Court Broadens Rules on Patenting Software

The Supreme Court says computer programs are patentable as part of a new process; the ruling may cause confusion

In 1978 the Supreme Court ruled that mathematical formulas and computer programs cannot be patented, and most observers thought that a long-standing dispute had finally been settled. But last week the Court seemed to have second thoughts. It decided, by a vote of 5 to 4, that an industrial process based on the use of a computer may be eligible for a patent even if the computer program is the only new step in the process.

Patent lawyers were still digesting the decision last week, and there is some confusion about its impact. But some experts have suggested that the ruling could permit companies to patent software by defining a new program as part of a novel application, such as automating an industrial process or computerizing office records.

Spokesmen for the burgeoning computer software industry have greeted the ruling with enthusiasm. "For the first time," says Jerome Dreyer of the Association of Data Processing Service Organizations, "the Supreme Court has recognized that software is more than just an idea." The Patent Office is less pleased. It has long resisted the notion that software is eligible for patent protection, and it has generally turned down inventions that are based on the use of computers to control processes in factories and offices. Such applications, it contends, often seek to patent the computer program.

Although the Supreme Court ruling does not extend the patent laws to cover all computer programs, it will affect the way the Patent Office deals with many computer-related inventions. Some 3000 such applications are now stalled in the Patent Office or in the courts.

The Supreme Court's action came in a case that has been wending its way through the legal system for more than 5 years. It involves a process for curing synthetic rubber inside a molding machine. Precision-molded rubber parts are usually made by heating uncured rubber in a press until sufficient time has elapsed for the rubber to harden. The curing time is calculated by an equation formulated a half-century ago by Svante Arrhenius, a Swedish chemist. It requires knowledge of the temperature inside the press. A major problem, however, is that the temperature varies when the press is opened and closed, and thus the curing time cannot be calculated precisely. This can result in undercured or overcured products.

Two scientists working for the Detroit-based Federal-Mogul Corporation, James Diehr II and Theodore Lutton, solved the problem by constantly measuring the temperature inside the press with thermocouples and feeding the information into a computer. The curing time is repeatedly recalculated with the Arrhenius equation, and the press is opened automatically when the computer signals that sufficient time has elapsed.

It is a clever invention. Federal-Mogul officials say that it has boosted productivity in the manufacture of oil seals by about 40 percent and that it has improved the quality of the products. But the Patent Office rejected a patent application for the process on the grounds that the only really novel thing about it is the use of a computer for repeated calculation of the curing time. If a patent were granted, the Patent Office argued, it would mean in effect that the computer program would be patented under the guise of being part of a larger process.

The Court of Customs and Patent Appeals, which has long feuded with the Patent Office over the interpretation of the rules governing computer-related inventions, overturned the ruling, and the case ended up in the Supreme Court.

The majority opinion, written by Justice William H. Rehnquist, stated that although a "mathematical formula, like a law of nature, cannot be the subject of a patent," a patent application cannot be denied "simply because it uses a mathematical formula, computer program, or digital computer." The Patent Office, wrote Rehnquist, should look at claims as a whole and decide whether the entire process comes under the scope of the patent laws. In other words, the office should stop breaking down patent applications into parts and throwing them out if the use of a computer is the only new part of the invention. Diehr and Lutton "do not seek to patent a mathematical formula, but instead seek protection for a process of curing synthetic rubber," said Rehnquist, and he directed the Patent Office to take a new look at the application in that light. (The patent could still be denied if the Patent Office determines that the entire process does not accomplish anything new.)

Rehnquist's reasoning failed to convince four of his colleagues. In a withering dissent, written by Justice John Paul Stevens, the minority argued that the Court's decision rests on a "misreading" of the patent application. "Diehr and Lutton do not claim to have discovered anything new about the process for curing synthetic rubber," wrote Stevens. They simply claim, he said, "to have developed a new method of programming a digital computer in order to calculate—promptly and repeatedly—the correct curing time in a familiar process."

The Court had already denied a patent, in a 1978 case known as *Parker* v. *Flook*, for the use of a computer to calculate the "alarm" point at which a petroleum refining process should be shut down or modified. The majority's opinion in the Diehr and Lutton case "trivializes" that earlier decision, said Stevens, who happens to have written the majority opinion in *Parker* v. *Flook*.

Stevens wrote that the Court's new decision "will aggravate" the current confused situation in which "a conscientious patent lawyer" cannot determine "with a fair degree of accuracy which, if any, program-related inventions will be patentable."

The confusion is compounded by the Court's ruling in a second patent case, involving a method developed by Honeywell Systems, Inc., for storing and retrieving information in a computer. Chief Justice Warren E. Burger did not participate in the Honeywell decision, and the justices were deadlocked. In a one-line decision, published without explanation on 9 March, the Court simply said that the invention was patentable. The lack of reasoning to support the decision will make it difficult for the Patent Office to use it as the basis for judging future program-related patent cases.

