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J.D. Roberts

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PRESIDENTS AND MUMMIES AND PATENTS, OH MY: WHY PATENTING SPECIAL EFFECTS TECHNOLOGY IS LIKE A BOX OF CHOCOLATES, YOU NEVER KNOW WHAT YOU’RE GOING TO GET

J.D. ROBERTS*

I. INTRODUCTION

In the summer of 1994, when most moviegoers came out of Forrest Gump delighted, Richard Bloomstein came out dismayed.1 When Forrest Gump interacted with real-life people like John F. Kennedy and John Lennon, their lip movements were altered so that they spoke dialogue that fit in with the story of the film and not what they had originally said. This was done by a special effect “technique” similar to one for which Bloomstein held two patents. Later, while watching the program “Movie Magic,” which explained how the effects were done, Bloomstein said, “I was seeing . . . a demonstration of everything in [my own patent] on television.”2 Bloomstein filed suit for patent infringement against Paramount Pictures, the studio that produced Forrest Gump.3

It seemed like a simple enough case. Bloomstein already held the patents.4 He had taken the inventive step of noticing a problem to be solved and developing a process to overcome it. A computer-generated special effect if done properly can be seamless, so much so that audience members do not realize that they are watching a special effect.5 Complex computer technology lies behind that seamless end. Because of the complexity of what is required to produce a computer-generated special effect, this simple dispute requires an analysis of almost every area of patent law before arriving

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* Student-at-Law, Merchant Law Group, Regina, Saskatchewan, Canada. University of Saskatchewan, B.A.; University of Saskatchewan, LL.B.


2. Id.


4. See id. Bloomstein had been issued U.S. Patent No. 4,600,281 and U.S. Patent No. 4,827,532. See id.

5. See Bloomstein, 1998 LEXIS 20839, at *5 ([T]he fictional title character appears to be conversing with actual images of former presidents John Kennedy, Lyndon Johnson, and Richard Nixon as well as with musician John Lennon.).
at a solution. The definitions of process, manufacture and composition of matter, the patentability of computer software, the printed matter doctrine, the history of patenting film and film related matters, and even the patenting of life all play a role in determining whether special effects technologies deserve protection.

There are two issues to be addressed regarding patenting special effects. The first is whether a patent is obtainable for a process of producing special effects. The second is whether a patent can be obtained in the resulting film. This Article will examine the case law in the United States, where the majority of special effects originate, and Canada, where an increasing number of American films are being produced. The analysis concludes that processes involving computer technology are patentable both in the U.S. and Canada, but patent claims in the resulting film itself are not likely to be permitted under the current law. The Article will then examine the history of patenting films and the increasing liberalization of patent requirements in the area of patenting of life, and it concludes that the bar on patenting films is based on misunderstandings and outdated law. For the purposes of this analysis, the two Bloomstein patents will be used to show just why they are or are not patentable.

II. THE BLOOMSTEIN PATENT AND THE COURTS

A. The Claims

Bloomstein obtained two patents for his system: U.S. Patent No. 4,600,281 (hereinafter the '281 patent) and U.S. Patent No. 4,827,532 (hereinafter the '532 patent). The litigation surrounding the '532 patent is the only time that the patentability of a cinematic work has ever come before the courts. As Judge Patel of the District Court of the Northern District of California noted in her judgment, both of these patents are essentially the same. For purposes that will become apparent later, it is important to explain what Bloomstein’s two patents claim and how they differ.

Regarding Bloomstein’s first patent, Claim 1 of the '281 patent, which is representative of the entire patent, claims a patent in a method of altering a cinematic work by substituting a second animated facial display for a first display. Both displays exhibit lip movements that are sufficiently different to constitute different languages. This method consists of three parts. The first involves generating data in digital form that represents the second facial display over different cinematic frames. The second is the same method of
digital data for the first facial display. The third involves using both sets of data in a "programmed digital computer" so that the first facial display can be altered into the second.

Regarding Bloomstein's second patent, Claim 1 of the '532 patent claims a patent in "a cinematic work having an altered facial display" that is made in accordance with a process that is described using the same words as Claim 1 of the '281 patent.

B. Patentability of Special Effects as Computer Software

1. How are Special Effects Done?

Most computer-generated special effects are achieved through animation. There are two methods of animation: key frame animation, which involves drawing the principal frames of the animation onto the computer and then using the computer to alter them; and performance animation, which uses live actors covered with data-generating sensors. Both of Bloomstein's patents use key frame animation. To explore this topic more fully, one must first introduce an example of performance animation.

In the movie The Mummy, performance animation was used to bring lifelike human movement to Imhotep, a mummy brought back from the dead, during the stages in which Imhotep had not yet acquired human form. The special effects technicians had Arnold Vosloo, the actor playing the Imhotep character, wear a suit with sensors that picked up the movements of him walking and transformed them into data on a computer. At that point the computer had an electronic mock-up of Vosloo's skeleton walking. Animation was then applied over that electronic skeleton to give the effect of a walking human body that had been decomposed for thousands of years. For the purposes of this Article, this animation method will be referred to as the "Mummy patent."

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6. Mikael Havlucyan, Patents Come to the Rescue of Special Effects: Why Patents are an Essential Element in the Protection of Computer-Generated Special Effects, 18 Loy. L.A. Ent. L.J. 101, 104 (1997). Key frame animation is produced via a five-step process, which greatly reduces animation time. See id. at 105-06. The newer performance animation is even less expensive and faster than key frame animation. See id. at 106-07.
7. The Mummy (Universal Studios 1999).
9. See id. (revealing process of creating skeleton, muscle structure and virtual flesh on computer and use of software to reconstruct actor's motions in three dimensions).
10. See id. (demonstrating how graphic artists enhanced computer model, which was replicating human motion).
2. History of the Patentability of Computer Technology in the United States

The issue of what is patentable subject matter is answered by 35 U.S.C. § 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.

The history of patenting computer technology was outlined by Justice Stevens in *Diamond v. Diehr*. This history is useful to understand the underlying reasons that computer software had been denied patent protection and to compare *Diehr* with Canadian cases.

In 1965, concern regarding the patent system's ability to deal with rapidly changing technology led to the formation of the President's Commission on the Patent System. The Commission recommended that computer programs be excluded from patent protection because the Patent Office would be unable to deal with the administrative burden of examining the flood of patent applications that would follow if computer programs were allowed protection. This same concern can be seen in the three major cases in this area, *Gottschalk v. Benson*, *Parker v. Flook*, and *Diamond v. Diehr*. Justice Stevens in *Diehr* pointed out that *Gottschalk*... *Parker*, and *Diamond* were not ordinary litigants – each was serving as Commissioner of Patents and Trademarks when he opposed the availability of patent protection for a program-related invention. No doubt each may have been motivated by a concern about the ability of the Patent Office to process effectively the flood

11. 450 U.S. 175, 194-205 (1981) (determining whether process for curing rubber, which includes mathematical formula and programmed digital computer, is patentable).
12. See id. at 197. Prior to 1968, the mental-steps doctrine would have prevented patenting a computer program because a patent could not be justified where the sole novel element or inventive contribution was a mental operation or mathematical computation. See id. at 195. Mere functions of machines were also considered unpatentable. See id. at 196.
13. See id. at 197. Almost concurrently, the Patent Office proposed guidelines that would make computer programs unpatentable. See id.
of applications that would flow from a decision that computer programs are patentable.\textsuperscript{16}

Justice Stevens also noted that the Court of Customs and Patent Appeals ("C.C.P.A.") did not share these concerns. It reversed the Board of Appeals of the Patent and Trademark Office decisions not to grant patents, and then it, too, was reversed by the United States Supreme Court in each case except \textit{Diehr}.\textsuperscript{17} The wavering on this issue was criticized because the cases did "not establish rules that enable[d] a conscientious patent lawyer to determine with a fair degree of accuracy which, if any, program-related inventions [would] be patentable."\textsuperscript{18}

\textit{Gottschalk v. Benson} involved a method for converting numerical information from binary-coded decimal numbers into pure binary numbers for use in programming a conventional computer.\textsuperscript{19} The Patent Office rejected the application for its patent, but the C.C.P.A. upheld it as patentable subject matter.\textsuperscript{20} The United States Supreme Court, in an unanimous decision, reversed the C.C.P.A.; the Court found that the method was not a "process" because it amounted to an attempt to patent nothing more than an abstract idea.\textsuperscript{21}

In \textit{Parker v. Flook}, the differences in opinion that existed between the Patent Office and the C.C.P.A. also began to divide the Supreme Court. Three justices, namely Chief Justice Burger and Justices Rehnquist and Stewart, took the C.C.P.A.'s position while four justices, namely Justices Stevens, Blackmun, Brennan and Marshall, agreed with the Patent Office's position. Justices White and Powell represented the swing votes. The invention in \textit{Parker} was a method for updating alarm limits during catalytic conversion processes, but its only novel feature was a mathematical formula.\textsuperscript{22} Again the Patent Office determined that this invention was not patentable. The C.C.P.A. found that it was patentable, but the majority

\begin{footnotes}
\item[16.] \textit{Diehr}, 450 U.S. at 218. For a discussion of the President’s Commission on the Patent System, see supra note 13 and accompanying text.
\item[17.] See \textit{id.} (noting that Court of Customs and Patent Appeals changed its position in 1968).
\item[18.] \textit{Id.} at 219. Justice Stevens found that this criticism would be most adversely affected by the majority’s decision. See \textit{id}.
\item[19.] See \textit{Gottschalk v. Benson}, 409 U.S. 63, 64 (1972). The claims were broad and included use of the method in any type of general purpose digital computer. See \textit{id}.
\item[20.] See \textit{id}.
\item[21.] See \textit{id.} at 71-73 (stating that practical effect of patent would be patent on idea of algorithm itself).
\end{footnotes}
of the Court held it was not. The issue in *Parker* was whether a claimed process loses its status as "patentable subject matter" if one step considered in isolation would not be patentable subject matter. Justice Stevens for the majority held that because the steps in the process were already known, the invention was not patentable subject matter under 35 U.S.C. § 101. Justice Stewart, in a strong dissent in which the then Chief Justice Burger and current Chief Justice Rehnquist concurred, agreed with the C.C.P.A. The Court determined that *Benson* did not apply to this case because the solution of the algorithm would not amount to an infringement. Justice Stewart answered the question at issue by saying that thousands of patented processes contained one or more steps that would have been patentable subject matter on their own. He further stated that the majority "[struck] what seems ... to be an equally damaging blow [as turning its back on the precedents that say it does not offend § 101 to have a patent in a process that includes one unpatentable step] at the basic principles of patent law by importing into its inquiry under 35 U.S.C. § 101 the criteria of novelty and inventiveness. Section 101 is concerned only with subject-matter patentability."

