parte* procedure in which no party other than the patent owner can participate. By raising this prior art in the supplemental examination, Casale precluded Topsoe or any other competitor from filing a petition for Inter Partes Review ("IPR) with the US PTO raising any of the prior art that Casale had omitted. In contrast to the supplemental examination procedure chosen by Casale, in an IPR proceeding, the third party who files the petition is allowed to fully participate. Casale wanted to prevent this from occurring so that it could completely control the dialogue with the US PTO.

92. Casale did not include any other prior use or prior art reference in its request for supplemental examination beyond those that had been raised in the European Opposition. Incredibly, in requesting the supplemental examination Casale *still* failed to raise the Topsoe prior art of which it was fully aware. Casale did not include any reference to Topsoe's 2009 FAI presentation or publication in its request for supplemental examination, or any other Topsoe presentation or publication about its low carbon ammonia technology.

93. Nonetheless, even without the Topsoe prior art, and even without an adverse party participating in the proceeding, on May 11, 2023, the US PTO issued the Supplemental Examination Certificate, finding that there was "[a] substantial new question of patentability affecting claims 1-23" of the '168 Patent based on the prior art references that were included by Casale in its request for supplemental examination that Casale had not previously disclosed during prosecution of the '168 Patent.

94. On June 28, 2023, an ex parte reexamination was ordered by the US PTO pursuant to 35 U.S.C. § 257. As the name implies, in a reexamination proceeding the validity of the patent is reexamined by the US PTO. That reexamination proceeding is still ongoing as of the date that this Complaint is being filed.

95. Casale did not include any reference to its revamp of IFFCO's Aonla Fertilizer plant from 2014 to 2018 in its request for supplemental examination or in any subsequently filed papers in the ex parte reexamination.

96. On November 2, 2023, Casale submitted an IDS in the ex parte reexam that included "Response letter from Topsoe counsel dated June 13, 2023" and Topsoe's 2009 FAI paper: "'Fertiliser Policy for Sustainable Agriculture', The Fertiliser Associate of India Annual Seminar 2009, December 3-5, 2009, 10 pages."

97. Casale has never retracted any of its statements to Topsoe's customer regarding the Disputed Patents and their enforceability, despite knowing that the US PTO placed the '168 Patent into reexamination because it found "[a] substantial new question of patentability affecting claims 1-23" and that the validity of the '067 European Patent is being seriously challenged in the European Opposition.

FIRST COUNT

(DECLARATORY JUDGMENT OF UNENFORCEABILITY OF U.S. PATENT NO. 11,286,168)

98. Topsoe incorporates by reference the allegations set forth in this Complaint as though fully set forth herein.

99. An actual and justiciable controversy exists between Topsoe and Casale concerning the '168 patent.

100. Due, at least in part, to Casale's repeated letters to Topsoe and to at least one Topsoe customer, there is a substantial controversy between Topsoe and Casale and there is sufficient immediacy and reality that Casale will seek to assert and enforce its patents against Topsoe. Therefore, a declaratory judgment action is appropriate.

101. Topsoe seeks a judgment declaring that the claims of the '168 Patent, and any related U.S. patents, are unenforceable under the doctrine of inequitable conduct.

102. The claims of the '168 Patent are unenforceable due to inequitable conduct committed before the US PTO by Casale, Casale's attorneys (including Zardi attorneys and Marco Zardi), attorney Simon, and Casale's employees' and '168 Patent inventors' Francesco Baratto ("Baratto") and Raffaele Ostuni ("Ostuni"), as well as Casale's Chief Technology Officer, Ermanno Filippi. These individuals deliberately and knowingly withheld and/or omitted material information from Topsoe prior art and Casale's own prior art in connection with the prosecution

of the application that matured into the '168 Patent in violation of the duty of candor to the PTO prescribed in 37 C.F.R. § 1.56. The information withheld and omitted was highly material, non-cumulative, and was withheld and omitted with an intent to deceive the PTO and/or '168 patent examiner, as described below.

