

## *Alice v. CLS Bank*: Are US Business-Method and Software Patents Doomed? Part 1

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.....In *Alice Corporation Pty. Ltd. v. CLS Bank International*,<sup>1</sup> the US Supreme Court made another incremental decision on whether patents could be issued on computer-related innovations. Although urged to rule categorically on whether business methods and software could be patented, the Supreme Court once again refused to opine broadly. Although three Justices sought a clear ruling that no business method could ever be patented, the majority of the Court was willing to hold only that the patent before it too broadly claimed an abstract idea and was therefore invalid. Yet, the reasoning the Court used further eroded the legal support for patenting business methods and software not considered technological or industrial. The Court's rationale for invalidating the patent applies with equal force to many or most business-method patents.

The *Alice* case is the fourth case since 2010 in which the Supreme Court unanimously held claimed inventions not entitled to be patented because they were too "abstract" and "preemptive," and therefore "patent ineligible." US law has long held that a patent cannot be granted on an abstract idea or natural principle, although a creative process or apparatus for implementing an idea or natural principle can, at least in principle, be patented.<sup>2,3</sup> The problem has always been how to distinguish the one from the other, and what legal tests or standards should be used to do so (see the "Patent Eligibility" sidebar).

A clue to determining whether a patent impermissibly claims an idea or permissibly claims an implementation of an idea has been whether the particular machinery or apparatus required to practice the patent limits the scope of the patent's claims to substantially less than all practical implementations of the underlying idea.<sup>4</sup> Many 19th and early 20th century precedents supported requiring patentees to limit their claims in that way to keep the patents from sweeping up so much of the underlying idea and its applications that no room was left for others to invent. (The Supreme Court's opinion in *Gottschalk v. Benson*, 409 U.S. 63 (1972) contains an enumeration of such patents.) This is illustrated in the seminal Supreme Court decision on Samuel Morse's telegraph patent.<sup>2</sup>

### The Morse telegraph patent case

Part of Morse's telegraph patent was invalidated because it was not limited to the particular machinery that he invented and disclosed in his patent, while another part of Morse's patent was upheld because it was limited to telegraphy as practiced with the inventive "repeater" apparatus that Morse had devised. The repeater circuit was a cascade of relays in which each successive relay closed a circuit to make a battery power the next relay in the cascade (see Figure 1a), which it did before the signal level too closely approached the noise level (see Figure 1b). This overcame the previously

unsolved problem that the signal levels deteriorated into the noise levels as their voltage progressively decreased with the distance that the signals traveled (see Figure 1c, in which the signal is swamped by the noise after it travels about 25 or 30 miles). Morse inserted the relays (or "repeaters" as the Supreme Court's opinion terms them) at intervals sufficiently short (say, every 20 miles between battery-and-solenoid sets) that the signal (a train of long and short pulses) was restored regularly to substantially its initial level before the noise could swamp it out. Figure 1b shows the resulting voltage versus distance graph of the signal when Morse's repeaters are used. Each relay acts as a nonlinear amplifier—something like a Schmitt trigger. Microwave radio relays operate on a similar principle. In the early 19th century, however, it was a novel and highly creative innovation.

In addition to his claim for telegraphy using the repeater cascade, Morse more sweepingly claimed the use of the electromotive force for transmitting intelligible signals at any distance. (Morse's actual language in his eighth claim was: "I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specification and claims, the essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed, for marking or printing intelligible characters, signs, or letters, at any distances,

## Patent Eligibility

The terms “patent eligible” and “patent ineligible” refer to claimed inventions that are or are not, respectively, considered to be the kind of thing on which patents can be granted—usually, on grounds of public policy. The Pythagorean theorem, Boyle’s law, the Laplace transform,  $E = mc^2$ , the superposition theorem, and  $Z = R + j\omega L - j\omega(1/C) =$

$|Z|(\cos \theta + j \sin \theta)$  are examples of patent-ineligible abstract ideas. The term “preemption” in this context refers to preventing others from using an abstract idea of the type just described, by obtaining a patent monopoly that keeps unlicensed persons from employing the idea.

