Patentable Subject Matter and the Supreme Court: What's the Matter?

By

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Until recent events have suggested otherwise, an observer of judicial decisions affecting the scope of patentable subject matter would have seen a steady march in the direction of expansion since the Supreme Court in *Diamond v. Chakrabarty*[2] ruled that claims, directed to a genetically engineered bacterium capable of breaking down components of crude oil, were patentable.[3] Following *Diamond v. Chakrabarty*, we had the Supreme Court's decision in *Diamond v. Diehr*[4] holding that a method of manufacturing molded articles is not precluded from being patented "simply because it uses a mathematical formula, computer program, or digital computer".[5]

Following *Diamond v. Diehr*, we had important decisions from the Federal Circuit including:

(i) *In re Alappat*[6], holding that an anti-aliasing rasterizer for reducing jagged edges in pixilated displays cannot be denied a patent on the basis of the mathematical algorithm exception to section 101[7];

(ii) *State Street Bank & Trust Co. v. Signature Financial Group*[8] holding that claims directed to a data processing system for managing a financial services configuration of a mutual fund portfolio constituted statutory subject matter, and could not be denied patent coverage simply because they involve a mathematical algorithm or implement a business method[9]; and

(iii) *AT&T Corp. v. Excel Communications, Inc.*[10], holding that a claimed communications method for generating a message record having a specific data structure constituted statutory subject matter, that "the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle", and that the requirement of a "physical transformation" is

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[2] Diamond v. Chakrabarty, 447 U.S. 303 (1980)

[3] 447 U.S. 309.

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

[5] 450 U.S. at 187.

[6] In re Alappat, 33 F.3d 1526 (Fed.Cir.1994) (in banc).

[7] 35 U.S.C. § 101; 33 F.3d 1544.

[8] Street Bank & Trust Co. v. Signature Financial Group, 149 F.3d 1368 (Fed. Cir. 1998)

[9] 149 F.3d 1373 and passim; and moreover "that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result'" within the scope of § 101.

[10] AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed. Cir. 1999).

"merely one example of how a mathematical algorithm may bring about a useful application."[11]

These decisions of the Federal Circuit establish a sophisticated and consistent approach to evaluation of statutory subject matter. The specter of a flood of business method patents, raised by those seeking to prevent the expansion of what constitutes statutory subject matter, was answered by Judge Rich in *Street Bank & Trust Co*: "Whether the patent's claims are too broad to be patentable is not to be judged under § 101, but rather under §§ 102, 103 and 112."[12]

Since *Diamond v. Diehr*—despite these impressive developments from the Federal Circuit—the Supreme Court has not ruled on what subject matter is statutory. Nevertheless, although the Supreme Court has not ruled, it still has spoken through a series of potentially troublesome minority opinions.

Consider *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.*[13], decided in 2006. Although in a one-line *per curiam* decision, the court dismissed the writ of certiorari as improvidently granted (since the issue of statutory subject matter had not been considered below), Justice Breyer, joined by Justices Stevens and Souter, wrote a lengthy dissent. The patent claim (claim 13) at issue reads as follows:

"A method for detecting a deficiency of cobalamin or folate in warm-blooded animals comprising the steps of:

"assaying a body fluid for an elevated level of total homocysteine; and

"correlating an elevated level of total homocysteine in said body fluid with a deficiency of cobalamin or folate."[14]

While conceding that "[t]he researchers who obtained the present patent found that an elevated level of homocysteine in a warm-blooded animal is correlated with folate and cobalamin deficiencies"[15], the dissenters take the position that "the correlation between homocysteine and vitamin deficiency set forth in claim 13 is a 'natural phenomenon'".[16] Furthermore: "Claim 13's process instructs the user to (1) obtain test results and (2) think about them. Why should it matter if the test results themselves were obtained through an unpatented procedure that involved the transformation of blood?"[17] Expanding on this position, the dissenters proclaim that "the process is no more than an instruction to read some numbers in light of medical knowledge.… And here, aside from the unpatented test, they [the steps of the claim] embody only the correlation between homocysteine and vitamin deficiency that the researchers uncovered. In my view, that correlation is an unpatentable 'natural phenomenon,' and I can find nothing in claim 13 that adds anything more of significance."[18] The opinion then suggests that the medical profession is being unfairly saddled with restrictions imposed by this patent, which, along

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[11] 172 F.3d 1358 and passim; see also Arrhythmia Research Technology v. Corazonix Corp., 958 F.2d 1053, (Fed.Cir.1992)(process claims including various mathematical formulae to analyze electrocardiograph signals to determine a specified heart activity are directed to statutory subject mater).

