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"COMPUTER PROGRAM PATENTS"

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Introduction

Intellectual property law attempts to provide appropriate protection and incentive for creative activity balanced with the public's need for dissemination of technology. Each of the forms of intellectual property law owe their character to the historical circumstances of their creation. Each form of new technology strains the capacity of the legal system by introducing new issues and new problems. The legislature's ability to fashion appropriate new legal frameworks for the protection of new technologies is significantly outstripped by the development of those new technologies themselves. It is therefore often practically left to the judiciary and the common law to provide stability to the advanced technology industries and therefore a basis for investment and job creation in Canada, while still maintaining a precedent based system that is intended to provide certainty in the resolution of disputes.

Perhaps nowhere have these challenges confronted the legal system more than in the issues relating to the protection of innovation involved in the design and creation of computer programs. Numerous factors have influenced the ebb and flow of decisions of courts and administrative tribunals relating to the protection of computer programs. Canadian legal development in the protection of computer programs continues to be significantly influenced by United States judicial leadership.

The purpose of this paper is to provide a framework for understanding the present Canadian position in respect of protection of innovation in computer programs through patent registration. The analysis will provide an overview of U.S. and Canadian developments in this field.

The Statutory Framework

The law of patents is derived originally from the Statute of Monopoly¹. That law declared all grants of monopoly rights at common law to be void with certain exceptions. The exceptions were seen as situations in which the grant of monopoly was justifiable in the circumstances. One of the exceptions was the grant of "letters patent" to the true and first inventor of any manner of new manufacture.

In Canada, the Federal Parliament has exclusive legislative jurisdiction in the field of patent law under the Canada Act, 1867. Pursuant to this legislative competence, Parliament has enacted the Patent Act², as amended. The Patent Act sets out a registry system for the protection of inventions. Section 2(d) of the Patent Act defines "invention" as follows:

"'Invention' means any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter."

The United States, like Canada, derives its patent system from British roots. The U.S. Patent Act³ states:

"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."

To complete the initial legislative framework governing the availability of patent protection for computer programs, it is important to note s. 28(3) of the Patent Act, which states:

"No patent shall issue ... for any mere scientific principle or abstract theorem."

This rule finds reflection in the manual of patent office practice, which provides the following examples of non-statutory subject matter:

1. 12.03.01(e) - Subject matter being any scheme or plan, system of doing business, method of accounting, providing statistics, personality or IQ tests and the like; and
2. 12.02.01(g) - Computer program per se, an algorithm, or a set of instructions to operate a computer (which essentially mathematical information derived from an algorithm).

These rules reflect the earlier statements of the U.S. Patent Office which, in 1966, stated in its guidelines⁴ that a computer program could be patented if it consisted of "utility steps" and not "mental steps". The underlying policy was that no one should be able to gain a monopoly on a scientific principle, theorem or similar subject matter. Some have argued that mathematical equations, formulae and the like are not invented but rather discovered, being natural truths which existed prior to discovery. In contrast to this early and simplistic view is the recognition of the considerable financial and human effort involved in the development of modern complex algorithms and computer programs. Despite the disadvantages of the patent registry system, patents provide the prospect for significant protection for the considerable investments made in research and development effort. As a result, there has been and will continue to be increasing pressure on the patent office to issue computer program related patents.

In the next section, the jurisprudence of the United States courts will be considered. Decisions of the U.S. courts have been particularly persuasive for Canadian courts dealing with similar patent law issues. The specific Canadian jurisprudence will then be examined.

The United States Jurisprudence

As previously stated, the U.S. Patent Office Guidelines stated that computer programs could be patented if the program consisted of utility steps and not mental steps. This case was a reflection of the decision in Re Abrams⁵ which established what later became known as the mental steps doctrine. This doctrine provides that if a process can be undertaken mentally, say, by working a formula on paper, then it cannot be patented. Most computer programs provide for the rapid execution of processes that are fundamentally capable of mental execution, but in an unreasonably long period of time. Strict application of the mental steps doctrine would preclude patent protection for all computer programs. This doctrine has been limited in subsequent cases of the Court of Customs and Patent Appeals (CCPA).

In Application of Prater and Wei⁶, the CCPA held that apparatus and process claims broad enough to encompass the operation of a programmed general purpose digital computer were not necessarily unpatentable. The court was persuaded that once a computer program has been introduced, the general purpose computer becomes a special purpose computer which, along with process by which it operates may be patentable subject to the requirements of novelty, utility and non-obviousness⁷. In Application of Bernhart and Fetter⁸, the CCPA determined that "the steps were performed by a machine, and, therefore, were not 'mental'"⁹. The issue then became one of characterization of

the patent application¹⁰. If a patent application would focus on a computer program as a new machine, then the claims may be allowable.