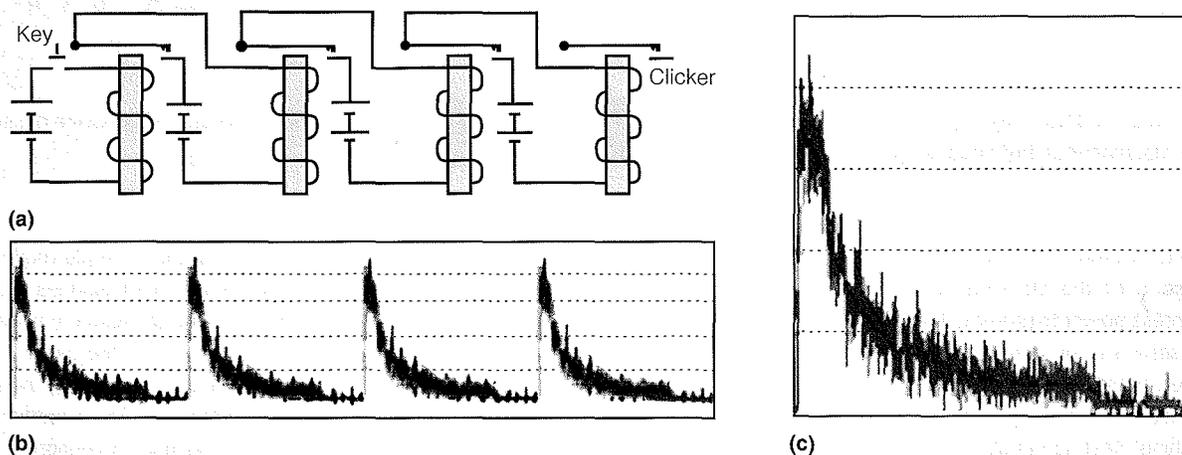


Figure 1. Morse’s telegraph patent. The figure shows, as the Supreme Court described it, Morse’s “plan for combining two or more electric or galvanic circuits with independent batteries to overcome the diminished force of electromagnetism in long circuits” (a). This is the “repeater” apparatus that Morse created. Part (b) shows how Morse’s repeater circuit overcame the previously unsolved problem of deteriorating signal levels, as shown in (c), by amplifying the signals before they became lost.

being a new application of that power of which I claim to be the first inventor or discoverer.”) If sustained, Morse’s claim would in principle cover radio telegraphy, tickertapes, and perhaps television, none of which Morse disclosed or taught how to make. The Court rejected this unduly preemptive claim, and its ruling became a foundation of law in this field. The Supreme Court said of Morse and his claims:

Professor Morse has not discovered that the electric or galvanic current will always print at a distance, no matter what may be the form of the machinery or mechanical contrivances through which it passes. You may use electro-magnetism as a motive power, and yet not produce the described effect, that is, print at a distance intelligible marks or signs. To produce that effect, it must be combined with, and passed through, and operate upon, certain

complicated and delicate machinery, adjusted and arranged upon philosophical principles, and prepared by the highest mechanical skill. And it is the high praise of Professor Morse, that he has been able, by a new combination of known powers, of which electro-magnetism is one, to discover a method by which intelligible marks or signs may be printed at a distance. And for the method or process thus discovered, he is entitled to a patent. But he has not discovered that the electro-magnetic current, used as motive power, in any other method, and with any other combination, will do as well.<sup>5</sup>