103. The '168 Patent lists two inventors, Francesco Baratto and Raffaele Ostuni.

104. On information and belief, Casale's Chief Technology Officer, Ermanno Filippi, was associated with and substantively involved in the preparation or prosecution of the patent application. Filippi is highly involved with Casale's research, development, and design related to ammonia production, as well as the design of the revamping and of new ammonia plants. Filippi also is highly involved with Casale's efforts to seek patent protection for its ammonia technology, as shown by the fact his name appears on hundreds of Casale's patents, many of which relate to ammonia processes. *See e.g.* U.S. Patent Nos. 11,155,468, 10,464,818.

105. Casale's attroneys at Zardi (e.g., Marco Zardi) were associated with and substantively involved in the preparation or prosecution of the patent application. The patent application was based on a PCT application filed by Zardi, and specifically, Marco Zardi. On information and belief, Zardi, and specifically, Marco Zardi, was involved in in instructing Casale's U.S. lawyers on the prosecution of the patent application by, for example, providing (and not providing) material prior art references.

106. The '168 Patent was prosecuted by the attorneys of Dorsey & Whitney LLP, including Marcus S. Simon (Reg. No. 50,258) ("Simon"), assisted by Angela Staschke and Holly Morton.

107. As a registered patent attorney for Casale, Simon was aware, or should have been aware, of his duty of candor to the US PTO.

108. Each inventor listed on the '168 Patent was made aware of and acknowledged their duty of candor to the US PTO and duty to disclose material information to the USPTO, stating:

> I acknowledge the duty to disclose all information which is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Combined Declaration and Assignment signed August 28, 2019.

109. Additionally, each inventor falsely declared in violation of 37 C.F.R. § 1.63: "I am the original inventor or an original joint inventor of a claimed invention in the above-identified application." Both inventors were fully aware that the invention claimed in the '168 Patent had already been publicly disclosed and in the prior art.

110. Filippi, Ostuni, Zardi, and Simon have been actively involved in communications regarding Casale's assertion of claims of infringement against Topsoe. Filippi, Ostuni, and Simon were each present during the September 15, 2023, call between Casale and Topsoe.

111. The '168 Patent has an effective filing date of January 31, 2018.

112. Prior to the effective filing date of the '168 Patent, Casale, including those individuals involved with prosecution of the '168 patent, had access to and knowledge of Casale's own prior art references as well as several pieces of prior art attributable to Topsoe, including but not limited to the 2009 Fertilizer Association of India Annual Seminar presentation; 2009 FAI Paper; and Topsoe's technology installed in IFFCO's Aonla Fertilizer plant, which Casale was hired to revamp between 2014 and 2018. Topsoe's disclosures predate the '168 Patent.

113. Baratto, one of the two inventors of the '168 Patent, was appointed Deputy Department Head of the Syngas Process Department of Casale in December 2012. His duties associated with this position include coordinating technical proposals and feasibility study

activities. On information and belief, due to Baratto's position, and the relatively small size of Casale, he would have worked on or at the very least known of the IFFCO project to revamp the Aonla Fertilizer Plant. Further, Baratto was involved in the design of Casale's ammonia plants, including revamp projects such as the IFFCO revamp of the Aonla Fertilizer Plant. Therefore, prior to, at the time of, and after the effective filing date of the '168 Patent, at least one of the '168 inventors, Baratto, had direct, firsthand knowledge of at least one piece of Topsoe prior art, namely, the low carbon ammonia processes and products embodied in the Aonla Fertilizer Plant that was installed by Topsoe and revamped by Casale from 2014 to 2018.

114. As CTO, Filippi duties associated with this position include revamping activities. Due to Filippi's position, and the relatively small size of Casale, he would have worked on or at the very least known of the IFFCO project to revamp the Aonla Fertilizer Plant. Further, Filippi was involved in the design of Casale's ammonia plants, including revamp projects such as the IFFCO revamp of the Aonla Fertilizer Plant. Therefore, prior to, at the time of, and after the effective filing date of the '168 Patent, at least Filippi, had direct, firsthand knowledge of at least one piece of Topsoe prior art, namely, the low carbon ammonia processes and products embodied in the Aonla Fertilizer Plant that was installed by Topsoe and revamped by Casale from 2014 to 2018.

115. Additionally, Filippi, frequently attends and presents at industry conferences. As just one example, Filippi attended the ESF North America 2022 Conference in Houston, Texas and presented on Casale's technologies for low-carbon ammonia. *See* https://www.linkedin.com/posts/casale-sa_greytogreen-ammonia-greenammonia-activity-6945292014645092352-R-ro/.

