IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND
Northern Division

G. W. Aru, LLC 12045 Cochise Circle Conifer, Colorado 80433 and Cochise Technology, LLC 12045 Cochise Circle Conifer, Colorado 80433 Plaintiffs, v. W. R. Grace & Co.-Conn. 7500 Grace Drive Columbia (Howard County), Maryland 21044 Defendant.	))	**JURY TRIAL DEMANDED** Civil Action No. _____

ORIGINAL COMPLAINT

Plaintiffs G. W. Aru, LLC ("Aru"), and Cochise Technology, LLC ("Cochise") (collectively, "Plaintiffs"), bring this Complaint against Defendant W. R. Grace & Co.-Conn. ("Grace" or "Defendant"), and allege as follows:

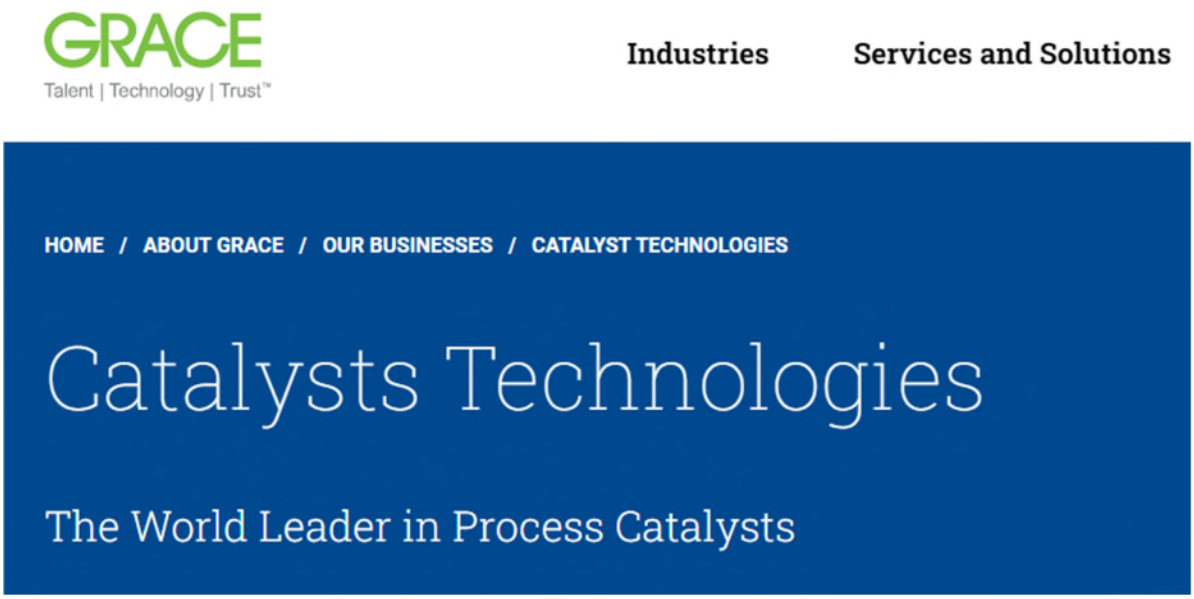
SUMMARY OF THE CASE

1. This is an action for patent infringement arising under 35 U.S.C. § 1 *et seq.* Plaintiffs seek treble damages and permanent injunctive relief against Grace for its willful infringement of Plaintiffs' patent rights on catalysts/promoters for petroleum refining that have revolutionized their category and won Aru the 2020 Innovative Partnership award from Marathon Petroleum Company LP ("Marathon"), the largest petroleum refinery operator in the United States.

Aru was one of only 10 out of more than 15,000 suppliers and contractors to Marathon selected for its Supplier Recognition Awards in 2020 and the sole winner of the award recognizing a company for coming up with innovative solutions and improved processes. *See* Exhibit A (copies of Marathon's letter informing Aru of the award and award brochure).

2. Aru was founded in May 2017 by Mr. Guido William Aru on the principles of Integrity, Innovation and Value. It specializes in sales, marketing, and technical support services for catalysts, sorbents, chemicals, and related technologies and services for the petroleum refining and petrochemical industries. Aru contracts with toll manufacturers to produce specific products and provides a channel-to-market for its manufacturing partners and new value-creation opportunities for its customers. It also offers a comprehensive portfolio of products and services, including Fluid Catalytic Cracking ("FCC") catalysts and additives.

3. Grace's website proclaims it "The World Leader in Process Catalysts," and its branding declares its core principles to be "Talent | Technology | Trust":



See: https://grace.com/about-grace/our-businesses/catalyst-technologies/. This "world leader" built on "trust" dangled a potential business relationship with the vastly smaller Aru over a period

between 2018 and 2022. Eager to collaborate with a company of Grace's stature, Aru disclosed its then patent-pending technology and related business and technical information to Grace subject to contractual obligations of confidentiality. However, after being given the details of Aru's crown jewel technology and business case, and because Aru's patented products were taking market share from Grace's competing products, Grace intentionally copied Aru's patented inventions while publicly denigrating Aru's reliability in the marketplace.

4. Grace terminated a joint marketing arrangement with Aru, increased prices for Aru, and eliminated cooperation on additive addition systems after having:

- Used Aru and its team's relationships to increase its direct sales to those refiners to whom they were jointly marketing by tens of millions of dollars per year in 2021 versus 2018;
- Received valuable insights from Aru regarding issues with Grace's high activity ZSM-5 additive and learned significantly better techniques for analysis of Sulphur oxide additive performance from Aru; and
- Learned the secrets of Aru's patented technology and business plans and used them to develop and commercialize Grace's infringing products, eggshell versions of their platinum and palladium carbon monoxide ("CO") to carbon dioxide ("CO_2") combustion promoters, including the palladium-based Optimized CP®P, that were all copies of Aru's then patent-pending products starting no later than December 4, 2020.

5. Even after terminating the joint marketing agreement and commercializing their infringing products, Grace continued to ask Mr. Aru for additional performance information and customers of his products and continued to entice him with the prospect of an expanded relationship and a more collaborative approach in 2022.

