How Signal Claims Can Clear the "Abstract Idea" Hurdle

In *Bilski v. Kappos*, [1] the Court unanimously held that a process for hedging risks in business was an unpatentable abstract idea. [2] In reaching such a conclusion, the Court did not reach uniform consensus. Justice Stevens criticized the plurality for failing to establish a guideline for distinguishing between unpatentable abstract ideas and patentable subject matter. [3] *Bilski* only narrowly addressed the subject matter patentability for processes, but other areas of subject matter, like software, have been categorized as abstract ideas. [4]

The propagated signal, which has been used to encode software, watermarks, and other data, is positioned precisely in one such questionable area of patent-eligibility. In its most basic claim form (“a signal”), the signal has been termed an abstract idea. [5] The Federal Circuit in *In re Nuijten* [6] struck down the signal claim for not falling within one of the subject matter categories of patentability. [7] Recent confusion in lieu of *In re Bilski* [8] and *Nuijten* prompted the United States Patent and Trademark Office (“USPTO”) to issue guidelines requiring software claims (computer-readable medium) to include the limitation “non-transitory” so as to not include any type of signal. [9]

The “non-transitory” limitation should not be the standard for differentiating between an abstract idea and eligible subject matter because this limitation is overly broad. Disqualifying all transitory inventions goes against patent law precedent and also limits innovation to futuristic technology. It also makes little practical sense to disqualify the signal claim based solely on its transitory nature while at the same time allow that same invention on a non-transitory CD. Such a distinction represents form over function because the invention can be conveyed to the computer in the exact same form. A better approach that is in line with patent law precedent should look to the invention’s physicality, transferability, and reproducibility. This standard, where inventions are embodied in a concrete form, ensures that abstract ideas are not patented.

**Physical**

Historically, courts have allowed signals that have demonstrated physical qualities. The Supreme Court in *Dolbear v. American Bell Tel. Co.* [10] held that electricity could be patentable subject matter. [11] Bell’s invention controlled the electricity force, [12] which involved real, physical effects. [13]

The Federal Circuit in *Arrhythmia Research Technology, Inc. v. Corazonix Corp.* [14] while not dealing with signals as an article of manufacture, stated that “[t]he view that ‘there is nothing necessarily physical about signals’ is incorrect.” [15] Importantly, other signal inventions have also been patented. [16]

The USPTO, notably, has previously held an expansive view of allowing computer readable media other than non-transitory computer disks. [17] In 1996, the idea of a propagated signal claim was widely unknown and under-appreciated in the software realm. [18] However, after releasing the *Computer-Related Invention Guidelines* (“Guidelines”), the USPTO also released Claim Examples to train examiners how to properly apply the Guidelines. [19] These examples
included a section on Compression and Encryption inventions. Claim 13, entitled Automated Manufacturing Plant, set forth the use of a signal claim.[20]

A computer data signal embodied in a carrier wave comprising:

a. a compression source code segment comprising . . . [recites self-documenting source code];

and

b. an encryption source code segment comprising . . . [recites self-documenting source code].[21]

In this example, the USPTO instructions explained that the “computer data signal” comprised “specific software embodied on a computer-readable medium” and a “specific machine or manufacture.”[22] This computer data signal controlled physical processes of the automated manufacturing plant.[23] Today’s USPTO should allow propagated signals as articles of manufacture because of the signals’ physical influence.

The Federal Circuit in Nuijten similarly held that signals that have physical effects are physical.[24] Furthermore, the court explained that signals are physical and man-made, exist in the real world, have tangible causes and effects, comprise particles, and are perceptible.[25] Continuing to approve of physical signals as patent-eligible should not disrupt patent law.

Transferable

An article of manufacture software claim should be patent-eligible when it represents a transferable embodiment which is disclosed in the claim.[26] The Federal Circuit in Nuijten explained how the signal claim failed because the preamble did not specify how “a signal” was to be transferred.

“[W]hile the claims are limited so as to require some physical carrier of information, they do not in any way specify what carrier element is to be used. . . . The text of the claims is not limited by any specified physical medium. . . . Therefore, any tangible means of information carriage will suffice . . . . [S]ome physical form for the signal is required, but any form will do . . . .”[27]

The level of specificity in how the invention is claimed should set apart patentable inventions from abstract ideas.

