EXHIBIT B

CEx parte Cornea-Hasegan

U.S. Patent and Trademark Office Board of Patent
Appeals and Interferences
No. 2008-4742

Decided January 13, 2009(Nonprecedential)

PATENTS
[1] Patent grant - Inventions patentable (§ 105.05)
Patentability/Validity - Subject matter (§ 115.05)
Claims in application directed to method for predict-
ing results of floating-point mathematical operations
and calculating results fail to recite patent-eligible
subject matter, since claims' recitation of "processor"
that performs series of process steps does not limit
steps to any specific machine or apparatus, since data
acted on by method do not represent physical and
tangible objects, and instead represent information
about intangible, abstract floating-point number,
since method steps merely determine particular result
from mathematical algorithm, and steps manipulating
other data and determining whether to perform calcu-
lation using floating-point hardware are insignificant
extra-solution activities, and since claims therefore
fail "machine-or-transformation" test for patent-
eligible subject matter; recitation of processor in
combination with purely functional recitations of
method steps, where functions are implemented using
unspecified algorithm, is insufficient to transform
otherwise unpatentable method steps into patent-
eligible process, and claim directed to abstract ideas
and/or data structures per se does not transform
physical subject matter.

[2] Patent grant - Inventions patentable (§ 105.05)
Patentability/Validity - Subject matter (§ 115.05)
Claims in application directed to method for predict-
ing results of floating-point mathematical operations
and calculating results, which recite "computer read-
able media including program instructions which
when executed by a processor cause the processor to
perform" method steps, fail to recite patent-eligible
subject matter, even though "computer readable me-
dia" limits scope of claimed media to tangible em-
bodiments such as those disclosed in specification,
since claim is directed to determining particular result
from mathematical algorithm, and limiting claim to

computer-readable media does not add any practical
limitation on scope of claim, and since additional
recitations of computer-readable media, hardware
prediction unit, steps manipulating other data, and
determining whether to perform calculation using
floating-point hardware are insignificant extra-
solution activities that fail to transform unpatentable
principle into patentable process.

Patent application (No. 10/328,572) of Marius A.
Cornea-Hasegan. Applicant appeals from rejection of
claims under 35 U.S.C. § 101 as being directed to
nonstatutory subject matter. Affirmed.

[Editor's Note: The Board of Patent Appeals and
Interferences has not designated this opinion as
citable precedent of the board.]

*1558 Before MacDonald, Homere, and Hughes,
administrative patent judges.
Hughes, J.

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 (2002) from
the Examiner's rejection of claims 1-10 and 18-27.
We have jurisdiction under 35 U.S.C. § 6(b) (2002).

We AFFIRM.

Appellant's Invention

Appellant invented a method for predicting results of
floating point mathematical operations and
calculating the results. Preferably, the results are cal-
culated using software rather than hardware (floating-
point hardware) when the results are tiny (too small
to be accurately calculated using hardware). (Spec. ¶¶
[0003], [0004], [0012].)

Claims

Independent claims 1 and 18 further illustrate the
invention. They read as follows:

1. A method, comprising:

normalizing by a processor operands a, b, and c for a floating-point operation;

predicting by the processor whether result d of said floating-point operation on said a, b, c might be tiny;

if so, then scaling by the processor said a, b, c to form a', b', c';

calculating by the processor result d' of said floating-point operation on said a', b', c';

determining by the processor whether said d is tiny based upon said result d';

if so, then calculating by the processor said d using software; and

if not, then calculating by the processor said d using floating-point hardware.

18. A computer readable media including program instructions which when executed by a processor cause the processor to perform the following:

normalizing operands a, b, and c for a floating-point operation;

utilizing the results of a hardware prediction unit predicting whether result d of said floating-point operation on said a, b, c might be tiny;

if so, then scaling said a, b, c to form a', b', c';

calculating result d' of said floating-point operation on said a', b', c';

determining whether said d is tiny based upon said result d';

if so, then calculating said d using software; and

if not, then calculating said d using floating-point hardware.

Rejections

The Examiner rejected claims 1-10 and 18-27 under 35 U.S.C. § 101(a) as being directed to non-statutory subject matter.

Appellant's Contentions

Appellant contends claim 1 claims subject matter that physically transforms an article to a different state, and is therefore statutory subject matter. (App. Br. 5.) Appellant also contends claim 1 is directed to patentable subject matter because it passes the "useful, concrete and tangible results" test described in *State Street* and *AT&T*.(*Id*. at 6.)