6. Lastly, as if to emphasize their bad faith conduct against Aru, on September 20, 2022, Grace presented Mr. Aru with a distributor agreement for a major customer. This agreement was sent after Grace's Global Vice President for Sales, Mr. Jeff Balko, was confronted by the lead subject matter expert for FCC for that customer in July 2022, who questioned Grace's announcement of the infringing CO to CO_2 combustion promoter products as evidently infringing the patent at issue here. In a telephone conversation between Mr. Balko and Mr. Aru on September 20, 2022, Mr. Balko admitted that this conversation with the customer occurred and that he told the customer then that he was not aware of the product announcement. Mr. Aru challenged the plausibility of that story, and Mr. Balko then admitted to Mr. Aru during a call on September 25, 2022, that Mr. Balko had seen and read the announcement in advance and communicated to those responsible for it that "it was a bad idea."

7. Grace's infringement has done and continues to do irreparable harm to Aru's reputation for innovation and reliability, customer relationships, market share, and the prices Aru can command for the patented inventions.

8. Accordingly, Plaintiffs seek the maximum enhancement of compensatory damages and attorney fees due to the willfulness and exceptional egregiousness of Grace's infringing conduct.

PARTIES

9. G. W. Aru, LLC, is a Colorado limited liability company and is the exclusive licensee of the asserted United States Patent 11,224,864 ("'864 patent"). Aru sells products licensed under the '864 patent under the trademarks Great FCC Promoter™, GFP™, and Ultra GFP® in both platinum and palladium versions.

10. Cochise Technology, LLC, is a Colorado limited liability company founded in February 2018 by Mr. Aru to research and develop new technologies for the petroleum refining and petrochemical industries with the objective of creating and patenting (or keeping trade secret) innovative new catalysts and other technologies. These technologies then could be monetized through licensing to Aru and potentially other companies. Cochise Technology, LLC, is the assignee of the entire right, title, and interest in and to the ’864 patent pursuant to an assignment dated April 3, 2019, and recorded in the United States Patent and Trademark Office (“USPTO”) at Reel 055265, Frame 0855, and a previous assignment dated May 16, 2018, of United States Provisional Application No. 62/651,295 recorded in the USPTO at Reel 046021, Frame 0831.

11. W. R. Grace & Co.-Conn. is a Connecticut corporation having its principal place of business at 7500 Grace Drive, Columbia, Maryland 21044. W. R. Grace & Co.-Conn. is registered to do business in Maryland and has appointed as its registered agent for service of process The Prentice-Hall Corporation System, Maryland, 7 St. Paul Street, Suite 820, Baltimore, Maryland 21202.

JURISDICTION AND VENUE

12. This Court has original and exclusive subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

13. This Court has general personal jurisdiction over Grace by virtue of its headquarters and numerous other substantial facilities being located in Maryland.

14. Venue is proper in the District of Maryland under 28 U.S.C. § 1400(b) because Grace has engaged in infringement of the ’864 patent and has numerous regular and established places of business in the District of Maryland.

BACKGROUND OF THE PATENTED TECHNOLOGY

Most Gasoline and Other Petroleum Products Are Made by FCC Processes

15. FCC processes are used in most modern petroleum refineries to convert crude oils into gasoline and other products. The additives at issue are referred to as CO to CO_2 combustion promoters and play a critical role in FCC processes.

16. Petroleum refining involves processes of converting large hydrocarbon molecules in crude oil into smaller hydrocarbon molecules having lower boiling points that form useful products like gasoline and gases.

17. In FCC processes, high molecular weight hydrocarbons are heated to high temperatures under pressure, mixed with cracking catalyst particles, which break the large hydrocarbons into smaller hydrocarbons, hence the name "cracking." Catalysts are substances that cause chemical reactions to occur more efficiently and/or rapidly without being consumed in the reactions they catalyze.

18. FCC processes use catalysts in the form of microspheres with specific properties that enable them to be fluidized with vapor in the process for both catalyzing specific reactions and regenerating the catalyst. FCC catalysts are porous solids of average size of approximately 70 microns. FCC catalyst is a common industry term for the main catalyst in FCC, which is added in large quantities from 1 to 40 tons or more per day. FCC additive is a common term for certain catalysts added in small quantities, generally 10 to 2,000 pounds per day, to FCC units to catalyze specific reactions.

Regeneration of FCC Catalyst Creates Pollutants and Damaging Afterburn

19. An effect of the "cracking" chemical reactions is the formation of carbon (coke) on FCC catalyst particles, which eventually deactivates their catalytic capabilities. So-

called "coked" catalyst is then reactivated in a regeneration process so that it can be reused. The catalyst regeneration process uses hot air to burn off the coke from the catalyst particles in a regenerator chamber, forming CO as a byproduct and producing heat that in turn is used in further cracking reactions with the regenerated catalyst.

20. The oxidation of CO is a highly exothermic (heat generating) process. This can result in CO afterburning. Afterburning can cause significant damage to the FCC equipment and can be reduced by more complete oxidation of CO to CO_2 in the catalyst bed.

CO to CO_2 Combustion Promoters
Reduce Pollutant Emissions and Afterburn

21. By promoting the oxidation of CO to CO_2, CO to CO_2 combustion promoters help control afterburn and reduce highly regulated emissions from FCC facilities. These benefits can also reduce down time for maintenance by extending intervals between maintenance.

22. For petroleum refinery operators, the business purpose of CO to CO_2 combustion promoters is to save money. Petroleum refinery operators purchase and use CO to CO_2 combustion promoters to improve the overall efficiency and regulatory compliance of their FCC operations and to reduce maintenance costs.

23. CO to CO_2 combustion promoters are made of porous support particles impregnated with noble metals in group VIII of the periodic table, such as platinum and palladium. Upon contact with CO molecules, these noble metals promote the oxidation of CO to CO_2 in a reaction that occurs essentially instantaneously at the high temperatures inside FCC regenerators. Those same noble metals, however, also catalyze reactions that form nitrogen oxides ("NOx") that are subject to strict emission regulations by the United States Environmental Protection Agency and various local air quality authorities in the areas where refiners operate FCC units.

24. Refiners can add CO to CO_2 combustion promoter to their FCC units in three ways:

- As a separate additive through an addition system that injects the promoter into the unit on a periodic basis;
- As an additive that is pre-blended with the FCC fresh catalyst or another additive by the catalyst or additive supplier, usually pre-blended at the catalyst or additive manufacturers' facility, but can be done by a third party logistics provider or at the refinery itself; or
- As an incorporated functionality into the fresh catalyst or another FCC additive.