A test for process claims developed which indicated that if the claim could be in the "technological arts" although performed by a computer, it was patentable since the steps were not "purely mental"¹¹. In Re Benson and Talbot¹², the CCPA rejected the argument that a particular data processing method was non-patentable subject matter on the ground that the programmable computer was merely a tool of the mind and the method was basically mental in character. The CCPA considered that a data processing method was not considered non-statutory where it consisted of steps which can be carried out by machine implementation as disclosed in the specifications¹³.

This first liberalizing effort of the CCPA was cut short in the United States Supreme Court decision in Gottschalk v. Benson¹⁴. In other words, the claims were not limited to a particular novel apparatus and therefore not confined to a specific end use in a field of technology. Since one may not patent an idea, the U.S. Supreme Court in effect overturned the CCPA decision in Re Benson and Talbot. The United States Supreme Court considered a patent claim for an invention described as being related "to the processing of data by program and more particularly to the programmed conversion of numerical information" in general-purpose digital computers. This broad claim was purported to cover the method in a general-purpose digital computer of any type. The Court addressed the issue of whether this was a "process" capable of patent protection. The Court recognized that the process in this case could be performed without the aid of a computer. The claim was so broadly framed as to be akin to the claim to a scientific truth¹⁵, a disembodied idea¹⁶, or a principle¹⁷. If the patent were

granted, it would pre-empt use of the mathematical formulation and the Court felt this would be too broad a monopoly. The Court did not state a general rule and so the possibility continued to exist that under the right circumstances a computer program might be capable of patent protection. The response of the CCPA to Gottschalk was to curb its formal liberal approach.

In Re Christiansen¹⁸ the CCPA held that claims to a method including known and necessary data gathering steps in a final step involving a mathematical equation were directed to non-statutory subject matter.

In Re Johnson¹⁹ the CCPA held that claims which were directed to a computer system which kept track of classes of transactions and grouped and printed out such transactions on a customer statement were not for a method of doing business, nor would the claims restrict others from using the algorithm. The decision was appealed to the U.S. Supreme Court. In Dan v. Johnson²⁰ the U.S. Supreme Court overturned the CCPA. The Court held the claims were obvious in view of the prior art which was the normal manual method of record keeping. The Supreme Court did not address the question of non-statutory subject matter.

In Re Chatfield²¹ the CCPA held that claims directed to a method including gathering data for a predetermined time, evaluating the data and controlling a computer to selectively process one of several programs was not directed to a particular algorithm or program and that the algorithm was merely incidental. In Re Noll²², the CCPA dealt with apparatus claims directed to scan conversion of data to tape data by means of a computer and reading out the converted data to raster scan a cathode ray tube. The sole novelty resided in the program for converting in the computer. The CCPA held the claims were to an

apparatus in a particular technology and did not preempt the algorithm.

In both Re Chatfield and Re Noll there was a vigorous dissent relying on Gottschalk. The U.S. Patent Office attempted to appeal both cases but was denied a writ of certiorari due to elapsed time limits and withdrawal of one party²³.

In Re Deutsch²⁴, the CCPA dealt with claims directed to a method of operating a system of manufacturing plants utilizing a program computer. In that case, the program was characterized as incidental to the invention and the claims were allowable. In Re Waldbaum²⁵, the U.S. counterpart to the Canadian Waldbaum Application, the CCPA struck down the claims on the basis that the claims were to the algorithm itself. Some have described the foregoing development of the CCPA as the creation of a "point of novelty test"²⁶. That is, in a patent application, if the point of novelty was the use of the computer program to execute a mathematical formula, the claim would not be allowed. The point of novelty test was a narrow reading of Gottschalk, but it still struck down a large number of broad or unspecified claims.

The characterization alternative to provide patent protection of computer programs was to avoid the entire issue of the subject matter's fundamental capacity to be protected under the patent system. In order to validate the patentability of the program, the Court looked instead to the use of a particular machine capable of being programmed²⁷ or to a more efficient mechanism to operate a machine²⁸.

In Re Flook²⁹, the CCPA examined claims directed to a method whereby a computer was programmed to process data from a catalytic hydrocarbon process and periodically reset alarm

levels. The CCPA looked to the post-algorithm solution activity of adjusting the alarm limits and held that with that characterization the claims were not merely claims to an algorithm and therefore not directed to non-statutory subject matter. This decision was appealed to the U.S. Supreme Court (discussed below).

In Re DeCastelet³⁰, the CCPA dealt with claims directed to a method of generating curves from data supplied to a programmed computer. The output from the computer could be used to control a drafting or milling machine. The patent application disclosed no specific algorithm, equation or formula but described the algorithmic process involved. The CCPA held that post-algorithmic solution activity showed the method only used as an algorithm but did not preempt it. The Court held that claims only defined the processing of data, not merely the use of equations as one step in achieving some other result. Since the computer only transmitted electrical signals representing results, this was not the kind of post-algorithm solution activity needed to overcome Gottschalk³¹.

