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Robert N. Schlesinger

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CASE DIGEST

*by Robert N. Schlesinger**

The materials in this section are intended to provide a concise overview of the case law which has developed in the program patentability area. Each case is summarized in a separate digest entry. Each digest entry contains the following information:

- case name
- case citation
- subsequent history (if any)
- title of patent in issue
- summary of salient facts
- legal analysis and holding of the court (or Patent Office Board of Appeals)

The digest entries are organized alphabetically within two subsections. The first subsection, entitled "Historical Cases," contains summaries of cases which, although concerning inventions outside the software field, are pertinent because of the legal doctrines enunciated in the courts' opinions. The second subsection contains all cases to date in the "program-related invention" field.[1] These entries include both those cases decided on the question of patentability and the question of infringement.

These materials can be used alone, or in conjunction with the Case Reference Table set forth in the next section, as an important reference tool by anyone involved in the area of software protection.

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* B.S. 1970, University of Iowa. Mr. Schlesinger is currently a law student in the SCALE program at Southwestern University School of Law, Los Angeles, California.

1. Because of the negative attitude of the United States Patent Office toward patents for computer programs *per se*, inventors have adopted a variety of forms in which to present their applications. As such, the term "program-related invention" has been adopted as a more accurate description of the inventions presented in the cases to date than either the term "program" or the term "software."

I. HISTORICAL CASES

H1 *In re* Abrams, 188 F.2d 165, 89 U.S.P.Q. 266, 4 CLSR 607 (C.C.P.A. 1951).

("*Petroleum Prospecting Methods.*")

Four claims were rejected because the steps which constituted the heart of the invention were purely mental in character. These steps involved the mental processes of "measuring," "determining," and "comparing."

This case set forth what later were referred to as the Abrams "rules" (*see* Case H5 *infra*) for determining the patentability of method claims which included mental steps. These "rules" were:

> 1. If all the steps of a method claim are purely mental in character, the subject matter thereof is not patentable, within the meaning of the patent statutes.
>
> 2. If a method claim embodies both positive and physical steps as well as so-called mental steps, yet the alleged novelty or advance over the art resides in one or more of the so-called mental steps, then the claim is considered unpatentable for the same reason that it would be if all the steps were purely mental in character.
>
> 3. If a method claim embodies both positive and physical steps as well as so-called mental steps, yet the novelty or advance over the art resides in one or more of the positive and physical steps and the so-called mental step or steps are incidental parts of the process which are essential to define, qualify or limit its scope, then the claim is patentable and not subject to the objection contained in 1 and 2 above.

While acknowledging that these rules were in apparent accordance with the reported decisions, the court found it unnecessary to apply them to the facts of this case. Finally, the C.C.P.A. in *Musgrave* (Case P21 *infra*) formally rejected these "rules" as "unsound."

H2 Burr v. Duryea, 68 U.S. (1 Wall.) 531 (1863).

("An Improvement in the Machinery for Making Hat-Bodies, and in the Process of their Manufacture.")

A patent may be granted to anyone who has discovered or invented "any new and useful art, machine, manufacture, or composition of

matter." Because a machine is a concrete thing, consisting of parts or of certain devices and combinations of devices, a patent must be granted where the invention comes within the category of a machine. The patent is for the machine, not for a "mode of operation, a principle, an idea, or for any abstraction whatsoever." This rule of law is not affected by the fact that the statute requires the patentee to explain "the mode of operation" of the invention which distinguishes it from all others.

The Court used this rationale to rule that there was no infringement of a patent for "an improvement in machinery for forming hat-bodies" by a similar patent for "an improvement in the machinery for making hat-bodies, and in the process of their manufacture."

H3 Cincinnati Traction Co. v. Pope, 210 F. 443 (6th Cir. 1913).

("*Transfer Ticket with a Detachable Coupon.*")

A street railroad transfer ticket with a detachable coupon was held patentable on its novel "structure" and its being an "article to be used in a method of doing business." It was held a "manufacture" within the meaning of the patent statute.

H4 Cochrane v. Deener, 94 U.S. 780 (1876).

("*An Improved Method of Bolting Flour and Improvements in the Different Parts of the Machinery Necessary in Carrying on the Process.*")

A process may be patentable, irrespective of the particular form of the instrumentalities used. If the patent is not confined to the particular instrument or machinery used to affect that object, the use of another instrument or machine to affect the object would be an infringement, the general process being the same.

A process is a mode of treatment of certain materials to produce a given result. It is not an act or series of acts, performed upon the same subject matter, to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable, whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things

should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.

