

No. _____

**In The
Supreme Court of the United States**

—————◆—————
INVESTPIC, LLC,

Petitioner,

v.

SAP AMERICA, INC.,

Respondent.

—————◆—————
**On Petition For Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit**

—————◆—————
PETITION FOR WRIT OF CERTIORARI

—————◆—————
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QUESTION PRESENTED

An invention is patentable if it satisfies statutory criteria in the Patent Act and is not a judicially-excluded natural phenomenon, law of nature, or abstract idea. These judicial exceptions to statutory patent eligibility arise from this Court’s concern, since 1853, that allowing preemptive patents would inhibit innovation. Accordingly, patents claiming abstract ideas are patent-eligible only if those claims include an inventive concept that offers “something more” than the abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014).

The Federal Circuit has added a new requirement, not found in this Court’s precedent, that the claimed inventive concept must occur in the “physical realm.” The Federal Circuit held below that a process is “abstract” because the process, which must be performed by a computer, does not occur in the “physical realm.” The Federal Circuit therefore held the process patent-ineligible, despite finding that the process was inventive, novel, and nonobvious under the Patent Act in previous proceedings.

The question presented is:

Does the Federal Circuit’s “physical realm” test contravene the Patent Act and this Court’s precedent by categorically excluding otherwise patentable processes from patent eligibility?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

RULE 29.6 STATEMENT

InvestPic, LLC is wholly owned by individual personal holding company ISPD, Inc., Regulus International Capital, LLC, the S.A.M. 2000 irrevocable trust, and Clara Miller. It has no parent corporation, and no publicly held company owns 10 percent or more of its stock.

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OPINIONS BELOW

The opinion of the United States District Court for the Northern District of Texas Dallas Division (App. 38a-65a) is reported at 260 F. Supp. 3d 705 (2017).

The original panel decision of the United States Court of Appeals for the Federal Circuit (App. 21a-37a) is reported at 890 F.3d 1016 (Fed. Cir. 2018). The August 2018 order of the Federal Circuit granting in part the petition for panel rehearing (App. 69a-70a) is available at 733 F. App'x 554 (Fed. Cir. 2018), and the August 2018 order of the Federal Circuit denying rehearing en banc (App. 67a-68a) and is unreported.

The modified panel decision of the United States Court of Appeals for the Federal Circuit (App. 1a-20a) is reported at 898 F.3d 1161 (2018). The October 2018 order of the Federal Circuit denying panel rehearing and denying rehearing en banc of the modified panel decision (App. 71a-72a) is unreported.

**JURISDICTION**

A panel of the Federal Circuit entered its modified judgment on August 2, 2018. App. 1a-20a. A timely petition for rehearing en banc was denied on October 10, 2018. App. 71a-72a. On December 7, 2018, Chief Justice John G. Roberts, Jr., granted Petitioner's request for an extension of time up to and including March 8, 2019 within which to file a petition for writ of

certiorari. This Court has jurisdiction pursuant to 28 U.S.C. § 1254(1).

**PERTINENT CONSTITUTIONAL
AND STATUTORY PROVISIONS**

Article I, Section 8 of the Constitution of the United States provides in relevant part:

The Congress shall have power . . . To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

35 U.S.C. § 101 provides:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 100 provides in relevant part:

The term “process” means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

35 U.S.C. § 100, § 101, § 102, § 103, and § 112 are reproduced in full in the Appendix at App. 73a-80a.

INTRODUCTION

The patent system delicately balances encouraging innovation and avoiding preemption of whole fields of discovery. This case implicates the fulcrum of that balance.

The Constitution and the Patent Act stimulate innovation by rewarding those who “promote the progress of science” with exclusive rights to their inventions. U.S. CONST., art. I, § 8, cl. 8; 35 U.S.C. § 100, *et seq.* “Whoever invents any new or useful process . . . or any new or useful improvement thereof, may obtain a patent therefor” if the invention is novel (§ 102), distinguishable from prior art (§ 102), nonobvious (§ 103), and enabled by a sufficient written description (§ 112). By granting inventors temporary, exclusive rights to their inventions, Congress allows inventors to reap the benefits of their labor without hiding their inventions from the world, while others are permitted to build upon the claimed inventions in increasingly innovative ways.

Because the purpose of the patent system is to promote innovation, this Court has long recognized the need to prevent the patenting of discoveries that constitute the “building blocks of human ingenuity,” namely, “laws of nature, natural phenomena, and abstract ideas.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71, 85 (2012)). An inventor may not receive a patent if the

patent would preempt and monopolize such “building blocks” and “stifle innovation.” See *Bilski v. Kappos*, 561 U.S. 593, 612, 649 (2010); *id.* at 655 (Breyer, J., concurring); see also *O’Reilly v. Morse*, 56 U.S. 62, 113 (1854); *Le Roy v. Tatham*, 55 U.S. 156 (1853). To prohibit patent claims covering these “building blocks,” this Court developed a two-step test for determining patent eligibility under 35 U.S.C. § 101. *Alice*, 573 U.S. 208. A court must first evaluate whether a patent claim is directed to a patent-ineligible abstract idea. *Id.* at 217. If it is, the court must determine whether the patent claims “something more” that “transforms” it into a patent-eligible invention. *Id.*

Lower courts have struggled with this test, both with determining whether a claim is directed to an abstract idea and with what “more” is required to transform the claim into a patent-eligible invention. See, e.g., *Front Row Techs., LLC v. NBA Media Ventures, LLC*, 204 F. Supp. 3d 1190, 1227 (D.N.M. 2016) (describing the post-*Alice* environment as “developing and unstable” because district courts interpret U.S. Supreme Court and Federal Circuit decisions in four different ways); *Secure Mail Sols. LLC v. Universal Wilde, Inc.*, 169 F. Supp. 3d 1039, 1045 (C.D. Cal. 2016) (noting that the *Alice* test is “easier to articulate than it is to apply”). The Federal Circuit in particular has so single-mindedly focused on what constitutes an “abstract idea” and “something more” that it has lost sight of, and now often ignores, the foundational principle underlying this Court’s decision in *Alice* and 165 years of

precedent: the need to avoid preempting future innovation.

