Appeal No. 2023-1217

IN THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

US SYNTHETIC CORP.,
Appellant

v.

INTERNATIONAL TRADE COMMISSION,
Appellee

SF DIAMOND CO., LTD., SF DIAMOND USA, INC., ILJIN DIAMOND CO., LTD., ILJIN HOLDINGS CO., LTD., ILJIN USA INC., ILJIN EUROPE GMBH, ILJIN JAPAN CO., LTD., ILJIN CHINA CO., LTD., INTERNATIONAL DIAMOND SERVICES, INC., HENAN JINGRUI NEW MATERIAL TECHNOLOGY CO., CR GEMS SUPERABRASIVES CO., LTD., FUJIAN WANLONG SUPERHARD MATERIAL TECHNOLOGY CO., LTD.,
Intervenors

Appeal from the United States International Trade Commission in Investigation No. 337-TA-1236

REPLY BRIEF OF APPELLANT US SYNTHETIC CORP.

Daniel C. Cooley
J. Derek McCorquindale
Brandon T. Anderson
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
1875 Explorer Street, Suite 800
Reston, VA 20190-6023
(571) 203-2700

James R. Barney
Mareesa A. Frederick
Christina Ji-Hye Yang
Alexander E. Harding
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
901 New York Avenue, NW
Washington, DC 20001-4413
(202) 408-4000

Counsel for Appellant

November 9, 2023

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF INTEREST

Case Number: 2023-1217

Short Case Caption: US Synthetic Corp. v. ITC

Filing Party/Entity: US Synthetic Corp.

Instructions:

1. Complete each section of the form and select none or N/A if appropriate.
2. Please enter only one item per box; attach additional pages as needed, and check the box to indicate such pages are attached.
3. In answering Sections 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance.
4. Please do not duplicate entries within Section 5.
5. Counsel must file an amended Certificate of Interest within seven days after any information on this form changes. Fed. Cir. R. 47.4(c).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: November 9, 2023 Signature: /s/ Daniel C. Cooley

Name: Daniel C. Cooley

1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	**2. Real Party in Interest.** Fed. Cir. R. 47.4(a)(2).	**3. Parent Corporations and Stockholders.** Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities. ☒ None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities. ☐ None/Not Applicable
US Synthetic Corporation		ChampionX Corporation

☐ Additional pages attached

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this **court** for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

☐ None/Not Applicable ☐ Additional pages attached

Kelly S. Horn Finnegan, Henderson, Farabow, Garrett & Dunner, LLP	Yicong (Eve) Du Finnegan, Henderson, Farabow, Garrett & Dunner, LLP	Smith R. Brittingham, IV Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
David K. Mroz Finnegan, Henderson, Farabow, Garrett & Dunner, LLP	Michael E. Kudravetz Finnegan, Henderson, Farabow, Garrett & Dunner, LLP	Robert K. High Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
Sonja Salhsten Finnegan, Henderson, Farabow, Garrett & Dunner, LLP	Ruohan (Jack) Li Finnegan, Henderson, Farabow, Garrett & Dunner, LLP (no longer with the firm)	

5. Related Cases. Other than the originating case(s) for this case, are there related or prior cases that meet the criteria under Fed. Cir. R. 47.5(a)?

☒ Yes (file separate notice; see below) ☐ No ☐ N/A (amicus/movant)

If yes, concurrently file a separate Notice of Related Case Information that complies with Fed. Cir. R. 47.5(b). **Please do not duplicate information.** This separate Notice must only be filed with the first Certificate of Interest or, subsequently, if information changes during the pendency of the appeal. Fed. Cir. R. 47.5(b).

6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☒ None/Not Applicable ☐ Additional pages attached

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

Cases

Statutes

Other Authorities

I. INTRODUCTION

The patent eligibility analysis for this case is simple. USS designed and made the PDC at issue. USS found that its PDC performed well and sought to objectively characterize its structure and properties. As a result, USS measured the intrinsic properties of its new PDC using international ASTM standards. USS then claimed its new PDC in the '502 patent based in part on the intrinsic properties of the material. The '502 patent's claims are directed to this composition of matter; they are not directed to an "abstract idea" under *Alice*.

The Commission and Respondents do not cite any case holding that a non-naturally occurring composition of matter with different characteristics from those found in nature—like the PDC at issue here—is ineligible subject matter under 35 U.S.C. § 101. Lacking precedent, the Commission and Respondents seek to show the claims are "directed to" abstraction under *Alice* by divorcing the properties of the material—what the Commission labels "side effects"—from the remainder of the PDC and then attack the individual claim elements with incorrect facts, inapposite caselaw, and attorney argument. But the PDC material cannot be separated from its claimed properties. As a matter of science and § 101 law, they must be considered together.

The Commission next confuses the preemption analysis under *Alice*, suggesting that the claims are preemptive because there are other "ways" to make

the invention. But the claims are directed to a composition, not a method. The Commission's preemption arguments also hinge on unclaimed features like pressure and cobalt percentages, rendering them irrelevant. And it is telling that Respondents—who admitted to benchmarking USS products—only started making PDCs falling within the claims *after* USS published its "way[]" of manufacturing.

The Commission and Respondents follow a similar approach to *Alice* step two. They allege that the products are "conventional," but can only show conventionality by discarding multiple claimed features as "side effects" and analyzing the remaining features independent of one another. The law does not allow this piecemeal approach. The claim features must be considered as an ordered combination. Far from conventional, no prior art teaches or renders obvious the claimed features. That is undisputed.