Embodying the software invention in a particular medium, and claiming the medium as part of the invention, ensures that the invention is not an abstract idea.[28] The medium makes the invention concrete and definite. When software is embodied on a transferable medium, the intangible and non-rivalrous software takes on a physical and rivalrous expression.[29] The transfer of signals can resemble the transfer of non-transitory media (i.e. CDs, hard drives, USB drives, etc.), where each involves physical and rivalrous transfers. Like a CD, where a tangible medium containing computer instructions can be transferred to only one destination, a transitory signal medium has a similar process.[30] Each transfer of the software using a signal involves one medium on which the software resides. The software on such a medium is transferred to only one recipient.
A recent example makes clear the distinction between an abstract signal and a patent-eligible signal. In *Microsoft Corp. v. AT&T Corp.*[31] the Court stated in dicta that “[a]bstract software code is an idea without physical embodiment . . . .”[32] The Court reasoned that in order for software to be a component, for purposes of 35 U.S.C. § 271(f), the software needed to be physically embodied.[33] The Court further reasoned that software needed to be expressed on a computer readable format like a CD to be combinable. “Abstracted from a usable copy, code is intangible, uncombinable information, more like notes of music in the head of a composer than ‘a roller that causes a player piano to produce sound.’”[34] A signal is unlike an abstract form of software because the signal physically embodies the software. Like the Court in *Microsoft* held that software needed to be embodied in a physical medium to be more than a mere idea, a signal passes subject matter eligibility by being physically embodied in a computer-readable medium.[35] 

**Reproducible**

Finally, the invention must be reproducible so that the invention as a whole is constant and predictable. Software embedded in a signal is more than an intangible algorithm or idea.[36] The medium makes the embodiment of the idea an application to a real-world object that is new and useful. When it does so in a reproducible way, the invention maintains the reliability and constancy of a non-transitory medium.

File transfers over the Internet, for instance, typically follow protocols that do not permit errors in the transfer. Signals that follow such protocols resemble manufactures insofar as they are reproducible and transferable. Equally important, those characteristics embody the idea in a real-world application, clearing the abstract idea exception to non-patentability.

The courts have upheld reproducible, transitory patentable subject matter in the past. In *In re Hruby*, the CCPA held that a transitory water fountain was eligible subject matter for a design patent.[37] The court rejected the notion that the fountain was fleeting[38] and held that it fit within the category of a manufacture.[39] The court reasoned that even though the fountain comprised transient and fleeting water molecules, the overall fountain remained substantially constant when certain parameters were met: configuring the orifice, maintaining a certain water pressure and atmospheric conditions. Additionally, the water fountain although made up of a transient composition of matter was physical in nature. The court reasoned that it would not make the fountain appropriate subject matter when frozen, but not eligible when liquid. The court also reasoned that the water fountain was reproducible.

Similar to the fountain in *Hruby*, a signal can also be maintained at a substantially constant level, especially when the signal is digital. In the field of distributing data through the Internet or networking communications, information in the form of a signal, is highly constant and includes packets of information that is able to be verified down to the very bit.[40] Like the water fountain, where the water pressure, the atmospheric conditions, and the orifice arrangements all when carefully maintained create a reproducible manufacture, a signal, when maintained, also has a precise structure and composition of data when transferred from one communication location to a destination.
A signal by the same analysis should also be a manufacture because of its reproducibility. In *Ex parte Rice*,[41] the BPAI held that a signal claim with the language “electromagnetic signal” was eligible subject matter, despite being “transitory and ephemeral in nature.”[42] A signal that, according to the court in *Nuijten*, is physical, transferable, and reproducible, should like the water fountain in *Hruby* and the electromagnetic signal in *Rice* pass the abstract idea hurdle and qualify as an article of manufacture.

**Conclusion**

Software patents have been a part of society for over 20 years now and show no signs of going away. For purposes of predictability, it makes most sense to claim software on the medium it is transferred on. It seems unlikely that the propagated signal, which shares much in common with patent-eligible manufactures, are dead—such claims rather must be adapted.[43] By adopting the standard of physical, transferable and reproducible, rather than non-transitory, a fair line for the patentability of signal claims can be drawn. At the same time, this standard encourages growth in the ever-expanding area of software development. Adopting such a standard will lift our society out of the industrial age by recognizing futuristic technologies as patentable subject matter.

The Supreme Court has maintained that 35 U.S.C. § 101 was meant to be expansive and include futuristic technologies. Some caution must be exercised in allowing unforeseen technologies to be patented, especially where the invention is an abstract idea. However, requiring all subject matter to be non-transitory is under-inclusive. In fact, as our society continues to move away from tangible media, the non-transitory limitation is detrimental for futuristic technologies. As long as the courts can correctly interpret new media that embody software, there is strong precedent to hold that signals are patent-eligible.