Instead of evaluating whether a claimed invention is likely to be preemptive, the Federal Circuit has legislated new exceptions to patentability detached from any basis in statute, case law, or principle. *See, e.g., Intellectual Ventures I LLC v. Capital One Bank*, 792 F.3d 1363 (Fed. Cir. 2015) (using a § 101 analysis as a proxy for the independent § 112 inquiry); *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016) (looking to whether a software program improves computer capabilities); *Exergen Corp. v. Kaz USA, Inc.*, 725 F. App'x 959, 966 (Fed. Cir. 2018) (finding a patent eligible in part because it took “years and millions of dollars” to invent); *see also* App. 1a-20a (applying a “physical realm” test).

The Federal Circuit’s application of *Alice* has become so unreliable and internally inconsistent that the U.S. Patent and Trademark Office (“USPTO”) has promulgated its own rules for determining patent eligibility under § 101. *See generally* 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 52 (Jan. 7, 2019). The USPTO’s new guidance faithfully applies this Court’s precedent. Unfortunately, it binds only the agency, while judicial unpredictability in the lower courts continues. This uncertainty deters innovation.

This case stands in the vortex of this crisis. The patent at issue, U.S. Patent No. 6,349,291, was a victim of a pronounced, but typical, misapplication of *Alice*.

Despite being found irrefutably valid under § 102 and § 103, *see* App. 81a-109a, the patent was felled on a Rule 12(c) motion under § 101.

The '291 Patent persevered through two separate reexamination proceedings between 2012 and 2017. The claims were vigorously attacked by its opponents and closely scrutinized by the USPTO, the Patent Trial and Appeal Board ("PTAB"), and eventually the Federal Circuit, culminating in a Federal Circuit determination that the established statutory requirements for patentability were met. App. 83a, 99a, 105a. Years later, however, the Federal Circuit reversed course, affirming the patent's ineligibility under § 101 because the invention "lies entirely in the realm of abstract ideas." App. 3a. To reach this conclusion, the Federal Circuit focused exclusively on whether the patent's claims encompassed an invention in the "physical realm," a requirement found nowhere in the Patent Act or this Court's jurisprudence. The claimed novel process here is a process that can only be performed by a computer; a human cannot perform the process. The Federal Circuit determined that the computer-executed invention does not touch the "physical realm" and therefore held it patent-ineligible.

The Federal Circuit's "physical realm" test ignores the preemption principles inherent in this Court's established patent-eligibility analysis, is isolated from principle, and is incapable of evaluating the patent-worthiness of a new computer-executed process. It ensures that claims that qualify under the Patent Act and this Court's precedent will be excluded from being

patented. Problematically, the Federal Circuit’s application of the “physical realm” test is not a one-off; the Federal Circuit articulated the test several years before this case, and courts have continued to apply it since the Federal Circuit’s *InvestPic* decision. Even tacit approval by this Court of the Federal Circuit’s baseless barrier to patent eligibility will drastically discourage innovation in fields that must use computers as tools.

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STATEMENT OF THE CASE

A. Factual Background

1. The Invention

The 1998 stock market crash caused catastrophic losses that vastly exceeded the worst that the industry had predicted were even possible. In the wake of the crash, Dr. Samir Varma, a physicist, pondered the inadequacy of existing processes for investment portfolio analysis. He resolved to create a more reliable method of evaluating investment decisions.

Dr. Varma determined that the investment industry was relying on an inaccurate method of assessing the health of investment portfolios based on a theoretical formula known as Gaussian distribution.¹

¹ Dr. Varma’s invention proved that Gaussian distribution systematically underestimates actual exposure to danger of catastrophic loss. Investment industry experts have since come to agree. *See, e.g.*, PABLO TRIANA, *THE NUMBER THAT KILLED US: A STORY OF MODERN BANKING, FLAWED MATHEMATICS, AND A BIG FINANCIAL CRISIS* (2012).

He considered whether he could devise a method of producing risk/return distribution curves based on real data about market behavior rather than an assumption-ridden formula. While reading a biology text about mollusks, Dr. Varma learned about the use of data resampling² to achieve a probability distribution curve. He realized that resampling might produce the data-based portfolio risk/return distribution curves he sought. But the known method of resampling could analyze only one investment data point at a time. Dr. Varma recognized this as a serious shortcoming because nearly all investment portfolios hold multiple interrelated assets.³ Dr. Varma thus invented an entirely novel resampling process that allows the simultaneous resampling of multiple assets comprising an investment portfolio.

Truly random resampling requires computational power many orders of magnitude greater than what can be done by hand. Dr. Varma accordingly developed complex code instructing multiple processors, working in parallel, to organize all the user-requested portfolio

² Resampling, or “simulation,” consists of studying part of a population to estimate properties of the whole population. First, a dataset is collected that represents observations about the population. Then, samples are repeatedly drawn at random from the dataset, thousands or millions of times. The data samples, aggregated, are then used to estimate properties of the population.

³ Resampling portfolio assets individually and sequentially causes all relationships between the individual assets to disappear. Thus, the old method of resampling could not detect when multiple assets went down in value together. The old method also failed to capture the fact that even individual assets tend to retain their upward or downward trajectories from day to day.

data into an array, and from that array, to retrieve each individual sample as a matrix.⁴ He specifically ensured that each sample-matrix captured not only historic individual asset prices, but also their tendencies over time, i.e., auto-correlation, and their tendencies relative to one another, i.e., cross-correlation. By systematically structuring the data that way, and by using his matrix-based resampling process, Dr. Varma was able to produce an empirical distribution curve that, unlike the formulaic Gaussian curve, detected, preserved, and actually took account of relationships buried deep within the historical data—even relationships that were previously unknown and counterintuitive. As a result, his invention avoided the standard method’s dangerous underestimation of portfolio risk and overestimation of portfolio returns.

