

**How Useful, Tangible, and Concrete is Federal
Circuit's Eligible Subject Matter Test?**

By

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I. Introduction

"Patented" is the buzzword these days. The commercials brag about their patented products; the venture capitalists want to see patents before they fund a start-up; and the chief technologist at any medium sized company is interested in protecting the company's edge over its competition through patents. But what inventions are eligible for patents? The Federal Circuit has ruled that an invention is eligible for patenting if the invention is a process, machine, manufacture, or composition of matter, and the invention produces a useful, concrete, and tangible result. The Board of Patents Appeals and Interferences (B.P.A.I.), however, has read Federal Circuit's test very narrowly and defined its own physical transformation test for eligible subject matter.

This paper analyzes both Federal Circuit's and B.P.A.I.'s tests for eligible subject matter. Part II of this paper briefly looks at the policies driving the eligible subject matter debate. Part III traces the Supreme Court's jurisprudence on the topic. Part IV describes the Federal Circuit's test for eligible subject matter. Part V presents the analysis of Federal Circuit's test and concludes that the Federal Circuit's test aptly addresses the eligible subject matter inquiry. Part VI describes

B.P.A.I.'s eligible subject matter test and concludes after an analysis that B.P.A.I.'s test is flawed.

II. The challenges in defining eligible subject matter and the policy guiding the subject matter inquiry

A United States patent provides a patentee an exclusive right to practice his invention for a term of twenty years.¹ In exchange, the patentee discloses his invention to public and the public is free to use the invention after the twenty year patent term expires.² The exclusive patent grant provides patentee an incentive to research new inventions while the public benefits from the disclosure of new inventions.³ In this way, the patent system provides an exchange between the patentee and the public that "promote[s] the progress of science and useful arts."⁴

¹ 35 U.S.C. § 154 (2006).

² *Bonito Boats v. Thunder Craft Boats*, 489 U.S. 141, 150-151 (U.S. 1989) ("The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years."); *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 186-187 (U.S. 1933) ("[The inventor] may keep his invention secret and reap its fruits indefinitely. In consideration of its disclosure and the consequent benefit to the community, the patent is granted. An exclusive enjoyment is guaranteed him for [the term of the patent], but upon expiration of that [term], the knowledge of the invention inures to the people, who are thus enabled without restriction to practice it and profit by its use.")

³ *Id.*

⁴ U.S. Const. art. I, § 8, cl. 8 (empowering Congress "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.")

An overly broad patent, however, can unfairly tilt the balance of this exchange and "discourage research by impeding free exchange of information, ... by requiring complex licensing arrangement, and by raising the costs of using patented information."⁵ On the other hand, the broader the patent-grant the better the incentive for patentee to research new inventions. This tension between granting broad patents as an incentive for the patentee and narrow enough patents that do not hinder the progress of science is balanced by defining the scope of the patent.

The Congress has provided various statutory limitations that help define the scope of a patent. Congress through 35 U.S.C § 101 has provided the subject matter that can be patented.⁶ 35 U.S.C § 102 makes sure that the United States Patent and Trademark Office ("P.T.O") only grants patents on novel invention.⁷ 35 U.S.C § 103 allows the P.T.O to deny patents on inventions that are obvious variations of prior inventions.⁸ Finally, Congress through 35 U.S.C § 112 has ensured that the patent claim is definite enough to avoid patentee from later claiming a

⁵ Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc., 126 S. Ct. 2921, 2922 (2006) (Breyer, J., dissenting).

⁶ See 35 U.S.C § 101 (Inventions patentable).

⁷ See 35 U.S.C § 102 (Conditions for patentability; novelty and loss of right to patent)

⁸ See 35 U.S.C § 103 (Conditions for patentability; non-obvious subject matter)

broader scope for his patent than the patent right P.T.O granted to him.⁹ All these statutes help P.T.O and courts define the scope of a patent.

The courts have been doing their part by interpreting these statutes and providing judicial gloss on statutory language of the above statutes. While our law is bound to change and adapt to our changing society, the dynamic world of intellectual property has kept our courts even busier in defining the rules of this ever-changing market. The courts in particular have had their hands full in interpreting § 101 and defining the boundaries of patentable subject matter. Inventions by definition do not fit conventional wisdom, or at least inventions keep pushing the envelope of our ever growing collective knowledge. It is not surprising then that the courts have struggled with defining the subject matter of the inventions that are eligible for patenting.

III. Supreme Court Cases: Sound Jurisprudence but confusing application

35 U. S. C § 101 states that "[w]hoever invents or discovers any new and useful process, machine, manufacture,

⁹ See 35 U.S.C § 112 ("The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.").

or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor.”¹⁰ The Congress through § 101 intended statutory subject matter to “include anything under the sun that is made by humans.”¹¹ The Supreme Court following the Congress’ guidance has ruled that laws of nature, natural phenomena, and abstract ideas are not patentable subject matter.¹² Laws of nature and natural phenomena are obviously not made by humans. Moreover, abstract ideas and laws of nature are “basic tools of scientific and technological work.”¹³ Patents on such fundamental tools would be too broad as they would exclude others from using those tools in various research endeavors. Such fundamental principles are therefore free for all humans to use and not eligible subject matter.¹⁴

The Supreme Court has also ruled that a patentee cannot claim an application of a fundamental principle such that the patent would preempt every use of a particular

¹⁰ 35 U. S. C. § 101.

¹¹ *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) (quoting S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H. R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)).

¹² *Id.* at 185.

¹³ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)

¹⁴ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (U.S. 1948) (“[M]anifestations of laws of nature [are] free to all men and reserved exclusively for none. He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end.”).

principle.¹⁵ The patentee in that case would indirectly claim the exclusive use of a fundamental principle and such principle is a "manifestation[] of ... nature, free to all men and reserved exclusively to none."¹⁶ A new useful application of a fundamental principle that does not preempt every use of that principle, however, adds to our knowledge-base. The Supreme Court has therefore ruled that such applications promote the progress of science and are eligible for patent protection.¹⁷

The Supreme Court's sound jurisprudence on patentable subject matter has made sure that only manmade applications of fundamental principles are eligible for patenting. While the Supreme Court has created sound rules on patentable subject matter, the application of these rules can lead to confusing results. The Supreme Court's own application of these rules demonstrates this problem.

In *Parker v. Flook*,¹⁸ the patentee claimed a method of

¹⁵ *Id.* at 187 (process applying a fundamental principle was patentable partly because the process did not preempt every use of fundamental principle it applied).

¹⁶ *Id.*

¹⁷ *Funk Bros.*, 333 U.S. at 130.