In Re Richmond³², the Court examined claims for a method of determining radar for bore sight calibration and velocity vector determination, which included a novel data gathering step and a final step of solving a mathematical equation. The CCPA held that the novel and necessary data gathering steps did not make the method patentable. It also held that whether the claimed method was essentially a mathematical calculation was decisive even if it was expressed in words rather than formulae.

At this point, the position of the CCPA was summarized in Re Application No. 096,284³³ as follows:

"Claims which are essentially directed to a mathematical calculation or which describe an algorithmic process and which effectively preempt the algorithm are directed to non-statutory subject matter, unless such claims include post-algorithmic solution activity which shows the algorithm is merely being used. Data gathering steps and the outputting of data to known user devices do not convert the claims to patentable form."

This CCPA's renewed effort at finding computer programs as capable of patent protection was again cut short by the United States Supreme Court, in Parker v. Flook³⁴. In that case previously discussed, a patent was claimed on a process for updating alarm limits during a catalytic conversion process³⁵. The Court characterized the only novel feature of the claim as being the mathematical formula. The Court found the claimant did not seek to wholly pre-empt the use of the formula, but did seek to pre-empt its use in a limited class of uses. The Supreme Court rejected the claim since the discovery of a new use for an existing principle or formula does not have the requisite novelty to found a patent claim.

Just prior to the decision in Flook, the CCPA had decided Application of Freeman³⁶. In that case, a computerized-typesetting claim was allowed. This was achieved based on a two-step test:

"First, it must be determined whether the claim directly or indirectly recites a mathematical algorithm. Second, the claim must be further analyzed to ascertain whether in its entirety it pre-empts that algorithm."³⁷

In Application of Walter³⁸, the second part of this restrictive reading of Gottschalk was modified after the decision in Flook to:

"If the mathematical algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in apparatus claims) or to limit the claim's steps (in process claims), the claim is statutory subject matter. If, however, the mathematical algorithm is merely presented and solved by the claimed invention and is not limited in any manner to the physical elements of process steps, no amount of post-solution activity nor limited field of use will render the claim statutory."³⁹

The United States Supreme Court accepted this new approach of the CCPA in Diamond v. Diehr⁴⁰. In that case, the U.S. Supreme Court allowed a claim in which a computer program was but one step in an entire process and where that process was, itself, patentable. The Court basically stated that it was irrelevant whether or not a particular invention was implemented by a computer program or not. The inventor should not be penalized for the use of a programmed computer in practicing the invention.

As a result, the Manual of Patent Examining Procedure⁴¹, was updated to indicate that if a claimed process recited steps or a series of acts which resulted in a physical transformation of a given article into a different stage or thing, then the process is patentable whether implemented by a computer or not.

In a subsequent U.S. Supreme Court split decision, which affirmed the CCPA decision, the Supreme Court also held that a patent claim involving a computer program in Diamond v. Bradley⁴² was valid.

Subsequent CCPA decisions⁴³ have allowed patents claimed on specific programs, not general concepts⁴⁴ and have

restricted processes that rely on computer programs to situations where the problem is no more than mere calculation⁴⁵. The Patent Office which was traditionally opposed to patent protection for computer programs issued guidelines reflecting the Freeman two-step test as modified by Walter⁴⁶. The new approach provides an emphasis on novelty⁴⁷, obviousness⁴⁸ and proper disclosure tests⁴⁹ rather than on the non-statutory subject matter test⁵⁰ as in the past⁵¹. This approach has opened the door to issue of numerous computer program related patents.

The major issue in the Courts of the United States since this decision has been a question of whether or not an enabling disclosure is provided. Both the Canadian and the U.S. jurisprudence in respect of this issue will be discussed below.

The Canadian Jurisprudence

The first case, decided only at the Patent Appeal Board level, was Waldbaum. The applicant in Waldbaum brought forward three characterizations:

- (1) a method of controlling a data processor to determine the relative number of 0s and 1s in a data set,
- (2) a method of operating a date processor with specific application to counting the number of busy and idle lines in a telephone system, and
- (3) a process consisting of a new use of a computer.

The Patent Appeal Board decided prior to the later United States Supreme Court restrictions on the CCPA's

expansionist policy and as result relied on the reasoning in Bernhart. The Board adopted the characterization of the program creating a different machine from the unprogrammed computer and thus decided it was patentable.

The first thorough analysis of the proper approach to validity of computer related claims is found in Re Application No. 096,284⁵². In that case the applicant sought a patent directed to a method of seismic exploration in which acoustic signals were generated, reflected from subsurface interfaces, and then detected. The detected acoustic signals were translated into electrical signals which were then processed to a convenient form using an automatic computing apparatus. The Board placed particular reliance on the development of the law in the United States Court of Patent Appeals and particularly the Waldbaum decision⁵³. The Court was willing to look to the U.S. jurisprudence, at page 101:

"particularly since section 2 of the Act is similar to and is based upon the corresponding section 101(35) of the United States Patent Act".