The remaining scattershot arguments, including Respondents' attempt to convert §101 into a pure fact issue and untimely 35 U.S.C. § 112 positions, likewise fail. The Commission should be reversed.

II. ARGUMENT

A. Claims 1, 2, and 11 of the '502 Patent Recite Patentable Inventions Under § 101

All parties agree that the claimed PDCs fall squarely within the statutory category of "composition of matter" under 35 U.S.C. § 101. The Commission creates a strawman that USS believes all "manufactures" are "*de facto* patent-

eligible." ITC Br. 46-47. But the issue is not about "de facto" rules. The issue is that neither the Respondents (who bore the burden) nor the Commission (who must apply the law) can identify any precedent for the contrary ruling here. More than unsupported, the Commission's ruling contradicts foundational Supreme Court jurisprudence.

USS and Amicus (PhRMA) cited to *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (USS Br. 21; Amicus Br. 8), where the Supreme Court analyzed composition-of-matter claims and found them patent eligible. *Chakrabarty* explains that "[i]n choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." 447 U.S. at 308.

While *Chakrabarty* recognized that § 101 does not embrace "every discovery," its examples of ineligible subject matter are far from this case. *Id.* at 309 (noting "a new mineral discovered in the earth," "a new plant found in the wild," "[the] celebrated law that $E=mc^2$," and "the law of gravity"). Other Supreme Court decisions dealt with similarly clear cases of ineligibility, including a method of "convert[ing] signals from binary-coded decimal form into pure binary form," *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972); "a method of updating alarm limits," *Parker v. Flook*, 437 U.S. 584, 585 (1978); a method of correlating metabolites, *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc*., 566 U.S.

66, 74 (2012); and "the abstract idea of intermediated settlement," *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 218 (2014). USS did not claim inventions like these.

The Commission responds that "nothing in *Chakrabarty* precludes applying the abstract ideas exception to manufactures and compositions of matter." ITC Br. 45. But the Commission has the inquiry backwards. It has applied an *exception*, not the *rule*. The abstract-idea exception does not expand outwardly, invalidating claims unless "preclude[d]." The Supreme Court cautioned against this logic, stating that the abstract-idea exception must be applied "carefully . . . lest it swallow all of patent law." *Alice*, 573 U.S. at 217.

The Commission seeks to distinguish *Chakrabarty* on its facts as pertaining to "a live, human-made micro-organism.'" ITC Br. 45-46. However, the nature of the invention in *Chakrabarty* supports the patentability of the claims at issue here. *Chakrabarty* claimed a "human-made, genetically engineered bacterium . . . capable of breaking down multiple components of crude oil." 447 U.S. at 305. Chakrabarty's invention was "believed to have significant value for the treatment of oil spills" because a "property" of the invention was "possessed by no naturally occurring bacteria." *Id*. This mirrors USS's PDC, which is a man-made synthetic diamond having properties and components that do not exist in natural diamond and performed better than even a leached PDC. *See* Appx1651-1653, 75:1-77:22; Appx2072-2073, 495:3-496:13.

The claims of *Chakrabarty* are also instructive. *Chakrabarty* claimed both "process claims for the method of producing the bacteria" and "the bacteria themselves." 447 U.S. at 305-06. The composition claimed was "a bacterium from the genus *Pseudomonas* containing therein at least two stable energy-generating plasmids, each of said plasmids providing a separate hydrocarbon degradative pathway." *Id*. at 305.[1] Thus, the claim focused on the properties of the plasmids and the function they performed, e.g., they were "stable energy-generating" and "provid[ed] a separate hydrocarbon degradative pathway." 447 U.S. at 305.

The PTO's position in *Chakrabarty* is strikingly similar to the Commission's position here. The PTO in *Chakrabarty* allowed the process claims but rejected the claims to the composition (the bacteria). *Id*. at 305-06. Like the PTO in *Chakrabarty*, the Commission believes that USS failed to "claim[] a particular fabrication process or a concrete compositional structure." ITC Br. 18; *see also* ITC Br. 22 ("[t]he inventors may very well have discovered and disclosed in the patent specification a new way of making an improved PDC," but the inventors failed to claim "the particular fabrication process and/or a concrete implementation of the improved PDC"). The Supreme Court disagreed and found the composition of matter patent eligible. Like *Chakrabarty*, USS "produced a new [PDC] with

[1] *See also* U.S. Patent No. 4,259,444, claim 1.

markedly different characteristics from any found in nature and one having the potential for significant utility." 447 U.S. at 310. Having done so, USS's invention "is not nature's handiwork, but [its] own; accordingly it is patentable subject matter under § 101." *Id*. USS's claims are patent eligible.

1. *Alice* Step One: Claims 1, 2, and 11 of the '502 Patent Are Eligible

a. The '502 Patent's Claims Are Not "Directed To" an Abstract Idea Under Step One

The claims of the '502 patent are not "directed to" an abstract idea. The Commission argues that "the focus of claim 1 is the observation of two magnetic behaviors, which is abstract." ITC Br. 27. Respondents argue that the claims are directed to the magnetic and thermal stability limitations. Int. Br. 51-54. But the claims focus on a *material*, and that material, like any other, is defined by its quantifiable attributes. The Commission's and Respondents' attempt to frame the invention as the "magnetic behaviors" is factually and legally wrong.