CO Oxidation Effectiveness Historically Outweighed Noble Metal Costs

25. As saving costs has always been the purpose for users of CO to CO_2 combustion promoters, there has always been an economic incentive to reduce the amount of expensive noble metals used in them. But before the inventions of the '864 patent, conventional wisdom held that CO oxidation efficacy was dependent on the amount of noble metal used.

26. CO to CO_2 combustion promoters typically use Group VIII noble metals to promote the conversion of CO to CO_2. Group VIII noble metals used for this process include platinum, palladium, and rhodium. These metals are very expensive.

27. Prior to the present invention, a relatively large amount of noble metal was required to achieve the desired result. A standard CO to CO_2 combustion promoter, such as Grace's CP® product, is a porous microsphere having a uniform distribution of noble metal throughout its internal and external surfaces.

Prevailing Wisdom Deemed Homogeneous Noble Metal Distribution Necessary

28. Numerous examples illustrate the prevailing wisdom over recent decades that homogeneous distribution of noble metals on supports in CO to CO_2 combustion promoters was needed for effective CO combustion. A contemporary example can be found in a 2021 paper by researchers at BASF Corporation titled "Pragmatic Approach toward Catalytic CO Emission Mitigation in Fluid Catalytic Cracking (FCC) Units," in which all of the experimental and control supports were deposited with noble metals by incipient wetness impregnation "to afford even metal distribution on the support." *See* Exhibit E.

29. Another recent example can be found in a provisional patent filed by Grace, United States Provisional Patent Application 63/086,149, filed on October 1, 2020. *See* Exhibit F. This Grace provisional patent application describes a CO to CO_2 combustion promoter prepared by adding noble metals on a ZSM-5 support by a process that results in a uniform distribution of noble metal in the support. *See* Exhibit F.

30. In another example from a decade earlier, INTERCAT Inc. ("INTERCAT") (owned since 2010 by Johnson Matthey, Inc. ("Johnson Matthey")) and Marathon published an article in the April 27, 2009, Oil & Gas Journal titled "Marathon refineries employ new FCCU CO combustion promoter" regarding INTERCAT/Johnson Matthey's development of a CO to CO_2 combustion promoter named COP-NP, which was adopted for use by Marathon pursuant to a consent decree with the United States Environmental Protection Agency. *See* Exhibit G. This article stated, among other things, describing the COP-NP promoter, "The catalytically active components must be uniformly dispersed on the support for maximum effectiveness." *Id*. Johnson Matthey to this day represents to refinery customers that CO oxidation occurs in the interior of promoter particles such that homogenous distribution of noble metals throughout the particles is

needed, upon information and belief. That is an unmistakable reflection of the prevailing wisdom, as until Aru's promoters were commercialized, Johnson Matthey had the highest market share of separately added non-platinum promoters with their COP-NP promoter, significantly higher than Grace's market share with CP-P, upon information and belief.

31. And in yet another example from a decade before the Oil & Gas Journal article, Grace filed on May 5, 1995, a patent application that matured into United States Patent 6,165,933, titled "Reduced NOx combustion promoter for use in FCC processes," which was issued on December 26, 2000. *See* Exhibit H. This patent also describes methods of making CO to CO_2 combustion promoters that result in homogenous distribution of noble metals.

The Inventions of the '864 Patent Yield
Surprising Results with a Large Market Opportunity

32. The patented technology defied the conventional wisdom by proving it could convert CO to CO_2 at high efficiency while using substantially less noble metal than previous CO to CO_2 combustion promoters at significantly less cost.

33. In addition to reduced noble metal costs, the new CO to CO_2 combustion promoter of the '864 patent reduces emissions from the use of combustion promoters, significantly reducing for some refiners using the technology their costs for NOx emissions compliance and also enabling some to operate without needing to invest in large capital projects to control emissions.

34. Upon information and belief, the global market for CO to CO_2 combustion promoters is 3,000,000 to 4,000,000 pounds per year. Pricing varies with the metal used—platinum and/or palladium—the metal content, and metal pricing, but the global gross sales of these CO to CO_2 combustion promoters totals approximately $100,000,000 per year or more.

PATENT-IN-SUIT

Issuance & Prosecution

35. The ’864 patent is titled “CO to CO_2 combustion promoter” and was issued by the USPTO on January 18, 2022, naming Mr. Aru as sole inventor and naming Cochise as assignee. A copy of the ’864 patent is attached as Exhibit B.

36. The ’864 patent matured from a continuation of United States Nonprovisional Application No. 17/043,031, which is a National Phase Entry of International Application No. PCT/US2019/024742 (“PCT Application”), filed on March 29, 2019, which designates the United States and claims the benefit under 35 U.S.C. § 119(e) of Netherlands Provisional Application No. 2020819, filed on April 24, 2018, and United States Provisional Application No. 62/651,295, filed on April 2, 2018 (collectively, “priority applications”). The claims of the ’864 patent are entitled to the benefit of all of the priority applications, including but not limited to the April 2, 2018, filing date of the first provisional application.

37. The USPTO published the application for the ’864 patent on June 3, 2021, as Patent Application Publication No. US 2021/0162377.

Grace’s Knowledge of the ’864 Patent

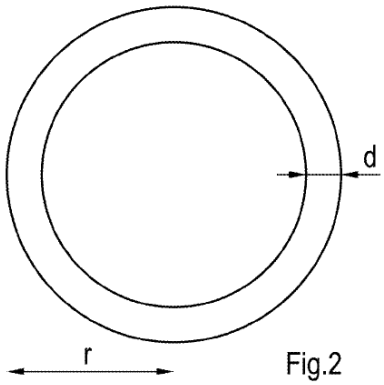
38. Aru advertised the initial patent-pending status of the technology, the grant of the ‘864 patent, and Aru’s exclusive right to manufacture and sell the patented technology. Further, Aru made Grace directly aware of the same in multiple meetings and emails.

39. Grace was on actual notice of the ’864 patent prior to its issuance, via an email dated December 28, 2021, from Mr. Aru to Michael Hawkins, Regional Marketing Manager of the Americas – FCC, at Grace updating him on the receipt of a USPTO issue notification with the number of the ’864 patent and its anticipated issue date of January 18, 2022.