### Machine limitations to avoid preemption

Thus, in the *Morse* case, the Supreme Court held that Morse could properly claim a patent monopoly on the system or process of transmitting signals at any distance by means of the repeater circuit

described earlier, but he could not properly claim a monopoly over any and all uses of electromagnetic force to transmit signals. The apparatus or machine limitation (“certain complicated and delicate machinery”) in the first type of claim limited the patent monopoly to what Morse taught and gave the world. The lack of a limitation to a particular machine in the second type of claim would both give Morse more than was commensurate to what he had contributed to society and, by “preempting” the field, discourage the inventive efforts of others who might come up with different or better ways to send signals at a distance using the electromagnetic force. Allowing such a claim would hinder the progress of science and useful arts, rather than promoting them in accordance with the constitutional mandate authorizing the

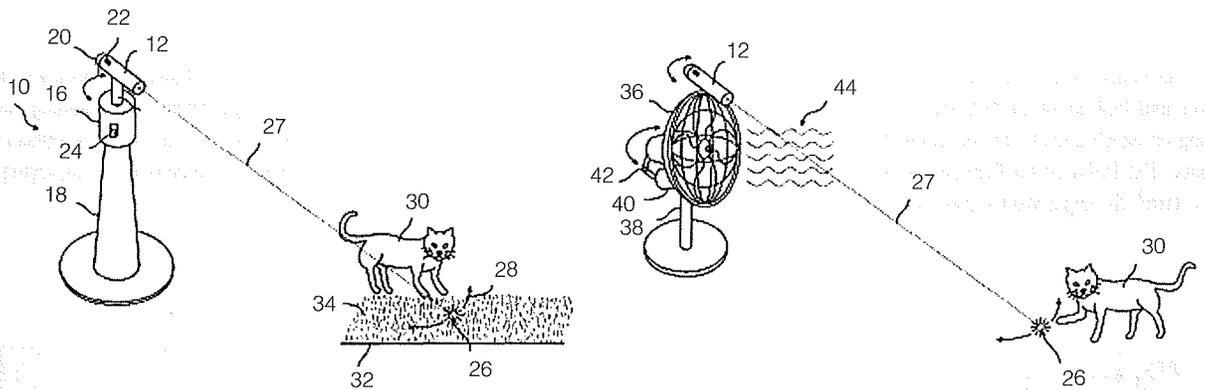


Figure 2. US Patent No. 6,701,872: "Method and apparatus for automatically exercising a curious animal." This device passes the machine test, but does not promote the progress of useful arts.

patent system. (Article I, section 8, clause 8 of the US Constitution gives Congress power to promote the progress of useful arts by granting inventors, for limited times, an exclusive right to their inventions.) That suggested a "particular machine" test as the clue to patent eligibility. (The machine must be particular, not generic. Morse taught performance of telegraphy by means of "certain complicated and delicate machinery," not with generic machinery. His particular machine was what he taught and what he earned a patent for.) As indicated, many 19th and 20th century precedents supported this test. Apparently, all of those that came before the Supreme Court did, because in the 1972 *Benson* case, the Court said that its prior precedents were consistent with that test, and therefore it was a "clue" to eligibility for a patent.

In the early 1970s, in the *Benson* case, the government urged the Court to hold, based on the *Morse* decision, that the decisive test for patent eligibility of implementations of abstract ideas (including algorithms) was whether the claims of the patent were limited to use of the underlying idea with particular machinery. But the Court refused to do so. It said, "We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior prece-

dent."<sup>6</sup> The Court correctly rejected the government's argument: the test does provide only a clue. The Court was correct for the following reasons.

First, the machine test lets some patents pass that it should not, for even a machine implementation can be patent ineligible. Two examples will illustrate that. Franz Kafka's story "In the Penal Colony" describes an elaborate machine to make the punishment fit the crime; US Patent 6,701,872 describes a machine for exercising cats (see Figure 2). Both of these machines are sufficiently "particular" and well described to satisfy the machine test's requirements. Nevertheless, neither machine satisfies the constitutional limitation that Congress has power to cause patents to issue only to promote the progress of "useful arts." (For more information on why that provision is a limitation on granting patents and what the useful arts were when the Constitution was adopted, see my previous work.<sup>7</sup>) Neither making the punishment fit the crime nor exercising cats is within the useful arts, and granting patents on these processes or devices does not promote the progress of useful arts.