There is no dispute that USS created a new PDC composition of matter or that the new PDC was a real, tangible thing for which USS tested and recorded the properties under recognized international ASTM standards. Appx1654, 78:1-7. The Parties also agree that the claims of the '502 patent recite the same properties that USS measured as provided in Table I of the '502 patent. Appx103-104, tbl.I; *see* Appx106-108, Claims 1, 2, 11, 15, 21. Therefore, the *focus* of the claims is simple:

it is this novel composition of matter. That USS chose to characterize the composition in objective and quantifiable ways—such as by its magnetic properties—is consistent with the invention.

To support their § 101 arguments, the Commission and Respondents seek to divorce their alleged "magnetic side effects" from the claimed material. The Commission suggests that "[t]he claimed invention departs from prior art PDCs only by *adding* observed magnetic side effects" (ITC Br. 29 (emphasis added)), and that these "side effects" were merely added to a "generic PDC structure" (*see, e.g.*, ITC Br. 18, 29-31, 36). But USS did not just "add[]" new "magnetic side effects" to a "generic PDC" like one adds new software to a computer. USS manufactured a new material—a mass of carbon and cobalt fused and sintered into a whole—and then *measured* the resultant coercivity and magnetic saturation of this new, real-life material.

As a matter of material science (and common sense), those measured properties that derive from a material cannot be disassociated into a "magnetic behavior" component and a "generic PDC" component. Dr. German explained that these "are inherent aspects of the material." Appx2823, 1243:12-25; *see also In re Cescon*, 474 F.2d 1331, 1334 (CCPA 1973) ("A compound and its properties are inseparable . . . ." (citations omitted)). The Commission likewise concedes that the claim features are necessarily interrelated. ITC Br. 34. It even cites inventor

Dr. Mukhopdhyay who explained that the coercivity (a claimed feature) is related to the diamond grain size (another claimed feature). Appx4206-4208, 76:3-78:2 ("a change in coercive force will give you an indication [of] . . . which direction cobalt percentage is going," but "you can't just use coercive force . . . . *[O]ther factors are important, for example, what the diamond grain size is*." (emphasis added)). The properties *jointly* define the invention.

In addition to disregarding material science, the Commission's "add-on" theory disregards binding precedent. By isolating a feature *involved* in the claim (i.e., the magnetic parameters), and analyzing the alleged abstractness of this feature in isolation, the Commission failed to consider the character of the invention as a whole. The court in *Enfish* explained that "[t]he 'directed to' inquiry, therefore, cannot simply ask whether the claims *involve* a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions *involves* a law of nature and/or natural phenomenon—after all, they take place in the physical world." *Enfish, LLC v. Microsoft Corp*., 822 F.3d 1327, 1335 (Fed. Cir. 2016). "Rather, the 'directed to' inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether '*their character as a whole* is directed to excluded subject matter.'" *Id.* (citations omitted).

The '502 patent's claims are not "directed to" the abstract idea of stronger bonding and the observation of magnetic side effects.

b. Caselaw Does Not Support the Commission's "Directed To" Analysis

Lacking precedent for its "directed to" analysis under *Alice* step one, the Commission attempts to stretch *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 1113 (2022), to fit. *See* ITC Br. 30-33. Respondents seek to analogize the PDC to *O'Reilly v. Morse*, 56 U.S. 62 (1853), and its claim to electromagnetism. Int. Br. 47-49. But these and other cases cited by the Commission and Respondents are inapposite.

(1) The '502 patent does not claim generic processes and machinery like *Yu*

The Commission first seeks to analogize the claimed PDC here and the camera method of *Yu*. ITC Br. 30-31. But unlike this case, *Yu* fits within the "generic processes and machinery" paradigm of *Alice* and its progeny. 1 F.4th at 1043 (quoting *Smart Sys. Innovations, LLC v. Chi. Transit Auth.*, 873 F.3d 1364, 1371 (Fed. Cir. 2017)). Similar to *Alice*, the claim in *Yu* recited "sensors," "lenses," "image memory," and a "digital image processor,"—i.e., a "conventional camera"—with a general-purpose processor programmed with certain functionality. *Id*. In contrast, USS's invention is a material; it is directed to neither a process nor computer componentry.

There was also nothing fundamentally new in *Yu*. The camera was generic, a point that the patent owner conceded. *Id*. Methods for enhancing photos were conventional: "the idea and practice of using multiple pictures to enhance each other has been known by photographers for over a century." *Id*. Furthermore, the claim in *Yu* directly recited the abstract idea. *Id*. None of these circumstances apply here. The PDC material *is* new. The material is not programmable with some conventional method. And USS did not claim the alleged abstract idea of "stronger bonding," but rather claimed a material by way of its constituent elements, bonding configuration, processing state, diamond grain size, and measured properties of the diamond table. *See, e.g.*, USS Br. 36-37.

When addressing *Yu* (ITC Br. 31-32), the Commission points to *American Axle & Manufacturing, Inc. v. Neapco Holdings LLC*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022), and argues that the claims at issue there did not expressly recite a natural law or abstract idea. ITC Br. 32. But pointing to another inapposite fact pattern where the claims recite ineligible subject matter for different reasons does not make *Yu* any more on point here.

American Axle is also distinguishable. *American Axle* related to a manufacturing method for tuning liners. 967 F.3d at 1293. At bottom, the method "simply require[d] the application of Hooke's law to tune a propshaft liner to dampen certain vibrations." *Id*. at 1292. In the '502 patent, the claims do not recite

a method and do not merely apply a well-known natural law. These cases cited by the Commission and Respondents are distinguishable.