¹⁸ 437 U.S. 584 (1978). Claim 1 represents the claimed invention in the patent:

1. A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons wherein said alarm limit has a current value of $Bo+K$ wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises:

(1) Determining the present value of said process variable, said

dynamically updating alarm limits for various variables, like temperature, pressure, and flow rates in a catalytical conversion process.¹⁹ If any variable in the process was above the alarm limit, the person monitoring the conversion process would know that the process was in an abnormal condition that needed to be fixed.²⁰

The alarm limits in a transient operation change throughout the operation depending on the changing values of various variables in the process.²¹ The claimed method helped calculate these periodically changing alarm limits.²² The method consisted of three steps. The first step consisted of measuring the value of a variable in the process.²³ Next step involved the use of a mathematical algorithm to calculate an updated alarm limit based on the measured variables.²⁴ In the final step, the actual alarm limit was adjusted to the updated alarm limit.²⁵

present value being defined as PVL;
(2) Determining a new alarm base B1, using the following equation:
 $B[1]=B_0(1.0 < v_1 > \min F) + PVL(F)$
where F is a predetermined number greater than zero and less than 1.0;
(3) Determining an updated alarm limit which is defined as B1+GK; and
thereafter
(4) Adjusting said alarm limit to said updated alarm limit value.

Flook, 437 U.S. 584, app., 596-597.

¹⁹ Id. at 585.

²⁰ Id.

²¹ Id.

²² Id.

²³ Id.

²⁴ Id.

²⁵ Id.

The patentee argued that he was claiming an application of a mathematical formula and such a claim did not preempt every use of that formula.²⁶ Additionally, the patentee cited Court of Customs and Patent Appeals (C.C.P.A) ruling that courts should consider the claim as a whole instead of dissecting it into different parts when doing a § 101 analysis. According to the patentee, his patent invention as a whole was claiming an application of a mathematical formula and the invention was therefore eligible for patent protection.²⁷

The Court did not agree with the patentee. The Court ruled that the only novel feature in the claimed invention was the mathematical formula used to calculate the alarm limit.²⁸ Mathematical formulas, like abstract ideas, are fundamental tools of scientific research that are free for everyone to use.²⁹

The Court acknowledged that patentee's invention did not preempt every use of the mathematical formula.³⁰ The formula, however, was a fundamental tool free for every man to use. The court therefore treated the formula as something that had already existed before patentee's

²⁶ *Id.* at 589-590.

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.* (citing *Gottschalk v. Benson*, 409 U.S. 113)

³⁰ *Id.*

invention.³¹ Absent the novel formula, there was nothing novel about patentee's invention.³² According to the Court, unless there was "some other inventive concept" in the patentee's invention, the invention was not eligible for patent protection.³³

The Court's analysis in *Flook* is confusing. First, the Court agrees with the C.C.P.A and advises against dissecting a patent claim in a § 101 analysis.³⁴ The Court then goes through part by part analysis of the claim. The Court states that everything except the mathematical equation in the claim is not novel.³⁵ The Court next focuses on the mathematical equation in the claim,³⁶ and rejects the patent claim as unpatentable because a mathematical equation is unpatentable subject matter.³⁷ The Court therefore dissects the claim even though the Court warns against it.

The *Flook* majority has also been criticized for combining § 102 and § 103 analysis with § 101 analysis. The Court starts its analysis by pointing out that "[t]his case turns entirely on the proper construction of § 101 of the

³¹ *Id.* at 594.

³² *Id.*

³³ *Id.*

³⁴ *Id.* at 593-594.

³⁵ *Id.* at 594-595.

³⁶ *Id.* at 588 ("The question is whether the discovery of this feature makes an otherwise conventional method eligible for patent protection.").

³⁷ *Id.*

Patent Act, which describes the subject matter that is eligible for patent protection. It does not involve the familiar issues of novelty and obviousness that routinely arise under §§ 102 and 103.”³⁸ The court then strikes down the patent claim as unpatentable because there is nothing novel about the invention.³⁹ As stated by the *Flook* dissent, the Court confuses the § 101 subject matter analysis with the novelty analysis done under § 102 and § 103.⁴⁰

Three years after *Flook*, the Supreme Court continued the debate between the *Flook* majority and dissent in *Diamond v. Deihl*.⁴¹ In *Deihl*, the claimed invention at issue was a process for molding uncured synthetic rubber into cured products in a press.⁴² The invention used a mathematical equation to calculate the exact time required to cure a particular batch of synthetic rubber.⁴³ The

³⁸ *Id.*

³⁹ Gregory A. Stobbs, *Software Patents*, § 402[K][3], 142-143(2d ed., Aspen L. & Bus. 2000)(criticizing the *Flook* Court for focusing on the novelty of mathematical formula and conducting a § 103 analysis for a § 101 inquiry.)

⁴⁰ *Id.* at 1300(“The Court today says it does not turn its back on these well-settled precedents ... but it strikes what seems to me an equally damaging blow at basic principles of patent law by importing into its inquiry under 35 U. S. C. § 101 the criteria of novelty and inventiveness.”)

⁴¹ 450 U.S. 175 (1981).

⁴² *Id.* at 177.

⁴³ *Id.* at 178. Claim 1 represents the claimed invention in the patent:

1. A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:
providing said computer with a data base for said press including at least,
natural logarithm conversion data (ln),

curing time in such a process is dependent upon variables like temperature in the curing press. The *Diehr* invention, like the *Flook* invention, measured the temperature in the press at various intervals, calculated the new curing time applying a mathematical equation, and updated the curing time periodically based on the result of that calculation.⁴⁴ The invention then compared the updated curing time with the amount of time the uncured rubber had been in the furnace.⁴⁵ If the time spent was equal to the calculated curing time, the press door opened so that the cured rubber can be taken out.⁴⁶

Even though the *Diehr* invention looks similar to *Flook*

the activation energy constant (C) unique to each batch of said compound being molded, and
a constant (x) dependent upon the geometry of the particular mold of the press,
initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure,
constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,
constantly providing the computer with the temperature (Z),
repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is
 $\ln v \text{ equ } CZ+x$
where v is the total required cure time,
repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and
opening the press automatically when a said comparison indicates equivalence.

Id. at 181 n. 5.

⁴⁴ *Id.* at 178-179.

⁴⁵ *Id.*

⁴⁶ *Id.*

invention, the *Diehr* court reached the opposite result as *Flook* court and ruled that the *Diehr* invention was within patentable subject matter.⁴⁷ Instead of focusing on the mathematical formula in the claim, the *Diehr* Court described the patent claim as a process for curing rubber.⁴⁸ The Court had no problems differentiating *Diehr* from *Flook* because the *Flook* invention, according to the Court, was a mathematical formula.⁴⁹

As apparent from *Flook* and *Diehr*, the patentable subject matter analysis in many cases turns on whether a court focuses on the mathematical formula in a claim or reads the claim as an application of that mathematical formula. While differentiating a mathematical formula from its application has proved challenging, the Supreme Court has not specified a test to distinguish one from another. The Court therefore has left that job to lower courts.