The machine test also bars some patents that it should not—some meritorious inventions might not fit within it because they do not use particular

machines. A possible example might be the (machine-less) use of canaries in coal mines to detect the presence of noxious gases ("coal damp" or "fire damp"), an important invention in making mining safer (for miners, not for canaries). A number of Neolithic inventions (for example, pressure flaking of stone tools) do not fit within the test.

By the same token, as the Supreme Court suggested in the *Benson* case (and again in *Biilski v. Kappos*), we cannot be confident that future advances in technology will not produce meritorious inventions that fail to fit within the test but nonetheless can be granted patents without preempting the underlying principle. Concerns about possible unforeseen consequences of categorical exclusions from the patent system have led the Supreme Court, also, to refuse to consider any blanket exclusion of patents on business methods or software.

A recurrent question since the *Benson* case has been whether, and in what circumstances, a claim limitation that an invention based on an abstract idea, such as a computer algorithm, is to be performed by using a general-purpose digital computer programmed in a certain way is sufficient to avoid the rule against patenting abstract ideas. Even if a programmed general-purpose computer is a

machine, is it a *particular* machine? Or just a generic machine?

### Computer implementation and “the piano roll blues”

For a time, the Federal Circuit court of appeals, the intermediate appellate court for patent appeals, insisted that any computer-implemented claimed invention is automatically patent eligible. For example, *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (*en banc*) and *In re Bernhart*, 417 F.2d 1395, 1400 (CCPA 1969) held that. This was based on the theory that a newly programmed digital computer is a new and particular machine (a “special purpose” computer) and therefore within the statutory categories of patentable subject matter. (Since 1790, the US patent statute has authorized patents to be issued on new and useful machines.<sup>8</sup>) The patent applicant made this legal argument in *Gottschalk v. Benson*, the first computer program case to reach the US Supreme Court.<sup>6</sup> The government then responded that this amounted, absurdly, to asserting that putting a new piano roll into an existing player piano transformed the old player piano into a new player piano. That gave rise to the derisive term “the piano roll blues” for the argument for per se patent eligibility of newly programmed computers. The piano roll blues argument was not successful in sustaining Benson’s claim to a computer-implemented process for conversion of binary-coded-decimal numbers to binary-coded numbers. (One claim in the *Benson* case required a computer implementation, but the Court nonetheless held it patent ineligible—a point on which the *Alice* Court later remarked.)

The piano roll blues argument never persuaded the Supreme Court, but it revived sporadically in the Federal Circuit during the Supreme Court’s long silence on patent matters after 1982 when intermediate appeals in patent cases were transferred away from the dozen-odd regional circuit courts of appeals and into the Federal Circuit. It became dominant in the Federal Circuit in the mid-1990s

with that court’s decision in the *Alappat* case, and later Federal Circuit decisions reaffirmed that ruling. The piano roll blues featured in one of the Federal Circuit opinions in the *Alice* case.<sup>9</sup> These decisions say that a new computer program converts a general-purpose digital computer (for example, a PC) into a special-purpose computer—a new *particular* machine. A few panel decisions of the Federal Circuit in recent years, however, held that mere use of a *generic computer* (that is, a conventionally programmed general-purpose digital computer) to add speed or efficiency to the performance of a method based on an otherwise abstract idea does not confer patent eligibility.<sup>10</sup> It would be fair to say that by the time of the Federal Circuit’s *Alice* decision in 2013 that court was evenly divided on whether to keep playing the piano roll blues—on whether that should furnish the test for patent eligibility of claimed inventions implemented with a computer program. The fragmentation of the appeals court through which all patent cases traveled made the outcome of patent cases unpredictably dependent on the composition of the panel of judges that happened to hear the case.