116. On information and belief, Filippi, Barrato, and Ostuni also had direct, firsthand knowledge of at least one additional piece of Topsoe prior art. As described above, materials from the 2009 FAI conference show that Casale representatives attended the Topsoe presentation, and Casale received the accompanied paper. Casale regularly participates in FAI meetings, seminars, and conferences and at least Filippi has attended and presented at FAI events.

117. Further, given that Topsoe and Casale are direct competitors in an industry with only a few players, and given that the Topsoe technology at issue had been widely known and used in the industry for decades, it is extremely unlikely that an alleged inventor of ammonia processes at Casale would not have known of Topsoe's technology. This is especially true in light of the frequency at which Topsoe publishes papers and other material on this technology and in light of the fact Topsoe's technology is used commercially in many facilities worldwide. Casale, as one of Topsoe's main competitors, undoubtedly paid attention to Topsoe's activity in the marketplace and at industry events. In fact, Casale has referenced Topsoe's commercial systems in its patents in the past, including in patents prosecuted by the Zardi firm that list Filippi as an inventor. *See e.g.* E.P. 16,168,159.

118. The '168 Patent is directed towards a process for synthesis of ammonia from natural gas. The '168 Patent includes two independent claims.

119. The first independent claim of the '168 Patent is:

> **1**. A process for synthesis of ammonia from natural gas, the process comprising:
>
> 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;
>
> 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;
>
> 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 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, said first and second streams having the same composition, wherein the first stream forms the fuel fraction and the second stream is process gas intended for the synthesis of ammonia.

Dkt. 1-1 at col. 18, ll. 38-57.

120. The second independent claim of the '168 Patent is:

> **21**. A method for revamping a plant for synthesis of ammonia from natural gas or ammonia/urea plant, wherein the plant includes a reforming section that includes a primary steam reformer and an air-fired secondary reformer, and a section for treatment of the synthesis gas by a shift reaction of carbon monoxide into carbon dioxide, and decarbonation; the method comprising:
>
> providing a flow of enriched air or oxygen and using said flow as oxidant, instead of air, for the secondary reformer;
>
> separating a part of the synthesis gas, downstream of decarbonation, for use as fuel fraction, and allocating a remaining process fraction of the synthesis gas for ammonia conversion;
>
> feeding said fuel fraction of the gas, which has a reduced CO2 content, as fuel for at least one furnace of the plant.

Dkt. 1-1 at col. 20, ll. 22-38.

121. As is apparent from the claims above, a key element of both claims is separating out the synthesis gas into two streams, one of which is then used as fuel.

122. During prosecution of the application that eventually issued as the '168 Patent, independent claim 1 was independent claim 19 and independent claim 21 was independent claim 39. The patent Examiner initially rejected both claims as obvious under 35 U.S.C. § 103 in light of Reddy et al (US 2004/0234426) in view of a much earlier filed patent owned by Casale, Ostuni et al (US 2016/0115017 A1). Office Action dated April 28, 2021.

123. In response, Casale argued that "[t]he PTO ha[d] not established a *prima facie* case of obviousness against independent claim [1] because, at a minimum, the PTO ha[d] not demonstrated that the cited references teach or suggest . . . 'separation of a part of said CO2-depleted synthesis gas as fuel fraction . . . 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, said first and second streams having the same composition." Response dated Oct. 22, 2021. (emphasis in original). Casale distinguished Reddy on the basis that Reddy did not split the synthesis gas into two streams having the same composition, but rather into "an hydrogen rich stream and a methane rich stream.". Casale argued that the "distinguishing feature of the 'first and second streams having the same composition,'…plays a substantial role in the solution of the technical problem underlying the claimed subject matter." This is because using the CO2-depleted synthesis gas rather than a methane rich gas (as Casale argued was taught in Reddy), reduces the CO2 emissions of the processes disclosed in the '168 Patent.[3]

[3] Casale did not make a separate argument directed towards the obviousness rejection of independent claim 21, but instead argued that in light of the arguments distinguishing Reddy in view of Ostuni, "the other rejections to the claims [were] moot and [did] not, therefore, need to be addressed individually." While Casale acknowledged that independent claim 21 did not specifically claim that "said first and second streams having the same composition," it claimed this

124. At the time Casale made these statements, it was well aware that the Topsoe low carbon ammonia technology included this same "distinguishing feature" but intentionally concealed this material information from the Examiner in order to secure allowance of the patent.