Invention Summary

40. In conventional CO to CO_2 combustion promoters, the noble metal is distributed homogenously throughout the support particles because of limitations of previously known manufacturing methods and the prevailing belief that combustion promotion efficacy was correlated with a uniform distribution of noble metals throughout the particle and with the amount of noble metal used.

41. In contrast, the ’864 patent discloses and claims novel and non-obvious CO to CO_2 combustion promoters in which the noble metal is distributed in an “eggshell” configuration such that a higher concentration of the noble metal is present in the outer region of the particle compared with the center of the particle. This “eggshell” configuration is illustrated in FIG. 2 of the ’864 patent, reproduced below:



Invention Advantages

42. The CO to CO_2 combustion promoters of the ’864 patent yield CO to CO_2 combustion activity equal to or better than conventional CO to CO_2 combustion promoters with significantly less noble metal per particle.

43. This technology greatly reduces the amount of Group VIII noble metal required by 50% or more compared with traditional CO to CO_2 combustion promoters. For example, palladium is the most common Group VIII noble metal used in CO to CO_2 combustion

promoters made and sold in the United States and is typically used at rates of 500 to 1,000 part per million (ppm) by weight (wt%) on the support. For a palladium-based CO to CO_2 combustion promoter, at average price from January 1 to June 30, 2022 of $2,230 per troy ounce, a 1,000 ppm promoter has $32.50 worth of palladium in each pound of product, whereas this technology would require less than $16.25 worth of palladium per pound to provide the same functionality. For a 500 ppm wt% palladium traditional promoter, it could be replaced by a promoter with 250 ppm wt% palladium or less, or alternatively with lower daily addition rates of a 500 ppm wt% eggshell promoter versus the conventional one, either option providing significant cost reduction and commercial advantage.

44. Cochise expended considerable effort and money to develop the patented inventions, and Aru has expended considerable effort and money to scale-up production from the lab to toll manufacturing and in marketing its platinum- and palladium-based CO to CO_2 combustion promoters to petroleum refiners throughout the world.

PARTIES' RELATIONSHIP

Cooperation Regarding SOx Additives

45. Aru began offering FCC additives to petroleum refiners in August of 2018. One additive Aru had manufactured for it was an FCC sulfur oxide ("SOx") reduction additive. SOx additives remove sulfur oxides from FCC air emissions to enable refiners to comply with their air emissions permits for this pollutant.

46. In August 2018, Aru discovered significant issues with how one supplier, Johnson Matthey, where Mr. Aru formerly worked, was classifying their SOx reduction additive products in their safety data sheets, declaring them non-hazardous when data Johnson Matthey filed publicly in Europe showed they knew their products to have significant human health hazards.

This was discovered while Aru was preparing the required safety data sheets for the Aru additive Ultra SOxBuster.

47. Upon discovering the safety issues and the misclassification by Johnson Matthey of the hazards in August 2018, Mr. Aru contacted all of the suppliers of SOx additives in the United States, including Johnson Matthey, BASF, Albemarle Corporation, and Grace, to alert them to the potential hazard issues. At Grace, Mr. Aru contacted Dr. Scott Purnell, then Vice President, Marketing, Refining Technologies. In January 2019, Dr. Purnell would become Vice President of R&D, Refining Technologies, at Grace, a position he holds to this day. Mr. Aru knew Dr. Purnell from previous interactions in the industry dating to 1994 and knew that his background as a Ph.D. in Chemical Engineering would make him qualified to understand the safety data issues.

Aru Gives Grace Numerous Valuable Insights on Safety and Business Strategies

48. On September 17, 2018, Mr. Aru met with Dr. Purnell at an industry conference in Park City, Utah, for their first discussion on this issue. On September 24, 2018, Mr. Aru and Dr. Purnell had a follow up discussion by phone on the safety issues discovered and the work that Grace had done in this area and published in REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) as required in Europe for import and sale of their SOx additive products. Mr. Aru also expressed interest to Dr. Purnell of working together to better understand the safety issue and also the potential of a broader relationship, including Aru buying products for resale from Grace, the potential for joint research and development of new SOx additives, and exploring if Grace had interest in the new patent-pending CO to CO_2 combustion promoter being commercialized by Aru at the time.

49. Mr. Aru and Dr. Purnell would meet in person again on October 2, 2018, at an industry conference in Atlanta, Georgia, to continue these discussions on the safety issues and discuss potential commercial collaboration ideas.

50. A follow up meeting on January 11, 2019, was arranged at Grace's headquarters in Columbia, Maryland, between Dr. Purnell, Mr. Aru, and Dr. Natalie Herring, Director of Technology and Business Development for Aru. The meeting was to discuss the work Aru was doing on the SOx safety issues and ideas for cooperation on the commercial side as requested by Dr. Purnell. Dr. Purnell also arranged a meeting for Mr. Aru with Mr. Mark Shelnitz, then Senior Vice President, General Counsel and Secretary at Grace, to discuss the safety issues and issues with potential criminal activity by Johnson Matthey, which may have impacted Grace's business. At the time of this meeting, these issues were being investigated by the UK's Serious Fraud Office.

51. Mr. Aru and Dr. Herring provided Dr. Purnell and others at Grace detailed additional information on the SOx safety issues and the studies Aru was conducting with Argonne National Labs in Chicago, Illinois, to better characterize and understand the actual chemical composition of SOx additives. Mr. Aru also discussed with Grace classification inconsistencies in their SOx additive safety data sheets that he uncovered.

Supposed Expansion of the Relationship

52. It was agreed in the January 11, 2019 meeting that Mr. Aru would document the ideas for commercial collaboration discussed at the meeting and prepare a document regarding these ideas and others, which Mr. Aru did by email to Dr. Purnell on January 16, 2019.

53. Grace reviewed these ideas internally and requested a meeting at the next industry conference in March 2019 to discuss in more detail. That meeting would occur on March

17, 2019. Before the meeting, Mr. Aru was informed that Mr. Nathan Ergonul would replace Dr. Purnell as Vice President, Marketing – Refining Technologies, at Grace and that Dr. Purnell would become Vice President, Research and Development – Refining Technologies. Mr. Bob Riley, Marketing Team Leader, Americas, reporting to Mr. Ergonul, was then assigned as Mr. Aru's primary contact at Grace.