The Court carried out a comprehensive analysis of the judicial development of computer program related patent claims in the United States Courts. The Court then noted the report on industrial and intellectual property, January, 1971, of the Economic Council of Canada which stated at page 103:

"patent protection of computer programs would not be appropriate."

This was reflected in the departmental working paper on Patent Law Revision, June, 1976, which, at page 180, sought to ensure that "all avenues for obtaining patent rights over computer programming techniques will be closed."

The Board said at page 109:

"It is also settled law in Canada that where a patentable advance has been made in some technical art in the form of an idea or concept, then the claims may take the form of a novel practical embodiment of the idea or concept: vide, Canadian Gypsum Co., Ltd. v. Gypsum Lime & Alabastine, Canada, Ltd. [1931] EX.C.R. 180 at p. 187. This embodiment must, of course, be described in the disclosure. But the exclusive right granted must be limited to embodiments of the idea or concept, or invention that was made: Vide, Farvwerke Hoechst Aktiengesellschaft Vormal's Meister Lucius & Bruning v. Commissioner of Patents (1932) 39 C.P.R. 105 at p. 131, 22 Fox Pat. C. 141 at 169. In other words, the claims must characterize the invention while defining the limits of the monopoly grant."

Applying these principles to the situation in front of the Board, they stated at page 109:

"...we are not satisfied that programming a computer in a particular way produces a new computer or indeed changes the computer in any way. It merely creates a temporary condition. A computer is inherently capable of performing a number of operations and in a particular sequence. No program can make a computer do something which is not inherently capable of doing, because it is evident the general purpose digital computers are designed so that they are capable of responding to any program that can be devised to operate within the physical restraints of the machine. This is in fact the rationale in designing general purpose digital computers. Generally speaking programs are a kind of product that any competent programmer could produce, as a matter of course, using his normal skills. When a new program is produced nothing but intellectual information has been added to what previously existed. In our view, any claim directed to it is not patentable, irrespective of whether the claim is directed to written instruction how to operate a machine, or to an information carrier."

The Board did go on to say, at page 110:

"It is clear however, that where an invention has been made in a "process control system" where a program is merely an incidental part of the system, it will not be objectionable."

The Board went on to reject the applicability of British jurisprudence in the patent field because of dissimilarity of the British Patent Act. The Board then went on to state the general principles outlining its approach to patentability of computer program claims. At page 111, the Board stated:

"To state our position now, taking into account the development since Waldbaum, it is:

- (1) claims to a computer program per se are not patentable;
- (2) claims to a new method of programming a computer are not patentable;
- (3) claims to a computer programmed in a novel manner, expressed in any and all modes, where the novelty lies solely in the program or algorithm, are not directed to patentable subject matter under section 2 of the Patent Act;
- (4) claims to a computing apparatus programmed in a novel manner, with the patentable advance is in the apparatus itself, are patentable; and
- (5) claims to a method or process carried out with a specific novel apparatus devised to implement a newly discovered idea are patentable."

The Board then applied those principles to the claims in question and found certain claims which they characterized as a method for programming a computer "as not directed to patentable subject matter". However, where the Board was able to

characterize a claim as a novel practical embodiment of an idea that was fully disclosed in the patent application, then the claims may be directed to patentable subject matter.

The Patent Appeal Board made a strong recommendation to the Patent Office to recommend its statement of principles as governing the patentability of computer related claims.

Responding to the foregoing direction, the Canadian Patent Office policy considered pessimistically the possibility of obtaining patent protection for computer programs. The law, as contrasted from the Patent Office policy, has outlined a familiar story. The decisions show that here, as elsewhere, the characterization of the computer program and its function in a machine or process claim is vital to the success or failure of the claim.

The leading Canadian case is Schlumberger Canada Ltd. v. Commissioner of Patents⁵⁴. Here, Schlumberger sought to patent a system that analyzed the various instrument readings made during the testing of a well. The measurements were recorded on magnetic tape and then input into a computer that had been programmed according to the mathematical formulae applicable. The output of this process was useful information.

The Patent Commissioner rejected the claim on the ground that Schlumberger had, in effect, claimed a monopoly on a computer program and also that such a program, even if new and useful, is not an invention within the meaning of section 2 of the Patent Act. Schlumberger appealed claiming that the invention is not merely a computer program but a complex process effected by a computer.