### The claimed invention in the *Alice* case

The patent at issue uses a computer system as an intermediary between two parties to an agreement. The intermediary computer system creates account ledgers (called “shadow” credit and debit records) that mirror the account balances of the parties at their respective banks. The intermediary constantly updates the shadow records as transactions occur, in order to allow only those bank transactions for which the shadow records indicate that parties still have “sufficient resources to satisfy their mutual obligations.” At the end of each day, the intermediary instructs the relevant banks to carry out permissible transactions in accordance with the updated shadow records. This mitigates the risk that only one party will perform the

agreed-upon exchange while the other defaults. The arrangement is thus akin to a computerized escrow or hold on a checking account.

The patent claims in the *Alice* case are of three types:

- the method just described, as carried out with a computer system;
- a computer system configured to carry out the method; and
- a computer-readable medium containing computer program code for performing the method.

The software and hardware used to implement the claimed invention are conventional and routine.

### The Federal Circuit’s decision in the *Alice* case

By the time the *Alice* case got to the Federal Circuit, that court’s decisions were sufficiently inconsistent, and the membership of that court so badly fragmented over the issue of patent eligibility of computer implementations, that the court decided to consider the following question in a hearing *en banc* (see the “*En Banc*” sidebar):

What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible abstract idea; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?<sup>11</sup>

The *en banc* hearing in the Federal Circuit resulted in an equally divided court on the validity of the system claims of *Alice*’s patent, and highly fragmented analyses rejecting the method and media claims. Half the court accepted the piano roll blues argument and found *Alice*’s system patent eligible. The other half recognized that the system claims described a machine—a computer—but rejected the piano roll blues argument that this was sufficient to confer patent eligibility:

A particular computer system, composed of wires, plastic, and silicon, is no doubt a tangible machine. But that is not the question. The

## En Banc

Hearing a case *en banc* means that all active judges who are members of the court sit together to hear and decide the case. At the time of the *Alice* case, there were 10 such judges on the Federal Circuit. A court's

*en banc* opinion becomes a binding precedent for the court from then on, unless and until overturned by a subsequent *en banc* opinion of the court, a decision of the Supreme Court, or a statute.

question we must consider is whether a patent claim that ostensibly describes such a system on its face represents something more than an abstract idea in legal substance. ... [M]erely adding existing computer technology to abstract ideas ... does not as a matter of substance convert an abstract idea into a machine. ... Abstract methods do not become patent-eligible machines by being clothed in computer language.<sup>12</sup>

That brought the case to the Supreme Court.

In the end, neither the Federal Circuit nor the Supreme Court gave a definitive answer to the important question that the Federal Circuit posed for *en banc* consideration. Nevertheless, the Supreme Court unanimously suggested some outer boundaries beyond which patents could not be had on computer-implemented abstract ideas.<sup>1</sup> To the extent that the Supreme Court's opinion lays down guidelines determining the patent eligibility of business-method patents, the guidelines do so only indirectly, because a majority of the Court refused to address the patent eligibility of business methods as such. Yet, because of their typical abstractness, and because of the legal analysis that the Court prescribed for implementations of abstract ideas, business-method patents now seem like lemmings marching in the thousands toward oblivion. That is not equally so for all software patents, of which business-method patents are a major subset. The Court left some room for non-business-method software patents.

### Recent Supreme Court case-law: the background of *Alice*

In the several years preceding the *Alice* decision, the Supreme Court

decided three cases in which the issue was whether a claimed invention was patent eligible. In *Bilski*, the Court held that a method for hedging commodity prices was ineligible.<sup>13</sup> A five-Justice majority held that the claimed method was ineligible because it was an abstract idea, and declined to rule that business methods were all ineligible. The other four Justices agreed that *Bilski*'s claimed method was an abstract idea, but they would have grounded ineligibility on the claimed method's being a business method, a category of subject matter they considered wholly outside the US patent system. (For a discussion of the case and the contrasting views of different members of the Court, see my previous work.<sup>14</sup>) The *Bilski* Court offered scant guidance on how to determine whether a patent claim preemptively covered an abstract idea—that is, was “too abstract.” On the other hand, although there was sharp disagreement over what was the best ground on which to decide the case, and a narrow opinion, all Justices agreed that *Bilski* sought impermissibly to patent an abstract idea.

