

August 19, 2010

By Email: Barney.deSchneider@ic.gc.ca

Barney de Schneider  
Assistant Commissioner of Patents  
Canadian Intellectual Property Office  
Patent Branch  
50 Victoria Street  
Gatineau, Quebec  
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Dear Mr. de Schneider:

Re: Proposed Amendments to MOPOP Chapter 16

FICPI Canada wishes to thank the Canadian Intellectual Property Office for the opportunity to comment on the proposed revisions to Chapter 16 of the Manual of Patent Office Practice which were released for public review on June 16, 2010.

As you know, FICPI (the Federation Internationale des Conseils en Propriété Industrielle), comprises more than 3500 intellectual property attorneys in private practice in over 80 countries. FICPI Canada is a self-governing national association of FICPI and represents the interests of Canadian patent and trade mark professionals. Our membership includes senior professionals at most major Canadian intellectual property firms. Our clients span all types and sizes of businesses, including multi-national corporations, small and medium size enterprises, and individuals.

We recognize that updating Chapter 16 of MOPOP represents an enormous effort and we commend the Patent Office for addressing this important project. It is crucial that MOPOP be kept up to date, and that it provide clear guidance to the examination staff in the Patent Office.

FICPI Canada's submissions are set out in the attached document, which includes a marked-up copy of the proposed draft of Chapter 16 containing recommended changes and notes.

FICPI Canada wishes to thank the Canadian Intellectual Property Office for the opportunity to provide comments. If CIPO has any comments about our submissions, or if you consider it would be helpful to have a meeting with representatives from FICPI Canada, please do not hesitate to contact the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'R. Storey', with a long horizontal stroke extending to the right.

Robert B. Storey  
President – FICPI Canada

cc Chris Evans (By email)

FICPI Canada Submission to CIPO

Re: Proposed Amendments to MOPOP Chapter 16

August 19, 2010

## Submission

This submission is provided in response to a call for comments on a draft amended Chapter 16 of the Manual of Patent Office Practice ("MOPOP") entitled "Computer-Implemented Inventions".

FICPI Canada shares the view that examiners should be provided with guidance when examining patent applications. Guidance documents generally provide greater objectivity and consistency in the examination of patent applications. FICPI Canada supports CIPO's ongoing work in amending MOPOP and acknowledges the contribution of the individuals involved in this work.

## Recommendations

### Recommendation 1

FICPI Canada is of the view that since there have been no changes to the statute and there have been no new decisions of the courts regarding computer-implemented inventions since the previous revision of MOPOP Chapter 16 in February 2005, there is no compelling reason for any changes to be made at this time to Office practice relating to examination of patent applications relating to computer-implemented inventions.

FICPI Canada is of the view that if any revisions to MOPOP Chapter 16 are to be made, such changes should only be made in response to new law on the subject of computer-implemented inventions (e.g. after a final decision from the courts in the *Amazon* appeal).

### Recommendation 2

FICPI Canada is of the view that the proposal in Chapter 16 to examine claims for statutory subject matter based on a "contribution" approach, as set forth in 16.01, 16.02.02, 16.02.03, 16.02.04, 16.03, 16.03.02, 16.03.03, 16.08.04, 16.09, 16.09.01, 16.09.03, 16.09.04, 16.09.05, has no basis in Canadian law.

Generally, it is understood that with the proposed "contribution" approach, instead of focusing upon the claim as a whole, the focus is only upon a subset of elements of the claim, the subset being identified through multiple levels of distillation or dissection of the claim.

At an initial level of distillation, the focus is on the "essential elements" of the claimed invention,<sup>1</sup> which the text defines as "the elements necessary to provide the useful result in a novel and inventive manner, and without which elements the solution would cease to be inventive".<sup>2</sup> The text asserts that, "[it] is also necessary that the description provide such instructions as are necessary for the person skilled in the art to understand, where applicable, the interrelationship of the essential elements necessary to provide the practical form of the invention".<sup>3</sup>

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<sup>1</sup> Proposed Draft MOPOP Chapter 16.03

<sup>2</sup> Proposed Draft MOPOP Chapter 16.05.04

<sup>3</sup> Proposed Draft MOPOP Chapter 16.05.04

As a further level of distillation, the text proposes to focus on only the "contribution" made by the inventors, meaning only those portions of a claimed invention that are both novel and non-obvious.<sup>4</sup> In other words, under this proposed new approach, patent applicants will no longer be permitted to rely upon features of the claim that are known from the prior art in order to demonstrate that the claim constitutes statutory subject-matter; rather, patent applicants would be permitted to rely only upon the novel and non-obvious features of the claim to demonstrate statutory subject-matter.<sup>5</sup>

