No. 13-298

In The Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF AMICUS CURIAE PROFESSOR LEE HOLLAAR AND PETER K. TRZYNA IN SUPPORT OF NEITHER PARTY

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Statement of Interest of *Amicus Curiae*[1]

Lee A. Hollaar is a professor of computer science in the School of Computing at the University of Utah, teaching courses in computer and intellectual property law and computer systems and networking. Programming computers since 1964 and designing computer hardware since 1969, he received his B.S. degree in electrical engineering from the Illinois Institute of Technology in 1969 and his Ph.D. in computer science from the University of Illinois at Urbana-Champaign in 1975. Prof. Hollaar was a Fellow with the Senate Committee on the Judiciary and technical advisor to its chair, Senator Hatch, and a visiting scholar with Judge Randall R. Rader at the Court of Appeals for the Federal Circuit.

As an inventor and patentee of computer-implemented technology, a Registered Patent Agent involved with the prosecution of patent applications since 1989, an expert witness and special master in patent litigation, the author of *Legal Protection of Digital Information* (BNA Books, 2002) and course material on patenting computer-implemented technology, and teacher of that material, Prof. Hollaar is concerned that the decision in this appeal might continue the unclear lines of what is statutory subject matter by making distinctions untethered to

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[1] In accordance with Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by amicus curiae Professor Hollaar and Peter K. Trzyna, and that counsel to a party did not author this brief in whole or in part. No person other than the amici curiae and their counsel made a monetary contribution to the preparation or submission of this brief. Petitioners and Respondent have consented to the filing of this brief and their consents have been filed with the Court.

real technological differences or perpetuate inventors of computer-program-based inventions to claim them in ways that obscure the patentable advance over the prior art. Having taught patent law to computer science and engineering students for almost two decades, he has seen how the disconnect between the current computer statutory subject matter distinctions and the realities of the technology leaves even the Federal Circuit, sitting en banc, unable to apply the current tests, to the determent of innovators (especially in software startups) and the entire patent system.

Peter K. Trzyna has been a Registered Patent Attorney since 1984, and is a member of the Illinois, New York, D.C., Federal Circuit, and Supreme Court bars. He has been doing patent prosecution for over 25 years, including as an attorney at Kenyon & Kenyon; Cadwalader, Wickersham & Taft; and Baker & McKenzie, where he was a partner in the Chicago office, prior to establishing his own law firm. Mr. Trzyna has a B.S., M.A., J.D., and M.S. in Engineering and Applied Physical Science, all from the University of Wisconsin. A joint inventor in fourteen patents and numerous pending patent applications, most of which are software-related, Mr. Trzyna also is the managing partner of Windy City Technology, a plaintiff in a successful patent infringement litigation. He has been extensively quoted in the *Wall Street Journal*, *New York Times*, *Economist*, *Washington Post*, and has co-authored articles directed to whether patent law makes technological sense. Having obtained hundreds of patents and had many enforced, he has seen technologically unsound USPTO rejections and

courts mired in trying to make sense of the intersection of computer science and patent law.

The views expressed here are solely those of Professor Lee Hollaar and Peter K. Trzyna.

Summary of the Argument

Over four decades since this Court finally found an acceptable method claim for such an invention, lower courts are still trying to find where to draw the line. But though many consider this Court's *Benson*[2]-*Flook*[3]-*Diehr*[4] trilogy of decisions, recently confirmed by this Court in *Bilski*,[5] confusing and contradictory. However, there is a simple, bright-line test for statutory subject matter that reconciles them, as revealed by original research into the Benson decision presented herein.

Rather than dismissing patentability based on characterizations of claimed computer-implemented inventions, this Court should grant certiorari to this case to draw clear Sec. 101 lines that that are understandable and simple to apply because they are firmly supported by technology and are in accord with its past opinions, thereby placing the focus on the other patentability requirements (novelty, non-obviousness, commensurate disclosure) to solve

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[2] *Gottschalk v. Benson*, 409 U.S. 63 (1972).

[3] *Parker v. Flook*, 437 U.S. 584 (1978).

[4] *Diamond v. Diehr*, 450 U.S. 175 (1981).

[5] *Bilski v. Kappos*, 561 U.S. ___ (2010).

today's problems with patents on computer-implemented inventions.