IV. The Federal Circuit's two pronged eligible subject matter test: True to Supreme Court's guidance and faithful to Congress' intent

The Supreme Court's subject matter analysis has focused on excluding laws of nature, natural phenomena, and abstract idea from patentable subject matter. There is, however, another facet to the subject matter inquiry. In

⁴⁷ *Id.* at 193.

⁴⁸ *Id.* at 187.

⁴⁹ *Id.* at 186.

addition to excluding laws of nature and abstract ideas, the claimed subject matter should also fit into one of the four patentable categories Congress defined in § 101.⁵⁰

The Federal Circuit has therefore devised two separate inquiries for these two requirements. The Federal Circuit has devised the “useful, tangible and concrete result” test for excluding laws of nature, natural phenomena, and abstract ideas from patentable subject matter.⁵¹ In most cases, this inquiry suffices because claimed subject matter easily fits into one of the four categories of patentable subject matter. In some cases, however, the Federal Circuit has explicitly analyzed the claimed subject matter to determine whether the claimed subject matter fits into one of the four subject matter categories defined by the Congress.

A. The Federal Circuit has followed the Supreme Court’s guidance and devised the “useful, concrete, and tangible result” test to exclude laws of nature and abstract ideas from patentable subject matter

The Federal Court, like Supreme Court, initially struggled with differentiating the laws of nature and abstract ideas from their applications. The C.C.P.A, Federal Circuit’s predecessor, through a series of cases

⁵⁰ In re Nuijten, 500 F.3d 1346, 1354 (Fed. Cir. 2007).

⁵¹ State St. Bank & Trust Co. v. Signature Fin. Group, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

formulated the Freeman-Walter-Abele test to handle subject matter analysis for inventions containing a mathematical algorithm.⁵² The Federal Circuit initially adapted the test but later rejected the test because the application of the test was misleading and confusing.⁵³

The Freeman-Walter-Abele test consists of two steps. First, the court determines whether the patent claim directly or indirectly recites a mathematical algorithm.⁵⁴ If there is a mathematical algorithm, the court next determines whether the claimed invention applies the mathematical algorithm "in any manner to physical elements or process steps."⁵⁵ The physical elements or process steps applying the mathematical formula cannot be a superficial addition to a claim to avoid a § 101 rejection. Instead the claim applying the mathematical formula should "encompass[] significantly more than the algorithm alone."⁵⁶ If the mathematical algorithm is applied in such a manner, the patent claim is eligible subject matter.⁵⁷

⁵² State St. Bank & Trust Co. v. Signature Fin. Group, 149 F.3d 1368, 1374 (Fed. Cir. 1998).

⁵³ *Id.* ("After Diehr and Chakrabarty, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter. As we pointed out in Alappat ... application of the test could be misleading.") (citation omitted)

⁵⁴ *Id.* (citing *In re Pardo*, 684 F.2d 912, 915 (CCPA 1982)).

⁵⁵ *Id.*

⁵⁶ *In re Abele*, 684 F.2d 902, 909 (C.C.P.A. 1982)

⁵⁷ *State St.*, 149 F.3d at 1374

The difficulty in applying this test is the uncertain definition of "mathematical algorithm."⁵⁸ "Mathematics, like a language, is a form of expression."⁵⁹ A majority of patentable operations of a machine, processes, chemical reactions, and many other patentable inventions can be represented through mathematical algorithms.⁶⁰ A court therefore can find a mathematical algorithm in almost any patent claim. Moreover, the test requirement that the patent claim encompass significantly more than the algorithm also adds to the unpredictability of the test.⁶¹ Different courts may differ on when a mathematical algorithm is significantly more in a particular claim. In sum, the uncertainty and vagueness of Freeman-Walter-Abele test led the Federal Circuit to abandon the test.

The Federal Circuit, in *State St. Bank & Trust Co. v. Signature Fin. Group*,⁶² again tackled the challenges of § 101 analysis for inventions containing a mathematical algorithm. In *State St.*, the Federal Circuit was asked to decide whether a machine that implemented a particular

⁵⁸ *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1063 (Fed. Cir. 1992) (Rader, J., dissenting); Stobbs, *Software Patents* at 159.

⁵⁹ *Arrhythmia*, 958 F.2d at 1063.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² 149 F.3d 1368 (Fed. Cir. 1998)

investment method was eligible for patent protection.⁶³ The investment method allowed various publicly traded

⁶³ 149 F.3d at 1370. Claim 1 represents the claimed invention in the patent:

1. A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:
 - (a) computer processor means [a personal computer including a CPU] for processing data;
 - (b) storage means [a data disk] for storing data on a storage medium;
 - (c) first means [an arithmetic logic circuit configured to prepare the data disk to magnetically store selected data] for initializing the storage medium;
 - (d) second means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases or decreases based on specific input, allocate the results on a percentage basis, and store the output in a separate file] for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds, [sic, funds'] assets and for allocating the percentage share that each fund holds in the [**9] portfolio;
 - (e) third means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;
 - (f) fourth means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and
 - (g) fifth means [an arithmetic logic circuit configured to retrieve information from specific files, calculate that information on an aggregate basis and store the output in a separate file] for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.

Id. at 1372.

investment funds to pool their resources together into a single portfolio.⁶⁴ The individual financial funds were therefore able to split the administrative cost and maximize tax benefits.⁶⁵ The investment method used complex mathematical algorithms to daily determine the loss and profit for individual financial funds.⁶⁶ This daily loss and profit in turn affected the share price of these publicly traded financial funds.⁶⁷

The accused infringer argued that the claimed machine used an abstract mathematical algorithm to calculate every participating fund's loss and profit.⁶⁸ Because the machine used a mathematical algorithm, an abstract idea, the accused infringer claimed that the machine was ineligible for patent protection.⁶⁹

The Federal Circuit started its analysis with the statutory language of § 101. The court stated that § 101's "broad and general" language allowed patents on "any ... process, machine, manufacture, or composition of matter or any ... improvement thereof."⁷⁰ According to the court,

[t]he repetitive use of the expansive term "any" in § 101 shows Congress's intent not to place any

⁶⁴ *Id.*

⁶⁵ *Id.* at 1371.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.* at 1373.