As yet another level of distillation, even among the subset of novel and nonobvious features representing the "contribution", patent applicants will only be permitted to rely upon features that are deemed to be "statutory features" as opposed to "non-statutory features".<sup>6</sup> In assessing whether an element of a claim is a "statutory feature", it appears that the Office intends to exclude any elements that are not viewed as providing "a technological solution to a problem in a field of technology", and also intends to exclude any features that the Office otherwise views as excluded subject-matter.<sup>7</sup>

To examine a claim, the text proposes to first conduct the distillation into "statutory" and "non-statutory" features.<sup>8</sup> If a claim includes both statutory and non-statutory features, then it will be necessary to conduct a second distillation of the claim to identify the "contribution" made by the inventors, meaning the novel and non-obvious elements of the claim, by comparing the claim to the prior art. If the "contributed" (novel and non-obvious) features are non-statutory, then the claim is to be rejected as non-statutory, even if the claim contains other statutory features that are known from the prior art. In other words, the Office proposes that it will not be enough for a claim to contain some elements that are statutory and others that are new and non-obvious; rather, the claim will have to contain a "statutory contribution",<sup>9</sup> meaning at least one feature that is statutory, novel and non-obvious.

Under the proposed MOPOP revisions, a claim directed to a device or machine, which until now would have inevitably been recognized as statutory subject matter in Canada, the United States, the European Patent Office and most if not all other countries in the world, can now be rejected as non-statutory if the novel and non-obvious features of the claim do not coincide with the features that the Office views as statutory features.

We must point out, however, that when considering questions of patentability, it is the patentability of the invention as claimed that must be assessed. Section 27(4) of the *Act* expressly confirms that the role of the claims is to define the "invention" for which a patent is sought:

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<sup>4</sup> Proposed Draft MOPOP Chapter 16.02.03

<sup>5</sup> For example, see analysis of claim 2 on page 16-17 and analysis of claims 2 and 3 on page 16-8

<sup>6</sup> Proposed Draft MOPOP Chapter 16.02.03, 16.03

<sup>7</sup> Draft Chapter 16, ss. 16.02.01, 16.02.03, 16.03, 16.03.02, 16.08.04, 16.09.01, 16.09.04

<sup>8</sup> For example, see analysis of claim 4 on page 16-11, claim 2 on page 16-25, and discussion of invention as a solution to a practical problem in 16.09.01

<sup>9</sup> Proposed Draft MOPOP Chapter 16.03

s. 27(4) The specification must end with a claim or claims defining distinctly and in explicit terms the subject-matter of the invention for which an exclusive privilege or property is claimed. [Emphasis added]

Thus, in accordance with s.27(4), "the invention" means the subject-matter defined by a claim. It is this subject-matter defined by each claim that must be analyzed for compliance with the definition of "invention" in s. 2.

S. 27(4) does not authorize the "invention" to be defined by some subset of the claim or the disclosure that may be referred to as the "contribution" of the inventors. Rather, S. 27(4) provides that it is the claim that defines the subject-matter of the invention. Accordingly, for the Office to define the invention based on anything less than the entirety of the subject-matter defined by the claim, is a contravention of s.27(4) of the *Act*.

Thus, Ss. 28.2 and 28.3 merely require "the subject-matter defined by a claim" to be novel and non-obvious. This statutory wording clearly requires novelty and obviousness to be assessed on the basis of the full subject-matter defined by a claim, i.e., the claim as a whole. It is a well-established principle in Canadian law that novelty and obviousness must be assessed on the basis of the entire claim; it is not permissible to dissect or distill the claim into its constituent elements then object that individual elements are not new or inventive.<sup>10</sup>

As stated by the Court in *McPhar*.<sup>11</sup>

"Moreover, it is not a correct approach to the determination of whether a claim is invalid to pick out an individual feature of the invention defined by it and contend that because such feature is not new or useful and does not involve the exercise of inventive ingenuity the Claim is, therefore, invalid. It is well settled, as Lord Romer said in *Non-Drip Measure Co. Ltd. v. Stranger's Ltd.*, (1943), 60 R.P.C. 135 at p. 145 that this is not a legitimate method of approach and that the alleged invention must be regarded as a whole."

There is absolutely no requirement in s. 28.2 or s. 28.3 that anything less than the full subject-matter defined by a claim be novel or obvious; there is certainly no requirement in s.28.2 or s. 28.3 that the "statutory" as opposed to the "non-statutory" elements of a claim be novel or obvious.