[12] 149 F.3d 1368 at 1377.

[13] Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc., 126 S.Ct. 2921 (2006).

[14] 126 S.Ct. 2924.

[15] 126 S.Ct. 2926.

[16] 126 S.Ct. 2927.

[17] 126 S.Ct. 2927.

[18] 126 S.Ct. 2928.

with others, among other things, "may inhibit doctors from using their best medical judgment".[19]

The analysis of the dissenters uses the concept of "natural phenomenon" to remove from consideration the discovery that is harnessed here in a test procedure for identifying vitamin deficiency. Having removed the key concept from consideration, the dissent next discredits the testing for homocysteine as an "unpatented test"—something that is old. But any claim can be dissected into a series of parts that utilize natural phenomena and that are old. Why could Edison's phonograph be patented, since it depended merely on the discovery that sound waves can make an impression on a rotating wax cylinder? Wax was old when the phonograph was developed. Rotating cylinders were old. If you eliminate from consideration the natural phenomenon of sound waves creating a pattern on the wax cylinder, you have cut the heart out of the invention.

At bottom, what troubles the dissent is that the claimed invention does not involve much more structure for its utilization than the discovery that homocysteine levels are linked to vitamin deficiency. Unlike Edison's phonograph, a sophisticated apparatus newly developed by the inventor, the invention here utilizes prior art tests for a known composition.

The dissent's approach is similar to the that of the Supreme Court in 1948 in ***Funk Bros. Seed Co. v. Kalo Inoculant Co.***[20], a case carefully distinguished and not overruled by the Court in later decisions[21], and also cited (among other cases) with approval in the *Labcorp* dissent.[22] The inventor in this case had tackled a problem in farming arising because leguminous plants depend on the infection of Rhizobium bacteria in their roots in order to fix nitrogen from the air; because no one species of bacterium infects all species of leguminous plants, farmers typically used different bacterium species for different groups of plants.[23] Thus a farmer growing clover, alfalfa, and soy beans would have to use three distinct bacterium species to inoculate these three distinct species of leguminous plants.[24] Prior efforts at mixing distinct species of bacteria were unsuccessful because the mixed species had an inhibitory effect on one another, and it was generally assumed that species had mutually inhibitory effects on one another.[25]

The inventor Bond in ***Funk Bros.*** "discovered that there are strains of each species of root-nodule bacteria which do not exert a mutually inhibitive effect on each other" and developed "a mixed culture of Rhizobia capable of inoculating the seeds of plants belonging to several cross-inoculation groups". A typical one of the claims at issue was drawn to a mixture of bacterial strains that do inhibit each other's ability to fix nitrogen: "An inoculant for leguminous plants comprising a plurality of selected mutually non-inhibitive strains of different species of bacteria of the genus Rhizobium, said strains being unaffected by each other in respect to their ability to fix nitrogen in the leguminous plant for which they are specific."[26]

Justice Douglas, writing for the Court, stated that

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[19] 126 S.Ct. 2928.
[20] Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948).
[21] See Diamond v. Chakrabarty, 447 U.S. 303 at 309; Diamond v. Diehr, 450 U.S. 175 at 188.
[22] 126 S.Ct. 2922.
[23] 333 U.S. at 128-129.
[24] 333 U.S. 129.
[25] 333 U.S. at 129-130.
[26] 333 U.S. 128.