*Diamond v. Diehr* involved a process for curing synthetic rubber that used a mathematical formula and a programmed digital computer. Justice Rehnquist, writing the opinion, held that this was patentable subject matter under § 101, and it was irrelevant that a mathematical equation was used because no attempt was made to preempt others from using that equation; the only prohibition was in using the equation in conjunction with the other steps in the process. Further, the use of a computer did not render the process unpatentable because the computer was used to achieve a result previously unknown in the art. In dissent, Justice Stevens

23. See id. at 587-88 (identifying how courts differed in their interpretations of *Gottschalk* holding).
24. See id. at 585 (considering whether applications of formula are patentable).
25. See id. at 594-95.
26. See id. at 599-600 (explaining *Gottschalk's* inapplicability).
27. See *Parker*, 437 U.S. at 599.
28. See id. at 599-600 (citing Eibel Process Co. v. Minn. & Ont. Paper Co., 261 U.S. 45 (1923) and Tilghman v. Proctor, 102 U.S. 707 (1800)).
29. Id. at 600 (limiting holding to subject-matter patentability).
30. *Diamond v. Diehr*, 450 U.S. 175, 187 (1981) (clarifying that patent only seeks to prevent others from using mathematical formula in conjunction with all of other steps in process).
31. Id. (explaining that precedent does not dictate that any patent including computer program will be held invalid).
stated that a computer program-related invention is unpatentable unless it makes a contribution to the art that is not dependent entirely on the use of a computer.32

The next significant case after Diehr is In Re Warmerdam.33 In rejecting the inventor's claim, Judge Plager rejected the old test that a computer program is unpatentable if it is no more than a mathematical algorithm:

The difficulty is that there is no clear agreement as to what is a "mathematical algorithm," which makes rather dicey the determination of whether the claim as a whole is no more than that . . . . An alternative to creating these arbitrary definitional terms . . . may lie simply in returning to the language of the statute and the Supreme Court's basic principles . . . .34

Thus, the standard under § 101 became less and less strict. In In Re Beauregard,35 the Patent Appeal Board initially rejected Beauregard's computer program product claims on the basis of the printed matter doctrine. During the appeals process, the Commissioner and the Board withdrew their oppositions stating that, "computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101." The Commissioner also agreed that the printed matter doctrine was not applicable. This effectively overturned the majority opinions in Benson and Flook.

While Warmerdam held that the mathematical algorithm test was no longer the way to decide this issue, the Federal Circuit Court of Appeals went further in State Street Bank & Trust Co. v. Signature Financial Group Inc.,36 which appears to hold that mathematical algorithms are patentable subject matter under § 101.37 The invention involved in State Street was a data processing system that

32. Id. at 219-20 (contending that computer must accomplish more than merely what was being done before).

33. 33 F.3d 1354 (Fed. Cir. 1994) (considering whether method and apparatus for controlling motions of objects and machines to avoid collision had requisite statutory subject matter).

34. Id. at 1359 (explaining shortcoming of Freeman-Walter-Abear test, which first determines whether mathematical algorithm is recited directly or indirectly, and then determines whether invention is merely algorithm).

35. 53 F.3d 1583 (Fed. Cir. 1995). For a discussion of the printed matter doctrine, see infra notes 131-45 and accompanying text.

36. 149 F.3d 1368 (Fed. Cir. 1998).

37. See id. at 1373 (clarifying that to be patentable, algorithms must be applied in useful way); see also 35 U.S.C. § 101 (1984).
recorded a financial information flow and made calculations necessary for maintaining a partner services fund. It allowed several mutual funds to pool their investments into a single portfolio, which consolidated the costs of administering the funds combined with the flow-through taxation advantages of partnership. Judge Rich held that an algorithm is patentable subject matter if it is applied in a useful way. Unlike the other cases in this area, State Street did not involve a patent application that was denied. Rather, the matter came to court because State Street Bank was negotiating with the patent holder for a license; it was only when negotiations broke down that State Street Bank claimed the patent was invalid. The fact that State Street Bank wanted to use this method was clear evidence that it was commercially useful, and this appears to have influenced greatly Judge Rich's judgment that, "the essential characteristics of the subject matter [are], in particular, its practical utility . . . . This renders it statutory subject matter even if the useful result is expressed in numbers . . . ." The result may have been different had this been an appeal from a decision by the Patent Appeal Board and had there been no clear evidence of utility. Nevertheless, it represents clear recognition by the courts that computer-related patents have come a long way and are, in most cases, now clearly statutory subject matter under § 101.

3. Examination Guidelines for Computer-Related Inventions

In 1996, the United States Patent and Trademark Office published the Examination Guidelines for Computer-Related Inventions, which outlines the steps that Office personnel should follow when considering an application for a computer-related patent. The

38. See State Street, 149 F.3d at 1371 (noting that system was developed for Signature's business).
39. Id. (explaining that system determines daily changes quickly and accurately, and this is essential to meeting business demands).
40. See id. at 1373. Judge Rich explained that for an algorithm to be applied in a useful way meant either that the result would produce a useful, concrete and tangible result or the result would correspond to a useful, concrete or tangible thing. See id.
41. See id. at 1370 (relating that State Street was negotiating for license to use patented system, and then filed action asserting patent's invalidity).
42. See id. at 1375 (rejecting business method exception and finding that system was patentable subject matter). Under the business method exception, patents that relate to doing business are denied. See id.
44. See id. at 7478-479 (explaining that Guidelines assist examiners in analyzing subject matter for compliance with substantive law).
Guidelines state that they “are based on the Office’s current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit’s predecessor courts[,] but the Guidelines do not have the force and effect of law.”45 In Bloomstein v. Paramount Pictures Corp., 46 Judge Patel recognized that they had no force of law, but he nonetheless found “them instructive on this issue.” Therefore, following the procedure set out in the Guidelines likely gives a good indication of the patentability of special effects technology because the Office is the first hurdle an invention must get over to obtain a patent.47

The first step under the Guidelines is to determine what “the applicant has invented and is seeking to patent, and how the claims relate to and define that invention.”48 Under this step, the Guidelines adopt the Warmerdam/Diehr approach and look at the claim as a whole to identify whether the invention has any “real world value.”49 Both the '281 patent and the Mummy patent would pass this requirement. Bloomstein believed that subtitles in foreign films were distracting, and he invented this process so that a film in another language could be dubbed into English and the foreign actors’ lips would move as if English were being spoken.50 This invention would have a use in the real world. The Mummy patent is also useful. Without it, it would be impossible to have an animation that would replicate human movement. Instead, the filmmakers would have to use a person dressed up in bandages as they did in

45. See id. at 7479 (clarifying that Guidelines are not law, but merely assist Patent and Trademark Office personnel in analyzing patent applications).


47. Because this Article is concerned with the issue of the patentability of special effects technology in general, the steps in the Guidelines regarding prior art and disclosure requirements will not be discussed because, for the purposes of this Article, it is assumed that these patents are the first of their kind.

48. Guidelines, 61 Fed. Reg. at 7479 (explaining that review of complete application will be performed, rather than simply initial determination of whether it simply recites mathematical algorithm).

49. Id. at 7479-480 (specifically rejecting claims for inventions which are merely idea or concept or which are starting point for further research). “An invention that has a practical application in the technological arts satisfies the utility requirement.” Id. at 7479. In determining what has been invented, the Patent and Trademark Office will rely heavily on the information the inventor provides; therefore the Guidelines should be consulted prior to filing the application. See id. at 7480.

50. Martinez, supra note 1, at 5.
the older mummy movies that were made before computer-related technologies were used.\textsuperscript{51}

The Office then reviews the claims. The\textit{ Guidelines} state, "Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims. An applicant is entitled to be his or her own lexicographer . . . ."\textsuperscript{52} The practical significance of this passage is illustrated by what happened to the '281 patent. Because Bloomstein never anticipated that his invention would be used to change lip movements from English into English, the court found that there was no infringement. Havluciyian, the only other commentator on this issue, writing before this came to trial, stated that the '281 patent was "an excellent illustration of the scope of [a patent] dealing with computer animation. Bloomstein's patent would be stronger . . . if it was not limited to changing facial expressions to fit the words of a different language."\textsuperscript{53} The lesson here is that while the law may allow special effects technology to be patented, the drafting of the claim is still very important. The\textit{ Guidelines} will hold the applicant to what is written in the claim. If the invention is not defined properly, infringement will not be able to be stopped. Havluciyian suggests, "Bloomstein might have drafted a claim that read: 'a method of altering facial displays utilizing electronic technology.' Such a claim . . . illustrates the potential magnitude a patent can provide."\textsuperscript{54}

The patent must comply with 35 U.S.C. § 101. The\textit{ Guidelines} were formulated around the time of\textit{ Warmerdam}, so their interpretation of the text of § 101 relates that to get a patent, the inventor must have a machine, manufacture, composition of material, or a process.\textsuperscript{55} In line with this limitation, the\textit{ Guidelines} state that the claimed invention must be classified into one or more statutory or

\textsuperscript{51} See\textit{ Building a Better Mummy}, THE MUMMY (Universal Studios 1999, DVD Collector's Edition) (explaining how computer generation was used specifically to avoid actors being wrapped in bandages).

\textsuperscript{52}\textit{ Guidelines}, 61 Fed. Reg. at 7480 (any definition provided will be applied throughout application, but in absence of specific definition, common meaning of term will apply).

\textsuperscript{53} Havluciyian,\textit{ supra} note 6, at 113 (explaining that Bloomstein's patent specifically stated that it applied to making changes in mouth and facial expressions to accommodate different languages).

\textsuperscript{54} Id. (explaining advantage of process patents is that if patent is broad, processes may still infringe even if they use other kinds of machines or subsequent technology).

non-statutory categories.\textsuperscript{56} There are two statutory categories in which an invention could fall: it could be either a statutory product claim or a statutory process claim.