This new type of resampling was not Dr. Varma’s only invention. He went a step further, developing novel code that allows users to systematically adjust the randomness of the resampling itself to reflect the user’s biases (e.g., optimism or pessimism about how the stock market will perform relative to the last twenty years). This feature was antithetical to those familiar with resampling; sampling is supposed to be, and always was, purely random, and adjusting the sampling process to express a user’s subjectivity changes that. *Inter Partes* Reexamination No. 95/001,939, Thomas N. Herzog Declaration at 6, 15 (submitted Jul. 18, 2012), <https://portal.uspto.gov/pair/PublicPair>. This additional

⁴ In several claims and Figure 6, these sample matrices are called “return objects.”

feature—known as the “bias parameter” in the patent claims—enables an investor to harness the objectivity of resampling historical data while simultaneously incorporating the user’s subjective preferences.

In sum, Dr. Varma developed a computer-software-based process that allows users to perform “what if” scenarios on investment portfolios and that generates, for the first time, an accurate representation of their likely performance.

Dr. Varma filed a patent application nearly twenty years ago claiming this process. The ’291 Patent issued in 2002.

Dr. Varma’s invention was an enormous breakthrough for the investment industry. Because the invention is empirical rather than theoretical, it can reveal information previously hidden within historical data. For instance, before 2008, the finance industry assumed that the risk of subprime mortgage defaults in one part of the country was unrelated to the risk elsewhere. When processed by Dr. Varma’s method, however, the data showed that the probability of default for packaged subprime mortgages was much higher than standard methods indicated. Dr. Varma’s invention has also demonstrated that the industry’s standard tools for assessing portfolio risks overemphasized diversification based on number of assets and underestimated the danger associated with holding multiple similar assets.

Highly respected experts in the field have celebrated the novelty and usefulness of Dr. Varma's invention. Michael Spence, recipient of the Nobel Prize in Economic Sciences in 2001, stated:

. . . Varma invented a turnkey system . . . that uses a variety of aspects of resampling techniques, to allow the data to determine the distribution outcomes. . . . Varma saw the presence of risk created by distributions not captured by parametric formulations, collected the statistical theory and computing horsepower needed, and assembled a risk assessment system delivered over a network as a service.

Inter Partes Reexamination No. 95/001,939, Michael Spence Declaration ¶¶ 39, 43 (submitted Jul. 18, 2012), <https://portal.uspto.gov/pair/PublicPair>.

The invention is a process for a software tool that serves a valuable purpose: it helps investors and fund managers protect investment portfolios from real dangers not captured by theoretical formulae.

2. The Patent Claims

An illustrative claim of the '291 Patent is included in footnote 3 of the Federal Circuit's opinion. App. 17a-18a. The invention teaches both the novel process of simultaneously resampling a matrix of temporally-correlated data points and the novel, counterintuitive process for adjusting the degree of randomness of the resampling. The '291 Patent claims only a narrow

application of these novel resampling processes for resampling historical investment data in multi-asset portfolios.

The resampling process actually claimed is neither a formula nor a “series of mathematical calculations,” as the Federal Circuit and the district court believed. App. 3a, 47a. No math is performed in the novel portion of the claimed invention, other than counting samples.⁵ In contrast, the investment industry’s prior method of assessing risk *was* mathematics-driven; before Dr. Varma’s invention, the field made risk assumptions based on a formula. The claimed invention cannot be reduced to a formula. Utterly unlike a formula, the invention generates different results every time the process is conducted, even if every user input and the underlying raw historical data remain identical. Thus, the patent does not, and indeed cannot, claim a result—a point that the district court misunderstood. *See* App. 54a (stating that the claims are “directed toward the result or effect of the abstract idea itself”).

The invention is a specific and unique process for arriving at a result. The claims define the particular process, the corresponding structure for that process, and the sequential interoperation of the structure and components to accomplish the process. The process

⁵ The patent specification and several of the dependent claims do identify several formulas, which are well-known in the investment industry. A user may apply these prior art formulas once the inventive resampling analysis is completed, but the formulas are ancillary to the claimed invention.

ultimately arrives at a useful result, but the result itself is immaterial to the novelty of the invention.

B. Procedural Background

No prior art nor combination of art can invalidate the '291 Patent on 35 U.S.C. § 102 or § 103 grounds. Despite intensive opposition to the '291 Patent by International Business Machines Corp. and SAS Institute Inc., the challengers were unable to identify any congressionally-imposed bar to this invention's patentability.

The patent as it exists today is the result of two separate reexamination proceedings before the USPTO, the PTAB, and the Federal Circuit. *See In re Varma v. IBM Corp.*, 816 F.3d 1352, 1355 (Fed. Cir. 2016); *IBM v. InvestPic, LLC*, No. 2015-1450, 2015 WL 1456097, at *6 (PTAB Mar. 27, 2015); *Ex parte Varma*, No. 2014-7760, 2014 WL 7186800, at *7 (PTAB Dec. 16, 2014); *Inter Partes* Reexamination No. 95/001,939; *Ex Parte* Reexamination No. 90/012,366. After substantial record development, briefing, and amendments to several claims, the patent reached the Federal Circuit on claim construction and validity under § 102 and § 103. That court held that the majority of the claims were valid, and remanded several claims to clarify one minor question. App. 109a. On remand, the matter was quickly resolved in favor of InvestPic, and the 37 claims now before this Court issued. U.S. Pat. No. 6,349,291, *as modified by* Certificate of Correction to *Inter Partes* Reexamination Certificate 95/001,939

(issued on Oct. 10, 2017), *and as further modified by Ex Parte* Reexamination Certificate 90/012,366 (issued on Oct. 30, 2017).