(2) *O'Reilly v. Morse* is inapposite because it claimed a natural phenomenon, and Respondents' "functional" arguments contradict long-settled law

Further arguing *Alice* step one, Respondents argue that "function alone cannot be patented" and seek to analogize USS's patent to *O'Reilly v. Morse*. Int. Br. 47-49 (citing *O'Reilly*, 56 U.S. at 62). But the '502 patent's claims do not recite "function alone" or nakedly claim a natural law.

O'Reilly v. Morse claimed the natural phenomenon of "electro-magnetism," untethered to any physical embodiment, i.e., "*however developed* for marking or printing intelligible characters." 56 U.S. at 112 (emphasis added). No such claim exists in the '502 patent. According to Respondents, "*O'Reilly v. Morse* has been refined by finding claims reciting functions without supporting structure to be invalid under either Section 101 or Section 112." Int. Br. 49. This point is irrelevant since the '502 patent claims recite supporting structure. And a measured material property, like magnetic saturation or coercivity, is not "functional," it is definitional; it defines what the material *is*.

Even characterizing a measured property as "functional," functional claiming has long been permitted. Respondents' argument on functional claiming aligns with a rejected view in *BASF Corp. v. Johnson Matthey Inc*., 875 F.3d 1360

(Fed. Cir. 2017). In *BASF*, the patent related to "a partly-dual-layer arrangement of catalytic coatings on a substrate over which exhaust gas passes." *Id*. at 1362. The claims recited, inter alia, a "composition . . . effective to catalyze" certain exhaust products. *Id*. at 1362-63.

The district court's logic in *BASF* aligns with the statements by the Commission in its Final Determination (emphases added):

BASF Corp. v. Johnson Matthey Inc.	***Certain Polycrystalline Diamond Compacts***
"Rather than explicitly defining the material compositions, the claims utilize **functional language** . . . ." 875 F.3d at 1365 (citation omitted).	"[T]he claims run afoul of section 101 due to the 'essentially result-focused, **functional** character of claim **language**.'" Appx28 (citation omitted).
"[T]he claims recite a performance **property** the composition must display, rather than its actual composition." 875 F.3d at 1365 (citation omitted).	"USS has not proven that the claimed electrical and magnetic **properties** are indicative of any specific microstructure." Appx27.
"'[A] practically **limitless number** of materials' exist that would 'catalyze SCR of NOx, even within the normal operating conditions of an exhaust aftertreatment system' . . . ." 875 F.3d at 1365 (citation omitted).	"[T]he asserted claims cover **all PDCs** exhibiting the claimed properties no matter what pressure was used to make them or how much catalyst is present in the PCD." Appx29.

The Federal Circuit reversed the decision in *BASF*. 875 F.3d at 1369. The Federal Circuit said, "[n]ot surprisingly, we have long held that nothing in the law precludes, for indefiniteness, 'defining a particular claim term by its function.'" *Id*. at 1366 (citations omitted). And while *BASF* focused on § 112, the case highlights

that patent law permits inventors to claim their inventions in various ways, including how they function.

To support its conclusion that functional claiming is permissible, the Court in *BASF* cites to *In re Swinehart*, *id.*, which states that "there is nothing intrinsically wrong with the use of such a technique in drafting patent claims." 439 F.2d 210, 212 (CCPA 1971). As here, *Swinehart* related to a "new composition of matter." *Id*. at 211. The claim included a functional limitation that the composition was "transparent to infra-red rays." *Id*. The CCPA held that "there is no support, either in the actual holdings of prior cases or in the statute, for the proposition, put forward here, that 'functional' language, in and of itself, renders a claim improper." *Id*. at 213. Considering whether functional language created issues *beyond* § 112, the court reasoned that "[w]e have also found no prior decision of this or any other court which may be said to hold that *there is some other ground* for objecting to a claim on the basis of any language, 'functional' or otherwise, beyond what is already sanctioned by the provisions of 35 U.S.C. § 112." *Id*. (emphasis added). The Commission's and Respondents' recasting of a measured property as a "side effect" or merely "functional" undermines long-settled law.

c. The Claimed Invention of the '502 Patent Does Not Improperly Preempt Future Innovation

The Commission and Respondents argue preemption in several ways—alleging that "substantially all" products made "stronger" are preempted; arguing an (unsupported) mathematical equivalence between cobalt percentage and the claimed properties; and alleging that the claimed invention is not limited to any compositional structure. These arguments all fail.

(1) The Commission Cannot Show Preemption by Relying on Unclaimed Processing Steps

The Commission starts by asserting that the '502 patent's claims preempt "*substantially all ways*" to achieve stronger PDCs. ITC Br. 36 (emphasis added). Respondents make a similar argument by faulting the claims for failing to recite the sintering pressure. *See* Int. Br. 17.

The arguments begin with a faulty premise. The claims are not process claims and are not seeking to preclude a *method* of doing something. This is not a case like *Flook* (method of updating alarm limits) or *American Axle* (method of tuning a drive shaft). The question is whether the *material* itself is eligible subject matter. Under the Commission's and Respondents' logic, a claim to a discrete object would become preemptive and patent ineligible because the claim omitted a manufacturing step or because the resulting product could be made multiple different ways. A boundless number of manufacturing techniques exist for almost

any product. That does not make them patent ineligible. The Commission cites no precedent holding that the existence of more than one technique for manufacturing a claimed composition of matter results in preemption.