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<sup>10</sup> See e.g., *Procter & Gamble Pharmaceuticals Canada Inc. v. Canada (Minister of Health)*, (2004), 32 C.P.R. (4th) 224 at 252-253 (F.C.T.D.), *alald.* 37 C.P.R. (4th) 289 (F.C.A.), *Canamould Extrusions Ltd. v. Oriangle Inc.* (2003), 25 C.P.R. (4th) 343 at 367 (F.C.T.D.), *affd.* 30 C.P.R. (4th) 129 (F.C.A.); *Crila Plastic Industries Ltd. v. Ninety-Eight Plastic Trim Ltd.* (1987), 18 C.P.R. (3d) 1 at 14 (F.C.A.); *Beloit Canada Ltd. v. Valmet Oy* (1986), 8 C.P.R. (3d) 289 at 297 (F.C.A.); *Omark Industries (1960) Ltd. v. Gouger Chain Saw Co.* (1964), 45 C.P.R. 169 at 218-219 (Ex. Ct.); *Riddell v. Patrick Harrison & Co. Ltd.* (1957), 28 C.P.R. 85 at 105-106 (Ex. Ct.).

<sup>11</sup> *McPhar Engineering Co. of Canada Ltd. v. Sharpe Instruments Ltd.* (1960), 35 C.P.R. 105 at 148 (Ex. Ct.).

Accordingly, by requiring novelty and non-obviousness to be found in "statutory" elements and disregarding any novelty or non-obviousness that may be found in "non-statutory" elements, the "contribution" approach imports new novelty and non-obviousness requirements which are more onerous than those imposed by Parliament in ss.28.2 and 28.3 of the *Patent Act* and thus s. 40 of the *Patent Act* prohibits the Commissioner from adopting such an approach.

In our view, the contribution approach proposed in the draft revision of Chapter 16 contravenes the Supreme Court judgments on subject-matter in *Harvard College* and in *Schmeiser*. As discussed above, the proposed "contribution" approach requires an identification of a subset of so-called "essential elements" of the claim that are novel and unobvious over the prior art. Under the proposed approach, a claim will only be considered statutory if at least one of the elements viewed by CIPO as "statutory elements" is also one of the "contributed" (i.e., novel and non-obvious) elements. Novelty and obviousness are addressed in ss. 28.2 and 28.3 of the *Patent Act* and s. 28.2(1) requires that "The subject-matter defined by a claim" must not have been disclosed in any of the circumstances described in s.28.2(1)(a) to (d). Similarly, s. 28.3 requires that "The subject-matter defined by a claim" must not have been obvious on the claim date having regard to the information described in s.28.3(a) and (b).

The Supreme Court of Canada has held that whether a claimed invention qualifies as statutory subject-matter is a question of law. In this regard, in *Harvard College*, the Supreme Court stated:<sup>12</sup>

Perhaps more important in this case is the nature of the problem under review, i.e. whether it constitutes a question of law, fact or mixed law and fact. In my view, the question of whether a higher life form can be considered a "manufacture" or "composition of matter" approaches a pure determination of law. There is no disagreement in this case regarding the nature of the specific invention: if it is determined that higher life forms are "manufacturers" or "compositions" of matter", then the oncomouse is an invention ... [emphasis added]

In contrast, it is well-established in Canadian law that novelty and obviousness are questions of fact, not questions of law.<sup>13</sup> Thus, the identification of the "contribution" made by the inventors, for the purpose of assessing statutory subject-matter, is necessarily a question of fact. However, by classifying statutory subject-matter as a "pure determination of law", the

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<sup>12</sup> *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45 at 474-475

<sup>13</sup> To name but a few authorities, see e.g. *Consolboard Inc. v. MacMillan Bloedel (Saskatchewan) Ltd.* (1981), 56 C.P.R. (2d) 145 at 167 (S.C.C.); *SmithKline Beecham Pharma Inc. v. Apotex Inc.* (2002), 21 C.P.R. (4<sup>th</sup>) 129 at 136 (F.C.A.); *Rothmans, Benson & Hedges Inc. v. Imperial Tobacco Ltd.* (1993), 47 C.P.R. (3d) 188 at 202 and 204 (F.C.A.); *Mahurkar v. Vas-Cath of Canada Ltd.* (1990), 32 C.P.R. (3d) 409 at 410 (F.C.A.); *Diversified Products Corp. v. Tye-Sil Corp.* (1988), 23 C.P.R. (3d) 313 at 319 (F.C.T.D.); *Beloit Canada Ltd. v. Valmet Oy* (1986), 8 C.P.R. (3d) 289 at 296 (F.C.A.); *Johnson Controls Inc. v. Varta Batteries Ltd.* (1984), 80 C.P.R. (2d) 1 at 16 (F.C.A.); *Cutter (Canada) Ltd. v. Baxter Travenol Laboratories of Canada Ltd.* (1983), 68 C.P.R. (2d) 179 (F.C.A.), leave to appeal refused (1983), 72 C.P.R. (2d) 287 (S.C.C.); *Xerox of Canada Ltd. v. IBM Canada Ltd.* (1977), 33 C.P.R. (2d) 24 at 54 (F.C.T.D.); *Lovell Manufacturing Co. and Maxwell Ltd. v. Beatty Bros. Ltd.* (1962), 41 C.P.R. 18 at 63 (Ex. Ct.).

