

DRAFT

Guidelines for Computer-Related Invention



(To replace Sections 16.04(e) and 16.06 to 16.08 of MOPOP)

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16.06**EXAMINATION OF COMPUTER-RELATED INVENTIONS****16.06.01****Schlumberger case**

Schlumberger Canada Ltd. v. Commissioner of Patents (1981), 56 C.P.R. (2d) 204-206, upheld the rejection of the patent application for a computer-related invention by the Commissioner of Patents for lack of patentable subject matter. The invention was in the field of seismic prospecting which is in a traditional field of patentable subject matter. The court set down the following principles:

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;

The fact that a computer is or should be used to implement discovery does not change the nature of that discovery;

The mere discovery that by making certain calculations according to certain formulae, useful information could be extracted from certain measurements, is not an invention within the meaning of section 2.

The whole application for patent was rejected. However, the court did not exclude any computer-related invention from patentability. The invention was characterized as being directed to the discovery of making certain calculations according to certain formulae which could extract useful information from certain measurements. The invention featured calculations and a mathematical formula, which must be assimilated to a mere scientific principle or abstract theorem, for which section 27(8) of the Patent Act prescribes that no patent shall issue. One of the claims of the application read:

Apparatus for processing well logging data to determine characteristic properties of earth formations, comprising:

a) *means for deriving a plurality of measurements representative of*

- characteristics of an earth formation at selected depth levels over a section of a borehole;*
- b) data processing unit; and*
 - c) means adapted to control said data processing unit for combining at least some of said derived measurements from at least some of said selected depth levels over said borehole section to compute at least one input parameter for said borehole section;*
 - d) combining at least some of said derived measurements from at least some of said selected depth levels with said at least one input parameter to compute at least one output parameter for at least some of said selected depth levels, and*
 - e) combining at least some of said derived measurements with said at least one output parameter for at least some of said selected depth levels to recompute said at least one input parameter or compute another input parameter for combination with at least some of said plurality of measurements to produce output parameters representative of at least one formation characteristic.*

The Schlumberger application did not fully describe the utilization of the derived information for the exploration of oil and gas.

The Patent Office has characterized the lack of a full description in Schlumberger as a **lack of integration** of the invention, which is reflected in the following rules:

- 1) Unapplied mathematical formulae are considered equivalent to mere scientific principles or abstract theorems which are not patentable under section 27(8) of the Patent Act.*
- 2) The presence of a programmed general purpose computer or a program for such computer does not lend patentability to, nor subtract patentability from, an apparatus or process.*
- 3) It follows from 2, that new and useful processing incorporating a computer program, and apparatus incorporating a programmed computer, are directed to patentable subject matter if the computer-related matter has been **integrated** with another practical system that falls within an area which is traditionally patentable. This principle is illustrative of what types*

of computer-related inventions may be patentable, and is not intended to exclude other computer-related applications from patentability.

16.06.02

Patentable art

A further indication that computer-related inventions may be patentable comes from the Supreme Court decision of *Shell Oil Company v. Commissioner of Patents* (1982), 2 S.C.R. 536, where it was stated that

art is a word of very wide connotation and is not to be confined to new processes or products or manufacturing techniques but extended as well to new and innovative methods of applying skill and knowledge provided they produce effects or results commercially useful to the public.

Since that decision, the Patent Appeal Board has allowed pure software inventions by granting patents to algorithms for calculating a number. In *Re Motorola Inc. Patent Application No. 2,085,228* (1998), 86 C.P.R. (3d) 72-76, the invention was directed to an algorithm for a more efficient calculation of the exponential value of a number. The calculation may be performed on a general purpose computer. Thus, the determination of whether a method relates to a patentable art depends neither on the kind of hardware to be employed in the method, nor whether a physical transformation is taking place during the execution of the process, but rather on the application of skill and knowledge in new and innovative ways. An algorithm is considered patentable subject matter if the results of the calculations are used as inputs into a system that as a whole is considered patentable. Here the exponential value of the number has a well recognized utility in further computational systems.

16.06.03

Methods of doing business

A method of doing business, devising a scheme or plan is not considered patentable unless the method is integrated into a method or system showing innovative skill and knowledge (see claim 3 in section 16.06.06).