⁶⁹ *Id.*

⁷⁰ *Id.* at 1372 n. 2.

restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101.⁷¹

The court then addressed the mathematical algorithm exception analysis. The court ruled that mathematical algorithms are not per se unpatentable. The Federal Circuit read the Supreme Court cases *Diehr*, *Flook*, and *Gottschalk v. Benson*⁷² as holding that "mathematical algorithms are not patentable subject matter [only] to the extent that they are merely abstract ideas."⁷³ An application of mathematical algorithm, however, is patentable unless it preempts every use of the underlying mathematical algorithm.⁷⁴ The way to distinguish an application from the underlying mathematical algorithm, law of nature, or an abstract idea is to focus on the result of the claimed invention instead of trying to classify the invention as one of the eligible subject matter category. When an invention produces "a useful, concrete and tangible result," the invention is an application of an abstract idea which does not preempt

⁷¹ *Id.* at 1373.

⁷² 409 U.S. 63 (1972).

⁷³ *Id.*

⁷⁴ 149 F.3d 1373. ("Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not "useful." From a practical standpoint, this means that to be patentable an algorithm must be applied in a "useful" way.")

every use of that idea.⁷⁵ Such an invention is therefore eligible for patenting.

Applying its analysis to the facts of the case, the Federal Circuit ruled that the claimed machine-implemented financial model applied the abstract mathematical principle to "produce a 'useful, concrete and tangible' share price", and the investment funds relied on this useful result in subsequent share trades.⁷⁶ Patent on that investment model machine claimed only a particular use of a mathematical algorithm in financial models.⁷⁷ The patent did not preempt every use of the mathematical algorithm and the public therefore is free to use the algorithm in other applications.⁷⁸ Accordingly, the claimed machine was eligible for patent protection.

The debate regarding patentable subject matter, however, did not settle with the *State St.* decision. In *AT&T Corp. v. Excel Communs., Inc.*,⁷⁹ the accused infringer claimed that a method for efficiently handling customer billing information in telephone systems was not patentable

⁷⁵ *Id.* (explaining that a machine applying a mathematical algorithm to produce a smooth waveform display on a rasterizer monitor "constituted a practical application of an abstract idea ... because it produced a 'useful, concrete and tangible result' - the smooth waveform.).

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ 172 F.3d 1352, 1359 (Fed. Cir. 1999)

subject matter.⁸⁰ The patentee claimed a process that can be implemented in already existing phone billing databases.⁸¹ The process involved adding a binary data field to identify whether both the caller and call receiver had the same long distance carrier.⁸² This identification allowed the phone service provider to bill such calls at a cheaper rate than calls that involved two different long distance carriers.⁸³

The accused infringer argued that the claimed process was not eligible subject matter.⁸⁴ According to the accused infringer, the *State St.* ruling was limited to machine claims and the ruling did not apply to process claims.⁸⁵ The accused infringer also argued that processes using

⁸⁰ *Id.* Claim 1 represents the patented invention:

1. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and

including, in said message record, a primary interexchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.

Id. at 1354.

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ Brief for Defendants-Appellees Excel Communications, Inc., Excel Communications Marketing, Inc., and Excel Telecommunications, Inc., *AT&T Corp. v. Excel Communs., Inc.*, 172 F.3d 1352, 1356 (Fed. Cir. 1999) (No. 98-1338), 1998 WL 34097499 at *25.

⁸⁵ *Id.*

mathematical algorithms are patentable subject matter "only if there is a 'physical transformation' or conversion of subject matter from one state into another."⁸⁶ Moreover, the accused infringer argued that a patent claiming a process needs to define a physical structure implementing the process.⁸⁷ According to the accused infringer, the patentee's process used Boolean principle, a mathematical algorithm, and the patent claim did not recite a physical structure to implement the process.⁸⁸ Moreover, there were no physical transformations recited in the claimed process.⁸⁹ According to the accused infringer, the claimed process was therefore ineligible for patent protection.⁹⁰

The Federal Circuit ruled that the accused infringer's arguments were misplaced.⁹¹ The court ruled that the process need not involve a physical transformation to be patentable.⁹² The physical transformation requirement was not a separate requirement but only one of the several ways of proving that the claimed invention produced a useful, concrete, and tangible result.⁹³ Moreover, the court ruled that the process patent claims need not recite a physical

⁸⁶ AT&T, 172 F.3d at 1358.

⁸⁷ *Id.* at 1359.

⁸⁸ *Id.*

⁸⁹ *Id.* at 1358.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.* at 1358.

⁹³ *Id.*

structure to implement the claimed process.⁹⁴ The accused infringer incorrectly relied on case law that required a recitation of physical structure for machine claims that were written in a particular way, i.e., means-plus-function language.⁹⁵ Such recitation requirement did not apply to process claims.⁹⁶ The Federal Circuit therefore ruled that the “useful, concrete, and tangible result” test applied equally to machine patents and process patents.⁹⁷ Here, the patentee applied the Boolean principle to produce a useful, concrete, and tangible result in form of differential billing capabilities for phone companies.⁹⁸ The method was therefore patentable subject matter.⁹⁹

In sum, the Federal Circuit has ruled that the test for excluding laws of nature and abstract ideas from patentable subject matter is whether the claimed invention produces a useful, concrete and tangible result. This test has been faithful to Supreme Court’s ruling and the test only excludes abstract ideas, laws of nature, and natural phenomena from patent protection.

⁹⁴ *Id.* at 1359.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.* at 1357-1358 (“Whether stated implicitly or explicitly, we consider the scope of § 101 to be the same regardless of the form - machine or process - in which a particular claim is drafted Thus we are comfortable applying our reasoning in . . . State Street to the method claims.”).

⁹⁸ *Id.* at 1360.

⁹⁹ *Id.*

However, producing a useful, concrete and tangible result is not enough to pass the gates of § 101. The claimed invention also has to fit into one of the four categories Congress defined as patentable subject matter.

B. The Federal Circuit has followed Congress' intent and limited the patentable subject matter to four § 101 categories even when the claimed invention produces a useful, tangible, and concrete result

In *In re Nuijten*,¹⁰⁰ the patentee claimed a technique for watermarking or embedding additional digital information in a digital signal.¹⁰¹ The additional digital information or the watermark can be used for various purposes like preventing illicit copying of the digital signal. The watermarks, however, introduce some distortion into the original signal. The patentee's technique provided a watermark with reduced distortion in the signal¹⁰². The P.T.O allowed patent claims on the patentee's process and apparatus to produce that watermark signal, but the P.T.O denied patentee's claim to the signal itself.¹⁰³

The Federal Circuit affirmed P.T.O's decision and ruled that

The claim must be within at least one category
.... The four categories [in § 101] together
describe the exclusive reach of patentable

¹⁰⁰ 500 F.3d 1346 (Fed. Cir. 2007).

¹⁰¹ *Id.* at 1349.

¹⁰² *Id.* at 1348.