The Commission also misstates the facts when it suggests that USS precludes "substantially all ways" to achieve stronger PDCs. ITC Br. 36. On this record alone, there are several ways to make a PDC stronger that the '502 patent does not preclude. For example, leaching a PDC is one "way[]" to make a stronger PDC, and the process of leaching is not precluded by the claims of the '502 patent. Appx1647-1648, 71:17-72:10.[2] SF Diamond allegedly created another way when it created design-around products that the Commission found did not fall within the claimed ranges. Appx16. The Commission ignores this additional "way[]" in its analysis.

Indeed, the Commission can only identify one "way[]" of making PDC "stronger" in which it believes (incorrectly) the '502 patent's claims are preemptive: that two products allegedly used a sintering pressure below 7.5 GPa, but nonetheless had claimed features. ITC Br. 36-37. In addition to logical and legal flaw of arguing preemption based on an unclaimed sintering processing step for an apparatus claim, the argument is also incorrect factually.

[2] A leached product is also not the same as the claimed product. *See, e.g.*, Appx1647-1648, 71:17-72:10.

USS analyzed *hundreds* of different products that Respondents manufacture. Respondents had access to even further products for testing, including their current, future, and past (i.e., prior art) products. Of the hundreds or even thousands of available products, Respondents and the Commission could only identify *two* products—the S18 and Dragon 2—that were made using pressures *allegedly* lower than 7.5 GPa and still fell within the claimed properties. ITC Br. 37-38; Int. Br. 37-38. This cannot meet any reasonable standard of preemption. Worse yet, for both products, the evidence of record contradicts their statements that the sintering pressures were below 7.5 GPa.[3]

It is revealing that Respondents could not show that *any* prior art products—made before the benefit of USS's patent disclosure—fell within the claimed ranges. Yet *after* USS disclosed its methods to the marketplace, Respondents, nearly all of whom admitted to benchmarking USS (*see* Appx1215-1216, 213:21-

[3] For example, the Commission can only point to a created-for-litigation spreadsheet from New Asia to suggest that the pressure used for the Dragon 2 was "less than 7.5 GPa" but without stating the actual pressure. *See* ITC Br. 37-38 (citing Appx710 (image taken from Appx6193)). When New Asia's sworn corporate witness was asked about the pressures New Asia used, he flatly admitted that "New Asia has no knowledge of a value for cell pressure of the Dragon2 during the sintering stage." Appx3491-3494, 73:16-76:16. Regarding the S18, the Commission's assertions conflict with Haimingrun's pressure-curve document, which reveals a manufacturing pressure consistent with the pressures disclosed in the '502 patent when the input pressure they disclose is applied to their own graph. Appx1474; *see also* Appx3326.

214:13; Appx887; Appx889; Appx1892-1893, 315:21-316:7; Appx821), released new products that fell within those ranges (*see, e.g.,* Appx6197-6233). In short, the overwhelming weight of the evidence shows that Respondents did not use some other "way[]" beyond the '502 patent's specification to create their infringing PDCs, to the extent that such a requirement is even relevant to preemption.

(2) Other Unclaimed Features Like Cobalt Weight Percentage Also Fail to Show Preemption

The Commission and Respondents also seek to show preemption by arguing about other unclaimed features, such as cobalt weight percentage or dihedral angle. Again, they cannot provide any precedent for these novel theories of preemption. Moreover, the theories hinge on unsupported attorney argument and are factually incorrect.

Pointing to Dr. German's testing of Respondents' infringing products, the Commission relies on attorney argument to suggest that the claims must be preemptive because the cobalt weight percentage values between Respondents products tested for infringement were higher than certain discussions of cobalt percent values in the patent disclosure. *See* ITC Br. 38-39 ("[I]f . . . the claimed magnetic effects identify a concrete implementation of a PDC, then it should follow that all infringing PDCs meeting these magnetic limitations . . . must have a metal content of less than 7.5 weight % . . . .").

This novel attorney argument fails for multiple reasons. First, while the term "cobalt" appears in claim 1 of the '502 patent, that is not the same as "cobalt weight percent," which is not recited in the asserted claims. The Commission is arguing the preemption again based on something other than the claimed invention. Second, the Commission's attorney argument assumes a simple one-to-one correlation between coercivity and cobalt weight percentage, which Dr. German confirmed is not accurate. *See* Appx2832-2835 at 1252:22-1255:5; *see also* Appx4196-4197, 66:8-67:20. The argument is rife with logical and factual holes.

The Commission ventures again into the science of PDC composition, and for the first time on appeal argues that to describe its invention USS should have claimed "mean free path, contiguity, or dihedral angle," citing Dr. German's testimony regarding these parameters. ITC Br. 35 (citing Appx2913-2914, 1333:1-1334:3). But the Commission misunderstands Dr. German's testimony. Never did Dr. German state that "contiguity" or "dihedral angle" are required parameters for defining the invention in the '502 patent. *See* Appx2913-2914, 1333:1-1334:7. Dr. German said the opposite: "[t]he claims are teaching us about how to do measurements of . . . microstructure." Appx2823, 1243:12-25. And Dr. German already noted how the claims address "mean free path" via the coercivity measurement. Appx2834, 1254:4-10; *see also* Appx1492-1493, 64:20-66:3.

Respondents also rely on attorney argument to imagine more "measurements" that allegedly should have been included in the claims, such as "bond lengths, bond strengths, bond extent, [and] bond amount." Int. Br. 9. Aside from the parameters already in the claims, no expert identified or applied any validated standards for how to measure "bond lengths, bond strengths, bond extent, bond amount" or how to measure "contiguity" or "dihedral angle," let alone established that such measurements were *required* to define the claimed PDC.