125. Casale's concealment strategy worked, and the Examiner withdrew the rejection. The reason the Examiner gave for allowing the claims was the "distinguishing feature of the first and second streams having the same composition." Notice of Allowance dated Nov. 18, 2021. As a result, the claims were allowed as originally filed. Independent Claims 1 and 21 in the issued patent are identical to independent claims 19 and 39, respectively, filed in the preliminary amendment on August 13, 2019.

126. The 2009 FAI Paper states that "Various schemes for optimizing the ammonia process in order to minimize the energy consumption as well as the emission of CO_2 will also be discussed in detail." This reference specifically discloses using part of the synthesis gas stream as fuel, stating that: "an excess of synthesis gas is produced, and this excess synthesis gas is used as fuel in the primary reformer." As specified by Casale in distinguishing the Reddy prior art reference, the purpose of separating two streams of synthesis gas, one used as fuel and one used for ammonia production, "plays a substantial role in the solution" provided in the '168 Patent. The 2009 FAI Paper discloses that the excess syngas used for fuel and the gas used to produce ammonia can be from the same source gas (e.g., have the same composition). The reference explains: "excess synthesis gas is produced, and this excess gas is used as fuel in the primary reformer." Therefore,

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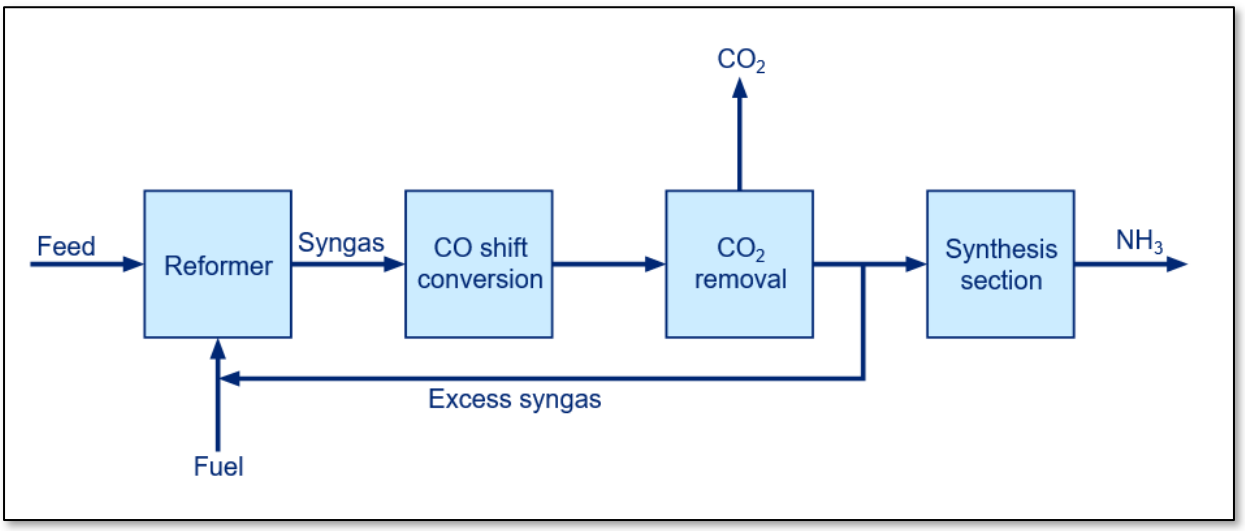
limitation was implicit. Casale contended that, in claiming that "separating a part of the synthesis gas, downstream of decarbonation, for use as fuel fraction, and allocating a remaining process fraction of the synthesis gas for ammonia conversion" and incorporating the argument as to claim 1 by reference, it is implicit in the language of independent claim 21 that the synthesis gas is separated into two streams having the same composition.

this reference is highly material to the patentability of the '168 Patent and should have been disclosed during prosecution.

127. The 2009 FAI Annual Seminar presentation discloses substantially the same information as disclosed in the 2009 FAI Paper, and includes the below figure, which shows the excess syngas being recycled back to the primary reformer as fuel. Therefore, for the same reasons as discussed above with respect to the 2009 FAI Paper, this reference is highly material to the patentability of the '168 Patent and should have been disclosed during prosecution.