54. Subsequent to this meeting, Grace requested that a confidentiality agreement be executed between Aru and Grace, which occurred on April 25, 2019.

55. Grace proposed in a series of emails in 2019 various ideas and profit-sharing models for Aru to offer Grace FCC additives to its customers and for Grace to offer certain Aru additives to Grace's customers, including the patent-pending CO to CO_2 combustion promoter. These ideas were discussed in various meetings with Grace at their Columbia, Maryland, headquarters, over the phone and at other locations during industry conferences.

56. Grace also agreed to cooperate with Aru by providing FCC catalyst and additive addition systems, equipment necessary for the refiners to be able to use the additives Aru was to offer. This enabled Aru to offer these Grace systems to its customers.

Disclosures Regarding Aru's Patent-pending CO to CO_2 Combustion Promoters

57. Thereafter, on October 10, 2019, the international patent application for Mr. Aru's inventions was published by the World Intellectual Property Organization as WO 2019/195088 A2. Mr. Riley told Mr. Aru in a phone call in early November 2019 that Dr. Purnell had seen the patent application and found it to be interesting and clever.

58. Mr. Aru traveled to meet at Grace's headquarters with Mr. Riley, Mr. Balko, and Mr. Ergonul on November 19, 2019, to discuss progress on the business collaboration, address the mechanics of how sales and products would be supplied, and how trademarks would be used

and licensed. Mr. Aru also presented another business opportunity to Grace, using Aru's promoters, both platinum- and palladium-based, preblended in Grace's fresh catalyst to customers for whom they supply CO to CO_2 combustion promoters in that form.

59. Mr. Aru explained the advantages and business case for using his promoters or licensing his technology for this pre-blending of CO to CO_2 combustion promoters. Mr. Aru explained how Grace could have a lower-cost product from the reduced platinum or palladium content of the promoter—reduced by 50% or more—but have the same CO to CO_2 conversion performance to sell to their customers, which would yield Grace significant profit margin improvement. Mr. Aru also explained that as his technology also reduces NOx emissions, this would be a performance advantage Grace could position with its customers to further improve margins using Aru's promoters or even increase opportunities for pre-blending in situations when customers are concerned with their permit limits on NOx emissions.

60. Subsequent to the meeting, Grace requested data on Aru's patent pending CO to CO_2 combustion promoters in an email from Mr. Riley on November 20, 2019, suggesting potential business opportunities. Mr. Riley also addressed the preblending business idea of Mr. Aru in this email as a reason for needing additional information to build Grace's confidence in Aru's promoters. Supplying Grace products for pre-blending in Grace's catalyst or licensing the technology to Grace was very enticing to Mr. Aru, as it would give his products and technology access to a significant market segment that was otherwise difficult or impossible for Aru to access. Upon information and belief, Grace preblends 100,000's of pounds of CO to CO_2 combustion promoters each year to customers across the globe.

Preblending Combustion Promoters with Fresh Catalyst Increases the Potential Market

61. On November 21, 2019, Mr. Aru provided the requested data, including proprietary cost information on production of the Aru CO to CO_2 combustion promoters, both platinum and palladium, and the economic and NOx emissions reduction advantages of the technology used to make the promoters. Mr. Aru would reiterate the business case for preblending Aru's promoters in this email:

> For pre-blending, getting maximum value will depend on what your agreements call for – is it specific ppm levels of PGM or a CO index or other performance measure? There are ways to position this technology in either case to generate greater return for you. We can also tailor the PGM level specifically for your requirements for further optimization.

This email and the attached data were marked confidential and subject to the obligations of the parties' confidentiality agreement.

62. Mr. Aru provided additional data and identified several specific FCC units where Aru's promoters were being used during 2019. This was done so that Grace could review their previously collected data from these units and potentially analyze the catalyst samples from these refineries that they retain (known as ecat samples) for their ability to catalyze CO to CO_2 oxidation. This CO combustion test, as it is known, would allow Grace to see if the Aru promoter, with its significantly lower Group VIII noble metal content, was working as well as the CO to CO_2 combustion promoter it replaced. This was critical for Grace to assess if preblending Aru's products would support the business case Mr. Aru presented.

63. Mr. Riley reported by email to Mr. Aru on February 21, 2020, that Grace had direct data and proof of the effectiveness and economic benefits of the Aru CO to CO_2 combustion promoters. This confirmed to Grace the business case for using CO to CO_2 combustion promoters using the then patent-pending eggshell technology to improve their margins.

Divergent Trajectories Through COVID

64. The parties' businesses were going in opposite directions at the time. During the COVID pandemic, many petroleum refineries responded by shutting down refineries or reducing their output and were resource constrained in their operations as staff were diverted to COVID safety issues. Despite the impacts of COVID, Aru's total sales grew by approximately 75% from 2019 to 2020, with its patent-pending CO to CO_2 combustion promoter sales more than doubling, while Grace's publicly reported refining catalyst sales declined by approximately 18% during that same time according to Grace's 2020 Form 10-K annual report.

65. The same 2020 annual report by Grace proclaimed that its previous CO to CO_2 combustion promoter product CP® P "is designed to enable refiners to control carbon monoxide emissions without increasing nitrogen oxides." However, upon information and belief, Grace knew that its CP® P product did not mitigate NOx emissions as well as Aru's patent-pending CO to CO_2 combustion promoter and was copying it to obtain its advantages, including but not limited to lower NOx emissions.

Joint Marketing Agreement for Grace's Products

66. With Grace's oral agreement, Aru began offering sales of the Grace's products openly to three of the top five United States refining companies in 2019. Grace openly discussed this relationship with those refiners as well. Grace identified these refineries as those were where Grace had previous issues and Aru's strong relationships would be advantageous for Grace.

67. Aru expended significant effort and resources to market Grace's products to these refineries and was able to sell Grace additive under Aru brand names at several FCC units at these companies. By early 2021, Aru had made significant gains in selling ZSM-5 where Grace

teams were previously unsuccessful. Ms. Julie Ellis, then Sales Operations Director, FCC at Grace and thus knowledgeable of all of Grace's FCC sales and customers, advised Mr. Aru on February 19, 2021, that she expected the ZSM-5 sales to Aru would make it one of Grace's top 5 customers for these additives. Ms. Ellis is now Vice President of Business Management – Refining at Grace.