2. *Alice* Step Two: Claims 1, 2, and 11 of the '502 Patent Reflect a Transformation and Must Be Considered as a Whole

Contrary to Respondents' position, *Alice* step two cannot be reduced to a pure question of fact. And step two cannot be performed, as the Commission did, by individually attacking elements, suggesting that some (but not all) features were known *by themselves*. When the elements are considered as an ordered combination, they represent a transformation into something more than a claim to an abstract idea alone.

Under step two, the court must "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent eligible application." *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (citation omitted). In failing to follow this law, the Commission improperly discards the magnetic

elements and fails to consider the elements together. For example, the chart in the Commission's brief (ITC Br. 51-54) fails to provide any evidence that coercivity, magnetic saturation, or specific permeability are conventional, and instead merely labels them "[m]agnetic side effect[s]." ITC Br. 53. But the Commission was still obligated to consider *all limitations*, both (1) "individually" and (2) as "an ordered combination." *Alice*, 573 U.S. at 217 (citation omitted). Casting claim features aside fails both requirements.

The Commission's error under *Alice* step two is particularly problematic here where the '502 patent claims a material. Unlike a general-purpose computer with a collection of standalone software modules, the features and measurements are related. Therefore, it is insufficient to merely show, for example, that it was "well-known" *in isolation* to use diamond grains exhibiting an average grain size of about 50 μm or less. ITC Br. 52. The Commission's brief itself concedes that diamond grain size is interrelated with coercivity, and several features help define the magnetic saturation. *See*, *e.g.*, ITC Br. 34 ("[Y]ou can't just use coercive force . . . . [O]ther factors are important, for example, what the diamond grain size is." (quoting Appx4206-4208, 76:7-78:2)); *see also* Appx2920, 1340:7-11 (Dr. German testifying that cobalt weight percentage is the dominant factor in determining magnetic saturation, but "[i]t is not the only factor"). Respondents' arguments fail for similar reasons. Int. Br. 54-55.

A literal and manmade transformation occurred to create the PDC material. It is undisputed that USS's claimed PDC was stronger, performed better, and was a success in the marketplace. Appx1651-1654, 75:1-78:12; Appx2072-2073, 495:3-496:13. This evidence shows that the claimed PDC involves a transformation that is "significantly more than a patent upon the [ineligible concept] itself." *Mayo*, 566 U.S. at 72-73. Like *Diamond v. Diehr*, 450 U.S. 175 (1981), the claimed magnetic parameters are not a claim to a naked mathematical formula, nor do the claims merely recite inputs, like "uncured rubber." *Id*. at 184. Rather, the claims recite a PDC that has been "transformed and reduced to a different state or thing." *Id*. at 182-84 (citation omitted).

B. Claims 15 and 21 of the '502 Patent Recite Patentable Inventions Under § 101

The Commission gives short shrift to the other claims, asserting that claim 15 is "directed to the same abstract idea." ITC Br. 41-43. For support, the Commission raises the same cobalt-equivalence arguments that it makes for claim 1. *See, e.g.*, ITC Br. 42. These arguments fail for the reasons noted in Section II.A.1, including that the cobalt percentage is not a claimed feature.

C. The Commission's and Respondents' Remaining Arguments Are Incorrect

1. Respondents Improperly Seek to Convert a Legal Inquiry into a Factual One

Respondents devote most of their brief to converting the § 101 issue from a legal question into a factual one. But the law is clear on this point. The court "review[s] questions concerning patent-eligible subject matter under 35 U.S.C. § 101 *without deference*." *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 713 (Fed. Cir. 2014) (emphasis added).

Here, Respondents seek to convert the central legal issue of *Alice* step one—whether the claims recite an abstract idea—into a factual question. But step one is a legal determination, and the only issue that courts have found *may* be factual is a subpart of step two, conventionality. Respondents cite to *Berkheimer*, 881 F.3d at 1368, 1370 (Int. Br. 25), but *Berkheimer* merely stated that, under *Alice* step two, "[w]hether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination." 881 F.3d at 1369; *see also Aatrix Software, Inc. v. Green Shades Software, Inc*., 882 F.3d 1121, 1128 (Fed. Cir. 2018) (noting that whether something is "well-understood, routine, [and] conventional activity" may be a question of fact (alteration in original) (citation omitted)). *Alice* step one, however, is a legal question.

Respondents' arguments should also be rejected on the facts of this case. Respondents never sought fact findings to support their § 101 analysis before the ALJ, nor did the ALJ frame the legal analysis under *Alice* step one as one of factfinding. The ALJ does not cite any expert testimony to support his "loose and generalized" statement (because none was offered), nor does he cite to any record evidence other than Dr. Bertagnolli's published paper and the patent specification themselves, both of which contradict his "loose and generalized" conclusion. *See* Appx325-327. As such, the statement would fail even under a substantial-evidence standard. Respondents cannot now reinterpret the ALJ's legal analysis to bootstrap their § 101 and § 112 arguments.

2. The Commission Conflated the Claim Limitations and Failed to Analyze Any Specific Claims of the '502 Patent

The Commission incorrectly suggests that USS "waived" its argument that the Commission conflated the claims and failed to analyze any specific claim of the '502 patent. ITC Br. 23-24. But USS cannot "waive[]" a rebuttal to an argument that Respondents never made on an issue where the Respondents—not USS—bear the burden. The Commission seeks to justify its failure to analyze specific claims by performing yet another burden reversal.