¹⁰³ *Id.* at 1351.

subject matter. If a claim covers material not found in any of the four statutory categories, that claim falls outside the plainly expressed scope of § 101 even if the subject matter is otherwise new and useful.¹⁰⁴

Because the signal did not qualify as process, machine, manufacture, or composition of matter, the Federal Circuit ruled that the signal was not eligible for patent protection. The court therefore followed the Congress' intent and limited the patentable subject matter to four categories specified by the Congress.

In sum, an invention is eligible subject matter if the invention does not claim a natural phenomena or an abstract idea. An application of natural phenomena or an abstract idea is patentable as long as the application does not preempt every use of the natural phenomena or the abstract idea. The Federal Circuit has stated that if the invention produces a useful, concrete, and tangible result, the invention is an application of an abstract idea and not the abstract idea itself. Additionally, the invention has to qualify as one of the four categories Congress specified in § 101 as patentable subject matter.

V. Analysis of Federal Circuit's test

The second prong of the Federal Circuit's is relatively straight forward. It follows the statutory

¹⁰⁴ *Id.* at 1354.

language and requires that the invention qualifies as one of the four categories stated in § 101. The Federal Circuit's "useful, concrete, and tangible result" test, however, requires closer scrutiny.

A. Advantages of the "useful, tangible, and concrete result" test

The Federal Circuit has devised a test that serves its purpose of excluding abstract ideas and natural phenomena from eligible subject matter. Moreover, the test gives practical guidance to lower courts on how to exclude ineligible subject matter from patent protection. Additionally, the test is neither too broad nor too narrow in allowing eligible patent subject matter to pass the § 101 inquiry.

1. The Federal Circuit's test gives courts an effective framework to exclude ineligible subject matter

Critics of the Federal Circuit's test point to the perceived disadvantages of the test and argue for a simpler framework.¹⁰⁵ Professor Osenga proposes that instead of applying the "useful, tangible, and concrete result" test, the courts should determine what the applicant is seeking

¹⁰⁵ The disadvantages or criticism of the Federal Circuit's test is addressed *infra* Part V.B.

to patent.¹⁰⁶ The courts should then determine whether the invention would preempt every use of an abstract idea.¹⁰⁷ If the invention preempts every use, then the applicant is claiming an abstract idea that is not eligible subject matter.¹⁰⁸

The drawback of using this approach is that it is not as easy to define the abstract idea or to define the line between the abstract idea and its application. The *Benson* claim of converting hexadecimal binaries to pure binaries exemplifies this problem. In *Benson*, if the court defined the abstract idea as converting hexadecimal binaries to pure binaries, then some courts may rule that when the conversion is done through a particular machine or a computer, the conversion is an application of the conversion idea. The courts may also define the abstract idea as converting from hexadecimal to pure binary *using a machine*. In that case the conversion machines would not be patentable subject matter because any claims to conversion machine would preempt every use of the above-mentioned abstract idea.

The lower courts and patent examiners need a framework that guides them through the challenging task of separating

¹⁰⁶ Kristen Osenga, *Ants, Elephant Guns, and Statutory Subject Matter*, 39 *Ariz. St. L.J.* 1087, 1125 (2007).

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

abstract ideas from their application. The Federal Circuit's test provides the lower courts with this framework that correctly focuses on the result of the invention rather than defining the abstract idea used in the invention.

The "useful, concrete, and tangible result" test correctly focuses on the result of the invention rather than the form of the invention. When an examiner focuses on the result of the invention, it is easier for the examiner to judge whether the patentee is claiming an abstract idea or an application of the abstract idea.

For example, the patentee in *AT&T* claimed a process that involved using Boolean principle to identify whether both the caller and call receiver had the same long distance carrier.¹⁰⁹ Even though the method used the Boolean principle, the result of the method was identifying whether the caller and the receiver use the same carrier.¹¹⁰

For an invention like *AT&T* invention, an examiner may mistakenly focus on the Boolean principle used in the method and rule the method as a mathematical algorithm or an abstract idea and therefore not eligible subject matter. Under Federal Circuit's test, however, if the examiner

¹⁰⁹ See *supra* Part IV.A

¹¹⁰ *Id.*

focuses on the result, it becomes immediately apparent that the claimed method produces a useful, concrete, and tangible result in form of differential billing capabilities for phone companies. The Federal Circuit's test therefore aptly guides the courts and patent examiners in excluding abstract ideas and natural phenomena from eligible subject matter.

Absent a framework, it is easy for the lower courts to inconsistently draw the line between the abstract idea and its applications. Such inconsistent line drawing would lead to inconsistent rulings on eligible subject matter. The Federal Circuit's test avoids these inconsistencies by providing a test that focuses on the result of the claimed invention instead of defining the abstract idea and its applications.

2. The Federal Circuit's test is not overly broad in defining the eligible subject matter

Again, the patentable subject matter is a broad inquiry. The subject matter, however, does have limits as discussed above. The Federal Circuit's test ensures that the subject matter inquiry walks this line between allowing a vast majority of subject matter to pass the § 101 inquiry, and yet excluding the few categories of subject matter that are not eligible for patenting.

One may argue that a competent draftsman may convert ineligible subject matter into patentable subject matter by merely adding a limitation or writing a claim in a different manner.¹¹¹ Following this argument, adding a useful and concrete step to an abstract idea should not convert the patent claim from ineligible to eligible subject matter.

The Federal Circuit's test would look at the result of the claim. Because of the added step, the claim may produce a useful, concrete, and tangible result. The amended claim with the additional step therefore would be eligible subject matter under Federal Circuit's test. The test at first blush appears too broad and appears to allow ineligible subject matter to pass through § 101 inquiry.

The test, however, is not overly broad. As stated by Prof. Holbrook, there is value in requiring a draftsman to add limitations to a claim.¹¹² The extra limitation in many cases would narrow the patent claim and if the narrow claim does not preempt every use of an abstract idea, such claim

¹¹¹ See *Parker v. Flook*, 437 U.S. at 590 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques..")

¹¹² Thanks to Professor Holbrook for making this point during one of our discussions.

should be eligible subject matter. The Federal Circuit's test therefore is not an overly broad inquiry. The test instead guides the patentee to define a claim that is not overly broad to claim every use of an abstract idea or natural phenomena.

In sum, the Federal Circuit's "useful, tangible, and concrete result" test attains its purpose of excluding natural phenomena and abstract ideas from patentable subject matter. Moreover, the test provides courts with a practical framework for § 101 inquiry and the test is not overly broad.

B. Disadvantages of the "useful, tangible, and concrete result" test

The Federal Circuit's test has been criticized for lacking any substance. The critics have pointed out that the test does not add any substance to § 101 analysis and the test confounds § 101 inquiry with other Patent Act inquiries like definiteness and utility requirements. This criticism, however, does not stand muster on closer analysis.

