

**Keywords:** 35 U.S.C. § 101; Statutory Subject Matter; Signal

**General:** Claims directed to “[a] signal with embedded supplemental data” require some physical carrier of information, such as an electromagnetic wave, in which information is embedded; however, transitory forms of signal transmission, such as an electromagnetic wave or an electrical signal, cannot be considered to fall within any of the four statutory classes under 35 U.S.C. § 101 and, thus, are not patentable.

*In re Nuijten*

84 U.S.P.Q.2d 1495 (Fed. Cir. 2007)

Decided September 20, 2007

## I. Facts

Nuijten filed a patent application directed to techniques for reducing distortion induced by the introduction of “watermarks” into signals, such as digital audio files. Watermarking refers to a technique by which an original signal is manipulated to embed additional data into the signal. Ideally, the additional data is imperceptible to someone who views or listens to the signal. Watermarks are often used to protect the media against unauthorized copying. Because watermarking involves embedding information into a signal, the original signal is altered or distorted. Nuijten’s patent application is directed to minimizing the distortion created by the introduction of a watermark.

The PTO allowed claims directed to a process for embedding supplemental data into a signal, a device that performs that process and a storage medium holding the resulting signals. However, the Examiner rejected the claims directed to “a *signal* with embedded supplemental data.” The Board affirmed. Nuijten appeals the decision of the board.

## II. Issues

- A. Are the claims at issue limited to covering only physical instances of signals, or do they also cover intangible, immaterial strings of abstract numbers?
- B. Is a signal with embedded supplemental data statutory subject matter under 35 U.S.C. § 101?

## III. Discussion

- A. In rejecting the claims, the Board construed “signal” broadly and asserted that the claim could be read to claim a signal that is merely data – that is, merely numerical information without any physical embodiment. Nuijten disagreed, arguing that “a signal must have sufficient physical substance to be discerned and recognized by a recipient.” Citing *Arrythmia Research Tech*, the Federal Circuit found that to convey information to a recipient a physical carrier, such as an electromagnetic wave is needed and thus, in order to be a “signal,” as required by the claim, some carrier upon which the information is embedded is required. Accordingly, the Federal Circuit held that *some* physical form for the signal was indeed required and that any form will do, so long as the recipient can understand the message.
- B. No. In analyzing whether a “signal” is directed to patentable subject matter, the court analyzed whether a transitory, propagating signal falls within any of the four statutory categories: process, machine, manufacture, or composition of matter, in accordance with 35 U.S.C. § 101. Before analyzing the claims under each category, the majority clarified statements made in *State Street*

*Bank* and noted that in holding that the question of whether a claim encompasses statutory subject matter should not focus on *which* of the four categories a subject matter claim is directed to, but rather on the essential characteristics of the subject matter, in particular, its practical utility, the court did not render irrelevant the necessity of the recited subject matter to fall within at least one category of the statutory subject matter.

The court (and the dissent) found that a “signal” of the type recited in the claims is not a process, machine, or composition of matter in accordance with 35 U.S.C. § 101. In short, the court noted that the statutory term “process” requires an action (i.e., an act or series of acts). Nuijten asserted that “the signal being encoded in accordance with a given coding process,” provided for the act of encoding and thus provided a process. The court dismissed this assertion stating that the recitation merely implies that the claims are potentially product-by-process claims in which the product is defined at least in part in terms of the method or process by which it is made. However, such claims are still directed to the ultimate product, not the underlying process. The presence of acts recited in the claim does not transform a claim covering the thing – here, the signal itself – into one covering the process by which the thing was made.

In rejecting the “signal” as a machine, the court held that a “machine” is a “concrete thing consisting of parts, or of certain devices and combination of devices.” The court noted that a transitory signal made of electrical or electromagnetic variances is not made of “parts” or “devices” in any mechanical sense. While such a signal is physical and real, it does not possess concrete structure in the sense implied by these definitions. Accordingly, the court found that a propagating electromagnetic signal is not a “machine” under Section 101.

In rejecting the “signal” as a composition of matter, the court reiterated the Board’s position (and Nuijten did not challenge) that “the signal is not composed of matter and is clearly not a ‘composition of matter.’” In *Chakrabarty*, the Supreme Court defined a “composition of matter” to mean “all compositions of two or more substances and all composite articles, whether they be the results of chemical union or of mechanical mixture, or whether they be gases, fluids, powders, or solids.” The recited signal, made of fluctuations in electric potential or in electromagnetic fields, is not a “chemical union”, nor gas, fluid, powder, or solid, and therefore not a composition of matter.

The court noted that the “question of whether the claimed signals are ‘manufactures’ is more difficult.” However, the majority spent very little time analyzing the question. The Federal Circuit noted that in *Chakrabarty*, the Supreme Court defined “manufacture” (in its verb form) as “the production of *articles* for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.” The Federal Circuit further noted that “manufacture” is used in the statute in its noun form, and therefore refers to “articles” resulting from the process of manufacture. The same dictionary the Supreme Court relied on for its definition of “manufacture” defines “article” as “a particular substance or commodity: as, an *article* of merchandise; an *article* of clothing; salt is a necessary *article*.” In holding that a signal is not a “manufacture,” the Federal Circuit resolved the “difficult question,” by finding (in its entirety):

These definitions address “articles” of “manufacture” as being tangible articles or commodities. A transient electric or electromagnetic transmission does not fit within that definition. While such a transmission is man-made and physical –it exists in the real world and has tangible causes and effects-- it is a change in the electric potential that, to be perceived, must be measured at a certain point in space and time by equipment capable of detecting and interpreting the signal. In essence, energy embodying the claimed signal is fleeting and is devoid of any semblance of permanence during transmission.

Moreover, any tangibility arguably attributed to a signal is embodied in the principle that it is perceptible—e.g., changes in electrical potential can be measured. All signals within the scope of the claim do not themselves comprise some tangible article or commodity. This is particularly true when the signal is encoded on an electromagnetic carrier and transmitted through a vacuum—a medium that, by definition is devoid of matter. Thus we hold that Nuijten’s signals, standing alone, are not “manufacture[s]” under 35 U.S.C. § 101.

The dissent concluded that the claim is indeed directed to a “new and useful” “manufacture,” and thus patentable under 35 U.S.C § 101. In choosing a dictionary from 1768, the dissent defined manufacture as “anything made by art,” and defined “art” as “the power of doing something not taught by nature and instinct.” In citing *Chakrabarty*, the dissent further noted that the Supreme Court observed that “Congress plainly contemplated that the patent laws would be given wide scope.” Further *Chakrabarty* embraces the notion that the scope of patentable subject matter includes “anything under the sun that is made by man.” The dissent further surmised that the most straightforward interpretation of the Supreme Court’s guidance in *Chakrabarty* is that an invention qualifies as patentable subject matter if it (1) is “made by man” and (2) “does not involve an attempt to patent laws of nature, physical phenomena, [or] abstract ideas.” In using the alternative definition of “manufacture” and giving great deference to the Supreme Court’s statements in *Chakrabarty*, the dissent found that a “signal” is patentable as a “manufacture”.