All told, third-party challengers spent six years attacking the claims at issue, scouring the earth for relevant prior art and providing the USPTO with more than a dozen references. InvestPic volunteered scores more, reflecting its confidence in the validity of the claims over all prior art.

Despite this rigorous review and ultimate confirmation of patentability, SAP America, Inc. brought a declaratory relief action in 2016 against InvestPic to invalidate the patent. Before any evidentiary record in the new proceeding had been introduced or developed, and while most of the patent claims were still pending in reexamination proceedings before the USPTO, the District Court for the Northern District of Texas struck the entire patent on a motion under Federal Rule of Civil Procedure 12(c). Based on the § 101 jurisprudence that has issued by lower courts since the *Alice* decision, the district court held that the same claims that had withstood extensive prior scrutiny were “directed toward the abstract ideas of mathematical calculations and data manipulation” and lacked any independent inventive concept. App. 55a-56a.

The Federal Circuit, upon considering the original claims for a second time and multiple new and narrower claims for the first time, affirmed the district court’s conclusion that the patent was not

subject-matter eligible under § 101, notwithstanding its earlier decision as to § 102 and § 103.

In a petition for rehearing, InvestPic noted that the district court and Federal Circuit's opinions were based solely on claims that no longer even existed due to the reexamination. The Federal Circuit subsequently issued a modified decision that mentioned the reissued claims in a footnote, but it did not otherwise change its analysis.



REASONS FOR GRANTING THE PETITION

This petition should be granted for three reasons.

First, the Federal Circuit's "physical realm" test is wrong and must be discarded. The test has no basis in the Patent Act or in this Court's § 101 precedent. It elides the central theme of the case law giving rise to the exclusionary principle, namely, the cardinal concern about whether the patenting of the "building blocks" of invention might preempt entire fields of discovery and inhibit future innovation.

Second, the decision below is particularly problematic in its application to § 100(b) processes. Congress did not create a non-"physical realm" exclusion in the Patent Act. Nevertheless, the Federal Circuit now requires an invention to be in the "physical realm" in order to be patentable. This expansion of the § 101 judicial exceptions would always exclude computer-executed processes, no matter how novel and narrowly drawn.

Third, the test exemplifies the conflict between lower courts about how the abstract idea principle is to be applied. District court decisions about the role of § 101 are fractured, and the Federal Circuit itself is split. The court below ignored preemption altogether, fostering further misapprehension by the Federal Circuit and other lower courts. The USPTO agrees that the tenebrous state of the lower courts' § 101 jurisprudence has created intolerable confusion. Only this Court can effectively resolve the uncertainty.

This Court admonished in *Alice* to “tread carefully in construing” the § 101 exclusionary principle “lest it swallow all of patent law.” 573 U.S. at 217. The lower courts have overlooked this directive. The “physical realm” test is indeed swallowing long-established patent law, and pioneering patents in the process. This case exemplifies the Federal Circuit’s growing lack of caution, as the court used § 101 to revoke a novel, narrow, and heavily-tested patent that had withstood exacting scrutiny on the legislative requirements for patentability. This Court must restore the limited role of § 101 in patentability analyses and remind lower courts of their duty to “tread carefully.”

A. The “Physical Realm” Test Ignores The Primacy Of Preemption Avoidance In This Court’s § 101 Jurisprudence.

Much of the lower courts’ confusion about the “murky morass” of § 101 jurisprudence emanates from a struggle to determine what it means for an idea to be

abstract. See *MySpace, Inc. v. Graphon Corp.*, 672 F.3d 1250, 1259-60 (Fed. Cir. 2012). This Court has consistently used “abstract” to mean “sweeping” or “overbroad.” See *Le Roy*, 55 U.S. at 185 (Nelson, J., dissenting) (defining “abstract principle” as “a principle considered apart from any special purpose or practical operation” (quoting jury instructions in *Neilson v. Harford*, 151 E.R. 1266 (1841))); *Gottschalk v. Benson*, 409 U.S. 63, 68 (1972) (situating “abstract” alongside “sweeping”); *Bilski*, 561 U.S. at 611 (dichotomizing “abstract idea” and “an *application*” of an idea (emphasis in original)). The principle of preemption is based on this definition; this Court does not allow the patenting of abstract ideas out of concern that granting a patent for an abstract—or “overbroad”—idea will disproportionately tie up the “building blocks” of invention. *Alice*, 573 U.S. at 217; *Mayo*, 566 U.S. at 73.

The term “abstract” can be understood another way, however: as the opposite of something “tangible,” “physical,” or “concrete.” See *Abstract*, WEBSTER’S THIRD NEW INT’L DICTIONARY (1993). This alternative definition has crept, albeit inconsistently, into the lower courts’ § 101 jurisprudence. The differing definitions of “abstract” have caused a rift between the § 101 jurisprudence that adheres to the principle of preemption and the jurisprudence that has become disconnected from that principle. The Federal Circuit’s “physical realm” test exemplifies that disconnect.

1. The § 101 exclusionary principle is rooted in preemption concerns.

The judicial exclusion of “abstract ideas” from patent eligibility stems from concern that allowing overbroad patents could forestall further innovation. The first cases to recognize the exclusion for abstract ideas articulated an unwillingness to allow patents for “fundamental truth[s]” because of concerns that giving one person exclusive rights to a “fundamental truth” would tie up the idea and preempt its use in future inventions. *Le Roy*, 55 U.S. at 175 (“A principle, in the abstract, is a fundamental truth” that “cannot be patented” because “no one can claim in [it] an exclusive right.”).