Respondents bear the burden under § 101, *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011), and thus also bear the burden of showing

representativeness. It is not USS's burden to disprove. As outlined in *Realtime Data LLC v. Reduxio Systems, Inc.*, representativeness requires an analysis and finding by the judge that a claim is representative. 831 F. App'x 492, 497 (Fed. Cir. 2020). No such finding exists in this case. The word "representative" does not appear a single time in the § 101 analysis of either the ALJ's or the Commission's opinions. *See* Appx18-36; Appx323-333. Rather, the ALJ and the Commission proceeded directly into the § 101 analysis.

Moreover, the Commission's argument is untimely. USS argued that the ALJ failed to address the specific claims of the '502 patent before the Commission. Appx413-415. Respondents could have timely argued, and the Commission could have addressed, whether USS waived its challenge when USS raised it below. But Respondents failed to raise USS's alleged waiver before the Commission, and the Commission failed to find any waiver during the briefing process. Thus, the "waive[r]" argument raised by the Commission at this stage is itself untimely and waived.

The Commission's waiver arguments seek to distract from the main issue: the Commission cannot explain why it *still* failed to analyze any specific claim of the '502 patent or conduct a representative claim analysis even after USS challenged the error in its briefing before the Commission. Appx413-415. The Commission's analysis of the '502 patent was improper.

D. Respondents' Alternative Grounds for Affirmance Also Fail

1. The Commission Correctly Rejected Respondents' Law of Nature Argument Under § 101

Coming full circle, Respondents argue that the claims are ineligible for reciting a natural law. Int. Br. 53-64. This argument fails for the reasons noted in Section II.A. The claims are not to diagnostics of naturally occurring substances. Rather, like *Chakrabarty*, the '502 patent's claims recite a non-naturally occurring composition of matter with markedly different characteristics from any found in nature and are therefore eligible under § 101. The Commission correctly rejected the Respondents' law-of-nature argument, finding that the asserted claims "obviously do recite compositions of matter that are not found in nature." Appx325.

Respondents cite *ChromaDex, Inc. v. Elysium Health, Inc.*, 59 F.4th 1280 (Fed. Cir.), *cert. denied*, No. 23-245, 2023 WL 6797747 (U.S. Oct. 16, 2023) (Int. Br. 62-63), but this case is inapposite. In *ChromaDex*, "[t]he claimed compositions remain indistinguishable from natural milk." 59 F.4th at 1284. Here, the claimed compositions differ from natural diamond. Natural diamond is made of carbon. *See, e.g.*, Appx1645, 69:6-19. USS's PDC further includes a metal catalyst and binder (e.g., cobalt) that infiltrates the diamond. Appx1645-1646, 69:20-70:8; Appx1635-1636, 59:3-60:18. Lacking a metallic binder, natural diamond would differ dramatically in its magnetic properties; it would also be significantly more

brittle than PDC when subjected to the harsh environment and impact forces that occur in oil-well drilling. Tellingly, Respondents presented no evidence that natural diamond is "indistinguishable" from PDC (it is not).

2. The Commission Correctly Rejected Respondents' Challenge Under § 112 for Enablement

Respondents alternatively argue that the ALJ and Commission erred in the enablement analysis. Int. Br. 70-78. Respondents seize on the after-arising decision in *Amgen Inc. v. Sanofi*, 598 U.S. 594 (2023), but that case did not alter relevant law. *Id.* at 616 ("For more than 150 years, this Court has enforced the statutory enablement requirement . . . . Today's case may involve a new technology, but the legal principle is the same."). The Commission correctly applied long-standing principles in finding the asserted claims fully enabled. Appx54-56.

Amgen is inapposite. *Amgen* noted the unpredictability of the art. *Amgen*, 598 U.S. at 600. The Court noted that there was a "'vast' number of additional antibodies" to test—"at least millions." *Amgen*, 598 U.S. at 613-14 (citations omitted). That is not *this* case—four different factfinders below directly and unanimously rejected Respondents' arguments related to "unpredictability of the art." Appx55-56. For one thing, according to the Commission, Respondents did not offer any record evidence on this point in the proceedings below, relying exclusively on "the testimony of *Complainant's* expert and fact witnesses." Appx55 (emphasis added). Respondents argued that USS's fact witness,

Dr. Bertagnolli, testified that more manufacturing information, such as "the full particle size distribution and the sintering pressure profile[,] is needed" to predict the properties of the PDC; and also that USS's expert witness, Dr. German, testified that "the only way a POSITA could ever determine whether a product met the claimed properties was to test each and every individual product." Appx55 (citation omitted). But the Commission found that Respondents below could muster "only attorney arguments" regarding whether the needed experimentation was therefore undue, because they had proffered no evidence on this subject, despite bearing the burden. *See* Appx55.

USS adduced the only actual evidence on this issue, and the Commission relied on it. It fully credited USS' witness testimony that Table I of the Asserted Patents contained "working examples . . . with a specific set of input conditions" such that one of skill "would know how the manufacturing information disclosed . . . can be used to achieve the claimed PDCs." Appx56 (citation omitted). USS affirmatively proved "that the universe of possible particle size distributions is limited by the magnetic properties disclosed in Table I," and that a skilled artisan could "easily" "make the disclosed PCDs in Table I through trial and error." Appx56 ("The evidence also shows that 'a POSITA could have easily measured these properties without any undue experimentation,' and that 'it is routine practice in the industry to test PDCs after manufacturing to ensure

consistent quality and performance.'" (citations omitted)). The Commission agreed that the claims were fully enabled. Appx56.