Supreme Court has clearly prohibited factual inquiries, such as the novelty and non-obviousness of the claimed invention or elements thereof, or the "contribution" of the inventors, from entering into the statutory subject-matter analysis.

The fact that all members of the Supreme Court agreed with the analytical approach taken in *Harvard College*,<sup>14</sup> and subsequently reiterated their unanimous approval of this approach in the *Schmeiser* decision,<sup>15</sup> has been viewed as "cementing" the "question of law" approach to statutory subject-matter in Canada.<sup>16</sup> Accordingly, the Supreme Court has clearly prohibited the involvement of factual inquiries such as novelty or non-obviousness from entering into the statutory subject-matter analysis.

The contribution approach clearly contravenes the Supreme Court of Canada judgments in *Harvard College*<sup>17</sup> and in *Schmeiser*,<sup>18</sup> by impermissibly transforming the statutory subject-matter analysis from a "pure determination of law" into a factual inquiry of novelty and non-obviousness.

A more serious flaw in the "contribution" approach is that it requires a comparison of the subject-matter of a claim to the relevant prior art in order to identify what novel and non-obvious features have been "contributed" by the inventor. This identification of the "contribution" of the claim is clearly a step in claim construction, as the Office effectively proposes to apply the requirements of patentability, including statutory subject-matter, to this "contribution" consisting of the novel and non-obvious elements of the claim rather than to the claim as a whole. Effectively, therefore, the Office would be construing the claimed invention as this "contribution".

However, it is well established in Canadian law that the prior art may not be considered for the purpose of construing the claims. Rather, the claims must be construed before conducting any analysis of validity such as novelty or nonobviousness analysis. For example, in *Visx v. Nidek*, the Federal Court of Canada stated:<sup>19</sup>

"[T]he first duty of the Court ... is to "construe" the patent. Claim construction must be effected before dealing with the alleged infringement or the validity of the patent. The construction of a patent is a question of law to be decided by the Court. Consequently,

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<sup>14</sup> *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45 at 474-475

<sup>15</sup> *Monsanto Canada Inc. v. Schmeiser* (2004), 31 C.P.R. (4th) 161 (S.C.C.) at 173-174 *per* McLachlin CJC and Fish J; and at 192-193 *per* Arbour J. (dissenting).

<sup>16</sup> R. J. Atkinson, "Mixed Messages: Canada's Stance on Patentable Subject Matter in Biotechnology", (2005), 19 I.P.J. 1 at 11.

<sup>17</sup> *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45 at 474-475

<sup>18</sup> *Monsanto Canada Inc. v. Schmeiser* (2004), 31 C.P.R. (4th) 161 (S.C.C.) at 173-174 *per* McLachlin CJC and Fish J; and at 192-193 *per* Arbour J. (dissenting).

<sup>19</sup> *Visx Inc. v. Nidek Co.* (1999), 3 C.P.R. (4th) 417 at 423 (F.C.T.D.), *affd.* 16 C.P.R. (4th) 251 (F.C.A.). See also *Emmanuel Simard & Fils (1983) Inc. v. Raydan Manufacturing Ltd.* (2005), 41 C.P.R. (4th) 385 at 396 (F.C.T.D.), *revd on costs only* at 53 C.P.R. (4th) 178 (F.C.A.): " ... [It] is essential as a first step to construe the claim: 'The first step in a patent suit is therefore to construe the claims. Claims construction is antecedent to consideration of both validity and infringement issues.' This must be done without reference to the allegedly infringing product or any relevant prior art (see *Whirlpool. supra*, at 1093)."

the claims must be construed without reference to prior art or to alleged infringing activities."

The Supreme Court of Canada has disapproved of extrinsic evidence for the purpose of claim construction in general, holding that claim construction should be properly limited to the four corners of the specification.<sup>20</sup> The Supreme Court has also cautioned against construing the claims "with an eye to the prior art".<sup>21</sup>

More generally, Canadian court decisions both before and after *Free World Trust* and *Whirlpool* have simply held that,<sup>22</sup> "The claims are to be construed without reference to the prior art." Numerous other Canadian court decisions have reached the same conclusion.<sup>23</sup>

The contribution approach also contravenes statutory provisions and Canadian court decisions on claim differentiation and claim redundancy. There is a presumption against redundancy of patent claims. In addition, as a result of Section 87 of the *Patent Rules*, Section 58 of the *Patent Act* and Sections 10 and 12 of the *Interpretation Act*, each claim must be given its own independent effect.