The Federal Court of Appeal examined the claim for novelty. It found that there was nothing new in using a computer to make the kind of calculations that were involved here. The novel element was the discovery of the mathematical formulae or relationship. The Court applied the mental steps doctrine: "If those calculations were not to be effected by computers, but by men, the subject-matter of the application would clearly be mathematical formulae and a series of purely mental operations; as such, in my view, it would not be patentable". Subsection 28(3) of the Patent Act provides that no patent shall issue for a "mere scientific principle or abstract theorem."

Schlumberger argued that the steps were not mental but mechanical and were only part of the process claimed as an invention. Pratte J. said "If the appellants' contention were correct, it would follow that the mere fact that the use of computers is prescribed to perform the calculations prescribed in the specifications, would have the effect of transforming into patentable subject-matter what would, otherwise be clearly not patentable". In effect, the basic process was not patentable and the use of the computer cannot change the nature of the basic claim. The Court was clearly using the characterization of the computer program as identical with the mathematical algorithm that underlies its logic.

Leave to appeal to the Supreme Court of Canada in Schlumberger was refused⁵⁵.

While the Schlumberger case provided an apparently narrow test, that test has been applied in at least eleven subsequent decisions of the Patent Appeal Board and in all cases to uphold computer related claims. In each case the Court cited Justice Pratte, at page 205:

"In order to determine whether the application discloses a patentable invention, it is first necessary to determine what, according to the application, has been discovered."

and then, as a second stage in the analysis, and in light of the "what has been discovered" characterization, follows the comment of Justice Pratte at page 206:

"I am in the opinion that the fact that a computer is or should be used to implement discovery does not change the nature of that discovery."

The Patent Appeal Board decisions, some of which will be described below⁵⁶, have all proceeded on the following basis. Firstly, they utilize the first comments of Justice Pratte as governing the procedure for the inquiry. In effect, the Patent Appeal Board carries out the exercise of characterizing the nature of the invention. If a Patent Appeal Board is able to find that the invention is other than merely a computer program or algorithm in isolation, then so long as all of the normal novelty, usefulness, obviousness and disclosure requirements are met, then the Patent Appeal Board allows the claims. The Patent Appeal Board uses the second comment from Justice Pratt in a permissive sense as indicating that it is possible to obtain patent protection for a computer program related invention.

It may be useful to review some of these decisions of the Patent Appeal Board, each of which have applied the Schlumberger test outlined by Justice Pratt to uphold the computer patent related claims.

In Re Application for Patent of Measurex Corp⁵⁷, the applicant sought patent protection for means of optimizing the performance of a multi-unit power plant by determining the

incremented deficiency of the boilers and thereafter determining the index of performance in reallocating the sequence of their use in the most optimum manner. The Patent Appeal Board characterized the invention as a bump test in combination with a computer which in their view described patentable subject matter⁵⁸.

In Re Bendix Corporation Application⁵⁹, the applicant sought to protect a control system which is used to advance an element, such as a machine tool, plotter, or display along the linear path and a circular motion path. The Patent Appeal Board found that while some of the elements, such as the pre-processor and the intermediate rate processor provide data processing functions, others, such as the interpolators and interpolator select provide apparatus, carry out other functions and therefore the overall combination relates to more than merely a computer program⁶⁰.

In Re Application for Patent of Batelle Memorial Institute⁶¹, the applicant sought protection for a system to obtain and enhance an output signal from an input wave form signal that had an offensive noise factor. The process utilizes a respective series expansion of walsh functions in a reciprocal walsh transform converter. The Patent Appeal Board characterized the invention in the following terms at page 136:

"We learn from applicants disclosure that a reciprocal walsh function may be obtained. He has shown a means in an assembly of apparatus which makes use of his discovery and carries out what he says has not been possible to do prior to his disclosure. It may well be that calculations were used, however, that does not negate the fact that this application shows the means in an assembly which attains the applicant's discovery. It is our view that applicant's disclosure of apparatus amounts to more than merely making calculations. We are

satisfied that applicant's discovery amounts to the embodiment of an idea in a means to carry it out."

As a result, the Patent Appeal Board found that the revised claims were directed toward more than mere calculation and in the absence of any cited art were acceptable⁶².

In Re Application for Patent of Westinghouse Electric Corporation (No. 2)⁶³, the applicant sought protection for an elevating system strategy to decrease the time taken to answer all calls included in the assigned path of a car but which occur behind the travel of the car. The essence of the invention was outlined in a flow chart which illustrated the logic of the algorithm. The Patent Appeal Board were persuaded that more than a generalized program for application to computers was presented. The Patent Appeal Board found that "an elevator system is the "what" that has been discovered and that it incorporates a strategy to produce improvement in an elevator operation." As a result, the Court found that certain of the claims were directed towards patentable subject matter⁶⁴.