The *Cochrane* "test" has been held to limit patentable processes to those which act to change specified materials to a different state or thing. *See* Case P1b *infra*.

H5 *Ex parte* Egan, 129 U.S.P.Q. 23 (Pat. Off. Bd. App. 1960).

("*Graphical Methods for the Interpretation of Dipmeter Logs.*")

The claimed process was for measuring the depth of well bores. It involved certain procedures such as (1) plotting one set of values on the first chart; (2) scaling off and reading from the chart a second set of values in a particular way on a second chart; and, (3) using this second chart to obtain the desired set of end-values. This process, which is analogous to a method of operating a computer, could be practiced by an unskilled operator who did not understand the mathematical processes involved in solving difficult problems in solid geometry.

The claim was ruled patentable because a process of utilizing apparatus in a particular way to get the useful result of doing tedious, time-consuming work by relatively unskilled labor is a statutory process. The applicant's precalculated charts, which could be looked upon as analogous to a calculating machine, were ruled a "manufacture" under the patent statutes because they were specified as a necessary and essential part of the method.

The court accepted the *Abrams* rules (*see* Case H1 *supra*) as established law.

H6 Halliburton Oil Well Cementing Co. v. Walker, 146 F.2d 817, 64 U.S.P.Q. 278 (9th Cir. 1944).

("*An Acoustical Method of Determining the Unknown Location of an Obstruction in a Well.*")

The court ruled that a method patent for determining the unknown location of an obstruction in a well was invalid for want of invention, finding that its novelty lie only in the performance of certain mental steps. The steps involved were described in the claims by such descriptive words as "determining," "registering," "counting," "observing," "measuring," "comparing," "recording," and "computing."

In ruling this patent invalid, the court reasoned that, in substance, the claimed method consisted of setting down three known values in a simple equation and then computing the unknown value.

H7 O'Reilly v. Morse, 56 U.S. (15 How.) 62 (1853).

("*An Improved Magnetic Telegraph.*")

A claim for the "use of the motive power of the electric or galvanic current, which I [Morse] call electro-magnetism, however developed, for making or printing intelligible characters, signs or letters at any distances, being a new application of that power" was held not patentable because the claim was "too broad and covers too much ground." The court reasoned that one cannot get a patent monopoly on an effect or a law of nature, *viz.*, electric current.

H8 Risdon Iron & Locomotive Works v. Medart, 158 U.S. 68 (1895).

("*A Method of Manufacture of Belt Pulleys; a Belt Pulley with Improved Balance; and a Belt Pulley that is Cheap, Light, and Durable.*")

A valid patent cannot be obtained for a process which involves nothing more than the operation of a piece of equipment; that is, for the function of a machine. A valid patent cannot be issued only for superior workmanship.

H9 The Telephone Cases, 126 U.S. 1 (1887).

("*An Improvement in Electric Telephony.*")

An apparatus claim for the electrical transmission of speech was patentable because there exists an equivalence of the changes in substances (the *Cochrane* test) (Case H4 *supra*) and electromagnetic alterations ("electrical undulations") for subject matter purposes.

H10 *In re* Yuan, 188 F.2d 377, 89 U.S.P.Q. 324 (C.C.P.A. 1951).

("*New and Useful Improvements in Low Drag Airfoil.*")

The claim to an airfoil, drawn as an article of manufacture, does not define patentable subject matter where the sole novelty of the claim resides in the method of mathematical computation by which the profile of the airfoil is determined. Purely mental steps do not form a patentable process.

II. Program-Related Invention Cases

P1a *In re* Benson, 441 F.2d 682, 169 U.S.P.Q. 548, 2 CLSR 1030 (C.C.P.A. 1971), *rev'd sub nom.* Gottschalk v. Benson, 409 U.S. 63, 175 U.S.P.Q. 673, 3 CLSR 256 (1972).

("*Conversion of Numerical Information.*")

This was the first case in which the claims were directed *solely* "to the art of data-processing itself," and specific computer hardware was disclosed. The examiner and the board rejected the method for programming a general purpose digital computer to convert binary-coded-decimal numerals (BCD) into pure binary numbers as directed to non-statutory subject matter.

The court held that Claim 8 was not subject to the "mental steps" doctrine, since such words as "reentrant shift register," "shifting" and "signals" in the claim limited it to a machine-implemented process. As for Claim 13, the court held that since the disclosed process had no practical use other than to enhance the internal operation of a digital computer, and since digital computers were in the "useful arts," then the process itself was in the useful arts and patentable. *See* Case P1b *infra* for the Supreme Court decision.