The \textit{Guidelines} define a product claim as, "a claim defin[ing] a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination."\textsuperscript{57} Bloomstein's '281 patent clearly does not fall within this definition, however the \textit{Mummy} patent might. Because the \textit{Mummy} patent involves the sensors that were placed on the actor's body to capture the movements and send them back to the computer, these sensors amount to a useful machine.\textsuperscript{58} However, the \textit{Guidelines} break down product claims into two categories. The first is for a claim that encompasses machines that cause a computer to perform an underlying process, and the second is for a claim that defines a specific machine or manufacture.\textsuperscript{59} The inventor in the \textit{Mummy} situation might be entitled to the second type of a product patent because of the invention of the sensors. However, the \textit{Guidelines} state that a claim will fall into the first category if it defines the physical characteristics of a computer component (like the sensor) exclusively as functions to be performed by the computer and that encompasses every product configured in a way to perform that process.\textsuperscript{60} If this turns out to be the case, then the claim must be examined on whether the process is statutory, and the claim would not be a product claim at all.\textsuperscript{61} This is not a negative thing; in fact, it provides greater protection than a product claim would. To illustrate this point, Havluciyian gave an example similar to the \textit{Mummy} patent of a dancer wearing a data suit with motion sensors that make an animated figure inside a computer move as he or she moves and concluded that a process patent "can protect the entire process . . . including the data suits,\textsuperscript{56} Id. (clarifying that classification in either category is simply initial finding, which will be further examined for statutory compliance); \textit{see also} 35 U.S.C. §§ 102, 103, 112 (1984).

\textsuperscript{57} \textit{Guidelines}, 61 Fed. Reg. at 7482 (defining statutory process claims and giving examples).

\textsuperscript{58} \textit{See Building a Better Mummy, THE MUMMY} (Universal Studios 1999, DVD Collector's Edition) (demonstrating how markers on actor were utilized).

\textsuperscript{59} \textit{Guidelines}, 61 Fed. Reg. at 7482 (explaining that claims in second category are statutory, while claims in first category require analysis of underlying process).

\textsuperscript{60} \textit{See id.} (explaining that existence of hardware element does not automatically place claim in second category).

\textsuperscript{61} \textit{See id.} at 7482-483 (explaining how classification of underlying process will affect classification of product claim).
other hardware, and software." Therefore in the above example, the inventor could patent the motion sensors as a product patent, or the inventor could patent everything involved in the process provided that the process is statutory subject matter.

To patent the *Mummy* and Bloomstein patents as process claims, they must fall into the definition of a process claim. The *Guidelines* relate that a process claim is "a claim that requires one or more acts to be performed." The *Mummy* patent requires the actor to move while wearing the sensors, and it also requires the computer to interpret that information into a moving animated skeleton. Thus, the *Mummy* patent comprises more than one act to be performed. Bloomstein's '281 patent requires that the lip positions from each facial movement be calculated, and then the computer must make the one match the other on the film. This brings it within the definition of a process claim. However satisfying this definition is only enough to satisfy § 101 prima facie; it still must be shown that the claim is statutory. The *Guidelines* state that "a claimed process is clearly statutory if it results in a physical transformation [that] falls into one or both of the following ('safe harbors')."

The first safe harbor is an independent physical act. Thus, "if a process claim includes one or more post-computer process steps that result in a physical transformation outside the computer . . . the claim is clearly statutory."

The *Guidelines* give an example of a process that controls a robot by storing data in a computer representing the robot's mechanical movements and uses a computer to calculate the robot's position and to move the robot based on those calculations. The '281 patent does not fall within this first safe

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62. Havlucyan, *supra* note 6, at 119 (clarifying difference between merely patenting software and patenting everything that creates computer animation as process).


64. *See Building a Better Mummy*, *The Mummy* (Universal Studios 1999, DVD Collector's Edition) ("[T]ake a performer of some type and you track the various positions of their [sic] body using a computer to basically try to correlate in three-dimensional space where they [sic] are and where the parts of their [sic] body are . . .").


67. *See id.*

68. *Id.* (requiring process to manipulate tangible physical objects and result in physical change in those objects).

69. *See id.* at 7484 (noting examples of statutory process of independent physical act, which consists of post-computer activity).
harbor because no physical entity is changed outside of the computer. There is no independent physical act involved with the '281 patent. However, the robot example and the *Mummy* patent are similar in that both involve storing data in a computer that represents movements based on movements by a physical actor outside the computer. But in the robot example, the computer manipulates the outside actor whereas in the *Mummy* patent, the outside actor causes the changes in the computer. Therefore the *Mummy* patent would not fall within this safe harbor.

The second safe harbor is the manipulation of data representing physical objects or activities. To be statutory the process requires the measurements of physical activities “to be transformed outside of the computer into computer data, where the data comprises signals corresponding to” physical activities outside the computer and where the process causes a physical transformation to the signals which represent physical activities. It is not immediately clear if the '281 patent falls within this safe harbor. It involves the measurement of lip movements of one language which are physical activities, and it transforms those inside the computer into lip movements of another language which represents a physical activity as well. The problem lies in the phrase “measurements of physical activities to be transformed outside the computer.” Again, it is helpful to look at the examples provided by the *Guidelines*. A statutory example is a “method of using a computer processor to analyze electrical signals and data representative of human cardiac activity . . . the transformation occurs when heart activity is measured and an electronic signal is produced.” It is conceivable that a process similar to the '281 patent could fall within this safe harbor, but the '281 patent involves an electronic signal that represents human lip movements which is similar to human cardiac activity. Also, in the '281 patent process, there is no measurement that occurs outside of the computer. Both lip movements are already entered into the computer as electronic data. Thus the '281 patent does not fall within the second safe harbor.

70. *See id.* (noting pre-computer process activity).
74. *Id.* (focusing on real world value of “predicting vulnerability to ventricular tachycardia immediately after a heart attack”).
75. *See Bloomstein*, 1996 WL 251918, at *2 (noting how lip movement process is instituted in film).
The Mummy patent, on the other hand, falls within this safe harbor. The Mummy patent, on the other hand, falls within this safe harbor. Another example given by the Guidelines describes a method of using a computer to conduct seismic exploration. The transformation occurs by “converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth’s surface.” In the Mummy patent, the transformation occurs by converting the movements made by the actor into electronic data, which provides representations of the movements made by the human skeleton. This safe harbor has a second requirement, namely that the process must have real world value. The Mummy patent has real world value by enabling filmmakers to present a realistic moving mummy that looks like a real corpse that has been decomposing for thousands of years and that moves like a real person would. Therefore, they do not have to resort to the old bandaged mummy look of earlier low budget films.

Although the '281 patent did not fall into either of the safe harbors, under the Guidelines a “claim may still be statutory [despite not falling within either safe harbor] if it is limited by the language in the claim to a practical application in the technological arts.” The Guidelines recognize that there is always a physical transformation that occurs within the computer because a computer acts on signals and transforms them during its operation. The important factor is what the computer does to achieve a practical application. If the computer merely manipulates an abstract idea or performs a mathematical algorithm, the process will not be statutory, but if the process is limited to a practical application of the abstract idea or mathematical algorithm in the technical arts, it will be statutory. The representations of lip movements in computer data form may

76. For a discussion of how the Mummy patent meets the requirements of the second safe harbor, see infra notes 79-81 and accompanying text.
78. Id. (highlighting real world value of geophysical exploration below earth’s surface).
79. For a discussion of the computer generation process, see supra notes 11-16 and accompanying text.
80. See Guidelines, 61 Fed. Reg. at 7484 (noting example of when “heart activity is measured and an electrical signal is produced”).
81. For a discussion of the real world value of process, see supra note 49 and accompanying text.
82. Guidelines, 61 Fed. Reg. at 7484 (clarifying that processes that fall within safe harbors are clearly statutory).
83. See id. (“[S]uch activity is not determinative of whether the process is statutory.”).
84. See id. (noting difference between statutory and non-statutory processes).
be viewed as a mathematical algorithm. There is, however, a practical application in that they would make dubbing more believable, and they enabled Forrest Gump to speak with John F. Kennedy. An example of a statutory claim given by the Guidelines is that "for a digital filtering process for removing noise from a digital signal comprising the steps of calculating a mathematical algorithm to produce a correction signal that will remove the noise." The '281 patent is similar to this. It removes the lip movements of the original language and replaces them with a mathematical algorithm that represents the lip movements of the second language. The end result produces different, practical and realistic lip movements of another language.

4. Patenting Special Effects as Computer Software in Canada

The Canadian jurisprudence on the patentability of computer software is not as comprehensive as its American counterpart. The Patent Appeal Board recently pointed out in Re Motorola Inc. Patent Application No. 2,085,228 that "[there is only one] Canadian court decision with respect to computer-related inventions, Schlumberger Canada Ltd. v. Commissioner of Patents." Further guidance is provided by Re Application No. 096,284, a decision of the Patent Appeal Board that set out its position on computer-related claims. This is the closest thing Canada has to the Guidelines. The major difference is that the Guidelines represent the state of the law in 1994 after Warmerdam, whereas Re Application No. 096,284 represents the state of the law in 1978, before the decision of the United States Supreme Court in Parker v. Flook.

The invention in Re Application No. 096,284 was a method of seismic exploration in which subsurface interfaces are generated in the form of acoustic signals and sent into subsurface interfaces where they are reflected back and converted into electrical signals. The Board held that this was not patentable subject matter. Compared to American jurisprudence, this decision is outdated be-

85. Id. (citing examples of statutory processes).
86. See Bloomstein v. Paramount Pictures Corp., No. C-95-1864 MHP, 1996 WL 251918, at *2 (N.D. Cal. May 6, 1996) (explaining process by which computer algorithms are applied to "interpolate" lip positions in frames between those where lip position has been empirically determined).
88. [1981] 56 C.P.R. 2d 204.
89. [1981] 52 C.P.R. 2d 96.
90. 437 U.S. 584 (1978). For a discussion of Parker, see supra notes 22-29 and accompanying text.
91. See Re Application No. 096,284, 52 C.P.R. 2d at 96.
cause the Guidelines give as an example of patentable subject matter a method that "convert[s] . . . seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface."92 Because this was the example used to justify awarding the Mummy patent, which is the stronger of the two claims, it appears as if it would not be patentable in Canada. But, this is not necessarily so. The Board does state that "where a programme [sic] is merely an incidental part of the system, it will not be objectionable . . . however [the patent must] have novel apparatus tied to a computer which controls the function at the end of a computer."93 Because the motion sensors that go on the actor's body are an apparatus, it is likely that the Mummy patent would be allowed. This is especially true considering the change in attitudes since 1978 that are represented by the increased reliance and the prevalence of computers in today's society. It is also likely that whoever is making the assessment on patentability, be it the Patent Office, the Appeal Board, or the courts, will be greatly influenced by the American jurisprudence. The Mummy patent should be safe in Canada.