[2] Id. at *35.

[3] Id. at *17.


[6] Id. at 1351.

[7] Id. at 1352.

[8] 545 F.3d 943 (Fed. Cir. 2008).
“When the broadest reasonable interpretation of a claim covers a signal per se, the claim must be rejected under 35 U.S.C. § 101 as covering non-statutory subject matter.” David J. Kappos, Subject Matter Eligibility of Computer Readable Media. 1351 OG 212 (Feb. 23, 2010). The reasoning is that the computer readable medium, when most broadly interpreted, could include a signal. \textit{Id.}

126 U.S. 455 (1888).

\textit{Id.} at 532–33.

\textit{Id.} at 532.

See \textit{In re} Nuijten, 500 F.3d 1346, 1353 (Fed. Cir. 2007) (holding that a signal implies with it a physical carrier).

958 F.2d 1053 (Fed. Cir. 1992).

\textit{Id.} at 1059.


Id.

It is important to note that the PTO has never consistently advocated signal claims. In Interim Guidelines from the preceding year, for example, stated “it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.” 1300 OG 142, at 25 (Nov. 22, 2005), available at http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm (last visited Apr. 1, 2010). Additionally, this example was removed shortly after posting it on the USPTO’s website. Email from Dan Santos, IP Attorney, to Trent Ostler, J.D. Candidate, Franklin Pierce Law Center (Apr. 1, 2010, 21:34 PST) (on file with author).

[22] Id. at 41.


[25] Id. at 1355.


[27] 500 F.3d 1346, 1353 (Fed. Cir. 2007).


[29] For instance, a CD containing software is a tangible embodiment of the invention that can only be used by one person. Even though a computer can read the CD and the digital contents can be copied to another storage medium, this does not diminish the tangibility and rivalry of that particular CD with software.

[30] Karjala, *supra* 20, at 65. In its executable form, the code exists as physical signals (high or low voltages or magnetic field strengths), not as ones and zeros that may be readable by humans. These physical signals may be used directly by the computer in the course of operations. For reasons of operational efficiency, however, these program signals are usually not directly used by the computer but rather are transferred from the diskette to other parts of memory, but the transfer is one to one and exact. . . . Consequently, while today the program does not directly govern computer operations from the diskette, its exactly transferred copy does. *Id.*


[32] *Id.* at 449.

[33] *Id.*

[34] *Id.* at 451 n.12.

[35] But see *In re Nuijten*, 500 F.3d 1346, 1366 (holding that signals are unpatentable because they fail the tangibility requirement of being a manufacture).

It is important to note that even though Hruby’s water fountain as a design patent relies on § 171 for subject matter, the only difference in language between § 101 and § 171 is “useful”:

101: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title. 35 U.S.C. § 101 (2008).

171: Whoever invents any new, original, and ornamental design for an article of manufacture may obtain a patent therefor, subject to the conditions and requirements of this title. 35 U.S.C. § 171 (2008).

Because the usefulness of software was never an issue in Nuijten, nor in other software patents, the subject matter concerns should be the same.


The court addressed the difference in language between article of manufacture and manufacture.

We fail to find in the opinion of the board majority any sufficient reason for holding the fountains are not ‘articles of manufacture.’ If, per chance, the board was attempting a distinction between ‘manufactures,’ which it seemed to think the fountains are, and articles of manufactures, we think that supposed distinction was fully disposed of by our predecessor court . . . in In re Hadden (holding that there is no difference between a manufacture and an article of manufacture).

The transmission that carries a data signal is governed by digital transmission standards that ensure that the sender’s and receiver’s content is the same. David Russell Smith, Digital Transmission Systems, at 13 (2003). The FCC authorizes carrier services and sets technical and operational standards. Id.


Id. at 2; accord O’Reilly v. Morse, 56 U.S. at 114–19; In re Breslow, 616 F.2d 516 (CCPA 1980).

Professor John Duffy at George Washington remarked:

Yet . . . there will still be nothing to stop Philips from claiming transport media (e.g., wires, cables, and fibers) containing the relevant signal. True, such claims may not be able to cover free space propagation of an electromagnetic signal, but that may matter little. Current technology requires electronic circuitry having physical wires to generate and to receive an electromagnetic signal. Moreover, many, perhaps even most, electromagnetic signals are today being transported by fibers, cables or wires. Thus, even under the PTO’s interpretation of § 101,
Philips should be able to achieve much of its intended objective, provided that the company observe some formalisms.