In Re Application for Patent of Janssens⁶⁵, the applicant sought protection for a telecommunication switching network being controlled by computer processors via peripheral interfacing circuits. The Patent Appeal Board found that the improvement lay in an orderly redistribution of programs between the processors. The applicant's data processing system distributed the program selectively among the processors by allocation, according to coded mask words, so that some programs were distributed to a plurality of processors and others were handled by one processor only. They found that the claims defined more than algorithms or calculations and are more than mere execution of programs and therefore the claims were properly directed to the applicant's discovery⁶⁶.

In Re Application of Vapour Canada Ltd.⁶⁷, the applicant sought patent protection for a method of obtaining operational data of a travelling vehicle and comparing it to store data of a preferred kind of operation. The claims were of a method and apparatus for analysing the performance data of the operation of rapid transit vehicles. The Patent Appeal Board reviewed all of the claims in detail. They found certain of the claims were directed to no more than extraction of information from recorded data so they were not directed towards an invention as required in the Schlumberger test. In reviewing the claims, the Patent Appeal Board considered whether something was added to the claim other than merely a method of analysis and storage of data.

In Re Application of Honeywell Information System Inc.⁶⁸, the applicant sought to obtain patent protection for a data processing system in which a plurality of elements enacted to provide a control arrangement for avoiding deadlocks in an operation where in plural processes operate and compete for common resources. The Patent Appeal Board characterized the invention as an architecture or computer structure which includes a combination of software, firmware, and hardware elements to make use of multiple processes relying on common resources. The Patent Appeal Board was particularly persuaded by the applicant's ability to cross-link the elements to demonstrate how the apparatus prevented a deadlock situation⁶⁹. At page 467, the Board stated:

"We find applicant's structure does relate a combination of elements working cooperatively in a device that we believes lies in a patentable area. We see the invention relates to a field of endeavour that is more than merely determining useful information from calculations."

In summary, the present practice of the Patent Appeal Board appears to contemplate a two-stage analysis. In the first stage, the proper approach is to characterize the nature of the invention. The second stage, then, is to examine whether or not the invention is merely calculations or a mere claim to a computer program. Where some significant element of the invention involves exercise of some influence on the state of some other element, machine, or step in a process, other than mere calculation steps in an algorithm, then there appears to be a basis for claiming patent protection. In summary, then, the Patent Appeal Board has taken a very liberal reading of the Schlumberger case and provided a reasonably healthy basis for the protection of computer program related innovation (and the accompanying research and development investment) in Canada.

While it appears clear that the Patent Appeal Board has taken a very liberal reading of the Schlumberger case, in effect, following the lead of the United States Supreme Court in Diamond and Diehr. The Federal Court of Appeal has not ruled on the present practice of the Patent Appeal Board and so while the Patent Appeal Board continues its liberal interpretation of computer related patent claims, patent applicants must be aware of the risk of application of the more conservative rule in Schlumber on a literal level.

Proper Disclosure

Once the Courts have struggled with the question of protection of research and development innovation in which computer programs may play a part, then the next issue is ensuring that proper disclosure of that computer program is made.

In White Consolidated Industries v. Vega Servo Control, Inc.⁷⁰, U.S. Patent No. 3,668,653 (control system) was invalidated for failure to comply with the disclosure requirements of 35 U.S.C., section 112. The first paragraph of that section states what is required in a patent application:

"Written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or to which it is most nearly connected to make and use the same,"

In this case, after determining what the essence of the invention was, the Court examined the patent to determine whether it contained an enabling disclosure. The Court found that the SPLIT computer program was of integral significance to the patent and was not disclosed.

35 U.S.C. s. 112 also requires:

"The specification shall ... set forth the best mode contemplated by the inventor for carrying out his invention."

The Court noted that not only was there no enabling disclosure but the best mode of practising the invention was not disclosed as well (since the best mode and in fact only mode of practising the invention required use of the SPLIT computer program).

The Court examined the requirements of an enabling disclosure under s. 112⁷¹. The test established from the cases is:

"That the disclosure must allow 'one of ordinary skill in the art' to implement the program process without 'undue' experimentation."⁷²

The amount of experimentation involved depends on the nature of the invention and the level of ordinary skill required in the particular art. In the White case, the Court recognized that a patent application may comply with the enabling requirements by identifying a trade secret program by name only if equivalent computer programs were readily obtainable and known to one skilled in the art.⁷³ In the case at bar, however, the patentee had exclusive control over the SPLIT computer programs and the Court determined that it would take several years of experimentation for persons skilled in the art to develop an alternative.