P1b Gottschalk v. Benson, 409 U.S. 63, 175 U.S.P.Q. 673, 3 CLSR 256 (1972), *rev'g sub nom. In re* Benson 441 F.2d 682, 169 U.S.P.Q. 548, 2 CLSR 1030 (C.C.P.A. 1971).

("*Conversion of Numerical Information.*")

On writ from the C.C.P.A. (*see* Case P1a *supra*), the Supreme Court held that the method claimed was not a "process" within the meaning of the Patent Act, since the method was not limited to any particular act or technology, to any particular machinery, or to any particular end use. Such a method was held unpatentable because (1) the method was so abstract as to cover both known and unknown uses of the binary-coded-decimal (BCD) to pure binary conversion; (2) the end use could

vary; (3) the end use could be performed through any existing machinery or future-devised machinery or without any apparatus; (4) the mathematical formula involved had no substantial practical application except in connection with a digital computer; and (5) the result of granting a patent would be to wholly preempt the mathematical formula involved and, in practical effect, patent the algorithm itself.

The Court also held that the transformation or reduction of an article to a different state or thing was the clue to the patentability of a process claim that did not disclose a particular machine, resurrecting the reasoning of *Cochrane*. Case H4 *supra*.

P2 *In re* Bernhart, 417 F.2d 1395, 163 U.S.P.Q. 611, 2 CLSR 359 (C.C.P.A. 1969).

("*Planar Illustration Method and Apparatus.*")

The application disclosed a method of and apparatus for automatically making a two-dimensional portrayal of a three-dimensional object from any desired angle and distance and on any desired plane of projection. The disclosure provided equations defining the geometric relationship between the three-dimensional and two-dimensional coordinates. The application then taught that the equations could be used to control the operation of a computer, with the output controlling the operation of a plotting machine.

The court found no basis for rejection on "mental steps" grounds, since the claims "recite, and can be infringed only by, a digital computer in a certain physical condition, i.e., electromechanically set or programmed to carry out the recited routine." The court rejected the applicability of the "printed matter" cases since "the invention . . . *requires* that the information be processed not by the mind but by a machine, the computer, and that the drawings be done not by a draftsman but by a plotting machine."

The fact that the point of novelty of the invention lay in the equations was held insufficient to reject the application, since "[t]o allow the claims in issue here would not prohibit all uses of those equations," but only where the equations were used "in the physical equipment recited in the claim."

The court also held that "if a machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed."

The examiner had also rejected the claims as being drawn to an "old combination" (a computer and plotting device). The C.C.P.A. reasoned that if a prior invention does not show or support the improved element itself, it defies logic to say that the same prior invention suggests the use of that improved element in combination with other elements.

P3 *In re* Brandstadter, 484 F.2d 1395, 179 U.S.P.Q. 286, 4 CLSR 976 (C.C.P.A. 1973).

("*Message Retrieving Organization.*")

The information submitted consisted largely of a systems diagram of apparatus for retrieving messages processed by a store-and-forward communications system. The application omitted any indication of the amount of time and effort which one of ordinary skill would have to expend to develop the program necessary to practice the invention, and lacked even flowcharts of the programs developed to practice the invention. The specification was held insufficient to permit one of ordinary skill in the art to practice the invention without undue experimentation and delay. A statement that the recited functions were "well known data processing functions" was held insufficient.

One skilled in an art has an expertise above that of the unskilled person, but if the selection of suitable apparatus to carry out the invention would require undue experimentation and delay, the disclosure is inadequate legal consideration for the granting of a patent.

P4 *In re* Brown, 477 F.2d 946, 177 U.S.P.Q. 691, 4 CLSR 56 (C.C.P.A. 1973).

("*Terrestrial Navigation System.*")

The claims to an invention relating to a terrestrial navigation system capable of all-weather operation were rejected for inadequate disclosure. The most tangible disclosure in the application was of a "mathematical model" of the system. While a program was said to have been prepared for the mathematical model, no program was disclosed. The court held that although a successful mathematical model may have value in developing a practical system, a discussion of such a model was not necessarily adequate to disclose how to make the actual

invention, particularly where there was so little description of the operative relationships of the elements.

Where an invention involves two technologies, the knowledge of a person skilled in *both* technologies is the criterion for sufficiency of disclosure. Several lengthy meetings with a person who later submitted an affidavit in support of the application denigrated the value of the affidavit on the issue of adequate disclosure.

P5 Bullard Co. v. General Electric Co., 348 F.2d 985, 146 U.S.P.Q. 141, 4 CLSR 1016 (4th Cir. 1965).