In the field of patents there is no clear definition of a method of doing business and it is therefore not practical to categorize inventions as methods of doing business. Data processing methods are now routinely used in financial, accounting, shopping, marketing and various other fields using expert systems, neural networks, fuzzy logic (probabilities), semantic networks (relationships) and others. Business method inventions have similar characteristics to computer-related inventions and are examined as innovative methods of applying skill and knowledge.

16.06.04

Statistics and prediction

The following method consists of a scheme or plan for generating statistics and for using the results of the statistics on new tires to predict tire durability. If steps (4) and (5) are the novel steps, then there is no patentable subject matter in claim 1, because the storing and correlation of data are well known data processing steps. There is no invention in the mere automation of a process.

Example

Claim 1. A method to predetermine the durability of tires, comprising:

- (1) manufacturing an arbitrary number of tires and measuring the radial force variations exerted by the tread surface of each of the tires during one revolution of rotation of each tire;*
- (2) measuring the lateral force variation exerted by the tread surface of each tire during one revolution of rotation of each tire;*
- (3) destructively determining the durable life characteristics of a portion of the tires to thereby provide a series of tested tires and a series of untested tires;*
- (4) storing the data of steps (1), (2) and (3) to provide a dictionary of the effect of lateral and radial force variation on the durable life characteristics of the tested tires;*
- (5) relating radial and lateral force variation of the series of untested tires to the stored data of step (4) to thereby provide tires of known durability characteristics.*

16.06.05**Mental steps – not patentable**

Subject matter accomplishing a result by means of a person's interpretive or judgmental reasoning represents non-patentable subject matter. In claim 2, there is a mental association of an icon with the content represented by another icon. The step of assuming that an undisplayed topical data is available, is an interpretive ability.

Example

Claim 2. A method for indicating, with regard to a desired item of a topical subject matter that is presented on a visual display of a computer along with other items, that associated undisplayed topical data of a subject matter topically related to the subject matter of the desired item is available, comprising:

presenting the desired item on a visual display of the computer utilizing a standard set of symbols; and

providing a symbol different from any other symbols of said standard set of symbols adjacent to and concurrently with the desired item on the display of the computer temporally prior to displaying the associated undisplayed topical data for indicating that the associated undisplayed topical data is available;

said different symbol being spaced from the desired item and other items such that said symbol is associated with the desired item.

16.06.06**Resource allocation – patentable and non-patentable claims**

If a claim contains an algorithm for making a prediction, the claim will be considered to be in a patentable form if the results from the algorithm are used as inputs into a system that as a whole is considered patentable.

Example

Claim 3. A method for allocating a demanded amount of power to a plurality of power output apparatus, each power output apparatus having a cost curve associated therewith, such that each of the power output apparatus supplies a portion of the demanded power, consisting of:

- a) entering data for each of the power output apparatus into a controller, the data providing information about each of the power output apparatus;*
- b) generating solutions for all possible output power demands according to algorithm A, the solutions indicating the portion of power each power output apparatus is to supply to provide the total power demanded at optimal cost efficiency;*
- c) storing the solutions in tables within a storage unit of the controller;*
- d) upon receipt of a demand for power, performing a search of the solution tables to obtain the amount of power each power output apparatus is to supply, the total of the amounts of power from each power output apparatus being equal to the amount of power demanded at optimal cost efficiency;*
- e) outputting control signals to each of the power output apparatus, the control signals being indicative of the amount of power to be supplied.*

Algorithm A in step b) is integrated with the power allocation apparatus for signaling the amount of power to be supplied. However, steps a) to c) are inexplicit because it is not clear if the steps are performed by a human (not patentable see 16.06.08) or by the components in the apparatus (patentable). An improved algorithm B, replacing algorithm A, may patentably distinguish over the claim. Claims for unapplied algorithms which are not integrated into a useful system are refused.

16.06.07**Resource allocation - non-patentable claim**

The following method calculates a number. The administrative or managerial utility of the result of the calculation consists of a human intervention. A claim containing an algorithm for making a prediction or calculating a value, must be integrated into a system as a whole to be considered as patentable subject matter.