Canadian Courts and Tribunals have also been vigilant to ensure that proper disclosure is made. In Re Application for Patent of Bown⁷⁴. The Patent Appeal Board dealt with an application relating to a visual communications system interlinking two or more similar terminals so as to provide a common picture at all terminals by transmitting change instructions to all terminals simultaneously. The patent examiner questioned whether sufficient disclosure had been made. In that case, the patent examiner argued that applicant disclosed the apparatus as being blank boxes. The Patent Appeal Board was persuaded by the inventor's explanation that the various structures and their makeup and functions as set forth by the description and drawings in the application were not in the category of a blank box and therefore contain a sufficient description to permit persons skilled in the art to practice the invention. In Re Application of Honeywell Information System Inc.⁷⁵, the Patent Appeal Board set out the proper test for disclosure relying upon Ernest Scragg and Sons Ltd. v. Leeson Corp. (formerly Universal Winding Co.)⁷⁶ in which Justice Thorson said at p. 99 C.P.R.

"It is settled law that a patent specification is not insufficient by reason of the fact that a competent workman of ordinary skill and art to which the invention relates may have to make trials or experiments in order to accomplish the results of the invention, if such trials or experiments are not themselves inventions and the competent workman can accomplish the desired result by following the teaching of the specification. The specification is sufficient if it enables him to put the invention into practice if sufficient directions are given to him to enable him to know what trials or experiments he may have to make and how to make them."⁷⁷

In that case, the Patent Appeal Board set out this test (which had been cited by the applicant) but decided only on the issue of non-patentable subject matter. The patent (which subsequently issued) was referred back to the examiner for continuation at the prosecution.

The patent agent and attorney faces a considerable challenge in ensuring that adequate disclosure has been made in a computer program related patent application. Failure to provide an enabling disclosure may result in a court holding a patent invalid, difficulty for a patent attorney to find infringement and other problems. As a result, Syrowik suggests⁷⁸:

- (a) That the patent solicitor and his client must attempt a realistic determination of the capabilities of the hypothetical person having ordinary skill in the programming arts and ensure that the disclosure is adequate in the sense that such hypothetical person could create the computer program in a matter of days or weeks without foreseeable major problems;
- (b) A conservative position, if the program is in existence prior to filing the patent application, would be to

deposit the entire program with the patent office. There are certain disadvantages of this approach and Syrowik argues that provision of a program written in low level language without proper documentation may not be adequate disclosure⁷⁹;

- (c) An alternative is to file a flow chart block diagram or equivalent to satisfy the required level of disclosure.

Summary

A claim for patent protection of a computer program may generally be available where the computer program is part of an otherwise patentable process or apparatus. Characterization of the role of the computer program is vital to the success or failure of the application. Where the court sees the program as a machine part, something that changes the nature of the machine or controls the machine, patent protection is possible. Where the court assimilates the algorithm underlying the program with the claim for patent protection, the claim is likely to be challenged.

The Canadian courts have traditionally shown a great willingness to follow the decisions of the United States Supreme Court in this area. This is understandable given the greater experience of the American courts with these matters and also given the fact that Canada's largest trading partner is the United States. It has been seen that the Canadian Patent Appeal Board follows the spirit of the more liberal trend, away from a concentration on the algorithm as evidencing the character of a computer-related claim and concentrate instead on the tests of novelty, non-obviousness, and proper disclosure as the proper criteria to determine whether or not a computer program is

eligible for patent protection. It has yet to be seen if the Federal Court of Appeal will validate the present approach of the Patent Appeal Board.

It is absolutely vital that appropriate enabling disclosure be made in computer program related patent applications. Where an applicant wishes to prevent disclosure of a unique program, routine or process then patent protection may not be the best alternative.

ENDNOTES

1. 1628 (U.K.) 21 Jac. I c. 3
2. R.S.C. 1985, c. P-
3. 829 Off. Gaz. Pat. Off. 1 (1966)
4. 35 U.S.C. 101
5. 188 F. 2d 165 (CCPA 1951)
6. 415 F. 2d 1393 (CCPA 1969)
7. See discussion in Re Application No. 096,284 (1978) 52 C.P.R. (2d) 96
8. 417 F. 2d 1395 (CCPA 1969)
9. D.M. Davidson, Protecting Computer Software: A Comprehensive Analysis (1983) 23:4 *Jurimetrics J.* 337 at p. 349
10. See M. Popper, (1979) Technology and Programming - Is it a Problem in Definitions?, cited in Palmer & Resendes, (1982) Copyright and the Computer, Consumer and Corporate Affairs Canada, Copyright Revision Series; See further analysis by M. Kratz, The Creator and the Benefits of Creation: Protection of Software in the Information Revolution (1985) 9:3 *Dalhousie Law Journal*, 555 at pp. 559-562
11. For example see In Re Musgrave, 431 F. 2d 882 (CCPA 1970); In Re Forster, 428 F. 2d 1011 (CCPA 1971); In Re Mahoney, 421 F. 2d 742 (CCPA 1970); and In Re McIlroy, 442 F. 2d 1397 (CCPA 1971)
12. (1971) 169 U.S.P.Q. 548
13. See discussion in Re Application No. 096,284 (1978) 52 C.P.R. (2d) 965
14. 409 U.S. 63 (1972)
15. See for example, MacKay Co. v. Radio Corporation, 306 U.S. 86 (U.S.S.C.)
16. See for example, Rubber-Tip Pencil Co. v. Howard, 20 Wall. 498