Bloomstein's '281 patent faces more difficulty. For the same reasons it failed to fall within the Guidelines' safe harbors, it will fail to fall within the Appeal Board's decision. The '281 patent would be seen as being predicated solely on the novelty of the program, which Re Application No. 096,284 held was not patentable subject matter.94 More troubling about the decision was that it came down before Parker v. Flook.95 The Board thoroughly analyzed all of the leading American cases and was aware that the Flook decision was forthcoming. The Board stated,

We wait with interest . . . the outcome of the U.S. Supreme Court in [Parker v. Flook]. If that Court follows what we understand to be the rationale of their previous decision in [Gottschalk v. Benson], the C.C.P.A. would, we believe, be overruled.""96

93. See Re Application No. 096,284, 52 C.P.R. 2d at 110.
95. 437 U.S. 584 (1978). For a discussion of Parker, see supra notes 22-29 and accompanying text.
96. Re Application No. 096,284, 52 C.P.R. 2d at 106 (emphasis in original).
The Board was, of course, correct about the Supreme Court, however it failed to foresee Justice Stewart's dissent, which would carry the day in *Diamond v. Diehr*. Therefore while Justice Stevens' position is no longer the law in the United States, it is the approach that *Re Application No. 096,284* adopted in Canada, and it has not yet been overruled.

Perhaps the '281 patent will be aided by *Schlumberger*. This case involved a process where measurements obtained in boreholes are recorded on magnetic tapes and then transmitted into a computer where they are transformed into human readable data such as charts, graphs, tables or figures. This invention would likely be patentable under the *Guidelines*, and it definitely would be patentable under *State Street*. In *Schlumberger*, however, Justice Pratte held it was unpatentable. It is interesting to note the similarity in the language of Justice Pratte and Justice Stevens, considering that *Schlumberger* and *Diehr* were decided in the same year. In *Diehr*, Justice Stevens began by stating that "[t]he starting point in the proper adjudication of patent litigation is an understanding of what the inventor claims to have discovered." In *Schlumberger*, Justice Pratte began his analysis by stating that "[I]n order to determine whether the application discloses a patentable invention, it is first necessary to determine what, according to the application, has been discovered." Justice Stevens refused the patent in *Diehr* because Goodyear obtained a patent on a rubber curing process in the 1800s, and the only thing new in the application at bar was a computer's calculations. Justice Pratte decided *Schlumberger* on the basis that the only thing new in the application is using a computer to calculate which was not new because those calculations were expressly of the type for which a computer was invented. This may be a coincidence, but it appears as if Justice Stevens' decision in *Diehr* strongly influenced Justice Pratte. Even if the similarity were a coincidence, it is clear that Justice Stevens' position continued to be

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98. See id. (noting process at issue for exploration of oil and gas).
99. See id. at 206 (noting that appellant's contention at trial that calculations at issue were mechanical not mental).
101. Schlumberger, 56 C.P.R. 2d at 205.
102. See Diehr, 450 U.S. at 205-06 (clarifying difference between discovering improved method for doing something and using computer to carry out old method).
103. See Schlumberger, 56 C.P.R. 2d at 205.
the one adopted in Canada and not the Rehnquist-Stewart position from *Parker v. Flook*. Under *Schlumberger*, the '281 patent would be regarded as merely using a computer to do a calculation for which computers were invented, and, therefore, the patent would be denied.

Jumping ahead twenty years to see how the Appeal Board decided a computer related in patent in *Re Motorola Inc. Patent Application No. 2,085,228*, it is notable that the decision made no mention of *Re Application No. 096,284*, and it mentioned *Schlumberger* only to distinguish it on the facts. *Re Motorola* limited *Schlumberger* to holding only that a computer program per se is unpatentable.104 The Board in *Re Motorola* held that although the invention was a device that carried out the method of solving the algorithm, the claim did not prevent the use of the algorithm; it only prevented the use of the algorithm in conjunction with the process, which made it patentable.105 This was the rationale used by Justice Rehnquist to uphold the patent in *Diehr*.106 Therefore, it seems as if this lays to rest Justice Stevens' position and allows a greater degree of protection to computer-related inventions. Because the *Guidelines* were heavily influenced by *Diehr* and they would grant patent protection to the '281 patent, it appears that the *Motorola* decision would allow the '281 claim to be patented in Canada.

C. Cinematic Works and the Printed Matter Doctrine

Unlike the '281 patent, the '532 patent claimed the end resulting cinematic work. The issue of its patentability came before the District Court of the Northern District of California twice.107 Judge Patel's first decision held that cinematic work as claimed in the '532 patent did not mean the entire motion picture, rather it meant the portion of which that was altered by using the method from the '281 patent.108 The second decision held that it was not patentable

105. Id. at 75.
106. See *Diehr*, 450 U.S. at 187 (explaining that combination of process and computer is different than just computer).
108. See *Bloomstein*, 1996 WL 257918, at *3 (discussing meaning of cinematic work).
subject matter under 35 U.S.C. § 101.109 Judge Patel noted, "While defendants assert that case law holds that a cinematic work is 'un-patentable,' they cite no cases which expressly discuss the patentability of films . . . . Plaintiff fares no better . . . [and t]his court has not located any cases either."110

Judge Patel therefore turned to the Guidelines. The test for non-statutory subject matter is the same as for non-computer-related inventions.111 A patent claim will be non-statutory if it claims to be descriptive material.112 There are two ways that material can be descriptive. First, it can be functionally descriptive such as data structures or a computer program that is only functional when encoded on a computer readable medium like a disk; second it can be non-functionally descriptive, which "includes but is not limited to music, literary works and a compilation or mere arrangement of data."113 Regarding functionally descriptive material, the Guidelines note:

Office personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as non-statutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, Office personnel should treat the claim as a process claim.114

The '281 patent was considered statutory material because although it used a computer, the computer executed the program's instructions.115 In the '532 patent, the computer is still a part of the process, but the patent claimed is in the celluloid that needs to

110. See id. at *19. The court noted one case on the subject, namely In Re Leitzell, 213 F.2d 326 (C.C.P.A. 1954). The United States Court of Customs and Patent Appeals, however, resolved the case without addressing the issue of whether a cinematic work was unpatentable subject matter. For a discussion of In Re Leitzell, see infra notes 153-55 and accompanying text.
111. Guidelines, 61 Fed. Reg. at 7481 (clarifying that "claims to computer-related inventions that are clearly non-statutory fall into the same general categories as non-statutory claims in other parts").
112. Id. (noting general categories of non-statutory subject matter as natural phenomena, and abstract ideas or laws of nature which constitute "descriptive material").
113. Id. (outlining types of descriptive materials).
114. Id. at 7482 (clarifying that computer program itself is not process claim).
115. See Bloomstein v. Paramount Pictures, Corp., No. C-95-1864 MHP, 1996 WL 257918, at *6 (N.D. Cal. May 6, 1996) (construing "programmed" as meaning "programmed with algorithms which process the lip position date and control
be projected in order to realize its functionality. However, because the '532 patent is in the form of celluloid, it is more likely to fall into the category of non-descriptive material. Although there is the possibility of arguing that film is analogous to a computer program, either way it is unpatentable. Non-functionally descriptive material when applied to a computer occurs

[w]here certain types of descriptive material, such as . . . photographs . . . are merely stored so as to be read or outputted by a computer without creating any functional interrelationship . . . . The policy that precludes the patenting of non-functional descriptive material would be easily frustrated if the same descriptive material could be patented when claimed as an article of manufacture. For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional descriptive material.

Because a cinematic work is essentially a series of still photographs, which are merely stored to be outputted on a computer, a cinematic work would be non-functionally descriptive. And, because celluloid stores the movie like a compact disc stores music, the resulting celluloid would be unpatentable as non-functionally descriptive material. Judge Patel reached the same conclusion. However there have been some changes in the law subsequent to the Guidelines, which change the analysis slightly. First, In Re Warmerdam, upon which the Guidelines and Judge Patel's judgment are based, held that the mathematical algorithm test was wrong and that the correct approach was to follow Diehr, which held that because the use of a computer achieved a result unknown in the art, the invention was not unpatentable simply because a computer was involved. It could be argued that, because the inventions let
filmmakers do something that was not available in the prior art, the
use of celluloid does not render this invention unpatentable. Further, In re Beauregard,\textsuperscript{120} which was decided after the Guidelines, held that a program stored on a tangible medium was patentable, which arguably could include a digitally altered cinematic work stored on celluloid. The decision in State Street\textsuperscript{121} is also relevant here because the emphasis placed on the usefulness of the product led to a conclusion that the invention was statutory “even though it was expressed in numbers.”\textsuperscript{122} In the case of the ’532 patent, there was a use for this patent in that Paramount Pictures Corp. infringed upon it and then argued it was not statutory, just as State Street Bank infringed upon the Signature Financial Group Inc.’s patent and then argued it was non-statutory.\textsuperscript{123} Had this case come before the judge from State Street, it is likely the court would have held that the ’532 patent was statutory even though it was expressed in film.

Paramount also asserted that the printed matter doctrine rendered the ’532 patent invalid under § 101.\textsuperscript{124} However, what Paramount’s counsel, Judge Patel and the Federal Circuit failed to realize was that printed matter, as Paramount argued it, is not a test for patentable subject matter under § 101. Rather it is an analysis to be employed in determining whether the subject matter would have been obvious to one of ordinary skill in the art under the meaning of 35 U.S.C. §§ 102-03.\textsuperscript{125} In doing so they, as Justice Stewart held, struck a damaging blow to the basic principles of patent law by importing into the inquiry under § 101 the criteria of

\textsuperscript{120} 53 F.3d 1583 (Fed. Cir. 1995) (holding that printed matter doctrine no longer applies to computer program embodied in tangible medium). For further discussion of this case, see supra note 35 and accompanying text.