Appellant contends that claim 18 is an article of manufacture, not a process; and claim 18 does not fall within a judicially-defined exception, and is therefore statutory subject matter. (*Id*. at 7.) Appellant also contends claim 18 claims subject matter that physically transforms an article to a different state, and is therefore statutory subject matter. (*Id.*) Appellant further contends claim 18 is directed to patentable subject matter because it passes the "useful, concrete and tangible results" test described in *State Street* and *AT&T*.(*Id*. at 8.)

Examiner's Findings and Conclusions

The Examiner found that the claims of the invention "are directed to a method or process for generating a result d by performing a floating point operation via a mathematical algorithm on operands a, b and c." (Ans. 3.) The Examiner concluded that the claims of the invention "are not limited to a practical application of the mathematical algorithm because the result d, a number, is not a tangible result because it is not a real-world result" (*Id*.)The Examiner also concluded that "a processor is ***1559** not physically transformed to a different state or thing merely because it uses software as opposed to floating-point hardware. . . . [U]sing different elements of the processor [ ] to calculate the result d does not mean that the processor is physically transformed to a different state or thing . . . ." (*Id*.)The Examiner also determined that "the result is clearly d and not in determining whether to use software or floating-point hardware. . . . [D]etermining [ ] whether to use software or floating-point hardware is not tangible because it is not a real-world result." (*Id*. at 3-4.)

ISSUE

Did Appellant show that the Examiner erred in rejecting the method of predicting results of floating point mathematical operations and calculating the results under 35 U.S.C. § 101 as being directed to non-statutory subject matter?

PRINCIPLES OF LAW

The Court of Appeals for the Federal Circuit's recent *In re Bilski* decision clarified the bounds of patent-eligible subject matter for process claims. *See In re Bilski, 545 F.3d 943 [88 USPQ2d 1385] (Fed. Cir. 2008)* (en banc). The *en banc Bilski* court held that "the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under § 101." *Id. at 956.*The *Bilski* court further held that "the 'useful, concrete and tangible result' inquiry is inadequate [to determine whether a claim is patent-eligible under § 101.]" *Id.* at 959-60.

The *Bilski* court, following Supreme Court precedent,[FN1] enunciates the machine-or-transformation test as follows: "A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." *Id.* at 954;*see also In re Comiskey, 499 F.3d 1365, 1377 [84 USPQ2d 1670] (Fed. Cir. 2007)* (discussing the same test from *Diehr, 450 U.S. 175 [209 USPQ 1]).*

Process claims directed to fundamental principles - including laws of nature, natural phenomena, and abstract ideas - mental processes, or mathematical algorithms are unpatentable. *Bilski*, at 951-52.A process claim that is tied to a specific machine may be patentable under § 101. *Id.* at 961;*Comiskey, 499 F.3d at 1377*.

While the *Bilski* court declined to elaborate on the "machine" branch of the test, it did provide some guidance on the issue. The court explains that "the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility" and "the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity." *Bilski*, at 961-62 (internal citations omitted). As *Comiskey* recognized, "the mere use of the machine to collect data necessary for application

of the mental process may not make the claim patentable subject matter." *Comiskey, 499 F.3d at 1380* (citing *In re Grams, 888 F.2d 835, 839-40 [12 USPQ2d 1824] (Fed. Cir. 1989)*).

Nominal recitations of structure in a method claim do not convert an otherwise ineligible claim into an eligible one. *Bilski*, at 957.*See also Benson*, 409 U.S. at 68-69 (comparing *O'Reilly v. Morse, 56 U.S. (15 How.) 62 (1854)*, to *The Telephone Cases, 126 U.S. 1 (1888)* - the Court explained that Morse's ***1560** eighth claim was disallowed because it failed to recite any machinery, however, Bell's claim was patentable because it recited specified conditions for using a particular circuit); *In re Schrader, 22 F.3d 290, 294 [30 USPQ2d 1455] (Fed. Cir. 1994)* (holding a simple recordation step in the middle of the claimed process incapable of imparting patent-eligibility under § 101); *In re Grams, 888 F.2d at 839-40* (holding a pre-solution step of gathering data incapable of imparting patent-eligibility under § 101).