In contrast, the "contribution" approach will often attribute the same meaning to two or more different claims in an application: this will necessarily occur whenever two or more claims, despite defining different sets of elements, are viewed as having the same "contribution". Accordingly, the "contribution" approach can improperly render many claims redundant, thereby depriving them of any meaning or effect, and thus contravenes the above-cited Canadian court decisions on claim redundancy and the above-cited sections of the *Patent Act*, the *Patent Rules* and the *Interpretation Act*.

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<sup>20</sup> *Whirlpool Corp. v. Camco Inc.*, [2000] 2 S.C.R. 1067 at 150

<sup>21</sup> *Whirlpool Corp. v. Camco Inc.*, [2000] 2 S.C.R. 1067 at 149

<sup>22</sup> *Glaxo Group Ltd. v. Canada (Minister of National Health and Welfare)* (2000), 6 C.P.R. (4th) 73 at 82 (F.C.T.D.), affd. 11 C.P.R. (4th) 417 (F.C.A.); *AB Hassle v. Apotex Inc.* (2001), 12 C.P.R. (4th) 289 at 313 (F.C.T.D.); *Novartis AG v. Apotex Inc.* (2001), 15 C.P.R. (4th) 417 at 447 (F.C.T.D.); *Pro-Vertic (1987) Inc. v. International Diffusion Consommateur S.A.* (1989), 26 C.P.R. (3d) 528 at 530 (F.C.T.D.).

<sup>23</sup> See e.g., *Lishman v. Erom Roche Inc.* (1996), 68 C.P.R. (3d) 72 at 86 (F.C.T.D.) *per* Rothstein J. as he then was: "The prior art has nothing to do with the construction of the claims in a patent ..."; *Dableh v. Ontario Hydro* (1996), 68 C.P.R. (3d) 129 at 142-143 (F.C.A.): "The appellant maintains that in construing claim 1 by reference to prior art and the concept of obviousness the Trial Judge has confused the task of determining a patent's validity with that of claim construction. We agree."; *Amfac Foods Inc. v. Irving Pulp & Paper, Ltd.* (1986), 12 C.P.R. (3d) 193 at 197 (F.C.A.): "... [I]n conformity with normal rules of claim construction, no reference to the prior art is either required or proper in this case."; *Beloit Canada Ltd. v. Valmet Oy* (1984), 78 C.P.R. (2d) 1 at 54, rev'd on other grounds 8 C.P.R. (3d) 289 (F.C.A.): "As Fox at p. 215 states claims are to be construed with reference to the entire specification, without reference to prior art, each claim should be given a distinct meaning if possible, and what is not claimed is disclaimed."; *Pfizer Canada Inc. v. Canada (Minister of Health)* (2005), 46 C.P.R. (4th) 244 at 260 (F.C.T.D.), affd. 54 C.P.R. (4th) 353 (F.C.A.): "The claims are construed by the Court at the outset of its decision before considering issues of validity or infringement. It is not to be a "results oriented" exercise, rather, it is to be carried out without an eye either to the alleged infringement or the prior art. (*Whirlpool* paragraphs 43 and 49(a))."

### Recommendation 3

FICPI Canada is of the view that some portions of the draft extend into areas already covered and best dealt by other chapters of the MOPOP. Such extension into overlapping chapters is not necessary for the purposes of Chapter 16. It is consequently recommended to delete portions of draft Chapter 16 and instead provide cross-reference to other MOPOP Chapters. Hyperlinks could be a convenient way for cross-referencing an online document.

Cross-reference is preferable since:

- it avoids inconsistencies within MOPOP on a given subject;
- it avoids having to rewrite more than one chapter of MOPOP when the law changes on a given subject;
- it avoids blending concepts which could lead to poorer understanding of description requirements.

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These and other recommendations from FICPI Canada are embodied in the attached marked-up version of draft Chapter 16. Notes and suggestions are also provided for improved reference to case law and concepts.

Respectfully submitted,

FICPI Canada

Per Robert Storey, Alain Leclerc, Stephen Perry and John Knox

## Chapter 16

### Computer-Implemented Inventions

#### 16.01 Scope of this chapter

The purpose of this chapter is to highlight Office practice as it pertains in particular to computer-implemented inventions.