> Bond does not create state of inhibition or of non-inhibition in the bacteria. Their qualities are the work of nature. Those qualities are of course not patentable. For patents cannot issue for the discovery of the phenomena of nature. See Le Roy v. Tatham, 14 How. 156, 175, 14 L.Ed. 367. The qualities of these bacteria, like the heat of the sun, electricity, or the qualities of metals, are part of the storehouse of knowledge of all men. They are manifestations of laws of nature, free to all men and reserved exclusively to 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.[27]

Justice Douglas then asserts that the discovery that certain strains of distinct species of bacteria can be mixed without a mutually inhibitory effect is "no more than the discovery of some of the handiwork of nature and hence is not patentable."[28] In other words, the discovery is not patentable subject matter. Having established the principle that the discovery is not patentable, Justice Douglas next turns to the application of the discovery: "The aggregation of select strains of the several species into one product is an application of that newly-discovered natural principle."[29] Having eliminated the discovery from consideration, Justice Douglas is unimpressed with its application: "But however ingenious the discovery of that natural principle may have been, the application of it is hardly more than an advance in the packaging of the inoculants."[30] He then points out that the bacteria in the mixture function in exactly the same way as bacteria always functioned. "They serve the ends nature originally provided and act quite independently of any effort of the patentee."[31]

In a final flourish, after snuffing the life out of the patent claims by characterizing them as based on an unpatentable discovery, Justice Douglas says that they are not directed to subject matter that is inventive as required by the 1941 Supreme Court decision in *Cuno Engineering Corp. v. Automatic Devices Corp.*[32] In hindsight, we can see deep irony in this citation. First of all, Congress overruled *Cuno Engineering* with passage of the Patent Act of 1952, which introduced the then new section 103 requiring that an invention be non-obvious. The standard that Congress made law in 1952 replaced the subjective language "flash of creative genius"[33] used in *Cuno Engineering*. Section

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[27] 333 U.S. 130, citing Telephone Cases, 126 U.S. 1, 532, 533, 8 S.Ct. 778, 780, 781, 31 L.Ed. 863; De Forest Radio Co. v. General Electric Co., 283 U.S. 664, 684, 685, 51 S.Ct. 563, 568, 569, 75 L.Ed. 1339; Mackay Radio & Tel. Co. v. Radio Corp., 306 U.S. 86, 94, 59 S.Ct. 427, 431, 83 L.Ed. 506; Cameron Septic Tank Co. v. Saratoga Springs, 2 Cir., 159 F. 453, 462, 463.

[28] 333 U.S. 131.

[29] 333 U.S 131.

[30] 333 U.S. 131.

[31] 333 U.S. 131.

[32] 333 U.S. at 131-132, citing Cuno Engineering Corp. v. Automatic Devices Corp., 314 U.S. 84, 90, 91, 62 S.Ct. 37, 40, 41, 86 L.Ed. 58, and cases cited; 35 U.S.C. s 31, 35 U.S.C.A. s 31, R.S. s 4886. Douglas refers to requirements of "invention or discovery" set forth in Cuno Engineering (using the term discovery in a completely different sense from that concerning statutory subject matter.

[33] See *Graham v. John Deere Co.*, 383 U.S. 1, 15 (1966), citing *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 62 S.Ct. 37, 86 L.Ed. 58 (1941).

103 of the patent law was therefore enacted by Congress to introduce a more objective standard in evaluating what inventions should be entitled to a patent.[34] Second, what does obviousness—or "invention" in the words of Justice Douglas—have to do with statutory subject matter?

Despite its muddled logic, however, this decision indicates a concern that there is little structure in the claimed invention beyond the discovery—the same concern we inferred in the dissent to *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.*, discussed above.

Should the patentability of subject matter hinge on the extent to which the claimed structure goes beyond naked discovery? To some degree, such a requirement is inevitable if pure discoveries cannot be patented. Yet where and how one draws the line makes a big difference. Consider *Gottschalk v. Benson*[35], decided by the Court in 1972. At stake was claimed subject matter directed to converting binary coded decimal numbers to pure binary numbers in a digital computer system. One of the claims is to a procedure used in a shift register:

> Claim 8 reads:
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> 'The method of converting signals from binary coded decimal form into binary which comprises the steps of
>
> '(1) storing the binary coded decimal signals in a reentrant shift register,
>
> '(2) shifting the signals to the right by at least three places, until there is a binary '1' in the second position of said register,
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> '(3) masking out said binary '1' in said second position of said register,
>
> '(4) adding a binary '1' to the first position of said register,
>
> '(5) shifting the signals to the left by two positions,
>
> '(6) adding a '1' to said first position, and
>
> '(7) shifting the signals to the right by at least three positions in preparation for a succeeding binary '1' in the second position of said register.'[36]

[34]The principal drafters of section 103 were the late Judge Giles J. Rich and P.J. Federico, whose remarks are quoted in the Brief of Amicus Curiae Pharmaceutical Research and Manufacturers of America in Support of Respondents, 2006 WL 2967758 *6-*7, in the KSR v. Telefex case, ___U.S. ___, 2007 WL 1237837 (2007). Quoted from Rich, *Ghost*, 1 APLA Q.J.at 28-31, reprinted in 14 Fed. Cir. B.J. at 165-70; and P.J. Federico, "Commentary on the New Patent Act," 35 U.S.C.A. at pp. 22-23 (1954), reprinted in 75 J.Pat. & Trademark Off. Soc'y 160, 183-84 (1993).

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

[36] 409 U.S. 63.

Writing for the Court, Justice Douglas stated that:

> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.[37]

The rhetoric is terrific. But the last statement, applied to the claim we quoted, is simply false. There are other ways to achieve the conversion in a digital computer than the way claimed. The question in each case is where and how to draw the line between pure discovery and a permissibly patentable utilization of a discovery in a claimed structure.

How would the Court decide *Gottschalk v. Benson* today? (The Court's decision in *Diamond v. Diehr*, finding statutory subject matter in a claimed method, utilizing an algorithm, of manufacturing molded articles, resulted from a vote of only five Justices, with Justice Stevens writing the opinion for the four dissenting justices.[38]) We have heard from the Federal Circuit on the issue, and after cases like *State Street Bank & Trust Co. v. Signature Financial Group*, it is clear that computer programs, while not patentable subject matter *per se*, when they are running in a digital computer or stored in a digital storage medium, they are patentable subject matter. The Supreme Court, however, has never ruled on the issue. Consider the following exchange in oral argument in *Microsoft Corp. v. AT & T Corp.*[39]:

> JUSTICE BREYER: I take it that we are operating under the assumption that software is patentable? We have never held that in this Court, have we?
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> MR. JOSEFFER: No, but as I was saying before --
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> JUSTICE BREYER: So what should we do here? Should, if we are writing this, since it's never been held that it's patentable in this Court --
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> MR. JOSEFFER: I think if --
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> JUSTICE BREYER: If I were writing something, should I say on the assumption that it's patentable? Since the issue isn't raised?[40]

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[37] 409 U.S. 72.

[38] 450 U.S. 175. Interestingly, Diamond v. Chakrabarty, 447 U.S. 303, was also a 5-4 decision, but the dissenters (Justice Brennan, joined by Justices White, Marshall, and Powell) did not include Justice Stevens.

[39] Microsoft Corp. v. AT & T Corp., 127 S.Ct. 1746 (2007).

[40] Microsoft Corp. v. AT & T Corp., oral argument, transcript, 2007 WL 541886, at *22.

This exchange suggests that one cannot assume that the jurisprudence of the Federal Circuit on statutory subject matter has been accepted by the Supreme Court. Indeed, a rather political agenda seems to be driving the interest of some of the Justices. In *eBay v. MercExchange*[41], the Supreme Court made it more difficult to get injunctions in patent cases. A concurring opinion by Justice Kennedy, joined by Justices Stevens, Souter, and Breyer—the same three who dissented in *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.*) criticized the use of patents "not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees." The opinion said that the threat of an injunction "can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent." The opinion furthermore criticized ... "the burgeoning number of patents over business methods", some of which have "potential vagueness and suspect validity"[42].

Thus a number of justices on the Court have manifested a willingness to tinker with patent law, particularly in the area of statutory subject matter. The sophisticated law developed by the Federal Circuit in this area can therefore not be taken for granted.

[41] eBay v. MercExchange, 126 S. Ct. 1837 (2006).
[42] 126 S. Ct. 1842.