Example

Claim 4. A method for allocating beds for a hospital comprising:

- a. obtaining patient information for each patient admitted to the hospital, and determining a score for each patient;*
- b. calculating an estimated duration for the hospital stay of said each patient based on an algorithm using coefficient inputs and specified diagnostic groups;*
- c. determining the number of hospital beds in use at a point in time using the dates of admission and LOS determined for each patient admitted to said hospital,*
- d. allocating hospital beds to patients awaiting admission based on said number of hospital beds in use.*

16.06.08**Human intervention -- non-patentable claim**

If a claim requires the intervention of human beings who must invoke their skills or mental abilities in order for the claim to achieve its stated desired results, that claim is not patentable.

Example

Claim 5. A method of locating a stolen tractor trailer provided with a locating cellular transceiver, comprising the steps of:

- (a) receiving an indication that said tractor trailer has been stolen;*
- (b) paging said locating cellular transceiver;*
- (c) maintaining an open voice channel with said locating cellular transceiver of said tractor trailer;*
- (d) estimating the coordinates of the tractor trailer location based on the location of one or more cell sites communicating with said locating cellular transceiver;*
- (e) determining the location of a search vehicle with respect to said one or more cell sites;*
- (f) monitoring said open voice channel from said search vehicle;*
- (g) locating said stolen tractor trailer based on the direction of arrival of RF signals emitted by said stolen tractor trailer and received at said search vehicle.*

The steps in the method require the versatility and intuitiveness of a skilled team of users. Human and interpersonal interactions involving various known devices are not a patentable method.

16.06.09**Program listings – not patentable**

A program listing alone, although constituting a workable embodiment of the invention, is not in a form to allow for examination. An application for patent must comply with all of the filing requirements which includes a description of the invention..

16.06.10**User interfaces – not patentable**

An invention is considered not to be correctly and fully described when the operation of the computer system is described merely in reference to a graphical user interface.

16.07**CLAIMS FOR COMPUTER-RELATED INVENTIONS**

Computer programs, being descriptive material, are not considered patentable subject matter according to section 2 of the Patent Act. Patentable claims must fit into one of the categories of patentable subject matter which are listed in the definition of *invention* which includes a process, machine and manufacture. A computer-readable memory storing program code may be patentable (see section 16.07.05).

16.07.01**Method claim – patentable claim**

The elements of a method claim are steps or acts commonly phrased as gerunds.

Example

Claim 6. A computer-implemented method of implementing database management (DBMS) operations in parallel, independent of physical storage locations, said computer-implemented method comprising the steps of:

generating a serial execution plan for operations in said DBMS;

generating a parallelized execution plan for said serial execution plan, said parallelized execution plan including first and second operations, said second operation including one or more slave processes operating on a plurality of data partitions, the quantity of said data partitions being greater than the quantity of said slave processes, each of said slave processes operating on a different one of said data partitions;

executing said parallelized execution plan when a plurality of parallel resources of said computer system are available, said first and second operations executing in parallel; and

executing said serial execution plan when said plurality of resources are not available.

16.07.02**Method claim – non-patentable claim**

Claims should be read giving them the broadest reasonable interpretation consistent with the description and the drawings without reading into the claims limitations which are disclosed but not claimed.

Claim 7. A method of providing reservations for restroom use, comprising;

*receiving a reservation request from the user;
notifying the user when the restroom is available.*

Claim 7 may be interpreted in the following two ways:

- (1) a non-automated system for execution by the interaction of two individuals. The claim is an example of a method of human interaction which traditionally has been considered to be non-patentable subject matter (see also 16.06.08).
- (2) a method performed by a computer where each step of the method is entered separately into a computer. The computer acts as a mere calculating tool. This interpretation is not open to the examiner since he cannot read into the claim what has not been defined. Not even the preamble of the claim is limiting the method to implementation by an apparatus. The claim does not define the totality of the integrated system (see claim 17).

16.07.03

System or machine claim – patentable claim

It was held by the Commissioner of Patents in *re Application 961,392* (1971), 5 C.P.R. (2d) 162 (Waldbaum) that a computer which is programmed in one way is deemed to be a machine which is different from the same computer when programmed in another way. Machine (system) claims are frequently expressed in terms of *means plus function* as shown in comparing system claim 8 with method claim 6.