The term “computer” is used in this chapter to refer to an electronic device comprising a processor, such as a general-purpose central processing unit (CPU), a specific purpose processor or a microcontroller. A computer is capable of receiving data (an input), of performing a sequence of predetermined operations thereupon, and of producing thereby a result in the form of information or signals (an output).

Depending on context, the term “computer” will mean either a processor in particular or can refer more generally to a processor in association with an assemblage of interrelated elements contained within a single case or housing. The term may be applied, for example, to a network server, personal digital assistant (PDA), multi-function cell phone, or similar device. In certain contexts, the term may be applied more broadly so as to refer to a device interacting with certain ubiquitous peripherals, such as a keyboard, mouse or display, necessary for interacting with the computer itself. In this sense, the term “computer” may refer to a “general purpose computer” such as a desktop or laptop computer capable of receiving input, such as via a keyboard, and providing output, such as to a display means.

In reading this chapter, it should be borne in mind that its purpose is to clarify, through elaboration, the application of the more generic teachings of other chapters to the particular issues encountered with computer-implemented inventions.

Nothing in this chapter should be interpreted as providing exceptions to any practice of general applicability set out in any other chapter. ~~Throughout this chapter, reference is made to the nature of the contribution in a claimed invention. Additional guidance on the contribution approach used to assess whether a patentable contribution has been made can be found in Chapter 13 of this manual.~~

#### 16.02 Subject-matter

~~As with any invention, in order to be patentable under the *Patent Act* the claimed subject matter of a computer implemented invention must fall within one of the five categories found within the section 2 definition of “invention”, namely art, process, machine, manufacture or composition of matter.~~

Section 2 of the Patent Act defines what is meant by “an invention”.

Section 27(4) of the Patent Act states:

s. 27(4) The specification must end with a claim or claims defining distinctly and in explicit terms the subject-matter of the invention for which an exclusive privilege or property is claimed.

This statutory principle, that the subject matter of the invention is defined by the claims, has been emphasized on numerous occasions by the Supreme Court of Canada.<sup>1</sup> And more recently, the Federal Court of Appeal has also emphasized that in analyzing the patentability of “the invention”, “What is in issue is the patent claim as construed by the Court.”<sup>2</sup>

Thus, the claims define the invention claimed by the applicant and to determine whether they fall within the definition of invention under Section 2, it is necessary to consider whether each claim defines subject matter that meets the requirements of Section 2.

Section 2 reads 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.

From the use of the word “or” in section 2, it is clear that a claim qualifying under any one of the statutory categories (“art, process, machine, manufacture or composition of matter, or ... improvement [there]in...”) is sufficient to define a statutory “invention” if it is new and useful.

The following sections set out how the five categories of invention apply to computer-implemented inventions in particular, and consequently refine the more general guidance provided in Chapter 12 of this manual.

~~A computer-implemented invention may be claimed as a method (art, process or method of manufacture), machine (generally, a device that relies on a computer for its operation), or product (an article of manufacture). Certain subject matter relevant in the computer arts may not be claimed as such, including computer programs, data structures, and computer-generated signals.~~

A guiding principle in respect of computer-related inventions was provided by the Federal Court of Appeal in *Schlumberger*, which noted that “the fact that a computer is or should be used to implement a discovery does not change the nature of that discovery”, and also that the presence of a computer cannot effect the “transforming into patentable subject-matter [of] what would, otherwise, be clearly not patentable”.<sup>3</sup>

### **16.02.01 Art**

The term “Art” is “a word of very wide connotation and is not confined to new processes or products or manufacturing techniques but extends as well to new and innovative methods of applying skill or knowledge provided they produce effects or results that are commercially useful to the public.

A claim is considered to fall within the category of "Art" if it recites subject matter that:

- (i) is not a disembodied idea but has a method of practical application;
- (ii) is a new and innovative method of applying skill or knowledge; and
- (iii) has a result or effect that is commercially useful.

Aspects (i) and (iii) are pure determinations of law whereas aspect (ii) is a determination of fact, i.e. novelty and obviousness. Assessment of the requirements for novelty and obviousness are described elsewhere in this manual.

In practice it is suggested that the Examiner assess aspects (i) and (iii) before considering novelty and obviousness of the claim and if the claim fails to satisfy aspects (i) and (iii) before a novelty an obviousness assessment has taken place, the claim may be considered not to fall under the category of art. It may however, fall under one of the other categories of patentable subject matter set forth in Section 2.

If aspects (i) and (iii) above are satisfied, then the Examiner should consider whether the claim satisfies the requirements for novelty and obviousness and if the claim fails to satisfy these requirements, even though aspects (i) and (iii) may be satisfied, the claim may be considered to not fall within the category of art. The claim may however, fall within one of the other categories of patentable subject matter set forth in Section 2.