Introduction

Computer technology has expanded well beyond the use of an expensive digital computer to control an industrial process, when this Court first considered the patentability of computer-implemented inventions more than a four decades ago, to being seemingly omnipresent. Microwave ovens, washers and dryers, television sets and radios, thermostats, furnaces and boilers, sprinkler controllers, and clocks and watches are but a few of the appliances where an embedded computer has replaced mechanical timers, gears, and switches, resulting in more reliable products able to perform more functions at lower prices.

To exclude inventions from possible patent protection merely because they are computer-implemented would ignore today's information age revolution and relegate the United States patent system to the 19th century, where the only patentable processes were those that transform or reduce an article to a different state or thing.[6]

When is an idea "abstract"?

This Court has repeatedly held that laws of nature, physical phenomena, and abstract idea are judicially-made exceptions to the statutory subject matter categories of 35 U.S.C. § 101. While the first two categories are generally-understood, there is

[6] *Cochran v. Deener*, 94 U.S. 780.

much confusion about when an invention is "abstract," especially regarding computer-implemented inventions.

One of the problems with this Court's use of the term "abstract" to describe when an invention is not patentable is that "abstract" is not a term used in computer technology.[7] However, there *is* a bright line that can be drawn between "abstract" and statutorily patentable that is a clear distinction in computer technology as well as being in complete accord with the past Supreme Court decisions.

The dictionary definition of "abstract" is a clear and simple test

The first non-archaic definition for "abstract" in *Webster's Third New International Dictionary* is:

> considered apart from any application to a particular object or specific instance; separated from embodiment.[8]

This simple, dictionary definition is in accord with all this Court's Sec. 101 decisions, particularly those involving computers. In *Flook*, the claimed method held to be unpatentable is not tied to any

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[7] Professor Hollaar has taught computer programming and hardware design since receiving his Ph.D. in computer science in 1975, and has been programming computers since 1964, and does not remember ever encountering the term used in the context that this Court has used the term.

[8] The third definition seems more fitting for all the confusion that has resulted from using a non-technical term: "difficult to understand."

particular embodiment, and particularly is not limited to performing the method using a computer at all. The claimed computation of the alarm limit could be done by hand. In contrast, the patentable method claimed in *Diehr* is explicitly tied to a digital computer, both in the preamble and in the claim element that requires "providing said computer with a data base for said press." Similarly, the claims found unpatentable in *Bilski* do not require that they be embodied on a computer.

Our research shows that Benson is in accord with this clear and simple test for when a claimed method is an "abstract idea"

Benson might appear to contradict this clear test, because while claim 13 is not tied to any embodiment, and therefore unpatentable, claim 8 requires a "reentrant shift register" and yet was also found unpatentable by this Court.

However, this seeming-divergence can be understood by considering the prosecution history of the Benson application,[9] which disclaimed any computer limitation. On page 7 of Benson's response to the first office action (page 23 of the prosecution history), Benson's attorney states "Finally, the method represented by these claims *can also be*

[9] Because a patent did not issue from Benson's application, the prosecution history is not public. However, the complete prosecution history was filed with the CCPA as a "Transcript of Record" in the case. That was also forwarded by the CCPA to the Supreme Court when Cert. was granted. A copy of the Transcript of Record stored with other Supreme Court documents at the National Archives, is available at http://digital-law-online.info/papers/lah/BensonAppendix.pdf.

carried out by hand, the shifting and adding being manual." (Emphasis added.) The "claims" referred to include both 8 and 13 in essentially the same form as considered by this Court. Further, on page 24 of the prosecution history, Benson's attorney reiterates

> Concededly, applicants' methods *can* be implemented by a set of instructions which are used to control the operation of a computer. As noted above, they can also be implemented by circuitry which is wired to perform the function. They can even be practiced by hand.[10]

In light of the prosecution history, what was claimed in *Benson* is an abstract method like the one in *Flook*, not tied to any embodiment and certainly not to a digital computer.

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[10] Emphasis in the original. Benson's attorney made those critical admissions because he felt the law at the time was that if a method could be carried out by hand, the invention was no longer "mental steps" and was therefore statutory subject matter.

The CCPA ignored the applicant's admission that "reentrant shift register" refers to a particular operation that can be "practiced by hand," instead substituting a definition it took from an encyclopedia, confusing the record that was before this Court in *Benson*.