128. In addition, as part of Casale's work on revamping the IFFCO ammonia units from 2014-2108, it was given extensive access to Topsoe's design for the ammonia units and learned that Topsoe's design included splitting a synthesis gas stream into two streams of the same composition so one stream could be used as a fuel. Therefore, this information is highly material to the claimed subject matter of the '168 Patent and should have been disclosed during prosecution of the '168 Patent.

129. Despite Casale's clear and undeniable knowledge of the numerous material Topsoe disclosures that predated the '168 Patent, no reference was made to any prior art disclosures attributable to Topsoe during prosecution of the '168 Patent.

130. Casale also did not disclose any of the Topsoe prior art references or Topsoe's low carbon ammonia process that was in commercial use when Casale filed a request for supplemental examination of the '168 Patent. Casale further did not disclose its revamp of IFFCO's Aonla Fertilizer plant from 2014 to 2018 after filing or during the pendency of the ex parte reexamination.

131. Casale intentionally omitted and only finally submitted the Second Letter that Topsoe had written to Casale and the 2009 publication referenced in the Second Letter to Casale in an IDS filed on November 2, 2023 in response to the reexamination non-final Office Action. Casale finally did so because it knew that Topsoe was aware of the reexamination and Casale's duty of disclosure to the USPTO.

132. Casale's disclosure during the ex parte reexamination of the Second Letter to Casale and the reference cited in that letter, Topsoe's 2009 publication of "Energy efficiency and CO2 reduction potential in ammonia plants based on lean gas" shows that Casale knows and understands that Topsoe's disclosures of its ammonia technology and the technology used in the IFFCO plant were material to patentability of the '168 Patent and are non-cumulative prior art to the '168 Patent. Therefore, Casale's knowing and intentional nondisclosure of these prior art references, and its access to Topsoe's technology implemented in the IFFCO plant constitutes an intentional and material nondisclosure.

133. Casale knew of the materiality of the Topsoe prior art references before, during, and after prosecution of the '168 Patent, and thus intentionally withheld the art so that it could receive a patent and wield that patent against Topsoe, the real inventor of the technology. The '168 Patent has an effective filing date of January 31, 2018, shortly after Casale completed its revamp of IFFCO's Aonla Fertilizer plant. Casale began sending communications to customers in the Fall of 2022, shortly after the '168 Patent issued on March 29, 2022. Casale's knowledge of the

materiality of Topsoe's prior art reference is also established by the fact Casale argued during prosecution that its invention was novel over the prior art due to the exact feature that Topsoe's concealed prior art has used and disclosed for decades.

134. For this reason, the Topsoe prior art that Casale concealed was necessarily non-cumulative, as Topsoe's prior art papers and implementation clearly include the specific feature that Casale argued was the "distinguishing feature" that made its purported invention patentable over the prior art, and that the patent examiner used as the basis of their notice of allowance of Casale's patent. The fact that Casale itself disclosed the Second Letter to Casale and the 2009 publication referenced in the Second Letter during the reexamination further demonstrates that the Topsoe prior art that Casale concealed was non-cumulative.

135. Casale's disclosure of the Second Letter to Casale and the 2009 publication referenced in the Second Letter during the reexamination does not, however, satisfy its disclosure requirements before the USPTO.

136. In addition to not disclosing the Topsoe prior art references, Casale withheld its own material prior art disclosures during prosecution of the '168 Patent, including at least 2012 MEGAMMONIA® – the Mega-Ammonia Process: the Newest Trend in the ammonia Industry.

137. Ermanno Filippi, Francesco Baratto, Raffaele Ostuni, and Marco Zardi were aware of Casale's own prior art such as 2012 MEGAMMONIA® – the Mega-Ammonia Process: the Newest Trend in the ammonia Industry. Indeed, Filippi has presented and published on the Megammonia.

138. 2012 MEGAMMONIA® – the Mega-Ammonia Process: the Newest Trend in the ammonia Industry discloses a process in which CO_2 is removed from synthesis gas and split into

two streams, one stream intended for synthesis of ammonia and one stream intended for use as fuel.