(*"Devices for Control of an Automatic Machine Tool."*)

The claims measure the invention. The claims, however, must be construed in light of the specification, which is protective only to the point that it gives such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the invention.

Combination claims for devices for the regulation of machine tool operations were ruled not infringed, since a combination patent covers only the *totality* of elements in the claims, and no element, separately viewed, is within the patent grant. Using this line of reasoning, the court held that a punched tape was not "equivalent" to an arrangement of mechanical cams performing the same function.

P6 *In re* Chatfield, 545 F.2d 152, 191 U.S.P.Q. 730, 6 CLSR 52 (C.C.P.A. 1976), *cert. denied*, — U.S. —, 195 U.S.P.Q. 465, 6 CLSR 466 (1977).

(*"Method of Operating a Multiprogrammed Computing System."*)

Claims to an invention which evaluated and reassigned program priorities as programs excecuted in a multiprogram computing system, although drawn to a method of operating a computing system, simply defined a novel method for operating that particular machine system in a particular mode and were not drawn to a mathematical problem-solving algorithm or to purely mental steps. The claims therefore defined patentable subject matter.

While the method adjusted priorities of computer processing programs, no program *per se* was claimed. The court narrowly construed the Supreme Court holding in *Gottschalk v. Benson* (Case P1b *supra*) to

apply *only* to claims which "would have preempted all practical uses of both the underlying mathematical formula and the involved algorithm." It refused to construe *Gottschalk v. Benson* as holding all computer programs unpatentable.

P7 *In re* Christensen, 478 F.2d 1392, 178 U.S.P.Q. 35, 4 CLSR 66 (C.C.P.A. 1973).

("*Method of Determining Subsurface Porosity.*")

A method claim, in which the point of novelty was a mathematical equation to be solved as the final step of the method, was held nonstatutory. The addition of the "steps" of establishing values for the variables in the equation cannot convert an unpatentable method to patentable subject matter.

P8 *In re* Comstock, 481 F.2d 905, 178 U.S.P.Q. 616, 4 CLSR 818 (C.C.P.A. 1973).

("*Electronic Calculator.*")

The application related to an electronic calculator having as its principle feature a means for retrieving numerical data placed in storage on a first-in, first-out (FIFO) basis. The court ruled that the specification sufficiently disclosed the structure supporting those elements of the combination of means appearing in the claims. A general reference to the structure of an IBM 1620 computer was held sufficient disclosure of apparatus. The specification described the invention and enabled one skilled in the art to make and use the invention.

A specific computer was disclosed. The court held that the disclosed computer was "altered by the operation of the disclosed program."

P9 *In re* de Castelet, 562 F.2d 1236, 195 U.S.P.Q. 439, — CLSR — (C.C.P.A. 1977).

("*Method of Generating a Curve, Applicable to Tracing Machines or Machine Tools.*")

Process claims were denied for a method of generating curves, employing a computer in conjunction with drafting and milling machines. The claims recited a process for solving a set of mathematical equations, the solution being a set of points along a curve, rather than a process which merely used equation solutions as one step in achieving some result other than the solution of the equations. The claims were rejected as drawn to nonstatutory subject matter, since a patent containing the claims would in effect be no more than a patent on the equations themselves.

Gottschalk v. Benson (Case P1b *supra*) was narrowly construed by the court and found *not* to hold all computer programs unpatentable.

P10 *In re* Deutsch, 553 F.2d 689, 193 U.S.P.Q. 645, 6 CLSR 408 (C.C.P.A. 1977).

("*Multi-Unit Optimization.*")

Methods of operating a system of manufacturing plants, when considered as a whole, did not preempt a mathematical formula, an involved algorithm or a program *per se*. The methods were therefore ruled to be statutory processes.

P11 Digitronics Corp. v. New York Racing Ass'n, 187 U.S.P.Q. 602 (E.D.N.Y. 1975), *aff'd*, 553 F.2d 740 (2d Cir. 1977).

("*Data Processing System Parimutuel Wagering Equipment.*")

A patent relating to a solid state electronic system for processing data from ticket issuing machines was held invalid for obviousness. The court reasoned that the claims did not perform functions that differed from the prior art in the totalisator business. Instead, solid state electronic means were merely applied to do the totalisator function with improved performance. The court found that this improved performance was just what could have been predicted when those means were applied to perform that function.

"The scope of the prior act in this case, in which the hypothetical reasonable person must be ordinarily skilled" is the data processing industry generally.

P12 *In re* Doyle, 482 F.2d 1385, 179 U.S.P.Q. 227 (C.C.P.A. 1973).