A method claim is "abstract," and therefore not patentable, when it is "separated from embodiment" or "apart from" a particular implementation

The test we propose, grounded in technology and simple to determine as well as reconciling all this Court's decisions, is that a method claim is abstract, and therefore not patentable, when it is "separated from embodiment" or "apart from" a particular implementation such as on a digital computer. Under this test, the fact that Benson's claims *could* be performed by a digital computer does not make them statutory subject matter. When a claim encompasses both statutory and non-statutory subject matter, the claim should be non-statutory, lest a person be able to get a patent that covers abstract methods.

This dictionary definition comports with this Court's latest opinion on statutory subject matter, *Bilski*, which endorsed the "machine-or-transformation test" as "an important and useful clue" but not the "sole" test, as the Federal Circuit had held. Under that test, a process is statutory if "it is tied to a particular machine or apparatus." This includes the machine formed when a digital computer is programmed as an embodiment of the claimed method. As the Federal Circuit noted:

> such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed

> to perform particular functions pursuant to instructions from program software.[11]

This continues to be an excellent description of the role of software in the control of a computer-implemented machine because programming a computer literally produces circuitry that is equivalent to clearly-patentable hardwired circuitry.[12]

Claiming computer-implemented inventions as methods helps produce good patents

There is a strong appeal for claiming a computer-implemented invention as a process or method.[13] Method steps are often the clearest way to describe the scope of this type of invention, making the claim easier for a patent examiner or court to determine the applicable prior art and for someone to determine infringement. Claimed method steps also make it easier for those who try to advance technology by developing alternative method steps

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[11] *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994).

[12] James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "Toward a Fact-based Standard for Determining Whether Programmed Computers are Patentable Subject Matter: The Scientific Wisdom of *Alappat* and the Ignorance of *Trovato I*," *Journal of the Patent and Trademark Office Society*, May 1995, Vol. 77, No. 5, 353-367; James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "The *Alappat* Standard for Determining That Programmed Computers are Patentable Subject Matter," *Journal of the Patent and Trademark Office Society*, October 1994, Vol. 76, No. 10, 727-802.

[13] The terms "process" and "method" are interchangeable. See 35 U.S.C. § 100(b).

for accomplishing the same result as that of the claimed method steps.

A recent book[14] posits that a major problem with patents is that it is difficult to determine what is covered by a patent, and this lack of a predictable property right produces uncertainty for developers and costly disputes that detract from the positive incentives of the patent system. The authors' research found that only in some sectors of technology, such as the pharmaceutical industry, do patents act as advertised, with their benefits outweighing their costs, while for software, the lack of clear claiming has had a definite negative effect.

Computer technology has matured considerably in the four decades since this Court decided *Benson*, with that opinion's concern about preempting all ways of doing something now highly unlikely, unless what is being claimed is such an advance over the prior art that it deserves patent protection. More likely, broad claims will be unpatentable based on prior art, and it is not necessary (or desirable) to use a statutory subject matter rejection to prevent issuance of such a patent.[15]

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[14] James Bessen and Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovation at Risk*, Princeton University Press, 2008.

[15] For example, even around the time of *Benson* this Court unanimously held a claimed computer-based invention unpatentable not because it wasn't statutory subject matter, but because it was obvious in light of the prior art. *Dann v. Johnson*, 425 U.S. 219 (1976). With hundreds of thousands of patents and publications in the computer art, such rejections of overly-broad patents are even easier.

When tied to a computer, a method claim is definitely *not* a transformation of an abstract idea, law of nature, or physical phenomena into a patented process by merely having a draftsman attach some form of post-solution activity to a mathematical formula, as this Court warned about in *Flook*.[16] Instead, claiming a process may be the best way to meet the statutory requirement of a claim "particularly pointing out and distinctly claiming"[17] the computer-implemented invention.

Patents on computer-implemented inventions are not nonstatutory patents on mathematics

One argument the opponents of patents for computer-implemented inventions make is that software is mathematics, and mathematics is not patentable, presumably because it is a "law of nature,"[18] or, if not tied to a computer as discussed above, "abstract."

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[16] But it is likely that whatever test courts adopt for computer-implemented inventions, patent prosecutors will find a way to write claims that meet it, since many have an engineering background trained to creatively work around constraints. For example, consider United States Patent 3,568,156, "Text Matching Algorithm," granted March 2, 1971, and assigned to Bell Telephone Laboratories. It discloses both an implementation as a computer program and an unlikely, but clearly statutory, implementation as circuitry, and then writes the claim in "means for" language which covers whatever is described in the specification.