Example

Claim 8. In a computer system, a database management apparatus for implementing database management operations in parallel, independent of physical storage locations, said database management apparatus comprising:

means for generating a serial execution plan for operations in said database management apparatus;

means for generating a parallelized execution plan for said serial execution plan, said parallelized execution plan including first and second operations, said second operation including one or more slave processes

operating on a plurality of data partitions, the quantity of said data partitions being greater than the quantity of said slave processes, each of said slave processes operating on a different one of said data partitions;

means for executing said parallelized execution plan when a plurality of parallel resources of said computer system are available, said first and second operations executing in parallel; and

means for executing said serial execution plan when said plurality of resources are not available.

16.07.04

Intangible system claim -- not patentable

Example

*Claim 9. A **computer software system** for topographic design of a document comprising:*

at least one document design model for providing a user a plurality of choices for each of several document design elements;

a set of instructions providing a document design process responsive to user input commands for accessing said document design model.

This claim has no means which are essential to the solution of the problem, nor does the claim define the totality of interrelated means for performing the functions. Terms, which have no clear dictionary definition, such as *computer software system*, must be clearly explained.

16.07.05

Computer product claims -- patentable claims

A computer-related invention may be claimed as a computer product provided that the complete invention is capable of storage on a computer-readable memory. Computer product claims are variously referred to as manufacture claims, disk claims or loosely, software claims. There are two basic forms of the claim:

- a) claims defining a computer-readable memory for use in configuring a computer where the stored statements and instructions are recited as steps.

Claim 10. A computer-readable medium having computer-readable code embodied therein for sharing a time quantum between threads in a process, the computer program product including:

determining that a first thread, which is currently being executed by a processor and which has an associated time quantum, is blocked;
determining a next thread to be executed by the processor; and
transferring unused time in the time quantum of the first thread to the next thread to be executed.

Claim 11. A computer-readable memory storing statements and instructions for use in the execution in a computer of the method of claim 6.

- b) claims defining a computer readable memory for use in configuring a computer where the stored statements and instructions are recited as program code.

Claim 12. An article of manufacture comprising a computer usable mass storage medium having computer readable program code embodied therein for causing a processing means to execute computer-implemented database management operations in parallel, independent of physical storage locations, said computer readable program code in said article of manufacture comprising:

code for causing said processing means to generate a serial execution plan for said database management operations;

code for causing said processing means to generate a parallelized execution plan for said serial execution plan, said parallelized execution plan including first and second operations, said second operation including one or more slave processes operating on a plurality of data partitions, the quantity of said data partitions being greater than the quantity of said slave processes, each of said slave processes operating on a different one of said data partitions;

code for causing said processing means to execute said parallelized execution plan when a plurality of parallel resources of said computer system are available, said first and second operations executing in parallel; and

code for causing said processing means to execute said serial execution plan when said plurality of resources are not available.

Claim 12 cannot be shortened by reference to machine (system) claim 8, analogously to claim 7, because the means of the system are not equivalent to the code means stored in the computer memory.

Numerous variations to the above two forms of claims are possible -- it is only necessary that the claim defines memory storing the code and that the memory is computer-readable.

Claims 1 to 3 have been referred to as storing ***functional descriptive material*** in contrast to the storage of non-functional descriptive material which is discussed below. A computer-related invention is designated functional when it is stored in a computer-readable memory. There is no functional interaction during reading of the code from memory. The memory merely carries or stores the code. The word *functional* signifies the interaction of the program code with the computer during the method and in the operating machine -- not to a functional interaction between the memory and the code stored thereon.

16.07.06

Computer product claims -- non-patentable claims

Claims 13 and 14 define a computer program and are therefore not patentable.

Examples

Claim 13 A program for optimizing an updated neighbour set used by a mobile unit during soft handoff comprising:

instructions for determining a one-way-delay for each sector with which said mobile unit is communicating, said sectors with which said mobile unit is communicating comprising a first active set;

instructions for creating a second active set comprising all sectors of said first active set sectors;

instructions for forming a neighbour set comprising at least one of said first and second active sets.