("*Method and Apparatus for Pattern Data Processing.*")

The application was to a system that "automatically produces data for [clothing] patterns of all the desired sizes from a single reference pattern." Schematic block diagrams were disclosed, including several computers, but *no programs* were set out.

Rejections by the examiner and Board of Appeal were based on inadequate disclosure of the "position data converter" and "computers." The affidavits submitted were held "unconvincing of the level of skill in the art to deal with the problem of modifying a computer to achieve the results" specified by the applicant. The C.C.P.A. affirmed the Board's rejections.

P13a *In re* Flook, 559 F.2d 21, 195 U.S.P.Q. 9, 6 CLSR 426 (C.C.P.A. 1977).

("*Method for Updating Alarm Limits.*")

In claims for a method for updating alarm limits, the intermediate step of the process *used* an algorithm to calculate the new values for the alarm. The final step involved adjusting the actual alarm value. While the examiner conceded that the method was clearly useful and within the technological arts, he held that it was non-statutory subject matter, since the only part of the invention which was not conventional was the algorithm used to adjust the alarm value.

The court held that the claims involved patentable subject matter since they were not limited to the mere act of solving an algorithm, but involved some post-solution activity (i.e. *use* of the algorithm to obtain a given result), and because the claims did not preempt the algorithm used. The court viewed the *Christensen* holding (*see* Case P7 *supra*) as limited to situations where there were no steps other than those steps required for solution of the algorithm.

P14 *In re* Foster, 438 F.2d 1011, 169 U.S.P.Q. 99, 2 CLSR 994 (C.C.P.A. 1971).

("*Processing of Geophysical Data.*")

Those method claims for processing seismograms to compensate for the effect of distortion and to emphasize the characteristics of geological formations were rejected as not distinctly claiming that which claimants regarded as their invention. This was because the "signals" alone could be read on visible patterns, which might be subjected to manual manipulation (human implementation), rather than limited to machine implementation.

Other method claims were held patentable over the contention that their "means-plus-function" language encompassed a human being as the means or a part of the means. The claims, limited to "electrical signals," were found to read only on machine implementations of the process, since the signals in those claims were limited to a form recognized in the art as limited to machine implementation.

The apparatus claims were held patentable since they were in the statutorily authorized "means-plus-function" form.

P15 *In re* Freeman, 5 CLSR 518 (Pat. Off. Bd. App. 1974).

("*A Computer-Generated Typsetting System.*")

The examiner claimed that the novelty resided in the algorithm and attendant software, and was analogous to the invention found unpatentable in *Christensen*. (Case P7 *supra*.) The Board held *Christensen* inapposite since "the instant case involves more than the mere practice of an algorithm or formula on data considered to be old and well known."

However, the Board entered a new rejection, based upon the reasoning of *Gottschalk v. Benson*. (Case P1b *supra*.) The Board reasoned that the novelty of the invention resided in the computer program and a patent on the invention "in practical effect would be a patent on the algorithm itself." The fact that appellant used apparatus language rather than method language (as used in *Benson*) was held "to be of no moment."

P16 *In re* Ghiron, 442 F.2d 985, 169 U.S.P.Q. 723, 3 CLSR 70 (C.C.P.A. 1971).

("*Programmed Data Processing with Facilitated Transfers.*")

Method claims were rejected for insufficent disclosure. The only

description of apparatus was in the form of "block diagrams" indicating the various elements of the system. The specification did not identify the elements, their interrelationship, nor a particular apparatus intended to carry out each function.

To rebut this rejection, appellants referred to a textbook, which they claimed showed computer components and circuits, and to certain classes in the Patent Office classification system (apparently relating to computer circuits). They asserted that these references made it clear that the selection and assembly of the components required to perform the claim method were "well within the skill of persons of ordinary skill in the art."

The court found this "evidence" to be "meager" and the argument to be conclusionary. It reasoned that this "showing is not persuasive that a person of ordinary skill in the art would be able to provide apparatus for practicing the present invention from appellant's drawing taken in connection with their specification." In addition, the court held that this "evidence" did not demonstrate that such a person would be taught how to modify previously known "overlap mode" computers to practice the invention.

The court specifically held that even where a claim was to a "method," adequate disclosure of the particular apparatus required to practice the method was still necessary.

P17 *In re* Gunn, 537 F.2d 1123, 190 U.S.P.Q. 402, 6 CLSR 248 (C.C.P.A. 1976).

("*Postal Apparatus and Method.*")

Evidence relating to the apparatus and method for computing the amount of postage and for printing such amount and the zip code of the addressee on mail was held insufficient to overcome a prima facie case of nonenablement. The Patent Office concluded that the disclosure was inadequate in view of the applicant's use of block diagrams and the lack of specific information with regard to structure of the computer, coin receiver, label issuer, label applier, amount display and geographical display.