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Although both decisions broaden the rules for patenting inventions based on the use of computers, the computer software industry is unlikely to rush to claim patent protection for its wares. Although industry spokesmen have long maintained that patent protection is essential to encourage innovation in programming, software companies have been doing very nicely without such protection. Software sales in the United States now amount to about $2 billion a year, and some analysts have forecast that they will reach $8 billion by 1985.

In the absence of patent protection, companies have relied primarily on trade secrecy to guard against unauthorized use of their products. Bruce Coleman, vice president of Informatics, a California-based software firm, says he expects that reliance to continue, because "trade secrecy is the most effective mechanism we have to protect software." In theory, some programs are already eligible for copyright protection, but Coleman notes that applications for both copyright and patents require disclosure of information. This, he argues, would foreclose the use of trade secrecy, and companies would be unwilling to file a claim unless they were reasonably certain it would be granted.

Given the confusion concerning the patentability of computer-related inventions, it would be difficult to predict the outcome of most patent claims based on computer software. Justice Stevens suggests that the only way to clear up the confusion would be "an unequivocal holding that no program-related invention is patentable . . . unless it makes a contribution to the art that is not dependent entirely on the use of a computer." But the Court last week averred the opposite.

Eventually, some suggest, Congress will have to step in to clear up the confusion by bringing the patent laws into the electronic age.

—COLIN NORMAN

The Fight Over Clean Air Begins

The outcome of a clash in Congress will affect autos, synfuels, utilities, and the steel industry, to list just a few

Congress has begun to consider major changes to the national Clean Air Act, launching what promises to be the most significant environmental struggle of the year. On the table are amendments that will affect virtually every industrial decision in the nation involving production, expansion, and relocation.

Business and environmental groups each have long agendas for the discussion, to be taken up initially by the full Senate Committee on Environment and Public Works, chaired by Robert Stafford (R–Vt.), and the House subcommittee on health and the environment, chaired by Henry Waxman (D–Calif.). Stafford says he expects the act's reauthorization to require at least 5 months, although as long as 2 years might be necessary "if interest groups seek to change the fundamental character of the law."

Stafford believes the law requires "only refinement and fine tuning," a view apparently shared by other congressmen who will figure prominently in the debate. Representative John Dingell (D–Mich.) and Senator John Chafee (R–R.I.), for example, both say they favor changes that will reduce the act's complexity, while preserving its overall goals. But the clash of regional interests, heightened by increasing concern about industrial performance and energy production, could result in some extreme proposals. Waxman has already warned of "some proposals which in the name of 'fine tuning' would actually gut the Clean Air Act. These must be resisted."

While no business group has openly avowed such a goal, there is no doubt that most would like to see many of the provisions in the act loosened and some of them eliminated entirely. Groups such as the Business Roundtable (of the top 100 corporations), the Chemical Manufacturers Association, the National Coal Association, the Edison Electric Institute, the Motor Vehicle Manufacturers Association, and dozens of other trade groups have been mobilizing for some time.

These groups claim that the act stifles industrial growth, constrains productivity, and bars the development of new energy sources by banning either new construction in polluted areas or expansion in areas that already have clean air. A group of construction unions and oil and chemical firms has hired John Quarles, a former deputy administrator at the Environmental Protection Agency (EPA), to coordinate their lobbying effort. Quarles' agenda for reform includes the elimination of strict rules against air quality deterioration in areas considerably cleaner than the national goal, more flexible deadlines for attainment of the air quality goals, and the loosening of rules against new construction in areas where the goals have not been met.

On the other side of the issue, environmentalists have been organizing with equal vigor. Five national groups have combined to defend the act under the rubric of the Clean Air Coalition. One of the groups, the Natural Resources Defense Council (NRDC), has recently hired David Hawkins, who was EPA administrator for clean air during the Carter Administration, to do some of its lobbying. Hawkins' agenda includes the preservation of most of the existing clean air requirements, the streamlining of EPA review for new construction permits, and the enactment of stricter controls on hazardous pollutants and chemical precursors of acid rain.

Congressional sources say that debate will ultimately center on the recommendations of the Reagan Administration, which are expected in late spring. The Administration has already drawn fire from environmentalists by proposing to limit a requirement that firms in highly polluted areas install expensive pollution control equipment. The change, announced on 9 March, is intended primarily to benefit the automotive and petroleum industries. Because the change involves only a reinterpretation of existing EPA rules, it is not subject to congressional approval.

Until more of the Administration's proposals are known, the major topic of discussion will be the recent report of the National Commission on Air Quality, which was established by Congress when it last revised the act in 1977. The commission, composed of four congress-

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