Below, Respondents only presented evidence that PDC fabrication *was* predictable. For example, to analyze prior art, Respondent expert Dr. Andrew Barron testified that it was "fundamental to chemistry material science that, if you take a group of materials and you process them, you undergo reactions with a certain process conditions, the properties will be the same," and that manufacturing outcomes could be predicted with math equations. *See, e.g.*, Appx2210-2214, 632:7-636:11.

Now, however, Respondents contend that *Amgen* teaches that it was error to find enablement where "the only way to know if a product met the claims is by testing." *Amgen* said no such thing. Int. Br. 77. The *Amgen* Court was clear that (1) it had not changed that law, 598 U.S. at 616, and that (2) "a specification may call for a reasonable amount of experimentation to make and use a patented invention." *Id.* at 612. "Thus, even if the particular particle size distribution information was needed," as the Commission correctly held, "Respondents have not shown that it would take undue experimentation for a [POSITA] to figure that out, *given the narrow set* of possible particle size distributions [in Table I] . . . ." Appx56 (emphasis added). This is a far cry from the "at least millions" of candidate antibodies at issue in non-enabled *Amgen*. *See* 598 U.S. at 613 (citation omitted).

In the face of this failure of evidence, Respondents allege that an unrelated statement by the ALJ in the § 101 context should be reinterpreted as "tantamount to finding [that] the art is unpredictable." Int. Br. 72. According to Respondents, the factfinders below simply did not "appreciate" that a "loose and generalized" connection between "design and fabrication choices, on the one hand, and electrical and magnetic behavior, on the other hand" (Appx27 (citation omitted)), is somehow a finding of "unpredictability" for enablement purposes. *See* Int. Br. 72. That is not correct. The ALJ language in the § 101 context was not a fact finding at all, much less one that can be used here; there is no citation to anything the ALJ analyzed in the record for support. *See* Appx27.

These decontextualized words were never intended to carry the technical and legal significance that Respondents now imbue them with—the ALJ and the Commission knew how to discuss enablement when addressing the *Wands* factors at the end of the opinion (*see* Appx55-56), but it never did so by "loose and generalized" language (*see* Appx21 (citation omitted)). Respondents would have this Court step over the Commission's express findings on enablement—including (a) crediting the USS witnesses who testified that the requisite experimentation was not undue given Table I, and (b) finding that Respondents adduced *no* relevant evidence—in order to bootstrap its "alternative" § 112 argument on appeal. This should be rejected out of hand.

Further, Respondents' "second" argument about the "unleached portion" (Int. Br. 72, 75-76) is waived for having never been presented to the Board below (*see generally* Appx54-56). It is cut from whole cloth on appeal and the absence of any citations to where it was allegedly argued previously is proof enough that it should be ignored now. As Respondents acknowledge, the words "unleached portion" serve to distinguish leached portions; nothing more. Int. Br. 72.

As a procedural matter, a common element running through Respondents' "alternative" theories under § 112 is that they all lack necessary evidence or factfinding below. This Court does not generally make underlying factual determinations in the first instance. *Singleton v. Wulff*, 428 U.S. 106, 120 (1976). And this is particularly improper when "winning" parties argue for affirmance on other grounds, as here. Int. Br. 70-78. While this Court permits this practice under the right circumstances (which is not universal among the circuits), alternate-ground affirmance is tightly constrained to legal issues only. *In re Comiskey*, 554 F.3d 967, 974-75 (Fed. Cir. 2009). In this case, Respondents' § 112 grounds improperly invite the Court to decide new issues of fact, policy, or agency expertise, but this should be declined. *Id*.

III. CONCLUSION

The Court should reverse the Commission's Final Determination and its finding that claims 1, 2, 11, 15, and 21 of the '502 patent are ineligible under

35 U.S.C. § 101 and affirm the unanimous finding that the '502 provides enabling disclosure.

Date: November 9, 2023

Respectfully submitted,

/s/ *Daniel C. Cooley*

Daniel C. Cooley
J. Derek McCorquindale
Brandon T. Anderson
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP
1875 Explorer Street, Suite 800
Reston, VA 20190-6023
(571) 203-2700

James R. Barney
Mareesa A. Frederick
Christina Ji-Hye Yang
Alexander E. Harding
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP
901 New York Avenue, NW
Washington, DC 20001-4413
(202) 408-4000

Attorneys for Appellant US Synthetic Corporation

FORM 19. Certificate of Compliance with Type-Volume Limitations **Form 19**
July 2020

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONS

Case Number: 2023-1217

Short Case Caption: US Synthetic Corp. v. ITC

Instructions: When computing a word, line, or page count, you may exclude any items listed as exempted under Fed. R. App. P. 5(c), Fed. R. App. P. 21(d), Fed. R. App. P. 27(d)(2), Fed. R. App. P. 32(f), or Fed. Cir. R. 32(b)(2).

The foregoing filing complies with the relevant type-volume limitation of the Federal Rules of Appellate Procedure and Federal Circuit Rules because it meets one of the following:

☑ the filing has been prepared using a proportionally-spaced typeface and includes 6,892 words.

☐ the filing has been prepared using a monospaced typeface and includes _____ lines of text.

☐ the filing contains _____ pages / _____ words / _____ lines of text, which does not exceed the maximum authorized by this court's order (ECF No. _____).

Date: 11/09/2023

Signature: /s/ Daniel C. Cooley

Name: Daniel C. Cooley