68. Mr. Aru and the team at Aru also assisted Grace with the sales of their FCC catalyst at these accounts. Mr. Aru and his team helped Grace identify opportunities for their products and provided feedback from the customers to Grace. Mr. Riley told Mr. Aru that the Technology Director for one of these refining companies told Grace in a meeting with their senior leadership of the refining group that working with Mr. Aru and his team was one of the smartest things they have done. Upon information and belief, discovery will show that Grace's catalyst and direct additive sales to these three refining companies increased in 2021 over what they were in 2018 by $50,000,000 or more per year.

69. Aru was also growing its sales of the patent-pending CO to CO_2 combustion promoters during 2019 and 2020, growing from just initial trials of a few hundred pounds in 2018 at two refineries to having over 20 users and over 200,000 lbs. in sales by the end of 2020. On September 15, 2020, Mr. Aru was notified in a phone call from Mr. Jeff Sexton, Refining Technology Director for Marathon, that Aru was awarded the very prestigious Innovative Partnership award for its GFP CO to CO_2 combustion promoters and for a hydrogen catalyst it supplied Marathon from its partner Magma Catalysis. *See* Exhibit A. Mr. Aru notified Mr. Riley at Grace of this development on September 17, 2020.

70. In 2020, Aru's palladium-based CO to CO_2 combustion promoter, GFP-PD, also replaced Grace's palladium-based promoter, known as CP-P, at several locations, and Grace would learn of its better performance from their direct support of these accounts using their

products. Mr. Balko at Grace confirmed this to Mr. Aru in phone calls on September 20 and 25, 2022.

71. In addition to selling Grace's products under Aru's brand, Mr. Aru provided critical data from third party laboratory analysis Aru commissioned and paid for, which showed issues with Grace's high activity ZSM-5 additive. This was done to help Grace improve their product. Aru also provided Grace with new analysis methods to improve their ability to demonstrate performance of their SOx additive product to their customers, in the spirit of their oral agreement and to demonstrate Aru's commitment to their relationship.

Grace Launches Copycat Products and Uses Unrelated Litigation As a Pretext for Terminating Joint Marketing Agreement

72. Unbeknownst to Aru at the time, in about early December 2020, Grace launched its Optimized CP®P product, which was a copy of Aru's patent-pending product. Despite their ostensibly collaborative business relationship, Grace did not mention this directly competitive copycat product to Aru at the time.

73. On December 23, 2020, Johnson Matthey Process Technologies, Inc. ("JMPTI"), a division of Johnson Matthey, filed a lawsuit in the United States District Court for the Southern District of Georgia, Case No. 4:20-cv-00322-WTM-CLR, naming as defendants a former JMPTI employee, Katherine J.M. Hovey, and Aru, accusing them of trade secret misappropriation. Mr. Aru promptly notified Mr. Riley of this development on December 31, 2020, which was as timely as possible with the Christmas and New Year holidays.

74. On January 5, 2021, in a telephone call with Mr. Riley, Mr. Aru discussed the complaint and its lack of merit, offering to explain Aru's defenses to Grace's attorneys.

75. On January 13, 2021, Mr. Ergonul called Mr. Aru and informed him that Grace was terminating the oral joint marketing agreement with Aru for business reasons citing

lack of progress in Aru gaining business for Grace. Subsequently, in a separate phone call, Mr. Riley told Mr. Aru this termination was a direct result of the lawsuit by JMPTI.

76. Mr. Balko also confirmed this termination was because of the JMPTI lawsuit in explaining the situation to senior executives from a major United States refining company in a joint lunch meeting with that company, Aru, and Grace on March 13, 2022, in New Orleans, Louisiana, during an industry conference. Mr. Balko stated that because Standard Industries was in the process of acquiring Grace at the time and this was not public knowledge, Mr. Tom Petti, President, Refining Technologies at Grace and Mr. Ergonul's then immediate supervisor and Mr. Ergonul made the decision to avoid an adverse association with Aru. Mr. Balko again reaffirmed this in his telephone conversations with Mr. Aru on September 20 and 25, 2022.

77. In contrast to Aru's open disclosure of the lawsuit against it by JMPTI, Grace did not reciprocate and disclose to Aru then pending litigation against Grace by Vertellus Holdings LLC, et al. ("Vertellus") in this district before Judge Stephanie A. Gallagher, Case No. 1:18-cv-03298-SAG. In that case, Vertellus alleged claims against Grace for misappropriation of trade secrets, breach of contract, correction of inventorship for patents that Vertellus alleged Grace obtained with Vertellus' information in breach of contract, and various related state law claims. In summary, Vertellus' claims against Grace arose from Grace's alleged use of Vertellus' information to obtain patents and to make catalysts for Vertellus' competitors, eliminating Vertellus' economic advantage in their production process over their competitors' production processes, reminiscent of Grace's willful copying of Aru's patented CO to CO_2 combustion promoter in this case.

78. The JMPTI litigation that Grace used as a pretext for terminating the oral agreement was quickly defeated by Aru on a pre-answer motion to dismiss for failure to state a

claim that was granted in an order dated July 8, 2021, in Southern District of Georgia Case No. 4:20-cv-00322-WTM-CLR.

79. Grace, on the other hand, lost summary judgment as to liability for Vertellus' claim that Grace breached their contract through its patent disclosures in an order by Judge Gallagher dated August 11, 2021, in District of Maryland Case No. 1:18-cv-03298-SAG.

80. The Vertellus case against Grace was scheduled for trial starting October 11, 2022, but after Grace lost several key motions, including a motion to amend its pleading to assert a judicial estoppel defense, Grace and Vertellus notified the Court of a settlement on September 9, 2022, and moved to stay the proceedings pending negotiation of a settlement agreement.

Grace's Retaliation Against Aru

81. After Mr. Aru notified Grace of the JMPTI lawsuit, Grace continued to offer products to Aru that the company could rebrand and sell, but Grace significantly increased the price of these products, first on January 10, 2021, and again on February 16, 2021. Subsequent discussions between Mr. Riley and Mr. Aru provided some price reduction. Aru, however, had made commitments to its customers based on Grace's previous agreement, which Aru honored, resulting in a net loss to Aru on some sales of Grace products.