*Claim 14. Computer **software media** which, when loaded into a processor, adapts said processor to:*

receive signals from an assembly identifier, said signals comprising an unique assembly identifier to said assembly of increasing magnitude;

responsive to said received signals, determine a current route for said assembly in the order of said magnitude.

Non-functional descriptive material is subject matter stored on a computer-readable material that cannot alter the manner in which the process steps are performed or the manner in which the computer interacts with the material. In claim 15, which defines genetic information stored in digital format, the subject matter is merely a rearrangement of **non-functional descriptive material** rather than any useful art, process, machine or manufacture under section 2 of the Patent Act.

*Claim 15. Computer-readable medium having recorded thereon the **nucleotide sequence** depicted in SEQ ID NO:1, a representative fragment thereof or a nucleotide sequence at least 99.9% identical to the nucleotide sequence depicted in SEQ ID NO:1.*

In claim 16, the means clause beginning with *program means* is avoidably ambiguous.

Claim 16. A system for providing a consistent user interface in a multiple application personal communications device, comprising:

a data storage in the device, for storing program instructions;

a bus means in the device, coupled to said data storage;

a data processor in the device, coupled to said data storage over said bus means, for executing said stored program instructions;

a data display screen in the device, coupled to said data processor, for displaying information;

*a **program means** stored in the data storage, having a first portion for managing communications using a public switched telephone network and displaying a first interface image on the display screen; said program means having a second portion, for managing communications using a mobile radio telephone network and displaying a second interface image on the display screen;*

The means clause purports to define an element in a system by its function, yet the element is to be stored in the data storage. The *means* expression is misdescriptive for *program code*.

Examples of other non-functional descriptive material are:

- data or information stored on a substrate which is not functionally related to the computer in which it is to be used;
- musical or literary works stored on computer memory;
- computer-readable storage medium carrying information that cannot alter or reconfigure how the computer functions;
- processes which differ from the prior art only with respect to non-functional descriptive material that cannot alter how the process steps are to be performed to achieve the utility of the invention.

16.07.07

Mere computerization – non-patentable claim

Claim 17 is in a patentable form of claim but defines the mere adaptation of a known method to new means of communication. The mere automation of a known method is not patentable.

Claim 17. A method of making reservations for restroom use by means of a computer system, comprising:

- submitting a reservation request;*
- assigning of a reservation number to the user;*
- entering said reservation number to a queue of requests;*
- receiving said reservation number;*
- receiving a signal indicating the availability of the restroom;*
 - when the reservation number is at the top of the queue;*
- setting an availability time period of the restroom for the user;*
- determining when the user is using the restroom within said time limit to delete said time limit;*
- detecting the user's exit from the restroom;*
- advancing the queue to the next reservation number;*
- sending a signal of the availability of the restroom to the next user at the top of the queue.*

16.07.08**Point-of-view – non-patentable claims**

Since users and providers of computer services may be geographically separated, different claims are drafted from the view of the service provider and the user. These so-called point-of-view claims reflect the jurisdiction in which protection is sought. When the complete method claim 17 is gutted of all steps but those of the user, the phrases in bold type-face remain and are reproduced in claim 18. This claim is incomplete through failure to define the whole invention. From the point of view of the user the two steps are the only discernible steps. However, a claim rather than being an instruction guide on how to make a restroom reservation must define distinctly and in explicit terms the subject matter of the invention in accordance with section 27(4). The following claim from the view of the user does not define the operable method which describes implementation by hardware and software:

Claim 18. A method of requesting reservations for restroom use, comprising;
submitting a reservation request;
receiving notification when the restroom becomes available.

The method does not define the concept of the integrated system method of claim 17 and therefore is not patentable (see also claim 7).

16.07.09**Signal claim**

In signal claims the invention is transmitted on a carrier wave. The complete invention must be capable of being transmitted.

Example

Claim 19. A computer data signal embodied in a carrier wave and representing sequences of instructions which, when executed by a processor, cause the processor to share a time quantum between threads in a process by performing the steps of:
determining that a first thread, which is currently being executed by a

*processor and which has an associated time quantum, is blocked;
determining a next thread to be executed by the processor; and
transferring unused time in the time quantum of the first thread to the next
thread to be executed.*