The fact that the Patent Office accepts applications without a drawing does not warrant the conclusion that an application need not disclose apparatus to perform the method, where the apparatus was not conventional.

P18a *In re* Johnston, 502 F.2d 765, 183 U.S.P.Q. 172, 4 CLSR 1491 (C.C.P.A. 1974), *rev'd sub nom.* Dann v. Johnston, 425 U.S. 219, 189 U.S.P.Q. 257, 5 CLSR 1133 (1976).

("*Machine System for Automatic Record-keeping of Bank Checks and Deposits.*")

Apparatus claims in a patent application for an automatic financial record-keeping system that utilizes a digital computer were found to be patentable. The court ruled that the apparatus claims (1) were in compliance with the statutory requirements that the subject matter which an applicant regards as his invention be particularly pointed out, (2) were of statutory subject matter ("record-keeping machine system") and were within the "technological arts," and, (3) were not indefinite on the theory that they purportedly encompassed a human being as part of the claimed invention. *See* Case P18b *infra* for the Supreme Court decision.

P18b Dann v. Johnston, 425 U.S. 219, 189 U.S.P.Q. 257, 5 CLSR 1133 (1976), *rev'g sub nom. In re* Johnston, 502 F.2d 765, 183 U.S.P.Q. 172, 4 CLSR 1491 (C.C.P.A. 1976).

("*Machine System for Automatic Record-keeping of Bank Checks and Deposits.*")

A patent was sought for a computer system for automatic record keeping of bank checks and deposits. By using machine readable checks and deposit slips bearing numerical category codes for various types of expenditures and sources of deposited funds, the system permitted a bank to furnish a customer with subtotals for each category of transactions conducted through the customer's single bank account.

The Court ruled that the computer system was not patentable on the ground of obviousness. A patent may not be obtained if the subject matter would have been obvious at the time the invention was made to a person having ordinary skill in the applicable art. The relevant prior art was held to be that of computer technology rather than the art of the banking industry.

P19 *Ex parte* King & Barton, 146 U.S.P.Q. 590, 1 CLSR 302 (Pat. Off. Bd. App. 1964).

("*Digital Computer.*")

The claims in the application related to a special purpose computer arranged to mathematically process stored data. The processing was performed in accordance with a system of mathematical expressions free of parenthetical groupings, already known to mathematicians as "Polish Notation."

The court ruled that the claims were not directed to the novel configuration of a computer which can process data expressed in Polish Notation, but that the claims merely set forth the result of the function accomplished by any computer operating on data in Polish Notation.

P20 *In re* Knowlton, 481 F.2d 1357, 178 U.S.P.Q. 486, 4 CLSR 799 (C.C.P.A. 1973).

("*A System for Computer Processing of List Information.*")

The application was for a system for computer processing of list information. The application contained a block diagram and a description thereof, with "disclosure of the preferred embodiment of the invention . . . made up of a number of computer programs listings." Additionally, the disclosure went into "considerable detail" concerning the interrelationship between the hardware elements. The specification also identified an "IBM 7094 Data Processing System" as one type of apparatus which could process the listed programs.

The Patent Office contended that to properly disclose the invention, the application would "not only have to include a detailed description of the circuits" of the computer, but would "also have to include a detailed description of the physical state such circuit would be placed in by the disclosed program." The Board affirmed. The C.C.P.A. overruled the Patent Office and Board on the disclosure rejections, but upheld the Board's prior art rejections.

P21 *In re* Mahony, 421 F.2d 742, 164 U.S.P.Q. 572, 2 CLSR 587 (C.C.P.A. 1970).

("*Synchronizing Circuit.*")

Method claims, which read on both statutory and nonstatutory subject matter, can still comply with the statutory requirement that the applicant distinctly claim what he regards as his invention. The term "bit" when used in conjunction with "bit stream" has a meaning in the

art which precludes reading the claims on a mentally performable process. Thus, machine implementation can be found in the term "bit."

P22 *In re* McIlroy, 442 F.2d 1397, 170 U.S.P.Q. 31, 3 CLSR 81 (C.C.P.A. 1971).

("*Machine Processing of Symbolic Data Constituents.*")

Whether a method claim is machine-implemented or mentally-implemented is not determinative in deciding whether the claim is statutory.

P23 *In re* Musgrave, 431 F.2d 882, 167 U.S.P.Q. 280, 2 CLSR 920 (C.C.P.A. 1970).