\textsuperscript{121} State St. Bank & Trust Co. v. Signature Fin., 149 F.3d 1368 (Fed. Cir. 1998). For a discussion of this case, see supra notes 36-42 and accompanying text.

\textsuperscript{122} See State St., 149 F.3d at 1375 (promoting focusing on essential characteristics of patent’s subject matter).

\textsuperscript{123} See Bloomstein, 1998 U.S. Dist. LEXIS 20839, at *3 (relating that defendants claimed ’532 patent covered unpatentable subject matter); see also State St., 149 F.3d at 1370 (noting that plaintiffs claimed patent was invalid after failed negotiations for license).

\textsuperscript{124} See Bloomstein, 1998 U.S. Dist. LEXIS 20839, at *25 (explaining that printed matter is only patentable if claim “involves a new and useful feature of a physical structure or a new and useful relation between the printed matter and the physical structure”).

novelty and inventiveness, whereas § 101 is concerned only with subject-matter.\footnote{126} The leading historical case on printed matter is In re Sterling,\footnote{127} which involved a system of checks and stubs that contained a space for the amount the depositor wants transferred from a checking account into a savings account.\footnote{128} The system used checkbooks to insert a savings check’s unique stub after a series of regular checks.\footnote{129} Judge Garret noted that the device “presents an ingenious and convenient arrangement for those desiring to do business in the manner which it suggests.”\footnote{130} Nonetheless, the patent was rejected because of the printed matter doctrine, which states that the “mere arrangement of printed matter on [a sheet] of paper does not constitute patentable subject-matter . . . . [N]ovelty cannot be predicated upon printing alone, but must reside in physical structure.”\footnote{131} In the case Ex Parte S,\footnote{132} a decision that relied on Sterling, it was held that differences in sound records embodied in a conventional carrier such as a record cannot be the basis for different patents.\footnote{133} Clearly following both of these cases, the ‘532 patent would not be patentable because it merely amounts to differences embodied in the conventional carrier, celluloid. However, these decisions were based on case law predating the 1952 Patent Act, which repealed the section upon which the printed matter doctrine was based.\footnote{134} Further, the decision in Sterling is out of step with modern law because, had the invention been invented today, it would still be “an ingenious and convenient way to do business,” which would have value and would therefore be similar to the

\footnote{126}{See Bloomstein, 1998 U.S. Dist. LEXIS 20839, at *29 (“The ’532 patent is . . . directed to . . . the images and accompanying soundtrack itself, therefore questions of novelty and utility are not at issue.”).}
\footnote{127}{70 F.2d 910 (C.C.P.A. 1934) (holding that patent must be based on novelty in physical structure).}
\footnote{128}{See id. at 911-12 (describing proposed patent and prior patents).}
\footnote{129}{See id. (stating that no physical difference existed between stubs, merely printed matter differed).}
\footnote{130}{Id. at 911 (describing manner of business consisting of writing checks and transferring funds to savings).}
\footnote{131}{Id. at 912 (stating that regular checks are not patentable, plaintiff had previously patented stub, and combination of checks in arrangement was patented by Watrous, meaning only new feature was writing).}
\footnote{132}{35 J. PAT. & TRADEMARK OFF. SOC’Y 904 (B.P.A. 1943).}
\footnote{133}{See id. at 905.}
\footnote{134}{See, e.g., In re Gulack, 703 F.2d 1381 (Fed. Cir. 1983) (holding that court must inquire as to whether there is new and unobvious functional relationship between printed matter and rest of invention). Any rejection based on printed matter doctrine is based on caselaw before 1952 Patent Act. See id. at 1385 n.8. The current approach requires that the claim be viewed as a whole. See id.}
invention in *State Street*. The only differences are that in 1934 it had to be done using the printed page, whereas today it would be done using a mathematical algorithm, and it would be patentable under § 101 without the printed matter doctrine ever being raised.\(^{135}\)

Both *Bloomstein* decisions stated that the printed matter doctrine has been refined by *In re Gulack*,\(^{136}\) but the courts erred here because *Gulack* did not refine the doctrine – it replaced it.\(^{137}\) *Gulack* involved a complex system that would "exploit certain arithmetic properties of all prime numbers larger than 5, \(P\), to create the semblance of magic or to educate with respect to intriguing aspects of number theory."\(^{138}\) The *Bloomstein* courts erred by failing to take into account that *Gulack* was not a case where the patent application was denied under § 101, but rather it was denied under § 103.\(^{139}\) The rationale of *Gulack* was that "a printed matter rejection under section 103 stands on questionable legal and logical footing."\(^{140}\) The key issue was not whether the differences or non-obviousness lie within the printed matter; it was whether the printed matter was functionally related to the substrate, which would occur for example where a computer program reconfigures the computer.\(^{141}\) Judge Patel recognized the second part but not the first. She stated twice in the case that § 103 was not at issue. If § 103 is not at issue, then the functionally related test from *Gulack* is not applicable, because the entire *Gulack* decision only involved § 103. Bloomstein’s lawyers attempted to bring this to Judge Patel’s attention by citing *Ex Parte Carver*,\(^{142}\) which followed the proper

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136. 703 F.2d 1381 (Fed. Cir. 1983).

137. See id. at 1385 ("Differences between an invention and the prior art cited against it cannot be ignored merely because those differences reside in the content of the printed matter.").

138. Id. at 1382 (stating that band has numerous digits imprinted on it, algorithm is used to generate quotient, and mathematical formula will produce answers on band, varying by where starting position on band is located) (footnote omitted).

139. See id. at 1384 (stating that because claims met requirements of 35 U.S.C. § 101, court would address rejection under 35 U.S.C. § 103).

140. Id. at 1385 n.8.

141. See *In re Gulack*, 703 F.2d at 1385-386 (explaining importance of functional, instead of structural relationship).

analysis, but again she missed the distinction between § 101 and § 103.143 Following the Gulack approach properly,

[I]t is essential that [the courts] focus on Diamond v. Diehr . . . . In our view, the claim analysis principles set forth in Diehr are fundamentally sound and are equally pertinent to claims raising non-statutory subject matter issues relating to . . . mathematical algorithms as well as to printed matter.144

Under § 101, Carver upheld an audio recording on the grounds that, “the claimed recording 'provide[d] the disclosed acoustic phenomena' regardless of what piece of music [was] being played and thus did not involve the printed matter doctrine.”145 There were three concurring opinions in Carver, and Judge Patel stated that one of them found a functional relationship and another disagreed entirely.146 She mentioned that the three judgments are concurring, yet she somehow missed that concurring means they all agreed on § 101; the three concurrences disagreed about § 103.147 Examiner-in-Chief Lindquist commented in obiter dictum that the claim would not hold up under § 103.148

There are similarities in the wording of Examiner-in-Chief Lindquist’s and Judge Patel’s judgments. Judge Patel dismissed the '532 patent by stating, “Here there is no novel and nonobvious [sic] functional relationship between the ‘cinematic work’ and any medium on which it would be stored. (No such medium is claimed in the patent).”149 Examiner-in-Chief Lindquist, while agreeing that subject matter was statutory under § 101, said he would dismiss the patent under § 103 because he found “no new and non-obvious functional relationship between the substrate and the recorded sound pattern . . . . First, the claims at bar [did] not specify the nature of the substrate . . . . And second, the substrate serve[d] no other purpose than a carrier or support for the recorded sound

144. Carver, 227 U.S.P.Q. at 467 (adopting claim as whole approach).
146. Id. (examining whether printed matter doctrine applies to recordings).
147. Id. (discussing concurring opinions).
148. See Carver, 227 U.S.P.Q. at 468 (noting that claims at bar would be “obvious” under § 103).
But in the concurring opinion that found a functional relationship, Examiner-in-Chief Nusbaum pointed out that "in view of our colleague [Lindquist's] comments, we find it appropriate to balance the record by indicating why, in our opinion, his view is not legally sound." The reason Nusbaum felt obliged to balance the record was because it was inappropriate for Lindquist to speak in *obiter dictum* about §103 because, as Justice Stewart stated, it struck a damaging blow to patent law to import a §103 analysis into §101. Because Judge Patel twice recognized that §103 was not in issue, it was wrong for her to conclude this matter based on Lindquist's conclusions or on *Gulack*.

Further, in a footnote, Judge Patel cited one other case, *In re Leitzell*, regarding patents and cinematic works, but she stated that the case was decided under §102 and therefore not at issue.

*In re Leitzell* is worth considering. The claim failed because an earlier claim had been granted for film, and the addition of a television system component did not distinguish it from the prior art. This is the same basis on which the invention in *Sterling* was rejected. If *Leitzell* is inapplicable then so is *Sterling*, because it was decided based on the section that today is §102. The other important feature of *Leitzell* is that it provides another example of a useful invention, whose process is still used today, where a patent in the resulting film would be justified. The *Leitzell* invention would be functionally related to the substrate because it prevents the television set or film projector from showing the product without permission.

Although §103 was not at issue in *Bloomstein*, it still is an issue that the Patent Office must consider when following the *Guidelines*. A claim will be denied under §103 if the prior art suggests storing a song on a disk, merely choosing a particular song to store on the disk would be presumed to be well within the level of ordinary skill in


151. *Id.* at 469 (Messenheimer and Nusbaum, Examiner-in-Chief, concurring) (addressing issue of §103 although not relevant to case).

152. *Bloomstein*, 1998 U.S. Dist. LEXIS 20839, at *26 n.8 (noting that printed matter rejection under §103 is irrelevant); *see id.* at *30 n.12 (noting issues not relevant to court's determination).


155. *Id.* (involving intervention where images were recorded in successive frames in altered form resulting in unintelligible pictures).

156. *Id.*
the art at the time the invention was made. The difference between the prior art and the claimed invention is simply a rearrangement of non-functional descriptive material.157

However, there still might be a legitimate argument that this is an open question. Carver was a two-to-one decision—though again both were in obiter dictum—that the resulting recording in a system of improving the sound in a sound recording was patentable under § 103. And as to the functionally related test, the most important thing about Beauregard is that the Commissioner of Patents rejected the printed matter approach entirely. The Patent Office in theory should have gone through a § 103 analysis when considering the '532 patent, yet it granted the patent.