[17] 35 U.S.C. § 112(b).

[18] *Benson*, 409 U.S. 63 (1972) is generally cited for that proposition.

But in most instances, the correspondence between computer programs and mathematics is merely cosmetic. For example, Einstein's famous equation $E=mc^2$ expresses a relationship between energy and matter, while the computer program statement E=M*C**2 represents the calculation of M times C raised to the second power and then assigning the result to a storage location named E. The program statement E=M*C**3 is equally valid in a computer program, but would be simply wrong as a natural law.

Unfortunately for understanding this distinction, early developers of programming languages made their calculation-and-assignment statements look like mathematical equations to seem familiar to scientists and engineers. However, a computer program is a series of statements that, when executed by processor circuitry, control machine operations and assign the result to a designated memory location, not a set of mathematical equations that are solved for their variables.

Even if we were to assume that a computer program includes a series of mathematical equations, that assumption ignores how computer-implemented inventions are usually claimed. Claims that include data structures in random-access memories, input devices such as keyboards or mice, screen display devices, clocks and time-outs, and computer networks (common in computer-implemented patents) cannot be considered equivalent to pure mathematics.

And if the post solution activity is indeed trivial, then infringement can be easily avoided by avoiding the triviality.

Two important caveats regarding the use of the dictionary definition as the "abstract idea" test

It is important to keep two things in mind regarding this definition of an "abstract," and therefore nonstatutory, idea.

First, this definition does not impose any new requirement for an embodiment in a machine for any process or method claim that is otherwise statutory under existing law. Process claims that transform or reduce an article to a different state or thing, recognized since *Cochran v. Deener*,[19] remain statutory subject matter because the are clearly not "abstract ideas."

Second, just because a method claim is explicitly limited to a computer embodiment, and is not an "abstract idea" but statutory subject matter does not mean that the claim is patentable. The claim must also meet the statutory requirements that the claim be limited to what is novel, non-obvious, and commensurate with what is disclosed in the patent application.

A problem with patents on computer-implemented inventions is *not* that they are claimed

[19] 94 U.S. 780 (1877).

as a method, but that they may claim more than what was disclosed in their patent application.[20]

Thus, while an old method implemented on a computer is statutory subject matter under the definition test of "abstract" discussed above, the claim cannot now be patented because today it is well-known how to program a computer to implement the old method. Even if computer programming was somewhat of a mystery at the time of *Benson*, today junior high school students (or even younger) are now writing computer programs. Giving the examiner a simple, definitional rule for the initial determination of statutory subject matter will give more time for the important determination of whether a claimed invention is obvious or not, particularly in light of well-known methods.

Using a method claim, rather than a machine claim, coupled with the Federal Circuit's developing law on full-scope of enablement,[21] discourages the use of overly-broad claim language, lest their patent claims be invalid for lack of enablement. Claiming as a method makes it easier to determine whether the claim is commensurate with the disclosure. And unlike claiming the invention using functional

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[20] This goes to the heart of the "patent bargain" – an inventor getting a patent in trade for disclosing how to make and use the claimed invention. In *O'Reilly v. Morse*, 15 How. 62 (1854), claim 8, the use of "electro-magnetism, however, developed for marking or printing intelligible characters, signs, or letters, at any distance" went well beyond what was disclosed in the application, and was properly rejected.

[21] See, for example, *Sitrick v. Dreamworks*, 85 U.S.P.Q.2d 1826 (Fed. Cir. 2008).

elements, claiming as method steps should avoid having to guess at what structure in the specification defines each claim element, how broadly that structure should be read, and what are its equivalents.

Computer-implemented apparatus claims are clearly patentable as "machines"

Nowhere is the confusion created by not understanding this Court's simple "abstract ideas" test more clear than in this case. Claims to a "data processing system" comprising a number of tangible devices were treated as if they were method claims, and then found nonstatutory as "abstract ideas."[22]

The answer to whether a computer-implemented invention is statutory subject matter when claimed as a computer[23] or data processing system should be clear. Of course, it is a machine. Babbage's analytical

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[22] By attempting to use technologically unsound characterizations of the claims, rather than the actual requirements of the claims, the Federal Circuit issued six separate decisions with none commanding a majority, spanning more than 125 pages in the 5-5 split, which as Judge Newman stated in her separate opinion, the Court in *CLS Bank* "propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation. Today's irresolution concerning Section 101 affects not only this court and the trial courts, but also PTO examiners and agency tribunals, and all who invent and invest in new technology." Newman Op. at 1-2

[23] While the term "computer" once meant a person who carried out calculation by hand, few today know that old meaning and instead think of it as short for an electronic digital computer.

engine, perhaps the first programmable computer, was designed using gears and similar mechanisms, reading its instructions off a set of cards particular to a given problem. Nobody would question whether it was a "machine," even though what it did could be changed by supplying a new program.