1. Does requiring a tangible and concrete result add any substance to § 101 analysis?

The B.P.A.I. has criticized the Federal Circuit's test for merely restating the existing principle that abstract

ideas and natural phenomena are not patentable.¹¹³ According to B.P.A.I., the “‘concrete and tangible result’ is just the opposite of an ‘abstract idea,’” and the Federal Circuit’s test therefore is a mere restatement of existing principles and not a separate test.¹¹⁴

The Federal Circuit’s test, however, is more than just a mere restatement. One of the challenges faced by the courts before the Federal Circuit’s test was drawing the unmanageable line between an idea and its applications. The Federal Circuit’s test shifts the focus from that unmanageable task to determining the result of the invention.

When the court focuses on a tangible result rather than the principles behind the invention, it is easier to determine whether the patentee is claiming an abstract idea or an application of that idea. Instead of drawing the unmanageable line between the idea and its application, the court instead can look at the result of the invention and determine whether the result is concrete and tangible.

A tangible and concrete result, like the share price in *State St.*, signifies that the patentee is not trying to patent a boundless abstract idea. The patentee is instead

¹¹³ *Ex Parte Bilski*, No. 2002-2257, *26 (B.P.A.I. 2006).

¹¹⁴ *Id.*

claiming a precise application of a mathematical algorithm or an abstract idea. If the patentee is trying to claim an abstract idea, the patentee's claimed invention would not produce a concrete and tangible result. Even if the patentee somehow comes up with a concrete and tangible result of a claimed abstract idea, the result would not be useful. The tangible, concrete, and useful test is therefore not a mere restatement of existing principles. The test requirements instead provide the courts and examiners with a practical framework to determine eligible subject matter.

2. Does requiring a concrete result confuses subject matter analysis with § 112 enablement analysis?

According to the P.T.O guidelines, for a process result to be concrete, "the process must have a result that can be substantially repeatable or the process must substantially produce the same result again."¹¹⁵ Repeatability or predictability of results, however, are enablement inquiries analyzed under § 112.¹¹⁶ One may argue that the two inquiries should not be intermingled and a

¹¹⁵ U.S. Patent & Trademark Office, Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility 22, http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf (Oct. 2005).

¹¹⁶ See Osenga, 39 Ariz. St. L.J. at 1120 ("The 2005 Guidelines, in requiring eligible subject matter to be repeatable or predictable, are similarly also intermingling elements of § 112 with the statutory subject-matter inquiry under § 101").

subject matter test that combines the two inquiries is faulty.

The two inquiries, however, focus on different issues and become separate inquiries when applied correctly. A patentee's specification is enabling when the patentee defines the invention in sufficient detail such that a person of ordinary skill in the art is able to practice the invention without undue experimentation.¹¹⁷ Repeatable and predictable results confirm that no undue experimentation was required.

Concrete result in § 101 inquiry, however, signifies that the patentee is not claiming a boundless abstract idea. The examiner or the court applying the § 101 test should not be focused on whether the invention is described in such detail that someone can read the patent and practice the invention. The inquiry is instead focused on the bounds of the patent claim. The focus therefore should be on whether the patentee is arguing that his invention produces a concrete result when the claimed invention instead produces boundless results that can be used in infinite ways.

The more concrete the claimed invention's result, the less likely it is that the claimed invention is a boundless

¹¹⁷ 35 U.S.C. § 112 (2006).

abstract idea. Even though the degree of concreteness is helpful in § 101 analysis, the examiner should not focus on such an amorphous term. The examiner should not rule an invention ineligible because the result is not concrete enough. The examiner should instead look at the other two requirements of the test. The other two inquiries in “useful, concrete, and tangible results” test would help determining eligible subject matter when the examiner is not sure about whether the invention produces a concrete result.

3. Does requiring a useful result confuses subject matter analysis with the utility requirement of § 101?

A criticism similar to the one stated above is that requiring a useful result under subject matter inquiry confounds subject matter analysis with utility analysis under § 101.¹¹⁸ The implication is that mixing the two inquiries renders the subject matter inquiry inapplicable or useless. Again, a careful look at the inquiry dissipates any confusion regarding the inquiry.

Under the utility analysis, the patentee is required to disclose at least one real world use of the claimed

¹¹⁸ See *Ex Parte Bilski*, No. 2002-2257, *26 (“The term ‘useful’ appears to refer to the ‘utility’ requirement in § 101, which is a separate requirement from the patent eligible subject matter requirement. Thus, it is not clear to us what is meant by the test.”) (citation omitted).

invention.¹¹⁹ This is to ensure that both the public and the patentee get their fair share as envisioned under the patent system. If the patentee obtains a patent on a chemical compound without even disclosing a single use of the compound to the public, the public has got a useless compound whereas the patentee has an exclusive right to make and use that compound for further research.¹²⁰ To avoid such a one-sided bargain, the patent system through utility requirement calls for the patentee to disclose at least one use of the claimed invention.

The utility inquiry also helps ensure that the patentee does not get an unreasonably broad patent. Patent on a compound is a broad patent and the patent system would only grant such a broad patent only if the patentee can disclose at least one real world use of the claimed compound.¹²¹ Like the utility inquiry, the subject matter analysis is also focused on ensuring that the patentee does not get too broad of a patent. The overlap between these two inquiries, however, is minimal and the overlap is a

¹¹⁹ Roger E. Shechter, John R. Thomas, *Principles of Patent Law*, 61-62 (West 2004).

¹²⁰ See *Brenner v. Manson*, 383 U.S. 519, 534 (U.S. 1966) ("Until the process claim has been reduced to production of a product shown to be useful, the metes and bounds of that monopoly are not capable of precise delineation. It may engross a vast, unknown, and perhaps unknowable area. Such a patent may confer power to block off whole areas of scientific development, without compensating benefit to the public.").

¹²¹ *Id.*

function of the Patent Act itself.

The Patent Act is written such that different inquiries are inter-connected and sometimes overlap on the fringes. For example, § 101 is focused on subject matter analysis but § 101 language allows patents on "new and useful" invention. Novelty, however, is addressed in § 102 and the "new" requirement is usually analyzed under § 102 instead of § 101. Similarly, the § 112 enablement requirement and § 101 utility requirement overlap as well.¹²² Just because an inquiry serves two related purposes in two different parts of the statute, the inquiry does not become faulty.

The useful result inquiry is one such inquiry. As discussed above, the inquiry is used under the utility analysis. The useful result requirement also helps the examiner or the court to figure out whether the patentee is claiming an abstract idea or a natural phenomenon. "[A] patent claim directed to a law of nature, a physical phenomenon, or an abstract idea will ordinarily have practical applications that are too attenuated from the subject of the claim to be 'useful.'"¹²³ For example, if Einstein tried patenting $E=mc^2$ and the only known use of

¹²² See *In re Brana*, 51 F.3d 1560, 1564 (Fed. Cir. 1995) ("The requirement that an invention have utility is found in 35 U.S.C. § 101 It is also implicit in § 112 P1.")