("*Corrections for Seismic Data Obtained from Expanding-Spread.*")

The examiner and Board applied the *Abrams* "rules" (Case H1 *supra*), and rejected the claims as "mental steps." The C.C.P.A. took this opportunity to reinstate the analysis of *Abrams* done by Judge Smith in *Prater I* (Case P26a *infra*), and held that the "rules" of *Abrams* "have never enjoyed the approval of this court," that and "Rules 2 and 3, at least, are logically unsound." In light of the *Prater* decisions, the claims were found patentable.

The court also held that in considering the patentability of a process consisting of a plurality of steps, the question as to whether individual steps are old is immaterial to the question of whether the *combination* of those steps is a patentable process.

P24 *In re* Naquin, 398 F.2d 863, 158 U.S.P.Q. 317, 4 CLSR 441 (C.C.P.A. 1968).

("*Analysis of Seismic Signals.*")

Opinions in affidavits filed by the applicant are not evidence. An affidavit, stating that an average programmer could program a computer to make the mathematical computations for the claimed method, would not overcome a rejection of the claims, since the specification did

not set forth the method in such terms as to enable a person skilled in the art to use it.

P25 *In re* Noll, 545 F.2d 141, 191 U.S.P.Q. 721, 6 CLSR 69 (C.C.P.A. 1976), *cert. denied*, — U.S. —, 195 U.S.P.Q. 465, 6 CLSR 465 (1977).

("*Raster Scan Computer Graphics System.*")

The claims were drawn to an apparatus for scan-converting a first sequence of data signals into a second sequence of signals. The examiner and Board rejected the application, claiming that the applicant perceived his invention "to lie in the computer program disclosed." The C.C.P.A. held that no matter how an applicant perceives his invention, it is the *claims* which define the invention. The claims, were distinguished from those in *Gottschalk v. Benson* (Case P1b *supra*), since they were limited to a particular technology (computer graphics systems and scan-conversion of graphic information), and were directed to statutory subject matter since they were drawn to a physical structure and not to laws of nature or a mathematical algorithm.

The court further held that the claims which encompassed "means-plus-function" recitations were not subject to rejection for failure to disclose the detailed internal structure of the computer as programmed. Nor need the specification disclose the full range of equivalents of the invention, some of which may be non-existent at the time the patent application is filed.

P26a (*Prater I*) *In re* Prater & Wei, 415 F.2d 1378, 159 U.S.P.Q. 583, 2 CLSR 8 (C.C.P.A. 1968), *superseded by*, 415 F.2d 1393, 162 U.S.P.Q. 541, 2 CLSR 32 (C.C.P.A. 1969).

("*Reduction of Data from Spectral Analysis.*")

The application was for a method and apparatus for processing conventionally-obtained data to produce a quantitative spectrographic analysis of a qualitatively-known mixture and to determine unknown component concentrations with minimum error. The examiner rejected the method claims as unpatentable mental processes. He rejected the apparatus claims on two grounds. First, he held that the invention "would be an obvious modification of a known general purpose digital computer to program it accordingly." Second, he held that since the apparatus claims read on unpatentable general purpose computers,

they failed to particularly point out and distinctly claim the appellant's invention. The board affirmed the decision of the examiner.

Judge Smith, speaking for the court, first distinguished the *Abrams* case (Case H1 *supra*) on the grounds that the steps in *Abrams* could *only* be performed mentally, while Prater's invention was to be performed "without requiring any steps to be performed in the human mind." The *Abrams* "rules" were also rejected.

Judge Smith then considered the decision in *Cochrane v. Deener* (Case H4 *supra*), rejecting the view expressed in previous cases that *Cochrane* stood for the proposition that a process claim, to be patentable, must act on physical substances. Analyzing the history of the mental process doctrine, he concluded that there was nothing in the patent laws to deny patent protection to process claims that could alternatively be read on "pencil and paper" practice. He held that the process claims were patentable.

The apparatus claims were also found patentable.

P26b (*Prater II*) *In re* Prater & Wei, 415 F.2d 1393, 162 U.S.P.Q. 541, 2 CLSR 32 (C.C.P.A. 1969), *superseding*, 415 F.2d 1378, 159 U.S.P.Q. 583, 2 CLSR 8 (C.C.P.A. 1968).

("*Reduction of Data From Spectral Analysis.*")

On rehearing, the C.C.P.A. held that the case was not "controlled by" *Abrams* (Case H1 *supra*), *Cochrane* (Case H4 *supra*) and *Yuan* (Case H10 *supra*). It further found it unnecessary to discuss the "mental steps" doctrine since the application disclosed apparatus for performing the process wholly without human intervention. However, the court did find the process claims overly broad, since they contained no express limitations which would preclude the invention from reading on "a mental process augmented by pencil and paper markings."