Bloomstein was appealed to the Federal Circuit, and in a terse judgment, the Federal Circuit affirmed the district court on the decision regarding the printed matter doctrine.158 It is unfortunate that, considering the issue of patentability had never before been decided, that the Federal Circuit, which is known as “[T]he Supreme Court of Patents,”159 could not have rendered a more complete judgment or made comment on the district court’s better reasoned Guidelines analysis.160 But because the Federal Circuit is the higher authority, the printed matter doctrine becomes the relevant test for determining the patentability of cinematic works.161

III. SHOULD PATENT PROTECTION BE GRANTED TO CINEMATIC WORKS?

The district court in holding the '532 patent invalid remarked on its understanding of the public policy issue involved:

[I]f Bloomstein’s patent were to be declared valid then any technological device used to enhance visual images on film (e.g. colorization process or computerized photographic equipment used to alter contrast or remove objects from photographic frames [also the invention in

159. Havluciyan, supra note 6, at 114 (discussing how court had inconsistencies with its treatment of patents for past thirty years).
160. See id. (suggesting that patents will be effective and important form of intellectual property protection for computer software).
161. See id. at 115 (noting that PTO Guidelines mandate software patents classified into three categories of patentable subject matter).
Leitzell would fit in here]) could claim patent rights in the resulting work, rather than be limited to a patent on the method used.\textsuperscript{162}

The question that comes to mind is: What is inherently wrong with granting a patent in the resulting work of these methods? Each one of these possesses a useful end result. It is this author's opinion that the refusal to grant patents in the resulting work is based on misunderstandings and is inappropriate in light of recent developments in patent law.\textsuperscript{163}

A. The History of Patenting Film – Misunderstandings

The patenting of film is one of the most widely misunderstood areas in patent law.\textsuperscript{164} Partly because of these misunderstandings, an inventor with a special effects claim in cinematic work faces an uphill battle.\textsuperscript{165} This is evident in the arguments made by the defendants in \textit{Bloomstein}, as well in as the decision of the Federal Circuit.\textsuperscript{166} The courts have stated instinctively that a patent may not be granted in a cinematic work, but as Judge Patel pointed out, the defendants were unable to find any case that supported this.\textsuperscript{167}

An illustrative example of the misunderstanding is found in an article by David Vaver. In arguing that patent protection is too broad, Vaver states,

The strongest economic argument [for granting patents] is utilitarian: without [patents], much research and creativity would not be carried on or financed by firms. But this is only partly true. No doubt, less activity would occur – but how much less and in what areas? . . . Recall that the motion picture industry, which now relies mainly on copyrights, contracts and (increasingly) trademarks to protect the exploitation of its products, in the beginning pro-


\textsuperscript{163}. See \textit{Bloomstein}, 1998 U.S. Dist LEXIS 20839, at *30 (holding that claims of '532 patent "describe non-functional descript material and therefore are unpatentable subject matter under section 101.")

\textsuperscript{164}. See id. at *20 (noting that courts have struggled to define what is excluded under § 101 and in applying those definitions).

\textsuperscript{165}. See id. (stating that '532 patent serves functional purpose by solving technological problems using computer based software).

\textsuperscript{166}. Id.

\textsuperscript{167}. See id. (stating that while defendants argue that case law holds cinematic work is "unpatentable," they cite no cases that expressly discuss patentability of films or frames of films).
ected itself with patent pools over the equipment, without which the patentees argued 'no business could be conducted.'

This statement suggests that the motion picture industry is a shining example of patent holders who falsely claimed they could not survive without patent protection. Yet, their industry is even more successful today. Vaver, however, failed to consider what actually happened in the early days of the movie business. If he had, he would have realized that the motion picture industry is actually a shining example of the dangers that threaten an inventor who is unable to obtain patent protection in the resulting work.

The first film related patent was for Thomas Edison's motion picture camera. In 1909, Edison joined nine film manufacturers to form the Motion Picture Trust Company, commonly referred to as the “Trust.” Together they held patents for all the motion picture camera or projection patents. Soon thereafter, the Trust joined forces with Eastman Kodak, the only source of film stock. In this way, the Trust had a patent monopoly in the three essential elements necessary to make films: cameras, film and projectors. Therefore, the only way to make a film and not violate patent law was through the Trust. The prospect of vast returns of money that the film industry provided was too much of a temptation. Independent producers made their own productions in violation of the Trust’s patents in places such as Philadelphia, Chicago, Cuba and especially Los Angeles. Because they were working with bootlegged cameras, they easily would be able to escape across the Mexican border if the Trust came looking. The Trust, in response, formed the General Film Company, and “lawsuits were

170. See id. (licensing each other’s right to utilize such controlled items and refusing to provide licenses to others).
171. See id.
172. See id. (licensing each other’s right to utilize controlled items).
173. See id. (noting that with Trust, no major studios or facilities were needed to make films).
175. See id. (noting that Hollywood provided ideal location to work because of its sunny weather, closeness to mountains and sea; as well as close proximity to Mexico).
filed, cameras were confiscated and productions were shut down." The result of the lawsuits did not bode well for the Trust. Three court decisions brought an end to the Trust's monopoly. The third of those decisions is often cited for the proposition that film per se is not patentable.

The "patents war" ended with the Supreme Court decision in Motion Picture Patents Co. v. Universal Film Manufacturing Co., which prohibited the Motion Picture Patents Company from extending the patent on the projectors to the films.

Motion Picture Patents Co. v. Universal Film Manufacturing Co., could be argued to hold that a patent in the underlying film is non-statutory. To give it that meaning, however, takes the holding out of context. This action was brought by Edison's Motion Picture Patents Company ("MPPC") because the General Film Company had been broken up in 1915 as a monopoly in violation of the Sherman Act. MPPC had to resort to clauses in its licensing agreement, which said that the licensee of the projector could only use films owned by MPPC. Judge Clarke held that the Patent Act did not permit the extension of patent monopolies through licensing agreements. The significance of the case is that Clarke held that a

176. See Frumes, supra note 169, at 528.

[Contracts enumerated in the petition, and the combination these described, were a conspiracy in restraint of trade or commerce among the several states and with foreign nations, and were and are illegal, and that the defendants and each of them (with the exception next noted) have attempted to monopolize, and have monopolized, and have combined and conspired, among themselves and with each other, to monopolize, a part of trade or commerce among the several states and with foreign nations, consisting of the trade in films cameras, projecting machines, and other accessories of the motion picture business, as charged in the petition of complaint filed.

Universal, 243 U.S. at 811.
178. See Eastman Kodak, 226 F. at 78-79.
179. 243 U.S. 502 (1917). Two restrictions discussed in the case were whether the machine should be used only with motion pictures leased from manufacturer licensed by plaintiff and whether the machine could be used at all without complying with plaintiff's fixed terms.
180. See Universal, 243 U.S. at 509 (raising issue as to what extent patentee or his assignee is authorized by United States patent laws to proscribe by notice attached to patented machine conditions of its use and supplies, which must be used in operation of it, under pain of infringement of patent).
patent in a film projector or camera did not extend to the film itself because it was not included in the patent claim.

The patent law simply protects [the inventor] in the monopoly of which he has invented and described in the claims of his patent . . . . Film is obviously not any part of the invention of the patent in suit . . . because to enforce it would be to create a monopoly in the manufacture and use of moving picture films, wholly outside the patent in suit and of the patent law as we have interpreted it.181

Justice Oliver Wendell Holmes, in dissent, found that there was nothing in patent law that would have prevented the MPPC from extending the patent into the film itself in the way that they did.182 Therefore, the district court in Bloomstein was correct in not mentioning Universal because, although it refused a patent in film, it did so on the grounds that it was not included in the patent application. Therefore, although Universal is sometimes cited as authority for cinematic works being unpatentable, the case actually leaves open the question.183 Universal must also be looked at in the context of its time. In the early part of the twentieth century, Americans were very concerned with anti-trust law, and they feared monopolies.184 Holmes' dissent is legally sound, and were this issue decided for the first time today, it is likely that his reasoning would be adopted over the majority's, because anti-trust law is not as great a concern today. It can be argued that Holmes indirectly permitted patents in film, but even if he did not, and even if patents could not be granted in the film, the method adopted by MPPC of forcing the licensee by contract to allow a patent could be adopted by inventors today.

It is also important to look at the effects of the inability of the Trust to obtain a patent in the underlying film.

Although Edison's control of the fledgling motion picture industry was over and the product of the patented projectors could no longer be used to control the market, the

181. Id. at 510, 518.
182. See id. at 519-21 (finding no predominant public interest in order to prevent film feeder from being kept from public).
183. Id.
184. See R.C.C. Cuming & Tamara Buckwold, Interjurisdictional Sales and Financing Law, Class Materials (University of Saskatchewan 2000) at 198-99; see also Diamond v. Chakrabarty, 447 U.S. 303, 319 (1980) ("The patent laws attempt to reconcile this Nation's deep seated antipathy to monopolies with the need to encourage progress") (Brennan, J.).
independent companies that fled to survive had permanently taken root in California. They never looked back and New York [and the Trust] never regained its former crown as the entertainment capital of the United States. 185

And who were those independents? “The companies [which fled to escape the Trust] included Adolph Zukor (Famous Players/Paramount), Carl Laemmle (Universal), and William Fox (Twentieth Century Fox).” 186 So Vaver’s statement that the motion picture industry is still thriving despite the loss of patent protection is partly true. Paramount, Universal and Twentieth Century Fox are still thriving today, but only because the patent protection was lost. These are the entities that infringe. The companies involved in the Trust ceased to exist shortly after the two Supreme Court decisions. 187 Only Kodak exists today. 188 It can readily be seen that Vaver’s use of the film industry as an example of why patent protection is not needed to protect inventors is inappropriate. If anything, the film industry shows just why patents are essential. 189 It also illustrates how patents in the film itself are also necessary. Copyright was insufficient to protect the General Film Company. They would have a copyright in the films that they produced themselves, but not in those made by Paramount, Universal and Twentieth Century Fox. 190 A patent in the film itself that results in using the patented inventions would have protected the Trust. 191 The Trust had the strongest patent protection possible. 192 It had an exclusive monopoly on the film, the camera and the projectors. Still the infringers went to Hollywood where they could have easily escaped patent

185. See Garon, supra note 174, at 20-21 (noting that in United States v. Paramount Pictures Corp., court again found that practice of licensing and distribution used by major studios created an illegal monopoly under Sherman Anti-Trust Act).