The computer program running on the embedded processor on an appliance such as a washing machine turns that embedded processor into a special-purpose washing machine controller, replacing the mechanical controller of past washing machines. Because the power and flexibility of the embedded controller allows the washing machine to perform functions that would be impractical using a conventional controller with motors and gears, the embedded controller would be patentable if novel and non-obvious. Babbage's analytical engine, impractical to implement given the mechanical technology of his day, has become today's computer, practical because the gears have been replaced by electronic circuits.

It is always possible to implement the technique of a computer as special-purpose hardware, although for any but the most simple techniques, it is impractical. This is why as more functionality is desired, programmed embedded general-purpose processors are replacing specialized electronic circuitry, just as such circuitry replaced mechanical devices.

Unfortunately, not looking at the particular claims that define the invention, and instead considering only a caricature of that invention,

precludes a technologically-sound determination of whether a particular claim recites statutory subject matter. Rather than simply observe that a claim is to, for example, a machine and then proceed to determining whether that machine is new and non-obvious, for computer-implemented inventions the machine is often viewed as a method and then after separating the method from the machine, determining whether it is "abstract," a term not used in computer science in that context. It is not surprising that we are here after over four decades of opinions on when and how computer-implemented inventions are patentable.

This Court last term, in the *Myriad* case,[24] was able to come to a unanimous opinion by looking at what was actually being claimed and recognizing that some claims were unpatentable because they covered naturally-occurring human DNA but some claims were patentable because they covered man-made cDNA, rather than simply considering all the claims as to "human DNA." Similarly, observing that some of the claims in this case are for methods, which may or may not be nonstatutorily "abstract," and some are clearly for statutory "machines," considerably simplifies the analysis and yields a clear and technically-sound result.

Again, note that a computer-implemented invention claimed as a machine does *not* mean that the claim is patentable. Rather, it only means that the claim has passed the statutory subject matter hurdle, and the requirements of novelty, non-

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[24] *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. ___ (2013).

obviousness, and sufficient disclosure must still be considered. Having a simple test, well-grounded in technology, such as "a computer is a machine and therefore statutory subject matter" will shift the time spent trying to determine whether the claim is statutory to better examination of the application to assure that patent claims are not granted on something that is obvious or outside of what is taught in the patent application.

Conclusion

The law of statutory subject matter regarding computer-implemented inventions will remain muddled as long as lower courts are unsure of what this Court meant by an "abstract idea." This is a problem, because experience shows that time spent on trying to determine whether a claim recites statutory subject matter takes away from the more-important determination of whether the claimed invention represents the novelty and unobviousness and the adequacy of disclosure that is the heart of the patent bargain.

But this problem is can be easily solved by this Court's opinion in this case.

First this Court can make it clear that one must not lump all computer-implemented inventions into the method category unless that is the specific form of the claim. Computers are clearly man-made objects, and machine claims for them recite statutory subject matter. But that does not mean that a computer-implemented invention is patentable just because it is claimed as a machine. The

implementation of an old technique on a computer using standard techniques is clearly obvious, even if the technique has never been computerized before. Other statutory requirements for patentability must also be considered.

Second, this Court can clarify that an "abstract idea" is one that has no claimed embodiment, perhaps even being done by hand, which as discussed above is in accord with the *Benson-Flook-Diehr* trilogy recently confirmed in *Bilski*. But again, simply tying it to a machine does not make it patentable. As with machine claims, method claims must be new, non-obvious, and adequately disclosed, the other key tests for granting or invalidating a patent.

This Court should use this case to restore proper emphasis on when something is be patentable – when an adequately-disclosed invention is a non-obvious advance over the prior art – by adopting the clear and simple test for when a claim to a computer-implemented invention is to statutory subject matter, as we propose: a test that draws distinctions supported by the underlying technology.

To do that, we strongly urge this Court to grant the writ of certiorari in this case.

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