82. On January 29, 2021, Mr. Riley informed Mr. Aru that Grace would also end cooperation with, and the supply of, catalyst and additive addition systems to Aru as a result of the JMPTI lawsuit. These systems are required to enable refiners to use the FCC additives offered by Aru. Many refiners have existing systems, some they own, and many are leased from companies such as Johnson Matthey and Grace. When leased, the right to use a competitor's FCC catalyst or additive may be restricted or require a very high monthly lease fee, making Aru's FCC

additives uncompetitive in some cases. As a result, Aru was forced to expend considerable effort, expense, and time to develop its own addition systems, which are just now becoming ready to market.

83. During 2021, Mr. Aru continued to provide updates to Mr. Riley on the JMPTI lawsuit via email, including the motion to dismiss and the orders dismissing the lawsuit against both Aru and Ms. Hovey. Aru continued to offer Grace products to customers where and when possible, given the commercial constraints on pricing and lack of cooperation on addition systems imposed by Grace.

84. In August 2021, Mr. Aru was notified by Mr. Riley that he was given a new position in Grace, and that Mr. Michael Hawkins would become the new Regional Marketing Manager of the Americas – FCC, and would become the principal contact at Grace for Mr. Aru.

85. Mr. Aru and Mr. Hawkins agreed to a meeting over lunch to discuss the Aru – Grace relationship and the path forward after the JMPTI lawsuit was dismissed. Mr. Aru also arranged for Mr. Riley to meet one of Aru's business partners, the CEO of UNICAT Catalyst Technologies, LLC, at this lunch as well. Mr. Riley was interested in the catalysts produced by UNICAT in his new role. This lunch occurred on October 1, 2021.

86. After this lunch, Mr. Aru received an ominous warning from Mr. Riley, advising Mr. Aru to get any agreements with, or promises from, Grace in writing. Mr. Aru asked what prompted Mr. Riley to say this, and Mr. Riley said "That's all I'll say."

Grace Dangles Renewed Collaboration While Copying Aru's Products

87. Mr. Aru and Mr. Hawkins exchanged a series of emails and phone calls after this meeting. On November 22, 2021 in a Microsoft Teams Meeting between Mr. Aru and Mr. Hawkins, Mr. Hawkins said Grace was interested again in pursuing a more collaborative

relationship. Mr. Hawkins requested an update on Aru's CO to CO_2 combustion promoter business and updated data on its performance. Mr. Hawkins would make these requests by email as well on December 13 and 28, 2021, suggesting in the latter email that Grace intended to take a more collaborative approach with Aru in 2022.

88. Given Mr. Riley's warning, Mr. Aru requested by email that Mr. Hawkins verify that the confidentiality agreement between Aru and Grace remained in effect. Mr. Hawkins would orally confirm this on December 28, 2021. Aru then provided additional confidential information on its customers and the CO to CO_2 combustion promoter performance data previously provided along with other previously-provided information on areas for collaboration.

89. On January 31, 2022, Mr. Balko asked Mr. Aru about setting up a lunch meeting at an upcoming industry conference in March 2022 with the technology director for a major United States oil refining company. Mr. Aru arranged for this lunch meeting with the technology director, the lead technologist for FCC, and the procurement manager on March 14, 2022.

90. On December 7, 2021, Mr. Aru learned that one domestic refinery began using a new palladium-based promoter from Grace called Optimized CP-P more than one year earlier, starting on or about December 4, 2020. Mr. Aru was not aware of what the promoter was, but the refinery explained it was a lower cost product than Grace's CP-P CO to CO_2 combustion promoter.

91. On February 23, 2022, by text and March 8, 2022, by email, Mr. Balko invited Mr. Aru to brunch on March 13, 2022, to meet the new CEO of Grace, Mr. Bob Patel. Mr. Aru met Mr. Patel at this brunch and briefly discussed his business and the collaboration he was to trying to achieve with Grace. Also on March 13, 2022, as alleged above, Mr. Aru emailed Mr.

Balko at Grace regarding the issuance of the ’864 patent and attaching a brochure regarding Aru’s GFP® product. *See* Exhibit H.

92. At the lunch meeting on March 14, 2022, Mr. Balko and Mr. Aru discussed their desired approach to joint collaboration in support of this customer. Mr. Balko also told the refiner that Grace was interested in the Aru promoter technology and exploring ways to collaborate on this. Mr. Balko sent an email to the lunch meeting attendees on March 21, 2022, writing in part: “We look forward to continuing to evolve our business relationship with Guido and we appreciate the feedback on what he and his team do well and what it means to [company name omitted]. We are committed to continuous supply of Olefins products to him and also to working towards an expanded relationship via potential upcoming Olefins product trials.”

Grace’s Announcement of its Copycat Products
Admits Infringement, Coopts Aru’s Business Case, and Denigrates Aru

93. On or about April 14, 2022, Grace announced it had developed optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoters in an article titled “CO promoter technology development” in the Q2 2022 edition of Petroleum Technology Quarterly (“PTQ”) authored by Grace employee Mr. Colin Baillie (*see* Exhibit C) and on Grace’s blog (*see* Exhibit D). Mr. Baillie is the product segment manager for Grace for this product line reporting to Mr. Ergonul at the time. This was the first time Aru became aware of what this Optimized CP-P was that Grace began selling in 2020 – a copycat of Plaintiffs’ technology. It was also the first time Mr. Aru was aware that Grace also copied his technology for their platinum-based CO promoters.

94. The technology needed and the approach described in Grace’s PTQ article apply equally to Grace’s platinum- and palladium-based CO to CO_2 combustion promoters. Aru believes that discovery will reveal that Grace also stole and used Aru’s business plan for

preblending both of these platinum- and palladium-based CO to CO_2 combustion promoters for customers that request preblended promoters in fresh catalyst. The advantages of doing so are compelling, as Aru's business plan and data given under the confidentiality agreement to Grace, including Mr. Ergonul, in November 2019 showed, and as Grace itself describes about its copycat promoters in the PTQ article:

> By incorporating a modified alumina, Grace's optimized CO promoters (both platinum- and palladium-based technologies) can provide the same CO promotion activity at a lower metals level, with an additional benefit of lower NOx emissions.