186. See Frumes, supra note 169, at 529 (noting that as Hollywood film industry structured independent production, production was occurring outside studios).

187. See id. at 525 (citing United States v. Paramount Pictures Corp., 334 U.S. 131 (1998)). Changes continued as individual actors and directors loosened the grip of exclusive service agreements and began to work on picture-by-picture basis. Id.

188. See id. at 528 (noting Trust’s members entered into agreement with only Kodak).

189. See Vaver, supra note 168, at 120 (noting historical use of patents).

190. See Frumes, supra note 169, at 529 (noting that Fox, Universal and Paramount are independent filmmakers).

191. See id. at 528 (noting that agreement with Kodak created monopoly in cameras, film and projectors which are all essential for film making).

192. For a further discussion of the Trust, see supra notes 169-78 and accompanying text.
protection and brought the Trust to its knees. Had the Trust had a patent in the resulting film, it would have been saved because it could have either confiscated the infringing film or obtained some sort of royalty or damages.

This danger exists today regarding special effects. Canadian courts are just starting to recognize patentability of computer processes. Perhaps a patent similar to the '281 patent would come up before a Canadian court and be rejected based on Schlumberger or Re Application No. 096,284. Unscrupulous filmmakers could go to Canada (where film production is increasing), infringe the patent and then bring the film to the United States. If the U.S. patent extended to the resulting film, the unscrupulous filmmakers would be unable to do this.

B. The Patent Act is Outdated

The United States Patent Act ("Patent Act") was drafted by Thomas Jefferson, passed on February 21, 1793, and has not changed substantially since. Commentators have noted that the drafters of the Patent Act would not even have been able to conceive of such things as computer technology and modern advances in the biotech industry when they drafted the Act.

Before the industrial revolution restructured labour on divided lines, there was no clear-cut distinction between discovery and invention, basic and applied research, and science and technology. Although we are now discovering the artificiality of these divisions, the patent system continues to reinforce them.

When the Patent Act was drafted, the state of the art was in machines such as the spinning jenny or the steam engine. Therefore, at the time, it made sense that there had to be a machine involved. It also made sense that a patent could not be granted in a mathe-

193. See Frumes, supra note 169, at 529 (noting that as Hollywood film industry became structured into studios, "independent" production could be identified as production occurring outside studios).

194. For a further discussion of Re Application No. 096,284, see supra notes 89-91 and accompanying text. For a further discussion of Schlumberger, see supra notes 97-103 and accompanying text.

195. For a further discussion of Canadian patents, see supra notes 87-106 and accompanying text.

196. See Chakrabarty, 447 U.S. 303, 309 (1980) (noting that in 1952 "when patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left the laws unchanged).

197. Vaver, supra note 168, at 104.
mational algorithm or in an invention where the only difference between it and the prior art was in the printed matter. In today's world these distinctions are no longer valid because computers are as important to our society as machines were to 1793 society. As we have learned, the main reason computer patents were denied was because the Patent Office felt incapable of dealing with all the applications. Recognizing the importance of computers to society, the courts have decided to grant the applications and ignore the old rule about mathematical algorithms. It follows from this that it is ridiculous to continue analogizing high-tech computer-related inventions to printed matter. 198 This is why Gulack held that a printed matter rejection stands on questionable legal footing. 199 And this is why Carver suggested a return to Diehr rather than utilize a printed matter, even the so-called modified one that the Bloom-stein courts used, or mathematical algorithm analysis. 200

The better approach is to recognize that the Patent Act as drafted in 1793 incorporated broad language so that advances that could not be contemplated at the time would be patentable when they arose in the future. 201 As Congress stated when it created § 101, statutory subject matter includes “anything under the sun that is made by man.” 202 But the Federal Circuit has held “despite the oft-quoted statement . . . Congress did not so mandate.” 203 This holding, however, is not consistent with the principal draftsperson's statement, that under § “101[,] a person may have invented a machine or a manufacture which may include anything under the sun that is made by man.” 204 As Chief Justice Burger held,

The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting “the Progress of Science and the useful Arts” with all that means for the social and eco-

198. For a further discussion of In Re Gulack, see supra notes 136-41 and accompanying text.


200. For a discussion of court's reasoning in Carver, see supra note 145 and accompanying text.

201. See In re Warmerdam, 33 F.3d 1354, 1358 (Fed. Cir. 1994) (noting that Congress included as patentable subject matter “any process, machine, manufacturer, or composition of matter, any improvement thereof . . . ”).


onomic benefits envisioned by Jefferson. Broad general language is not necessarily ambiguous when congressional objectives require broad terms . . . . Mr. Justice Douglas reminded that the inventions most benefiting mankind are those that “push back the frontiers of chemistry, physics, and the like” . . . . Congress employed broad general language in drafting § 101 precisely because such inventions are often unforeseeable.205

It would have been unforeseeable in the early days of film that techniques such as colorization, scrambling and the Bloomstein process would have been available.206 The significance of the broad language is that as long as the invention is a manufacture and is not a law of nature, abstract idea, or natural phenomena, it is patentable.207

C. Liberalizing of Patent Protection in Analogous Areas

To determine whether a patent in the resulting film is a manufacture and is not merely an abstract idea, it helps to look away from the printed matter analysis to other areas of patent law. Four examples of patents that have been allowed illustrate that the '532 patent falls within the broad language of statutory subject matter and within the language of § 103.208

1. The Polyploid Oyster

Ex Parte Allen209 involved a method for producing polyploid oysters by isolating male oysters from female oysters and then inducing the oysters to spawn.210 The inventor had claimed a patent both in the process and in the resulting polyploid oyster. Examiner-in-Chief Smith for the Board of Patent Appeals held that this was a valid patent, stating,


206. For a discussion of Bloomstein’s patents, see supra note 6 and accompanying text.

207. See Barr v. United States, 324 U.S. 83, 90 (1945) (discussing Parker v. Flook, 437 U.S. 584 (1984) and distinguishing Parker and finding that statute was not confined to “particular application[s] . . . contemplated by the legislators”).

208. For a further discussion of these four examples, see infra notes 209-39 and accompanying text.


210. See id. at 1426.
The examiner has presented no evidence that the claimed polyploid oysters occur naturally without the intervention of man, nor has the examiner urged that polyploid oysters occur naturally. The record before us leads to no conclusion other than that the claimed polyploid oysters are non-naturally occurring manufactures or compositions of matter within the confines of patentable subject matter under 35 U.S.C. 101.211

In Bloomstein, Judge Patel stated that to grant a patent in the end result of the '532 patent would be wrong, because the process was already protected in the '281 patent.212 Why then is it allowable for a patent to be granted in the polyploid oyster as well as the process that produces it? This is a case where the printed matter doctrine as used in Bloomstein could have applied because the invention is the polyploidy, the common carrier is the oyster itself. The court gets around this issue by focusing on the fact that the oyster did not occur naturally. The resulting celluloid of the Bloomstein patent, a colorized film, or a scrambled film do not occur naturally either; they appear in that state because of the intervention of human ingenuity.

2. Azadirachtin Solution and The Neem Tree

W.R. Grace & Co. obtained a patent for both a method of creating a stabilized azadirachtin solution and the stabilized azadirachtin solution itself called Neemix.213 The resulting solution makes the extract more valuable to the pesticide industry and more useful to farmers.214 The Neemix solution patent has attracted a great deal of controversy. The azadirachtin solution had been the subject

211. Id. at 1427. By controlling the temperature of the oyster’s eggs, fertilizing the eggs to form zygotes, and applying hydrostatic pressure to the zygotes at a predetermined intensity for a predetermined time following the formation of the zygotes, polyploidy is induced resulting in an oyster that is not found in nature. See id.


214. See id. at 283 (noting that neem tree, azadirachta indica, is known to cure ailments).
of Indian traditional medicine for years.\textsuperscript{215} However the Patent Office found no problem in granting the patent application.

According to U.S. law, purification or modification of a naturally occurring compound can result in the award of a patent with claims to the purified substance. Further, the Grace patent appears to satisfy 35 U.S.C. sections 101, 102, and 103. . . . The fact that some contend that the improvement was “obvious” in India to Indian farmers does not itself defeat patentability in the United States . . . foreign knowledge can only defeat a U.S. patent’s novelty claim if that foreign knowledge appeared in a printed publication before the invention or application by the U.S. applicant.\textsuperscript{216}

The ’532 patent failed in the district court and Federal Circuit because it was considered non-obvious. How then is it justified that a patent on the improvement contained in the Neemix solution is non-obvious? Is it functionally related to the substrate? Consider this statement:

For many, the neem tree controversy is more specifically about the inequitable distribution of Grace’s economic gain. For many activists, it is inconceivable that those who merely “tinkered” with neem seeds should retain all economic benefit. They maintain that Indians provided the raw material – an assiduously cultivated understanding of the neem tree’s properties – and that therefore they are the rightful beneficiaries of any commercial development.\textsuperscript{217}

What is the practical difference between what W.R. Grace did and what the ’532 patent did? By examining the effect the ’532 patent had on the film itself, it is apparent that Paramount supplied the raw material; in this case it would be the film \textit{Forrest Gump}. The method of the ’532 patent improved the film by making it appear as if John F. Kennedy were speaking the lines of dialogue that he “said” to the fictional Forrest Gump. Without the ’532 patent, Kennedy would speak the dialogue he spoke in the real life film clip that was used. If the slight improvement made by W.R. Grace was

\textsuperscript{215} See id. (noting that solution is also used in Indian cultures to prevent psoriasis, to clean teeth, as antidote for malaria, as spermicide and as insecticide).

\textsuperscript{216} See id. at 284 (stating that Environmental Protection Agency registered Neemix in 1994).

\textsuperscript{217} See Marden, \textit{supra} note 213, at 287.
sufficient to make Neemix novel even though Indian farmers already possessed this knowledge, then certainly the ingenuity of filmmakers to produce the effect of Kennedy speaking to Forrest Gump should support the argument that a patent should be granted in the underlying film. Just as a patent was obtainable in the end Neemix solution, which is a result of using the patented method, a patent should be obtainable in the film, which was a result of the patentable special effect process.