17. See for example, LeRoy v. Tatham, 14 How. 156
18. (1973) 178 U.S.P.Q. 35
19. (1974) 183 U.S.P.Q. 172
20. (1976) 189 U.S.P.Q. 257
21. (1976) 191 U.S.P.Q. 730
22. (1976) 191 U.S.P.Q. 721
23. See discussion in Re Application No. 096,284 (1978)
52 C.P.R. (2d) 96 at p. 104
24. (1977) 193 U.S.P.Q. 645
25. (1977) 194 U.S.P.Q. 465
26. Davidson, *supra*, at p. 350
27. See for example, In Re Noll, 545 F. 2d 141 (CCPA
1971)
28. See for example, In Re Deutsch, 553 F. 2d 689 (CCPA
1977)
29. (1977) 195 U.S.P.Q. 9
30. (1977) 195 U.S.P.Q. 439
31. See discussion in Re Application No. 096,284 (1978)
52 C.P.R. (2d) 96 at p. 104-105.
32. (1977) 195 U.S.P.Q. 340
33. (1978) 52 C.P.R. (2d) 96
34. 437 U.S. 584 (1978)
35. Stevens, J. at p. 585
36. 573 F. 2d 1237 (CCPA 1978)
37. Davidson, *supra*, at p. 351
38. 618 F. 2d 758 (CCPA 1980)
39. Davidson, *supra*, at p. 351
40. 450 U.S. 175, 209 U.S. P.Q. 1 (1981)

41. (MPEP), s. 2110, 4th ed. 1979, rev. September, 1982
42. 450 U.S. 381 (1981), affirming Matter of Application of Bradley, 600 F. 2d 807 (CCPA 1979)
43. Pursuant to s. 402, Federal Courts Improvement Act of 1982 Public Law 970164, the CCPA and Court of Claims were merged into the United States Court of Appeal for the Federal Circuit.
43. Federal Courts Improvement Act of 1982, Public Law 970164
44. See for example, In Re Abelle, 684 F. 2d 902 (CCPA 1982)
45. See for example, In Re Pardo, 684 F. 2d 912 (CCPA 1982)
46. s. 2110, Manual of Patent Examining Procedures
47. s. 102
48. s. 103
49. s. 112
50. s. 101
51. Davidson, supra, at p. 353
52. supra, (1978) 52 C.P.R. (2d) 96 (P.A.B.)
53. (1972) C.P.O.R. 7
54. (1981) 56 C.P.R. (2d) 204, [1982] 1 F.C. 845, 38 N.R. 299 (F.C.A.)
55. 63 (2d) 261 n., 40 N.R. 90 n.
56. See also Re Application of Seiscom Delta Inc. (1985) 7 C.P.R. (3d) 506; Re Application for Patent of General Electric Co. (1984) 6 C.P.R. (3d) 191; Re Application for Patent of International Business Machines Corp. (1984) 6 C.P.R. (3d) 99; Re Application for Patent of Societe National Elf Aquitaine (1984) 6 C.P.R. (3d) 9; Also see Re Application for Patent of Bartley (1983) 3 C.P.R. (3d) 396 which applies a similar approach.

57. (1983) 10 C.P.R. (3d) 93
58. now Patent No. 1,170,750.
59. (1984) 5 C.P.R. (3d) 198
60. now Patent No. 1,176,734
61. (1984) 8 C.P.R. (3d) 133
62. now Patent No. 1,179,780
63. (1985) 8 C.P.R. (3d) 85
64. now Patent No. 1,119,134
65. (1984) 6 C.P.R. (3d) 213
66. now Patent No. 1,187,157
67. (1985) 9 C.P.R. (3d) 524
68. (1986) 13 C.P.R. (3d) 462
69. now Patent No. 1,216,072
70. 214 U.S.P.Q. 796 (1982) aff'd 713 F.2d 788 (Fed. Cir. 1983)
71. For a more detailed discussion on this case and the requirement of disclosure, see D.R. Syrowik, Disclosing Computer Programs in an Application for a United States Patent - A Trap for the Unwary (1985) Jurimetrics Journal 21.
72. Syrowik, supra, at p. 26
73. White, supra, at p. 823; Syrowik, supra, at p. 26.
74. (1987) 19 C.P.R. 507 (now Patent No. 1,234, 936)
75. (1986) 13 C.P.R. (3d) 462
76. (1964) 45 C.P.R. 1, 26 Fox. Pat. C. 1 [1964] Ex. Cr. 649
77. supra, 99 C.P.R.
78. Syrowik, supra, at pp. 29-30:
79. Syrowik, Supra, p. 30