In *Morse*, for example, this Court rejected telegraph inventor Samuel Morse’s claim for “electro-magnetism, however developed, for making or printing intelligible characters, letters or signs, at any distances.” 56 U.S. at 114. While most of Morse’s claims were patent-eligible, this Court held that the last claim was “too broad” and “cover[ed] too much ground” because it was not limited to any specific implementation and attempted to cover “the exclusive right to *every* improvement” of the electric or galvanic current. *Id.* at 112-13 (emphasis added). The Court denied that single claim, noting that allowing a patent for all uses and improvements of electromagnetism threatened to preempt all future use of electricity. *Id.* at 113.

In the 165 years since *Le Roy* and *Morse*, this Court has continued to recognize that allowing field-preemptive

patents would “discourage arts and manufactures” in contravention of the Constitution’s mandate that the patent system “promote the progress of science and useful arts.” U.S. CONST., art. I, § 8, cl. 8; *Le Roy*, 55 U.S. at 175. This Court has thus rejected patents that claim only generalized ideas. *See, e.g., Benson*, 409 U.S. at 68, 71-72 (rejecting a patent because the claims were so “abstract and sweeping” that allowing the patent “would wholly pre-empt” use of the mathematical formula recited in the claims); *Bilski*, 561 U.S. at 611-12 (rejecting a patent for the “basic concept” of risk hedging because allowing the patent “would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea”).

This Court has meanwhile allowed patents that claim only narrow applications of more general principles. *See, e.g., The Telephone Cases*, 126 U.S. 1, 535 (1888) (allowing Alexander Graham Bell’s telephone patent, where it did not claim the exclusive right to *all* telephonic use of electricity); *Diamond v. Diehr*, 450 U.S. 175, 187 (1981) (allowing a patent involving a mathematical equation because it claimed only a specific application of the equation and did not seek to preempt the use of the equation itself).

The *Alice* test is the latest reminder from this Court that preemption forms the core and basis of the abstract ideas exclusion. Under *Alice*, patent claims that invoke abstract ideas are eligible for patenting only if they include “something more” than the abstract idea that is sufficient to “transform” the claimed

idea into a narrower application of the abstract idea. 573 U.S. at 221. As *Alice* explains, patents that “integrate the building blocks [of human ingenuity] into something more” do not pose the same risk of preemption as patents that claim only the “building blocks” themselves. *Id.* at 217. Patents that include “something more” “*therefore* remain eligible” for patenting. *Id.* (emphasis added).

By requiring inventors to claim “something more” specific and applied than a broad, preemptive “building block,” the Court ensures that *something left* remains for others in the field to discover and claim.

2. The Federal Circuit’s “physical realm” test lacks grounding in any principled § 101 jurisprudence.

The Federal Circuit’s “physical realm” test is detached from the preemption principle at the heart of this Court’s § 101 analyses. Yet in the decision below, the Federal Circuit applied the “physical realm” test as though it were an integral part of the *Alice* inquiry. At *Alice* step one, the court examined whether the claimed process in the ’91 Patent was “directed to the creation of something physical.” App. 13a. It concluded that the claimed improved process was “abstract” because it was “not a physical-realm improvement.” App. 14a. The Federal Circuit then turned to *Alice* step two, where it required “an inventive concept in the non-abstract application realm.” App. 16a. Because the court had already determined that the inventive concepts in

the '291 Patent were computer-implemented and thus in the non-“physical realm,” the court necessarily, indeed, tautologically, found the patent ineligible under § 101. App. 16a.

The decision below was not the Federal Circuit’s first use of the “physical realm” test, but it was by far the most expansive application. Earlier uses do not contemplate or support use of the “physical realm” test to strike a patent because the claimed process takes place within a computer rather than in the “physical realm” like a chemical or mechanical process. Instead, earlier uses of the “physical realm” test support only the exclusion of inventions involving merely conceptual or mental steps.

For instance, in 2012, the Federal Circuit seized upon a patent holder’s contrasting of the “realm of the abstract” with the realm of the “physical” in arguing that its patent, which involved a series of conceptual steps, claimed eligible subject matter. *Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1322 (Fed. Cir. 2012). Responding to the patent holder’s contention that the patent was not abstract because the claimed conceptual steps involved evaluating physical legal documents about real property, the court observed that not all patents that are “tied to the physical world through . . . tangible means” are patent-eligible. *Id.* The court implied that ties to the physical world may be a necessary but not sufficient condition for patent eligibility, but it provided no explanation for why any tie to the physical world was necessary.

Several months before this Court’s *Alice* decision, the Federal Circuit again hinted at the phrase “physical realm,” this time in a case involving a patent that claimed a mental process for selecting a therapeutic treatment regimen. *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 F. App’x 950, 955 (Fed. Cir. 2014). The court stated that when a claim involves an abstract idea, eligibility requires that the claim apply the idea “in the realm of tangible physical objects (for product claims) or physical actions (for process claims).” *Id.* The *SmartGene* court used the terms “tangible” and “physical” specifically to exclude mental processes. *See id.* at 954.

Just two and a half months after *Alice*, the Federal Circuit reiterated its position that invention must take place in the “physical realm,” this time improperly attributing the “physical realm” test to *Alice. buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1353 (Fed. Cir. 2014). Although a “physical realm” requirement appears nowhere in *Alice*, the Federal Circuit described *Alice* step two as requiring “an ‘inventive concept’ in the physical realm of things and acts—a ‘new and useful application’ of the ineligible matter in the physical realm—that ensures that the patent is on something ‘significantly more than’ the ineligible matter itself.” *Id.* (quoting *Alice*, 573 U.S. at 217-18).

In the instant case, the Federal Circuit contracted its interpretation of the “physical realm” to exclude the digital realm. It further expanded the “physical realm” test to subsume both *Alice* step two *and* step one. The court posited that invention in the non-physical realm

is “abstract” and therefore will always fail *Alice* step one. App. 12a-14a. Moreover, the Federal Circuit determined that invention outside of the “physical realm” will also fail *Alice* step two unless there is “an inventive concept in the non-abstract application realm.” App. 16a. But because invention not in the “physical realm” is “abstract” by the Federal Circuit’s definition, any inventive concept involving processes that do not occur in the “physical realm” cannot escape the “realm” of the “abstract.”