See Exhibit C.

95. The PTQ Q2 2022 article regarding Grace's new optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoters authored by Mr. Baillie (Exhibit C) contains admissions demonstrating that these products infringe the '864 patent, as described further below. The article coopted Aru's business case for the patented promoter, touting reduced usage of expensive noble metals while still effectively promoting CO to CO_2 oxidation with the added environmental benefit of NOx reduction. And this article also publicly denigrated Aru's reliability in the marketplace by implying that the use of tolling manufacturers is unreliable.

96. Grace has admitted to Aru, including but not limited to in telephone conversations between Mr. Aru and Mr. Balko on September 20 and 25, 2022, that Grace copied Aru's patented CO to CO_2 combustion promoter technology because Grace was losing business to Aru and needed to compete. Mr. Balko admitted in these calls that Grace's sales had been down significantly, and they were desperate not to lose any business. Declines in sales occurred at all of the catalyst companies, as refiners were not producing as much because of the global shutdowns from COVID. Demand for gasoline, jet fuel, and diesel all dropped and thus refiners did not need to buy or use as much catalyst products from Grace and others. Aru's business burgeoned, however, because of the success of the patented technology and the cost savings to refiners

continued to grow during COVID for the reasons alleged above with respect to price increases for noble metals.

COUNT I
PATENT INFRINGEMENT
35 U.S.C. § 271(a)

97. Plaintiffs hereby incorporate by this reference each of the foregoing numbered paragraphs as if fully set forth herein.

98. Grace has directly infringed at least one claim of the ’864 patent under 35 U.S.C. § 271(a), literally or under the doctrine of equivalents, in connection with making, using, selling, and/or offering to sell its optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D.

99. For illustrative pleading purposes, following is a description of how Grace’s optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D meet each and every limitation of claim 1 of the ’864 patent. This is for notice pleading purposes only and in no way limits the infringement theories, asserted patent claims, or accused products in this case. Subject to receiving in discovery samples of Grace’s relevant CO to CO_2 combustion promoter products for testing and analysis, Plaintiffs will disclose their infringement contentions timely in accordance with Section VIII. of the Local Rules of the District of Maryland and the Court’s Scheduling Order in this case.

100. Claim 1 of the ’864 patent recites:

> 1. A CO to CO_2 combustion promoter comprising microsphere sized porous particles, each microsphere sized porous particle having a diameter of less than 1 mm, and independently comprising:
>
> silica, alumina, or mixtures thereof; and
>
> one or more Group VIII noble metals distributed in the particle as an eggshell such that a higher concentration of the one or more Group VIII noble metals is present in the outer region of the microsphere sized porous particle as compared to the

concentration of the one or more Group VIII noble metals in the centre of the microsphere sized porous particle.

"A CO to CO_2 combustion promoter"

101. Grace's optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D are CO to CO_2 combustion promoters.

"microsphere sized porous particles, each microsphere sized porous particle having a diameter of less than 1 mm, and independently comprising"

102. Upon information and belief, Grace's optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D comprise microsphere sized porous particles having a diameter of less than 1 mm.

"silica, alumina, or mixtures thereof"

103. The microsphere sized porous particles in Grace's optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D comprise alumina. For example, this fact is admitted in Grace's announcement in PTQ Q2 2022 authored by Mr. Baillie. *See* Exhibit C at 81.

"one or more Group VIII noble metals distributed in the particle as an eggshell such that a higher concentration of the one or more Group VIII noble metals is present in the outer region of the microsphere sized porous particle as compared to the concentration of the one or more Group VIII noble metals in the centre of the microsphere sized porous particle"

104. Grace's optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D comprise the Group VIII noble metals palladium and/or platinum. The noble metals in these Grace products are distributed in the microsphere sized porous particles as an eggshell such that a higher concentration of the noble metals is present in the outer region of the particle as compared to the concentration in the center

of the particle. For example, this fact is admitted in Grace's announcement in PTQ Q2 2022 authored by Mr. Baillie:

> The process Grace uses to incorporate palladium and platinum onto the combustion promoter naturally leads to a particle where the majority of the metals are located at the surface. However, the advanced alumina used for the optimized CO promoters results in an even higher proportion of the metals residing on the outer surface of the particle.

See Exhibit C at 80-81.

105. In accordance with 35 U.S.C. § 284, Plaintiffs are entitled to receive compensatory damages in an amount to be determined at trial, but in no event less than a reasonable royalty. Plaintiffs intend to seek all available damages, including but not limited to lost profits damages.

106. Grace's infringement has been willful from the issuance of the '864 patent, entitling Plaintiffs to treble damages under 35 U.S.C. § 285 for all of Grace's sales of optimized versions of its palladium- and platinum-based CO to CO_2 combustion promoter products described in Exhibits C and D, and any other Grace products that infringe the '864 patent, from January 18, 2022 forward.

107. Grace's infringement has caused and is continuing to cause irreparable harm to Plaintiffs. Plaintiffs thus are entitled to permanent injunctive relief against Grace's continued infringement of the '864 patent.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs respectfully pray for judgment in their favor against Grace as follows:

A. Adjudging that Grace has directly infringed one or more valid claims of the ’864 patent in violation of 35 U.S.C. § 271(a);

B. Permanently enjoining Grace from making, using, selling, offering to sell, or importing any product covered by any claim of the ’864 patent;

C. Awarding Plaintiffs damages to compensate for Grace’s patent infringement in an amount to be proven at trial, including lost profits, but in no event less than a reasonable royalty for Grace’s use of the inventions claimed in the ’864 patent, together with prejudgment and post-judgment interest and costs of suit as fixed by the Court as provided in 35 U.S.C. § 284;

D. Trebling Plaintiffs’ compensatory damages for patent infringement in accordance with 35 U.S.C. § 284 due to the willful and wanton nature of Grace’s infringement;

E. Finding this case to be exceptional under 35 U.S.C. § 285 and awarding Plaintiffs their reasonable attorney fees; and

F. Awarding Plaintiffs such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38, Plaintiffs demand a trial by jury on all issues in this case so triable.

Dated: October 13, 2022

Respectfully submitted,

/s/ Jennifer K. Squillario

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*Motions for admission *pro hac vice* to be filed

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