3. Strawberry Flavoring

The court in In re Kratz allowed a patent for using a certain constituent of strawberries to enhance strawberry flavor in foods. This was a decision under § 103, which under the Guidelines was a barrier for obtaining a patent in film. Judge Baldwin of the C.C.P.A. noted that the strawberry flavor compound 2-methyl-2-penetenoic acid ("2M2PA") is a naturally occurring product found in strawberries. Judge Baldwin also noted that appellants were apparently not the first to discover or synthesize 2M2PA in a substantially pure form. The sole distinction between the substantially pure 2M2PA and that known in the art was the use to impart an enhanced fresh fruit flavor. This sounds similar to printed matter, and the patent was held to be not obvious because

[a]ppellants do not seek to claim 2M2PA, per se, nor 2M2PA in its natural state, nor even a composition encompassing strawberries; but instead present claims to compositions containing substantially pure 2M2PA and preparative methods thereof. Since the claims do not encompass natural compositions, in that "substantially pure" 2M2PA does not apparently occur in nature . . . the test is not met.

218. 592 F.2d 1169 (C.C.P.A. 1979).
219. See id. at 1173 (stating that appellants were first to patent 2-methyl-2-penetenoic acid in fresh strawberries).
220. See id. at 1175 (noting that issue in case was whether it would be obvious to use compounds found in strawberries to create strawberry flavoring or whether addition of substantially pure synthetically produced 2M2PA to food made it unobvious).
221. See id. at 1172 (stating that record established that appellants did no more than expected analysis for expected objective).
222. See In re Kratz, 592 F.2d at 1173 (stating that same action was brought in Application of Bergstrom, 427 F.2d 1394 (1970)).
223. See id. (noting that this use was heart of rejection).
224. Id. at 1174.
To use Baldwin's language from *Kratz*, the '532 patent "is not seeking to claim a patent in the entire movie *Forrest Gump*, per se, nor *Forrest Gump* in its natural state before the '281 patent process was used on it, but instead the '532 patent claims to the portions of the film containing the altered lip movements (via the '532 patent) and the preparative methods thereof (via the '281 patent)." Because the claim does not encompass the film as it was before, the test would not be met here either.

4. *Diamond v. Chakrabarty*

The liberalization of granting patent applications that has occurred over the years, providing the groundwork for the decisions to grant patents for polyploid oysters and the Neemix solution, is mainly due to the decision of the United States Supreme Court in *Diamond v. Chakrabarty*.226 The analysis employed by Chief Justice Burger in *Chakrabarty* leads to the conclusion that film would also be patentable. Chakrabarty claimed a patent in the process used to produce certain bacteria. Likewise, the process used to produce should also be granted patent protection.227 The patent was granted. The applicant in *Chakrabarty* also claimed a patent in the resulting bacteria, but the Patent Office denied this on the grounds that it was unpatentable under § 101 as a law of nature. Similarly, the patent in the resulting film was using the special effect provision denied for being an abstract idea.228 The issue for the Supreme Court to decide in *Chakrabarty* was whether the bacteria constituted a manufacture or a composition of matter.229

The Court defined manufacture 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."230 The '532 patent produces a new article (in our example it is the film *Forrest Gump* with President Kennedy speaking the film's dialogue) from the use of raw materials (which is the film with President Kennedy speaking the dialogue he orig-

225. See id. (construing Baldwin's statements regarding issue at hand).
227. See *Chakrabarty*, 447 U.S. at 304.
228. See id. at 306 (noting that Chakrabarty appealed to Patent Office Board of Appeals and Board affirmed).
229. See id. at 307 (explaining that Patent Office Board of Appeals relied on 1930 Plant Patent Act’s legislative history and concluded that § 101 was not intended to cover things laboratory created).
230. Id. at 308 (noting definition used came from *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1938)).
nally spoke). The changed film possesses new qualities by the machinery of the '281 patent. Therefore, it should be considered to be a manufacture under the Supreme Court's definition.

The Supreme Court defined composition of matter as "all compositions of two or more substances and . . . all composite articles whether they be the result of chemical union, or of mechanical mixture." It is more of a stretch to fit film into this definition. The resulting film would be a composition of the digital animation of the new lip movements, which according to the patent are contained in one piece of film (substance number 1) with the film with the old lip positions (substance number 2). The result is not the result of a chemical or mechanical union; it happens inside a computer and therefore would be a digital mixture. The definition used in *Chakrabarty* came from a 1957 decision that cited a textbook from 1937, both before computer technology was prevalent in society. Had computer technology been as important in 1957 as it is today, it would be likely that some form of digital mixture would be included in the definition. Chief Justice Burger stated, "[I]n choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated the patent laws be given wide scope." Because of this recognition, a digital mixture should not be a hurdle to patentability.

Burger also recognized that § 101 does impose some limits. For example, a pure discovery of nature or a formula such as $E=MC^2$ would be unpatentable, but

[j]udged in this light, [Chakrabarty's] microorganism plainly qualifies as patentable subject matter. His claim is not to a hitherto unknown natural phenomenon, but to a nonnaturally [sic] occurring manufacture or composition of matter – a product of human ingenuity "having a distinctive name, character [and] use."
The reasoning behind the prohibition against patenting a formula is roughly for the same as the reasoning why printed matter cannot be patented; the policy behind both is that the discoverer has come up with nothing new.\textsuperscript{238} The ’532 patent does allow a new discovery.\textsuperscript{239} It is, as Burger required, a fundamentally different manufacture or composition of matter, which is a product of Bloomstein’s ingenuity having a distinctive character (Kennedy speaking different words than he actually did) and use (by providing the filmmakers with the ability to make more realistic films and the filmgoers with a more enjoyable movie).

D. The Case Against

Obviously the greatest bar to the patenting of film is that protection is available through copyright.\textsuperscript{240} Copyright protects the maker’s films.\textsuperscript{241} It is argued that because film is a work of art and copyright protection is also provided, there is no need to grant patent protection as well. It would be ridiculous to grant a patent to the studio that produced \textit{Forrest Gump} or the filmmakers who made it because the film is a creative work. The printed matter doctrine would be correctly applied.\textsuperscript{242} However, as Justice Stevens stated, “[T]he starting point in the proper adjudication of patent litigation is an understanding of what the inventor claims to have invented.”\textsuperscript{243} With the ’532 patent, what was invented was not a creative work of art – it was a process of enabling the filmmakers to make the work of art better. Patents such as the ’532 patent allow the filmmakers to make, and the filmgoers who watch to experience, a mummy walking with realistic human movements, to view a black and white movie in color, or to make it look as if historical figures were interacting with a fictional character. The \textit{Leitzell} patent allows cable companies such as HBO the ability to prevent those

\textsuperscript{238.} \textit{See id.} at 310 (citing Harntraft v. Wiegmann, 121 U.S. 609, 615 (1887)) (holding that patentee who discovered species of rootnodule bacteria and who produced mixed culture from species unpatentable because patentee had discovered “only some handiwork of nature”).

\textsuperscript{239.} \textit{See Chakrabarty}, 447 U.S. at 310 (stating that in order to be patentable, patentee should produce something new with different characteristics from any found in nature).

\textsuperscript{240.} \textit{See generally} Vaver, \textit{supra} note 168, at 98 (suggesting that in copyright and patent fields, claims rest on myth and paradox rather than proof).

\textsuperscript{241.} \textit{See id.} at 107 (noting that “artistic works” are covered and these include drawing, engraving and sculpting).

\textsuperscript{242.} \textit{See id.} at 106 (stating that copyrights protect movies, television, music and literature).

\textsuperscript{243.} Diamond v. Diehr, 450 U.S. 175, 193-94 (1980).
who have not paid for their service from having access to it.\textsuperscript{244} Further in \textit{Leitzell}, the patent that these special effects technicians would be granted are not in the film as a whole but only in the selected frames in which their ingenuity was utilized.\textsuperscript{245} The special effects provide a practical use by applying science to produce a better result. The THX sound system would be able to obtain a patent in the resulting film under \textit{Carver}. Therefore, why should not a scientific improvement in the visual medium? As Judge Patel held in \textit{Bloomstein}, "Bloomstein may have potential copyright protection for the resulting cinematic work using his method. This court does not consider this argument relevant to the question of whether the '532 patent covers valid subject matter."\textsuperscript{246} The dual coverage of copyright and patent was recognized as long ago as 1915. "[T]he Edison patent on the picture film was limited to its negative form, and did not cover the positive motion picture films, which were dealt in commercially."\textsuperscript{247} This recognized that the positive motion picture is the artistic endeavor covered by copyright and that the negative form was a scientific endeavor produced by the ingenuity of Thomas Edison. There is no reason why the negative portions of \textit{Forrest Gump} or of the colorized or scrambled movie should not be covered by a patent, leaving the positive work protected by a different copyright holder.

\section*{IV. Conclusion}

Special effects are becoming more and more important to the film industry. A great deal of ingenuity is required to produce them. With that ingenuity comes the potential for conflicts over intellectual property rights. As the Bloomstein patent and the experience of Thomas Edison illustrate, hard work and years of effort can easily be infringed upon, with inventor reward. Patent protection is required. Because the majority of special effects work is done on computers, their patentability depends on the patentability of computer software. Because the Patent Office has moved away from its doomsday predictions that it would be unable to han-

\textsuperscript{244} For a further discussion of \textit{In re Leitzell}, see supra notes 153-56 and accompanying text.

\textsuperscript{245} See \textit{In Re Leitzell}, 213 F.2d 326, 327 (C.C.P.A. 1954) (explaining that in order to be of any availability at all, individual frame images disclosed in apparatus of reference must constitute continuous depiction of photographed subject and must be recovered in sequence).


\textsuperscript{247} See United States v. Motion Picture Patents Co., 225 F. 800, 811 (E.D. Pa. 1915).
dle the flood of computer applications and because courts have moved towards allowing patenting for nearly every sort of computer program, special effects process patents can be protected. But as the *Bloomstein* case proves, because the '281 patent was held not to be infringed, the possibility of infringement is still very real, and therefore the dangers that occurred at the turn of the twentieth century, provide a real threat of reoccurring again. Therefore, it is important for special effects inventors to be able to claim patent protection in the film itself. It is unjust that patents are available in oysters, solutions, strawberry flavoring, and bacteria resulting from processes, but patents in film are not. Once the courts realize this, it is likely they will agree.