The Federal Circuit has thus effectively replaced this Court’s long-established focus on the risk of preemption with its own “physical realm” test. The test is not grounded in this Court’s precedent and flouts several of its key directives. In *Bilski*, this Court refused to endorse a bright-line application of a test requiring that a process either employ a particular machine or transform an article from one state to another. 561 U.S. at 605; *see also id.* at 612 (Breyer, J., concurring) (also rejecting the “useful, concrete, and tangible result” test identified in *State Street Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998)). This Court declared that the machine-or-transformation test “may well provide a sufficient basis for evaluating processes similar to those in the Industrial Age—for example, inventions grounded in a physical or other tangible form”—but that “times change.” *Id.* at 605.

Notwithstanding the conflict between the Federal Circuit’s “physical realm” test and this Court’s jurisprudence, district courts have already embraced the

“physical realm” test. *See, e.g., iSentium, LLC v. Bloomberg Fin. L.P.*, 343 F. Supp. 3d 379, 393 (S.D.N.Y. 2018) (dismissing an infringement case after finding the patent ineligible under § 101, where the patent “purports to describe an improvement to data analysis, and not an improvement to the functionality of a computer or network”); *Freeny v. Fossil Grp., Inc.*, No. 2-18-cv-00049 (E.D. Tex. Feb. 12, 2019) (magistrate judge recommendation that motion to dismiss on § 101 grounds be denied based on the conclusion that a claim was not directed to an abstract idea because it was “drawn to a physical device”). The application of the “physical realm” test is not an isolated incident.

B. Congress Allows Patents On Novel Processes Even If Executed By Computers. The “Physical Realm” Test Does Not.

Bilski, *Alice*, and their progeny correctly held that well-understood, routine, and conventional processes do not become patent-eligible merely by being implemented on a computer. *See Alice*, 573 U.S. at 224; *Bilski*, 561 U.S. at 612. After all, the decision to implement an already familiar concept on a computer is not, in this digital era, sufficiently inventive to reward with patent protection. But the core problem with *Bilski*- and *Alice*-style patents is not that they claim applying an abstract idea on a computer, but that there is no novel, non-obvious invention that is distinguishable over prior art in the first place. In other words, most *Bilski-Alice*-style patents will not survive § 102 and § 103 scrutiny either. Further, many of these types of patents raise

preemption concerns, as courts want to avoid tying up the computerized use of well-known concepts.

Through the “physical realm” test, the Federal Circuit distorts the *Bilski-Alice* rule into a new test that is logically incongruent with *Alice*. *Alice* held that implementing an abstract idea on a computer is not the sort of “additional feature” that is, alone, sufficient to transform the abstract idea into “something more.” *Alice*, 573 U.S. at 224. The Federal Circuit misread *Alice*’s rule that the computer cannot be *the* inventive step to mean that the existence of a computer eliminates the possibility of there being *any* inventive step.⁶ Thus, a novel, nonobvious, enabled, and otherwise patentable process automatically becomes patent-ineligible under the “physical realm” test if a computer is required for its implementation.

This judge-made categorical exclusion of computer-implemented processes does not reflect this Court’s intent. *See Bilski*, 561 U.S. at 605 (“[U]nforeseen innovations such as computer programs” are not “always unpatentable.”); *Alice*, 573 U.S. at 224 (“The fact that a computer ‘necessarily exist[s] in the physical, rather than purely conceptual, realm’” is “beside the point.”). It also contradicts the Federal Circuit’s

⁶ That is, unless the invention creates or improves something physical, like the computer itself. *See, e.g., Enfish, LLC*, 822 F.3d at 1336 (looking to whether a software program improved the capabilities of a computer); App. 13a (stating that allowed claims in another case “were directed to the creation of something physical”—namely, an improved display (citing *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299 (Fed. Cir. 2016))).

earlier acknowledgement that “[m]uch of the advancement made in computer technology consists of improvements to software that, by their very nature, may not be defined by particular physical features but rather by logical structures and processes.” *Enfish, LLC*, 822 F.3d at 1339 (finding no “exclusion to patenting this large field” of software improvements in *Bilski* or *Alice*).

The exclusion also contravenes the Patent Act itself. Congress broadly encourages invention by permitting anyone who “invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” to obtain a patent “subject to the conditions and requirements of” the Patent Act. 35 U.S.C. § 101. The congressional requirements for patentability are limited: the claimed idea must be distinct from ideas that exist in prior art, the idea must be nonobvious in light of the prior art, and the patent must teach, or enable, others to use the claimed idea. Meanwhile, the range of patentable subject matter permitted by Congress is exceedingly broad: “any new and useful process, machine, manufacture, composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. “Process,” in turn, is defined generally by Congress as “process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.” 35 U.S.C. § 100(b). The ’291 Patent has both “new and useful process[es]” (matrix-based resampling and a process for biasing the resampling)

and “a new use of a known process” (resampling as specially adapted for portfolio analysis).

While terms such as “machine” or “composition of matter” may fairly be interpreted as referring to things in the “physical realm,” the term “process” cannot. “Process” is commonly understood to mean “a series of actions, happenings, or experiences.” *Process*, WEBSTER’S THIRD NEW INT’L DICTIONARY (1993). Nowhere in the common definition or in the Patent Act is a requirement that these actions or happenings take place in the realm of things that can be physically seen, touched, and manipulated. *See also Bilski*, 561 U.S. at 604 (disapproving exclusive use of the machine-or-transformation test).

In 2011, Congress reexamined the Patent Act, ultimately enacting the Leahy-Smith America Invents Act. Although the revised Act narrowed patentability for certain kinds of inventions (e.g., tax strategy inventions), it did not narrow the definition of “process” or otherwise delimit patentability to inventions that can be seen, heard, or felt.