Turning to the "transformation" branch of the "machine-or-transformation" test, claims reciting incidental transformations or extra-solution activity also do not convert an otherwise ineligible claim into an eligible one. To permit such a practice would exalt form over substance and permit artful claim drafting to circumvent the limitations contemplated by section 101. *See Diehr, 450 U.S. at 191-92* ("insignificant post-solution activity will not transform an unpatentable principle into a patentable process.").

In *Benson*, the Supreme Court reviewed several of its precedents dealing with process patents before drawing the conclusion that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." *Benson*, 409 U.S. at 70. The Court explained that several cases - *Corning v. Burden, 15 How. (56 U.S.) 252 (1854)* (tanning and dyeing), *Cochrane,94 U.S. 780* (manufacturing flour), *Tilghman v. Proctor, 102 U.S. 707 (1880)* (manufacturing fat acids), and *Expanded Metal Co. v. Bradford, 214 U.S. 366 (1909)* (expanding metal) - could all fairly be read to involve physical transformation of some article or material to a different state or thing. *Benson*, 409 U.S. at 69-70. *See also Bilski*, at 962-63 (discussing physical transformation and reviewing Supreme Court precedents including *Diehr* (process of curing rubber)).

Where the claims do not involve a physical transformation, analysis is more challenging. As the *Bilski* court explained, the central question is "whether Applicants' claim recites a fundamental principle and, if so, whether it would pre-empt substantially all uses of that fundamental principle if allowed." *Bilski* at 954.In other words, we must distinguish between "claims that 'seek to pre-empt the use of' a fundamental principle, on the one hand, and claims that seek only to foreclose others from using a particular 'application' of that fundamental principle, on the other. *Id*. at 953 (quoting *Diehr*, 450 U.S. at 187).

ANALYSIS

Claims 1-10

Appellant confines his arguments to the patentability of independent claim 1, and does not provide additional arguments addressing the patentability of dependent claims 2-10. (App. Br. 6.) Accordingly, claims 2-10 are grouped together and stand or fall with claim 1. Appellant waives separate argument of the patentability of the grouped claims. We consider in this decision only those arguments that Appellant actually made. Any arguments omitted in Appellant's briefs are waived. See 37 C.F.R. § 41.37(c)(1)(vii).

Our reviewing court recently held that "the applicable test to determine whether a claim is drawn to a patent-eligible process under § 101 is the machine-or-transformation test set forth by the Supreme Court . . . ." *Bilski*, at 966.

[1] Appellant's claim 1 recites a series of process steps performed by a "processor." The recitation of a processor in itself, however, does not tie the process steps to a particular machine. In other words, the recitation of a processor does not limit the process steps to any specific machine or apparatus. Appellant does not dispute this point. Thus, claim 1 fails the first prong of the machine-or-transformation test because it is not tied to a particular machine or apparatus. Appellant's claim 1 also fails the second prong of the machine-or-transformation test because the data acted on by the method does not represent physical and tangible objects. Rather, the data represents information about an abstract floating-point number, which is intangible. Thus, claim 1 fails the machine-or-transformation test and is not patent-eligible under 35

U.S.C. § 101.

As discussed above, Appellant's claim 1 recites a method performed by a "processor." The recitation of a "processor" performing various functions fails to impose any meaningful limits on the claim's scope. The recitation of a "processor" performing various functions is nothing more than a general purpose computer that has been programmed in an unspecified manner to implement the functional steps recited in the claims. The recitation ***1561** of a processor in combination with purely functional recitations of method steps, where the functions are implemented using an unspecified algorithm, is insufficient to transform otherwise unpatentable method steps into a patent eligible process. Holding otherwise would exalt form over substance and would allow preemption of the fundamental principle present in the non-machine implemented method by the addition of the mere recitation of a "processor." Such a field-of-use limitation is insufficient to render an otherwise ineligible process claim patent eligible. *See Bilski*, at 957 (citing *Diehr*, 450 U.S. at 191-92 (noting that eligibility under § 101 "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.")).