139. This Casale prior art reference was published prior to the effective filing date of the '168 Patent and is therefore prior art to that patent. The reference is highly material to the claimed subject matter of the '168 Patent and should have been disclosed during prosecution of the '168 Patent.

140. This reference was published by Casale. Therefore, it is undeniable that Casale knew of this prior art reference before, at the time of, and after the filing date of the '168 Patent. And given that Casale knew of this art, and—by its own admission during prosecution of the '168 patent—knew that the stream splitting feature was material to patentability, Casale should have disclosed this art to the examiner as well.

141. Despite Casale's clear and undeniable knowledge of its own material disclosure that predated the '168 Patent's effective filing date, no reference was made to it during prosecution of the '168 Patent.

142. Casale clearly knew that its own prior art references are material prior art to the patentability of the '168 Patent as Ostuni *et al.* (US 2016/0115017 A1), a patent application also owned by Casale and invented by Ostuni, was cited in the obviousness rejection of the '168 Patent.

143. Similarly, in Casale's US2019/0023565 (which names as inventors Ermanno Filippi, Francesco Baratto, and Raffaele Ostuni and originates from a PCT application filed by Marco Zardi) Casale disclosed its own prior art references, and the US PTO cited Topsoe prior art references when rejecting the claims presented by Casale. Thus, Casale knew its own prior art references, as well as Topsoe prior art references were material to patentability of the '168.

144. Casale's failure to disclose the Topsoe prior art references and its own prior art disclosure during the initial prosecution of the '168 Patent was done knowingly and intentionally, with the intent to fraudulently obtain the '168 Patent by withholding material prior art references. This therefore constitutes an intentional and material nondisclosure.

145. Intentional nondisclosure of material prior art during prosecution of a patent application constitutes inequitable conduct.

146. Inequitable conduct during prosecution of a patent application renders any resultant patent unenforceable.

147. All non-duplicative relevant prior art must be disclosed and filed during prosecution of a patent application. An explanation for not submitting any relevant prior art must be included during prosecution of a patent application. No such explanation was filed during prosecution of the '168 Patent as to the nondisclosure of the Topsoe references or the Casale references that were known to Casale.

148. At least attorneys Simon and Zardi, inventors Baratto and Ostuni, and CTO Filippi were aware of certain Topsoe and Casale prior art and the materiality of Topsoe and Casale prior art to the claims they were pursuing in the '168 Patent and intentionally withheld that information from the US PTO.

149. Casale's, Casale's attorneys, attorney Simon's, Zardi's and Casale's employees' and '168 Patent inventors' Baratto and Ostuni and Casale's CTO Filippi's failure to disclose material information to the US PTO was done knowingly and intentionally, and with intent to deceive the Examiner and the US PTO into issuing a patent even though the '168 Patent's claims were not patentable or which would be at risk of not being patentable due to material disclosures in at least Topsoe and Casale prior art.

150. Casale, Casale's attorneys, attorney Simon, and Casale's employees and '168 Patent inventors' Baratto and Ostuni engaged in this conduct to avoid the Examiner rejecting claims of the '168 Patent so that Casale could monetize its intellectual property through litigation against other members of the industry, to monetize the intellectual property of Topsoe that Casale derived from its access to Topsoe's processes as well as to recapture technology that already was part of the public domain.

151. As a result of the unenforceability of the '168 Patent and Casale's assertion of the '168 Patent and allegations of infringement of the '168 Patent against Topsoe and its customers, Topsoe has suffered and will continue to suffer harm and seeks declaratory judgment of unenforceability of the '168 Patent, and any related U.S. patents.

SECOND COUNT

(UNFAIR COMPETITION AND FALSE ADVERTISING UNDER THE LANHAM ACT)

152. Topsoe incorporates by reference the allegations set forth in this Complaint as though fully set forth herein.

153. "Any person who, on or in connection with any goods or services, or any container for goods, uses in commerce any word, term, name, symbol, or device, or any combination thereof, or any false designation of origin, false or misleading description of fact, or false or misleading representation of fact, which—is likely to cause confusion, or to cause mistake, or to deceive as to the affiliation, connection, or association of such person with another person, or as to the origin, sponsorship, or approval of his or her goods, services, or commercial activities by another person, or in commercial advertising or promotion, misrepresents the nature, characteristics, qualities, or geographic origin of his or her or another person's goods, services, or commercial activities, shall

be liable in a civil action by any person who believes that he or she is or is likely to be damaged by such act." 15 U.S.C. § 1125(a)(1)(A)-(B).