Computer-implemented inventions falling within the category *art* are typically claimed include graphical user interfaces, data structures, database schemas, data communications protocols, communications signals and as methods for example.

Many methods involve the use of a computer or an apparatus or system including a computer. A method claim that, for example merely recites mathematical steps for solving a mathematical formula, would be considered non-statutory does not become statutory likely fail to meet aspect (i) and would probably not be saved simply by virtue of some part of the method being carried out on or by a computer. The method itself, as a whole, must be a solution to a practical problem and must lie within a field of technology

Claims to computer implemented methods for playing known games or creating works of art do not define inventions that belong to a field of technology and do not come within the definition of invention in section 2 of the Patent Act.

A method of controlling a computer's operations so as to achieve a technological result, in contrast, would come within the definition of invention in section 2 of the

~~Patent Act. In such a method, the electronic processes within the computer are considered to satisfy the requirement that the method include (either explicitly or implicitly) at least one act performed by a physical agent upon a physical object, producing in that object some change of condition.~~

Claims directed to what may be regarded as professional skills are generally considered to fail to satisfy the requirement the claim must have a result or effect that is commercially useful to be considered an "Art" under Section 2.

### **16.02.02 Process**

As noted in section 12.02.02 of this manual, a process implies the application of a method to a material or materials. ~~To be statutory, a process must apply a statutory method.~~ A mathematical algorithm that is not patentable per se, could be part of a patentable process that applies that algorithm to solve a practical problem. For example, in the fields of speech recognition and wireless transmission and reception, mathematical algorithms are used to improve recognition accuracy or to improve reception, respectively. Both of these examples are representative of current innovation in these respective fields of technology that are implemented on computer technology.

~~When assessing the contribution of a computer-implemented process, it must be borne in mind that the necessary ingenuity novelty, non-obviousness and utility of the claim as a whole can arise from the method, from the application of the method in a field in which such a method has not previously been applied. material or materials, or from the recognition that applying the method to the material or materials leads to an unexpected useful result.~~

### **16.02.03 Machine**

A device such as a computer, or an apparatus or system including or operated by a computer associated with other devices, is generally viewed as falling within the category machine. A device including a CPU or other processor is generally viewed as falling within the machine category.

~~Whether or not a claim to a device defines a patentable invention depends on the presence of a contribution in the claimed matter and the nature of this contribution [see section 13.05.03 of this manual]. As noted in section 13.05.03b, for a claim to be patentable it must define at least one statutory element that forms part of the contribution. For a claim to a device to be patentable, the device itself must therefore be a contributed practical form. That is, the device must provide a novel and unobvious technological solution to a technological problem.~~

~~Determining whether or not a device satisfies the requirements for patentability this is the case~~ can be performed by assessing the device itself, but in many cases can also be performed indirectly by reference to the method implemented by the device. Where a statutory method is implemented by a computer, apparatus or system, a device capable of implementing the entire method is ~~necessarily a solution to a practical problem~~ satisfies the requirements for patentability. Presuming the device has been specifically modified to implement the method, such that it is novel and unobvious, it will be eligible for patentability ~~a statutory contribution~~. The patentability of a device is not negated, however, from the mere fact that the device is intended to implement or to be used in a non-statutory method. The question to be addressed in such cases remains whether the device ~~is provides a novel and unobvious inventive technological solution to a technological problem~~.

Where a device ~~is directed to statutory subject matter~~ does provide such a solution, its patentability does not depend on whether it was adapted by providing new hardware or by controlling existing hardware in a particular manner by the addition of software or firmware (software programmed into a read-only memory).

~~Note that the “technological solution to a technological problem” whether or not a device is patentable~~ does not have to be in relation to the operation of the computer as a general purpose device (e.g. it is not necessary that a computer be made more efficient or reliable), but could be simply that the general purpose device has been technologically adapted to act as a special purpose device. Thus, presuming novelty and ~~ingenuity~~ inventiveness, any of the following provide ~~the basis for a patentable device technological solutions to technological problems and would be viewed as contributed devices~~: a computer programmed to allow its speakers to simulate “surround sound” (known hardware controlled by new software), a computer adapted to operate using two central processing units (new arrangement of known hardware, controlled by new software), a computer programmed to allocate memory to video processing in a manner that increases the efficiency of the device when running several applications (known hardware controlled by new software), and a computer whose motherboard has an inventive new video card slot with a faster data transfer rate (new hardware).