The past half century has benefited from numerous patentable inventions in the non-physical realm. For instance, the 1970s enjoyed a proliferation of calculator patents, for which the inventive concept did not involve any improvements to the hardware, but only to the internal programming process by which the calculator performed mathematical functions. *See, e.g., Mike Sebastian, Calculator Related Patents* (last updated Nov. 5, 2006), <https://www.rskey.org/~>

[mwsebastian/patents/patents.htm](#) (compiling 1,809 calculator patents). Similarly, there have been significant advances in medical methods based on non-physical realm advances. For instance, ultrasound imaging can now be used to perform differential diagnosis due to improvements in the computerized analysis of data obtained by a known physical device. *See, e.g.*, U.S. Pat. No. 8,221,321. And the 1990s and early 2000s saw a swell of digital patents, including the patent for Google’s “PageRank” algorithm. By declining to impose a legislative exception to patentability for the burgeoning field of digital patents when enacting the America Invents Act, Congress impliedly authorized continued patent protection for inventions within the digital realm.

The Federal Circuit’s “physical realm” test usurps Congress’s role as the body empowered by the Constitution to encourage, reward, and protect invention. Looking forward, one can easily imagine advances in processes that occur in the non-physical realm that would deserve patent protection—for instance, better methods of modeling a city’s housing needs, improvements in the computerized instructions used by self-driving vehicles, or improved weather simulations to predict hurricane trajectories more accurately. Under the Federal Circuit’s “physical realm” test, such developments would be unpatentable even if they met all the legislatively-determined requirements of the Patent Act.

The “physical realm” test thus threatens to eviscerate patent eligibility in computer-intensive fields

like artificial intelligence, machine learning, and data science, putting U.S. inventors, companies, and investors at a competitive disadvantage relative to their counterparts in other countries. See Kevin Madigan & Adam Mossoff, *Turning Gold into Lead: How Patent Eligibility Doctrine Is Undermining U.S. Leadership in Innovation*, 24 GEO. MASON. L. REV. 939, 941-42 (2017) (calculating that nearly one in ten patents rejected in the U.S. on § 101 grounds are granted in Europe or China). Many applications rejected on § 101 grounds “represent the cutting-edge, push-the-envelope innovation” that the U.S. patent system is constitutionally required to promote. *Id.* at 956. Without strong patent laws to protect genuinely novel, nonobvious, and enabled innovation, the key research and development incentives that for many years propelled the United States to the top of the Global IP Index will disappear. See *id.* And without incentives for inventors to innovate, many valuable inventions may never come into being. *Id.*

The corrosive effects of the Federal Circuit’s post-*Bilski* and *-Alice* jurisprudence have already been felt, most acutely by the highest-growth sectors of our economy. Patent applications in certain USPTO E-Commerce Art Units have seen dramatic spikes in the percentage of office actions being denied on § 101 grounds, from 25% pre-*Alice* to a rejection rate above 75% in every month since *Alice*. See Colleen Chien, *The Impact of 101 on Patent Prosecution*, PATENTLYO (Oct. 21, 2018), <https://patentlyo.com/patent/2018/10/impact-patent-prosecution.html>. The overall allowance rate in

certain e-commerce art units has dipped as low as 1.3%. Gene Quinn, *E-Commerce Art Units: Where Patent Applications Go to Die*, IP WATCHDOG (Jul. 14, 2016), <http://www.ipwatchdog.com/2016/07/14/where-patent-applications-go-die/id=70913/>.

Meanwhile, over 60% of the district court cases that have addressed patent eligibility since *Alice* have found claims ineligible under § 101. Meredith Addy, *Alice at Age Four: Time to Grow Up*, IP WATCHDOG (Sept. 18, 2018), <https://www.ipwatchdog.com/2018/09/18/alice-age-four-grow-up/id=101447/>. Of the cases appealed to the Federal Circuit on patent-ineligibility grounds, over 90% have been affirmed. *Id.*

These numbers reflect more than the mere rejection of low-quality patent applications. Whole classes of invention are being denied patent protection in the United States not because they fail the statutory tests for patentability but rather because they are deemed to fail the expanding judicially-created § 101 test.

C. Conflict About How To Apply *Alice* Leaves Patent-Eligibility Decisions To Chance.

Serious inconsistencies in the lower court jurisprudence leave the likelihood of patent eligibility for certain types of invention muddled and unpredictable. Notwithstanding this Court's grounding of the abstract ideas exclusion in a preemption analysis, a number of Federal Circuit decisions—including the decision below—disregard the preemption inquiry entirely and substitute their own tests for subject-matter

eligibility. *See, e.g., Enfish, LLC*, 822 F.3d at 1336 (finding patent-eligible a software program that improves the functionality of a computer); *Finjan, Inc. v. Blue Coat Sys.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018) (finding patent-eligible a software program because it “enables a computer security system to do things it could not do before”); *Exergen Corp.*, 725 F. App’x at 966 (finding a body temperature detector patent-eligible in part because it took “years and millions of dollars” to invent).

Yet other Federal Circuit decisions do evaluate preemption risk, albeit in inconsistent ways. While some panels hold that the absence of preemption risk confers patent eligibility, others hold that preemption is relevant only as a potentially disqualifying factor. *Compare, e.g., DDR Holdings LLC v. Hotels.com LP*, 773 F.3d 1245, 1259 (Fed. Cir. 2014) (holding that a method of creating websites was patent eligible because the claims recited a “specific way” of accomplishing the result and did not “attempt to preempt every application of the idea”) and *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) (holding claims reciting a method of filtering internet content patent eligible because they recited a “specific, discrete implementation” and did not threaten to “preempt all ways of filtering content on the internet”) with *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015) (“While preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility.”) and *OIP Tech., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362-63 (Fed. Cir.