As discussed above, Appellant's claim 1 also does not transform physical subject matter. The purported transformation of data, without a machine, is insufficient to establish patent-eligibility under § 101. See *Bilski*, at 961 ("[E]ven a claim that recites 'physical steps' but neither recites a particular machine or apparatus, nor transforms any article into a different state or thing, is not drawn to patent-eligible subject matter."). Here, Appellant's method steps merely determine a result d from a mathematical algorithm. Accordingly, the claim is directed to abstract ideas and/or data structures *per se*. The steps manipulating other data (floating-point operands) and determining whether to calculate d using floating point hardware are insignificant extra-solution activity. Such "insignificant [extra]-solution activity will not transform an unpatentable principle into a patentable process." *Id*. at 957 (citing *Diehr*, 450 U.S. at 191-92;*Flook*, 437 U.S. at 590). To permit such a practice would exalt form over substance and permit Appellant to circumvent the limitations contemplated by § 101.

Claims 18-27

Appellant confines his arguments to the patentability of independent claim 18, and does not provide additional arguments addressing the patentability of dependent claims 19-27. (App. Br. 8.) Accordingly, claims 19-27 are grouped together and stand or fall with claim 18. Appellant waives separate argument of the patentability of the grouped claims.

Appellant's claim 18 recites a "computer readable media including program instructions which when executed by a processor cause the processor to perform . . . ." Appellant contends that the claim is directed to an article of manufacture, and does not fall within a judicially-defined exception. (*Id*. at 7.) Thus, Appellant contends the claim is directed to statutory subject matter patentable under § 101. (*Id.*)

[2] In contrast to independent claim 1 above, claim 18 recites "computer readable media." When broadly construed in a manner consistent with Appellant's Specification, the claimed "computer readable media" limits the scope of the claimed media to tangible media embodiments such as the disclosed "fixed magnetic disk, [ ] floppy disk drive, [ ] optical disk drive, [ ] magneto-optical disk drive, [ ] magnetic tape, or non-volatile memory including flash memory." (Spec. ¶ [0058].) Even so, analysis of a "manufacture" claim and a "process" claim is the same under § 101. *See AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1357 [50 USPQ2d 1447] (Fed. Cir. 1999) (abrogated by *Bilski*, 545 F.3d 943 [88 USPQ2d 1385]) ("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."); *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 [47 USPQ2d 1596] (Fed. Cir. 1998) (abrogated by *Bilski*). Appellant acknowledges this, stating that the "reasoning applied as to why the 'process' claim 1 is directed to statutory subject matter may also be applied" to this claim. (App. Br. 7.)

As with claim 1, Appellant's claim 18 also does not transform physical subject matter and is not tied to a particular machine. Here, Appellant's claim recites computer readable media, but Appellant's claim is still directed to determining a result d from a mathematical algorithm. Additional recitations of computer readable media, a hardware prediction unit, steps manipulating other data (floating-point operands) and determining whether to calculate d using floating

point hardware are still insignificant extra-solution activities that fail to "transform an unpatentable principle into a patentable process." *Bilski*, at 957.Limiting the claim to computer readable media does not add any practical limitation to the scope of the claim. Such a field-of-use limitation is insufficient to render an otherwise ineligible claim patent eligible. *See id*.(citing *Diehr, 450 U.S. at 191-92* (noting that eligibility under ***1562** § 101 "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.")). To permit such a practice would exalt form over substance and permit Appellant to circumvent the limitations contemplated by § 101.

CONCLUSION OF LAW

Appellant did not show the Examiner erred in rejecting the method of predicting results of floating point mathematical operations and calculating the results under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

DECISION

We affirm the Examiner's rejection of claims 1-10 and 18-27.

AFFIRMED

FN1. The *Bilski* court, citing numerous Supreme Court precedents, stated:

The Supreme Court . . . has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-empt the principle itself. A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. *See Benson*, 409 U.S. at 70 ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."); *Diehr, 450 U.S. at 192* (holding that use of mathematical formula in process "transforming or reducing an article to a different state or thing" constitutes patent-eligible subject matter); *see also Flook*, 437 U.S. at 589 n.9 ("An argument can be made [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular appa-

ratus or operated to change materials to a 'different state or thing'"); *Cochrane v. Deener, 94 U.S. 780, 788 (1876)* ("A process is . . . an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.").

> FN1. *Bilski*, at 954.*See Diamond v. Diehr, 450 U.S. 175 [209 USPQ 1] (1981)*; *Parker v. Flook, 437 U.S. 584 [198 USPQ 193] (1978)*; *Gottschalk v. Benson, 409 U.S. 63 [175 USPQ 673] (1972)*; *Cochrane v. Deener*, 94 U.S. 780 (1876).

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Ex Parte Marius A. Cornea-Hasegan

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