Next, in *Mayo*, the Court invalidated a patent on a medical assay claimed so broadly that it preemptively covered the underlying natural principle or law of nature on which the test was based.<sup>15</sup> The assay was based on the natural principle that the correct dosage amount of a certain drug was correlated with the blood level of a drug metabolite. In contrast to the *Bilski* opinion, *Mayo* more ambitiously attempted to harmonize the whole body of law in the field—from *Neilson v. Harford*<sup>16</sup> and *O'Reilly v. Morse*<sup>2</sup> in the 19th century through *Ben-son*,<sup>6</sup> *Flook*,<sup>17</sup> and *Diehr*<sup>18</sup> in the late 20th century to the present.<sup>19</sup> In a very key

passage in the *Mayo* opinion, the Court explained:

[A] process that focuses upon the use of a natural law [must] also contain other elements or a combination of elements, sometimes referred to as an “inventive concept,” sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself.<sup>20</sup>

In other words, the implementation could not be trivial or conventional—it had to be sufficiently creative that it added something of substance to the natural law.

The reason for this requirement is that an insubstantial, uncreative addition to the natural law would be ineffectual to limit the patent from preempting the natural law; it would effectively leave the patent one on the natural law, or its use, in itself. In the *Mayo* case, for example, once a person knew the correlation between the metabolite's blood level and its medical significance, the claimed assay implementing that natural principle was trivially different from a mere restatement of the principle itself. The patent claim was scarcely more than a directive “apply the principle.” The patent therefore effectively claimed the underlying principle, because there was no way to use the principle without infringing the patent.

At the time, some thought this rule was meant to apply only to patents involving a law of nature, and not to abstract-idea and software patents as well. Yet, the case from which *Mayo* took that legal principle was *Flook*, which declared the rule in denying patent eligibility to an implementation of a mathematical algorithm. The algorithm in that case provided a method of smoothing observed data points to

establish the contour of an underlying trend in the data (specifically, in order to detect an imminent runaway condition in a chemical reactor). Even assuming the algorithm's novelty, however, the implementation in *Flook* was conventional or routine, and therefore the claim was patent ineligible. That *Mayo* took this legal principle from the *Flook* case should have telegraphed that the rule was one of general applicability to patent-eligibility cases. *Alice* confirmed that message.

A year after *Mayo*, the Court decided the *Myriad* case.<sup>21</sup> Here, the issue was whether what was said to be a "product of nature" could be patented. The narrow holding was that DNA was not subject to patenting, but cDNA was. DNA is isolated from its underlying natural material by such conventional and trivial means that once a gene's location on the chromosome is learned, it is effectively a natural product even though not found in nature in its isolated form. But cDNA, which is DNA minus sections of useless material called *introns*, must be derived by more complex means; it is deemed not a product already found in nature. The point of more general interest in the *Myriad* case, however, was that the Court equated laws of nature, natural phenomena, and abstract ideas to the products of nature at issue—so that the same legal rule applied to the patent eligibility of all of them—although the opinion slurs over this point without explanation. Still, this is another hint of what became in the *Alice* case (or already was) an explicit unification of patent-eligibility law for laws of nature, abstract ideas, principles, and products of nature.<sup>22</sup> A central, unifying feature of the legal analysis in *Myriad*, as in

*Mayo*, was that conventional or trivial expedients earned no weight in a patent-eligibility analysis.

Part 2 of this Micro Law column will describe the Supreme Court's *Alice* decision, along with the reaction to it in industry and what appears to be its consequences for software patents in general and business-method patents in particular.

MICRO

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