¹²³ *In re Nuijten*, 500 F.3d 1346, 1365 (Fed. Cir. 2007)

that formula was the satisfaction Einstein felt from concluding his research, the claimed result would be too attenuated from the formula to be useful under Federal Circuit's test. The formula standing alone, instead of being used in an application, would not be patentable.

The useful inquiry may be difficult to apply in fringe cases but the inquiry is helpful in a lot more cases. The useful result inquiry is an amorphous inquiry that requires the court or the patent examiner to determine how attenuated the relationship is between the useful result and the claimed invention. However, in close cases, the other two prongs of the Federal Circuit's test would help the courts to determine whether a claimed invention is eligible subject matter.

In sum, "the useful, tangible, and concrete result" test effectively excludes natural phenomena and abstract ideas from eligible subject matter. Moreover, applied correctly, the inquiry does not muddle other patent law inquiries into the subject matter inquiry to the extent that the test becomes useless or unworkable. The Federal Circuit's test, instead, provides a much needed framework for lower courts that is neither too broad nor too narrow.

The Federal Circuit has therefore defined a two prong test for eligible subject matter analysis. The first prong,

"useful, concrete & tangible result," excludes natural phenomena and abstract ideas from eligible subject matter. The second prong requires the claimed invention to fit into one of the four patentable categories as defined by the Congress. Besides these requirements, there are no subject matter requirements defined by the Congress, the Supreme Court, or the Federal Circuit. Nevertheless, the B.P.A.I. has added additional requirements in patentable subject matter inquiry. These additional requirements, however, are not defensible and create unnecessary confusion amongst the patent bar.

VI. The B.P.A.I. Jurisprudence

A. The B.P.A.I. has parted from the precedence and defined an unreasonable patentable subject matter test

In *Ex Parte Bilski*, Bilski claimed a process for "managing (i.e., hedging) the consumption risks associated with a commodity sold at a fixed price."¹²⁴ The patent did

¹²⁴ *Ex Parte Bilski*, No. 2002-2257, *2 (B.P.A.I. 2006). Claim 1 represents the invention:

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider [*2] at a fixed price comprising the steps of:(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

(b) identifying market participants for said commodity having a counter-risk position to said consumers; and

(c) initiating a series of transactions between said commodity

not specify a machine to implement the claimed process.¹²⁵ Moreover, the claimed process did not require any physical transformation of matter.¹²⁶ The B.P.A.I. ruled that process claims that do not specify a machine to implement the process are patentable subject matter only if the claimed process involves a physical transformation of matter.¹²⁷ Because Bilski's claimed process did not specify a machine implementation and did not involve any physical transformation of matter, the B.P.A.I. ruled that Bilski's process was not patentable subject matter.¹²⁸

The B.P.A.I. started its analysis by defining the term 'process' in § 101.¹²⁹ According to B.P.A.I., Congress codified the pre-existing case law when it enacted § 101.¹³⁰ The Supreme Court, at that time, "arguably defined a 'process' as an act, or series of acts, performed on the subject matter to be transformed and reduced to a different state or thing."¹³¹ The B.P.A.I. ruled that "the physical subject matter [being] transformed can be matter (an object

provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

Id. at *1-*2.

¹²⁵ *Id.* at *6.

¹²⁶ *Id.*

¹²⁷ *Id.* at *32.

¹²⁸ *Id.* at *43.

¹²⁹ *Id.* at *32.

¹³⁰ *Id.* at *17

¹³¹ *Id.*

or material) or some form of energy (e.g., ... electromagnetic waves propagating in space)".¹³² When a process is implemented by a machine, information in form of electrical signals is transformed from one state to another.¹³³ A machine implemented process claim therefore inherently involve physical transformation of energy and therefore satisfy the definition of process under § 101.¹³⁴ Accordingly, B.P.A.I. ruled that such claims are patentable subject matter.¹³⁵

According to B.P.A.I., inventions in *State St.* and *AT&T* are examples of machine implemented processes where physical transformation of data is inherent.¹³⁶ *State St.* and *AT&T* holdings are therefore limited to "special cases" that involve transformation of data by machine.¹³⁷ A process claim that does not specify a machine implementation, however, does not involve any inherent physical transformation of matter or energy.¹³⁸ According to B.P.A.I., such non-machine-implemented process claims are patentable subject matter only if the process explicitly

¹³² *Id.* at *32-*33.

¹³³ *Id.* at *27.

¹³⁴ *Id.* at *24.

¹³⁵ *Id.*

¹³⁶ *Id.* at *18.

¹³⁷ *Id.* at *23.

¹³⁸ *Id.* at *42.

states a physical transformation of matter.¹³⁹

The B.P.A.I. defended its physical transformation test and stated that the transformation test allows the public to objectively analyze the scope of the claimed process "because one can identify, analyze, and discuss what and how subject matter is transformed."¹⁴⁰ In support of its test, the B.P.A.I. stated that even though Bilski's process may produce a useful result, Bilski's process is an abstract idea.¹⁴¹ Bilski's process is an abstract idea because the claimed process is so broad that it preempts "any and every possible way of performing the steps of the [risk hedging] plan."¹⁴² Because Bilski's process is an abstract idea, it is not patentable subject matter.¹⁴³ According to B.P.A.I., the physical transformation test, therefore, correctly weeds out Bilski's process as unpatentable subject matter.¹⁴⁴

In sum, the B.P.A.I. ruled that the "useful, concrete, and tangible result" test do not apply to non-machine-implemented processes because the *AT&T* and *State St.* holdings were limited to machine implemented data transformation processes. A non-machine-implemented process

¹³⁹ *Id.*

¹⁴⁰ *Id.* at *17.

¹⁴¹ *Id.* at *46.

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

or method is patentable only if there is a transformation of physical subject matter.

B. B.P.A.I.'s physical transformation test is not defensible because the test is based on misconstrued interpretation of Supreme Court precedence and the test does not add any substance to already existing § 101 jurisprudence

There are several flaws with the *Bilski* court's analysis. First, courts have acknowledged that the definition of the term 'process' under § 101 is not limited to processes that involve physical transformation of subject matter.¹⁴⁵ Second, the *Bilski* court misconstrues the abstract idea inquiry. Finally, the *Bilski* court's physical transformation requirement cannot bar non-machine-implemented processes because, like machine-implemented processes, non-machine-implemented processes also inherently involve physical transformation of subject matter.