The apparatus claims were again held patentable. The "means-plus-function" language was held not to encompass the human being as a "means."

P27 *In re* Richman, 563 F.2d 1026, 195 U.S.P.Q. 340, — CLSR — (C.C.P.A. 1977).

("*Radar Boresight Calibration and Velocity Vector Determination.*")

A method of calculating an airborne radar boresight correction angle aboard the aircraft, which utilized an arithmetical formula and included new and unobvious steps for acquiring the data used in the formula, was found not statutory subject matter.

The court held that if a claim was directed essentially to an arithmetic formula, substituting "words which mean the same thing" as the formula in the claim would not render the method patentable. This would be true even if the formula (or substituted words) were limited to a "specific purpose."

P28 *In re* Scarbrough, 500 F.2d 560, 182 U.S.P.Q. 298, (C.C.P.A. 1974).

("*Computer-Controlled Vocal Response.*")

The application related to devices which provided vocal responses, under control of a computer, from a vocabulary of spoken words stored in analog form. Each device in the application was identified only by its generic name and the overall function it performed. The applicant claimed that with this identification, a person of ordinary skill would be able to make and use the apparatus with only a reasonable amount of experimentation. The court held this disclosure insufficient because an unreasonable amount of work would be required to achieve the detailed relationships the applicant claimed to have solved.

P29 *In re* Tarczy-Hornoch, 397 F.2d 856, 158 U.S.P.Q. 141 (C.C.P.A. 1968).

("*Pulse Sorting Apparatus and Method.*")

A process claim, otherwise patentable, is no longer to be rejected merely because the application of which it is a part discloses apparatus which would inherently carry out the recited steps.

P30a (*Waldbaum I*) *In re* Waldbaum, 457 F.2d 997, 173 U.S.P.Q. 430, 3 CLSR 173 (C.C.P.A. 1972), *superseded by*, 559 F.2d 611, 194 U.S.P.Q. 465, 6 CLSR 415 (C.C.P.A. 1977).

("*Method of Operating Data Processor.*")

This application related to a method for controlling the operation of a data processor to determine the number of 1's in a data word.

The specification stated that there were numerous needs for such a method in computer-controlled systems. A traffic study on telephone lines was given as an example. The court ruled that the process was useful in the internal operation of the computer system and hence a statutory process within the "useful arts," citing *In re* Benson (Case P1a *supra*) and *Musgrave* (Case P22 *supra*).

P30b (*Waldbaum II*) *In re* Waldbaum, 559 F.2d 611, 194 U.S.P.Q. 465, 6 CLSR 415 (C.C.P.A. 1977), *superseding*, 457 F.2d 997, 173 U.S.P.Q. 430, 3 CLSR 173 (C.C.P.A. 1972).

("*Method of Operating Data Processor.*")

Between the first and second hearing on Waldbaum's application, the Supreme Court decided *Gottschalk v. Benson* (Case P1b *supra*). The court, in this second opinion, held that the claims directed to a method for controlling the operation of a data processor and those directed to the new use of a stored program data processing apparatus were so abstract and sweeping as to cover both known and unknown uses of the claimed method, and thus "proscribed by *Benson*." A patent on such claims would, in effect, be a patent on the algorithm itself and would not define a statutory process.

In addition, the court held that the claims directed to methods specifically applied to counting busy and idle lines in a telephone system would, in effect, be a patent on the algorithm itself, citing *Christensen* (Case P7 *supra*).

P31 *In re* Warmus, 561 F.2d 816, 195 U.S.P.Q. 234, 6 CLSR 430 (C.C.P.A. 1977).

("*Computer Prepared Contract Plan.*")

An application for a patent relating to a method for computer-assisted preparation of motor vehicle sales documents was rejected for obviousness.

P32 *In re* Wheeling, 413 F.2d 1187, 162 U.S.P.Q. 588, 2 CLSR 297 (C.C.P.A. 1969).

("*Optimization with Random and Historical Vectors.*")

Method claims were rejected by the Patent Office as having no novelty other than mental steps. The claims related to the production of an optimum value of a system output function, where the effect of changes in variables upon the function could be determined.

On appeal the C.C.P.A. remanded the case for further hearings. The reasoning was that in rejecting claims, the Patent Office failed to state the statutory basis for the rejection. The court further held that the Patent Office must also identify the issues with sufficient clarity that the C.C.P.A. can review them on appeal.