154. Casale's communications to at least one Topsoe customer in November 2022 compared its blue ammonia technology, which it falsely claimed were covered by the Disputed patents, with Topsoe's blue ammonia technology. Casale's communications falsely claimed that Topsoe's blue ammonia technology infringed the Disputed Patents, including the '168 Patent and that the '168 Patent was valid and enforceable. Further, Casale falsely claimed that Casale was the only legitimate source for low carbon ammonia technologies that uses a portion of the synthesis gas stream as fuel. Casale knew, however that these communications were false and misleading: Casale knew that the '168 Patent was invalid and unenforceable and that it was it not the only legitimate source for this technology. Casale also knew that its '067 Patent, which it specifically referenced in its communications with the customer, was the subject of the European Opposition, which was filed four months earlier in June 2022 and had raised serious prior art invalidity concerns regarding the Disputed Patents. Thus, Casale misrepresented the nature, characteristics, and qualities of both Casale's products and of Topsoe's products, and made objectively baseless claims to Topsoe's customers.

155. Despite Casale's knowledge of its inequitable conduct and the resultant unenforceability of the '168 Patent, it still engaged in a course of conduct in which it asserted its ***unenforceable*** patent rights against Topsoe and notified customers of its patent rights, falsely claiming that its patents were valid and enforceable.

156. Casale, in asserting its unenforceable patent rights and specifically stating that they were "enforceable," despite knowing that the Disputed Patents are unenforceable, if not also invalid, has acted in bad faith and with malice. In so doing, Casale's actions are not guarded from

liability under the Lanham Act. Casale has acted with malice and specific intent, as it had knowledge of the falsehood of its baseless statements and/or acted with reckless disregard for the truth and made the statements regardless, with the intent to cause harm to Topsoe's reputation and business.

157. The false statements made by Casale as set forth here, constitute material misrepresentations and/or omissions of the nature, characteristics, and qualities of Casale's and Topsoe's goods, services and/or commercial activities, and are thus in violation the Lanham Act, 15 U.S.C. § 1125(a). The statements were intended to mislead or confuse consumers and direct them to Casale's products instead of Topsoe's products.

158. Casale's communications constitute unfair competition under 15 U.S.C. § 1125(a)(1)(A). Casale's communications included false and misleading descriptions and representations of facts, including the enforceability of the Disputed Patents and their infringement. These false and misleading descriptions and representations of fact were made with knowledge of their falsehood and with the bad faith intent to cause confusion and mistake as to the ability of Topsoe and its customers to make, use, sell, and offer to sell the Topsoe's low carbon (blue) ammonia products and processes and were likely to cause such confusion and mistake.

159. Casale's communication to customers constitutes commercial advertising or promotion as it constitutes commercial speech by a competitor with the intent to influence consumers into buying Casale's services rather than Topsoe's. Casale's communication to customers constitutes sufficient dissemination to the relevant purchasing public to constitute advertising within the relevant industry. Here, the relevant market for purchasers of low carbon ammonia technology is incredibly small, with limited customers offering only a small number of very large projects that will typically take years to install. Therefore, Casale's communication to

customers, even in a vacuum, constitutes commercial advertising and promotion within the scope of the Lanham Act. Casale engaged in a course of conduct specifically to interfere with Topsoe's relationships with its customers by notifying at least one customer of Topsoe's alleged infringement, and creating uncertainty as to Topsoe customers' abilities to do business with Topsoe without liability. This conduct is well within the scope of commercial advertising and promotion.

160. Casale's actions took place in interstate commerce. Casale, which is a foreign corporation, and which has a United States headquarters in Texas, sent a letter to at least one customer with operations in the U.S. and in this District, about use of Topsoe's blue ammonia technology in projects on the Gulf Coast in Texas. Casale also has falsely advertised that its ammonia technology is "patented" at industry events. Additionally, Casale has caused its blue ammonia technology products to enter interstate commerce, including through its proposals to customers in the U.S.

161. Casale's communications deceived and/or had the capacity to deceive customers. As a result of Casale's communications, at least one customer is under the impression that Casale owns valid, enforceable, and exclusive rights to low carbon (blue) ammonia technology, which is not true.