1. The B.P.A.I. has misconstrued Supreme Court precedence in defining its eligible subject matter test

The *Bilski* court draws support from *Benson*, a Supreme Court ruling, for defining the term 'process' as a series of step involving physical transformation of subject

¹⁴⁵ 409 U.S. at 64 (1972).

matter.¹⁴⁶ In *Benson*, the Supreme Court stated that

Transformation and reduction of an article "to a different state or thing" is the clue to the patentability of a process claim It is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a "different state or thing." We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents It is said we freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology. Such is not our purpose.¹⁴⁷

The Supreme Court did talk about transformation being the clue to patentability. The word "clue", however, implies that physical transformation is not a necessity but only one of the many characteristics that may make a process patentable subject matter.¹⁴⁸ Moreover, the Supreme Court explicitly stated that there may be processes that qualify for patentability even if they don't meet transformation requirement.¹⁴⁹ Additionally, the Supreme Court did not freeze the definition of process and left room for

¹⁴⁶ *Bilski*, No. 2002-2257 at *17 (citing *Ex parte Lungdren*, 76 USPQ2d 1385, 1387 (B.P.A.I. 2005) (citing *Benson*, 409 U.S. at 64.)).

¹⁴⁷ *Benson*, 409 U.S. at 70-71.

¹⁴⁸ *AT&T*, 172 F.3d at 1358 ("The notion of 'physical transformation' can be misunderstood. In the first place, it is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application. As the Supreme Court itself noted, 'when [a claimed invention] is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101.' . . . The 'e.g.' signal denotes an example, not an exclusive requirement.").

¹⁴⁹ *Benson*, 409 U.S. at 70-71.

expanding scope of the term.¹⁵⁰ The lower courts have subsequently used Supreme Court's allowance to expand the term process since the *Benson* ruling. While business methods were not considered patentable processes at the time of *Benson* ruling, the B.P.A.I. itself now acknowledges that business methods are patentable processes.¹⁵¹ The meaning of the statutory term process therefore has expanded since *Benson* and the term process is not limited to series of steps that involve physical transformation.

2. The B.P.A.I. misapplied the abstract idea inquiry in devising its physical transformation test

The B.P.A.I. also contends that *Bilski's* process is an abstract idea because it is so broad that it preempts every possible way of performing the steps of the claimed process.¹⁵² The abstract idea inquiry, however, is meant to prevent patentees from claiming an invention such that it preempts every use of a known formula or a fundamental principle.¹⁵³ Such known formulas or fundamental principles are in public domain and a patentee may not deprive the public from every use of these formulas.¹⁵⁴ The preemption theory, however, does not hold for a novel process applying

¹⁵⁰ *Id.*

¹⁵¹ *Ex Parte Bilski*, No. 2002-2257 at *7 ("Business Methods' have long been considered statutory subject matter.").

¹⁵² *Id.*

¹⁵³ *Diamond v. Diehr*, 450 U.S. 175, 182 (1981).

¹⁵⁴ *Id.*

a fundamental principle because the novel process is not in the public domain. Moreover, the process claim is limited to application of a fundamental principle to that particular process. The public is free to use the underlying principle in other processes. The process claim therefore does not preempt every use of the fundamental principle. Accordingly, the Supreme Court has stated that a process claim is meant to allow patentees to claim every possible way of practicing a novel process.¹⁵⁵ The Supreme Court has held

That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be dispured. If one of the steps of a process be that a certain substance is to be reduced to a powder, it may not be at all material what instrument or machinery is used to effect that object, whether a hammer, a pestle and mortar, or a mill. Either may be pointed out; but if the patent is not confined to that particular tool or machine, the use of the others would be an infringement, the general process being the same.¹⁵⁶

The Supreme Court has therefore explicitly stated that a process patent can claim every possible way of executing the steps of the claimed process.¹⁵⁷ Accordingly, Bilski's process is not an abstract idea just because the patent claims every possible way of executing the steps of the claimed process.

¹⁵⁵ *Cochrane v. Deener*, 94 U.S. 780, 787-788 (1877).

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

3. The correct application of B.P.A.I.'s own physical transformation test fails to serve the B.P.A.I.'s purpose of barring certain non-machine implemented processes as ineligible subject matter

Finally, the *Bilski* court's physical transformation test does not weed out non-machine-implemented process as unpatentable subject matter because every non-machine-implemented process, like machine-implemented process, involves a physical transformation as well. Every human made non-machine-implemented process requires human input. Even the self sustaining processes require human input to start that process. If the process is self sustaining and it exists in nature without any human interaction, the process is a natural phenomena and therefore unpatentable. Patentable processes are therefore human made processes requiring human interaction.

Whenever a human initiates a process or carries out certain steps in the process, the human takes information like preexisting state of the process, manipulates the information in his brain, and makes a decision about what the human needs to do next. The human brain manipulates and transmits this information to the rest of the human body through chemical and electrical synapses.¹⁵⁸ These synapses are specialized junctions throughout our nervous system

¹⁵⁸ <http://en.wikipedia.org/wiki/Synapse> (accessed May 9, 2007).

that help relay information through chemical and electrical interaction between various cells in our body.¹⁵⁹ The human body, like machine-implemented inventions in *AT&T* and *State St.*, takes information from an external process and stores the information in form of electrical and chemical impulses.¹⁶⁰ These electrical and chemical impulses in human body, like the electronic data in *AT&T* and *State St.*, go through various physical transformations while the human is interacting with the process.¹⁶¹ Non-machine-implemented processes therefore also inherently involve physical transformation of subject matter. The physical transformation test therefore would allow every process, machine-implemented or not, to be patentable subject matter.

VII. Conclusion

The § 101 inquiry is meant to prevent patentees from patenting laws of nature, natural phenomena and abstract ideas. Additionally, the inquiry requires that the claimed invention fits into one of the four subject matter inquiries defined by Congress. The inquiry otherwise is meant to allow a broad variety of subject matter to be patentable. The claimed subject matter may not pass other

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

¹⁶¹ *Id.*

patent law inquiries of novelty and non-obviousness. These inquiries, however, are separate inquiries and should not be combined with the initial § 101 inquiry. The Federal Circuit's "useful, concrete, and tangible" test achieves the purpose of preventing patentees from patenting the three categories of unpatentable subject matter. The B.P.A.I., however, has devised its own physical transformation test to decide whether the subject matter is patentable. The B.P.A.I.'s physical transformation test, however, is not defensible because the test is based on misconstrued interpretation of Supreme Court precedence and the test does not add any substance to already existing § 101 jurisprudence. The Federal Circuit should therefore reverse *Ex Parte Bilski* and advise the B.P.A.I. to restrain from devising patentable subject matter tests that prevent patentees from patenting otherwise patentable subject matter.