2015) (“[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the e-commerce setting do not make them any less abstract.”).

The Federal’s Circuit’s intra-circuit split makes the patent eligibility of certain kinds of processes unpredictable and unreliable in the district and appellate courts. *See Smart Sys. Innovations, LLC v. Chicago Transit Auth.*, 873 F.3d 1364, 1377 (Fed. Cir. 2017) (Linn, J., concurring in part and dissenting in part) (noting that lower court applications of *Alice* “often lead[] to arbitrary results”); *Cal. Inst. of Tech. v. Hughes Commc’ns, Inc.*, 59 F. Supp. 3d 974, 980, 990 (C.D. Cal. 2014) (noting that the § 101 jurisprudence “leave[s] open the question of when, if ever, computer software is patentable”); *see also Front Row Techs., LLC*, 204 F. Supp. 3d at 1227; *Secure Mail Sols. LLC*, 169 F. Supp. 3d at 1045.

The crisis for invention posed by the lower courts’ § 101 morass has not gone unnoticed by the USPTO. The agency has directly acknowledged the dilemma for inventors, businesses, patent stakeholders, and the more than 8,500 patent examiners and administrative judges tasked with applying the *Alice* test. In its most significant acknowledgment yet, on January 4, 2019, the USPTO issued revised § 101 procedures for determining whether a patent application claim is directed to a judicial exception to patent eligibility. *See* 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019).

The new guidance provides a disciplined, multi-pronged approach for analyzing subject-matter eligibility. The USPTO guidance identifies this Court’s judicial exceptions, including specific categories of ideas to treat as “abstract,” and instructs examiners to consider whether the recited judicial exception is integrated into a practical application of the exception. *Id.* at 52, 53-54. The guidance also addresses the route to patent eligibility when a claim does not “integrate” the exception into a practical application by directing examiners to consider whether the claim recites an additional step or combination of steps that add limitations that are not well-understood or routine in the field. *Id.* at 56. Notably, the agency acknowledges this Court’s preemption concerns by noting that successful claims must be “more than a drafting effort designed to monopolize the judicial exception.” *Id.* at 53.

The USPTO guidance, however, does not resolve the judicial discrepancies regarding the application of *Alice*. Until the judiciary receives clarification or redirection, the USPTO’s efforts to remedy the confusion will have limited effect. Worse, any conflict between the USPTO’s approach and that of the lower courts’ will exacerbate the effects of the uncertainty surrounding § 101, as inventors receive intellectual property rights from the USPTO only to have them stripped away by reviewing courts applying an altogether different test. Thus, the USPTO guidance is not a remedy, but rather, a spotlight on the quagmire that is the § 101 inquiry.

D. This Case Is An Ideal Vehicle To Restore Consistency And Reliability To § 101.

The patents at issue in *Alice* and *Bilski* were excellent examples of the types of inventions not deserving of patent protection, and this Court did not need to labor long over why the claims failed each step of the *Alice* test. *Alice* involved nothing new beyond simplistic code to balance escrow accounts that could be implemented in a single weekend by a second-year engineering student. Oral Argument at 2:29, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014) (No. 13-298), <https://www.oyez.org/cases/2013/13-298>. *Bilski* claimed the general and well-known concept of risk-hedging, implemented on a computer, but did not actually teach any new ideas or processes for hedging. 561 U.S. at 612. Because the *Alice* and *Bilski* patents were both so clearly patent-ineligible, this Court had little opportunity to teach what a patent-eligible computer-implemented process actually looks like. The patent here, in contrast, is worth this Court's efforts to explain the counterpart to its decision in *Alice*.

The InvestPic patent is not a trivial coding project. See *Inter Partes* Reexamination No. 95/001,939, Philip M. Neches Declaration (submitted Jul. 18, 2012), <https://portal.uspto.gov/pair/PublicPair>. It accordingly survived exacting scrutiny during its dual reexamination proceedings before the USPTO, the PTAB, and the Federal Circuit. The claims that emerged from those proceedings were entirely novel and nonobvious; InvestPic's vigorous opponents were not able to identify prior art, or any combination of art, that could

invalidate the patent on § 102 or § 103 grounds despite the tens of thousands of pages of literature reviewed. This is not a patent that reflects a process everybody—or anybody—knew or practiced. Rather, the inventor identified an esoteric process (resampling), modified it in at least two new ways (resampling of data matrices, and a bias parameter to enable adjusting the randomness of the resampling), and applied it to a problem in a specific field (investment) using a then-uncommon tool (parallel processing). He proceeded to patent a highly detailed, narrow, enabled application of this invention.

Proof of the narrowness of the '291 Patent is in the substantial subsequent patenting over the patent by other inventors. More than fifty patents have issued that cite the '291 patent as prior art. *See, e.g.*, U.S. Pat. Nos. 7,620,578, 7,613,647, 8,800,857. This alone amply demonstrates the non-preemptive nature of this patent—a critical feature that was not true of the *Alice* or *Bilski* patents. It also demonstrates the significant value of the invention for promoting progress, as many others have taken efforts to refine or build upon the invention.

The InvestPic patent adheres to each of the steps specified in the Patent Act as necessary for receiving patent protection. Yet the Federal Circuit concluded that “if any protection is to be found” for this patent, “the innovator must look outside patent law in search of it, such as in the law of trade secrets, whose core requirement is that the idea be kept secret from the public.” App. 20a. Should the only protection available for an invention that enables investors to protect their

life savings for retirement lie in keeping that invention secret from the public? Surely the answer is no. Inventive ideas of this kind, which others have already built upon, should be precisely what patent protection is for, so that the inventor is rewarded while others are simultaneously permitted to use and build upon the innovation.

◆

CONCLUSION

For the foregoing reasons, the Court should grant the petition for a writ of certiorari.

Respectfully submitted,

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