162. Casale's communications are material and likely to influence the purchasing decisions of customers. As Casale well knew, customers for blue ammonia technology would be unwilling to make the large capital expenditures needed to build or revamp an ammonia plant under threat of patent infringement (even when that threat is unfounded). Therefore, the false statements in Casale's communications were likely to influence purchasing decisions.

163. As a direct and proximate result of Casale's false and misleading statements in the marketplace, Casale caused economic injury to Topsoe. Casale's false and misleading statements have caused at least one customer to withhold trade from Topsoe.

164. Further, as a direct and proximate result of Casale's false and misleading statements, Topsoe has suffered, and will continue to suffer, monetary damages, and seeks recovery, in an amount to be proven at trial, to compensate for Casale's false advertising and unfair competition. Casale's false advertising and unfair competition will continue to damage Topsoe, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

165. Casale acted in bad faith, intentionally, with knowledge of, and in willful and conscious disregard of Topsoe's rights, in misrepresenting the nature, characteristics and qualities of Casale's process and its illicitly obtained '168 Patent and of Topsoe's process. Topsoe is entitled to injunctive relief and to the recovery of all available damages, interest, attorneys' fees, costs, enhanced damages, and Casale's profits.

166. This is an exceptional case within the meaning of Section 35 of the Lanham Act, 15 U.S.C. § 1117.

THIRD COUNT

(COMMON LAW UNFAIR COMPETITION)

167. Topsoe incorporates by reference the allegations set forth in this Complaint as though fully set forth herein.

168. Topsoe alleges herein that the claim for common law unfair competition arises out of the same facts that support Topsoe's causes of actions for the Lanham Act violations. Therefore, Casale's actions give rise to an actionable cause of action for common law unfair competition.

169. As described in Topsoe's Lanham Act claims, Casale has, among other things, knowingly made false and misleading representations to Topsoe's customers regarding the validity and enforceability of the Disputed Patents and their alleged infringement. These false, misleading, and baseless descriptions and representations of fact were made with knowledge of their falsehood and with the bad faith intent to cause confusion and mistake as to the ability of Topsoe and its customers to make, use, sell, and offer to sell Topsoe's low carbon (blue) ammonia products and processes and were likely to cause such confusion and mistake. As a result of Casale's unfair competition, Topsoe has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Casale's false advertising and unfair competition. Casale's unfair competition will continue to damage Topsoe, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

170. As a direct and proximate result of Casale's false and misleading statements, Topsoe has suffered, is suffering, and will continue to suffer immediate and continuing irreparable injury for which there is no adequate remedy at law.

171. On information and belief, Casale's false and misleading statements are knowing and willful, flagrant, and/or with intentional disregard as to the true nature of the product it offers. Topsoe is entitled to an award of punitive damages.

PRAYER FOR RELIEF

WHEREFORE, Topsoe prays for judgment and seeks relief against Casale as follows:

A. For declaratory judgment that Casale's '168 Patent, and any related U.S. patents, are unenforceable;

B. for judgment awarding attorneys' fees pursuant to 35 U.S.C. § 285, or otherwise permitted by law;

C. for judgment awarding to Topsoe all gains, profits, and advantages derived by Casale as a result of its wrongful conduct;

D. for judgment awarding monetary damages sufficient to compensate Topsoe for the harm suffered as a result of Casale's wrongful conduct;

E. for a judgment awarding enhanced damages and/or attorneys' fees pursuant to 15 U.S.C. § 1117;

F. for a permanent injunction that: (a) enjoins Casale, its officers, agents, servants, and employees, and all persons in active concert and participation with them, including their affiliates, from further disseminating the false and misleading statements in any form or medium, making the disparaging claims in any form or medium; and (b) requires Casale to withdraw, retract, and/or retrieve all the offending false and misleading statements and disparaging claims;

G. for a judgment awarding punitive damages for Casale's unfair competition;

H. for judgment awarding costs of suit, as well as pre- and post-judgment interest; and

I. for judgment awarding Topsoe such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the federal Rules of Civil Procedure, Topsoe hereby demands a trial by jury of this action.

Dated: May 2, 2024

Respectfully submitted

By: /s/*Robert Riddle*

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