~~Where a computer or other device does not provide a solution to a technological problem, the computer or device as a whole is not a contributed practical form of an invention. Where such a device is further defined in terms of discrete non-statutory features, the claim would be objected to on the ground that it does not define a statutory “invention” within the meaning of section 2 of the Patent Act [see section 13.05.03b of this manual]. For example, a~~ A computer or other programmable device cannot be patentably distinguished from other computers on the basis of non-statutory data stored on it; storing non-statutory data on the computer does not make the computer a new and unobvious solution to a practical problem [see section 12.06.07 of this manual]. However, storing

statutory data such as a set of computer executable instructions that when performed by a computer, cause the computer to be directed to statutory subject matter, would define a statutory "invention" within the meaning of section 2 of the Patent Act.

#### **16.02.04 Manufacture**

~~The category manufacture encompasses both the processes of making technical articles or materials by the application of physical labour or mechanical power; for manufacturing and the products articles or materials made by such processes [see section 12.02.04 of this manual]. As noted in 16.02.03, a device including a CPU is generally viewed as falling within the category machine. The category manufacture therefore applies to computer-implemented inventions either where a computer is used to control a manufacturing process, or where a non-machine computer product article or material is claimed. The principles discussed in 16.02.02 apply equally to computer-controlled manufacturing processes.~~

~~The concept of a non-machine computer product article or material applies to a physical memory having computer-executable instructions stored thereon. A computer program per se is not statutory because it is disembodied. When stored on a physical medium, the resultant product having computer executable instructions, that when executed provide the computer program, may be considered a manufacture. The patentability of such products depends on the nature of the contribution, and is discussed in 16.08.04.~~

#### **16.02.05 Composition of matter**

The category of invention *composition of matter* relates to chemical compounds, compositions and substances and is not of great significance to computer-implemented inventions. A computer-controlled method or process for manufacturing compositions of matter could be evaluated under the category *art* or *process* as the case may be.

#### **16.03 Examining computer claims**

A patentable claim must ~~include a~~ be directed to statutory contribution subject matter. Where a claim is directed to a computer, it falls into the statutory class of machine, and therefore it must be determined whether the machine itself is part of the contribution satisfies the requirements for patentability - that is, whether the computer itself may be considered novel and inventive.

~~In evaluating whether the computer has been contributed, it is first necessary to identify the essential elements of the device; i.e., those that, as a set, provide a technological solution to a technological problem. For the computer to be patentable, this set of elements must be novel and inventive.~~

As noted in 16.02.03, where the machine has been specially adapted to implement the entirety of a patentable (statutory, useful, novel and inventive) method, the machine is

considered to be a technological solution and is patentable.

### **16.03.01 Adapting a computer to solve a problem**

A computer can be adapted to solve a problem either by its hardware, software or a combination thereof. Where the adaptation is performed via hardware, this will typically permit a structural comparison of the computer to other computers and will facilitate the assessment of novelty and ingenuity.

More often, however, a computer will be adapted via software. In evaluating whether a computer adapted by software is the result of ingenuity, it is useful to draw a distinction between the design of a computer program and the expression of that program in a specific programming language.

Designing a computer program comprises steps such as developing a method to be implemented by the computer and creating flow charts, design diagrams or pseudocode to describe the method steps to be performed by the computer in order to solve a problem. Furthermore, specific operations and their necessary sequence to enable the computer to implement the method are determined, which may be susceptible to patent protection.

Once the design is completed, the computer program is expressed as lines of code. Expressing a computer program in a specific programming language, however, is considered to fall within the definition of a "literary work" and therefore may be protected via Copyright common general knowledge of an un inventive skilled programmer and is not considered to require inventive effort. This person skilled in the art is considered to be able to express the program in any number of programming languages without the exercise of judgement or reasoning, and therefore without the exercise of ingenuity. Consequently, the inventive ingenuity necessary to provide patentability to a computer is never found simply in writing computer code to express a developed program.

### **16.03.02 Patentability and programming**

A computer program is not, by itself, statutory subject-matter. However, if the result of running the program on a computer is to provide a novel and inventive technological solution to a technological problem, then the program is viewed as modifying the technological nature of the computer as a whole. The program in such cases is not a discrete element of a claim to the computer.

In considering whether a program will bestow patentability on an otherwise known computer, the goal is therefore to identify whether it provides a novel and inventive technological solution to a technological problem.

In cases where the computer program expresses is defined in terms of a statutory method (i.e. a series of steps which provides a technological solution to a technological problem), the method may be patentable provided it is program will be considered to be technological in

~~nature. If the method is also both novel and inventive, then the programmed computer would be patentable. Thus Also, as noted in 16.02.03, where a computer implements the entirety of a patentable method, the computer is patentable. If the method, while technological, is not novel and inventive then it is not sufficient to render the computer patentable. Note that where the computer only implements part of a patentable method, care must be taken to base the assessment only on those parts of the method which take place on the computer, and not on the basis of the method as a whole.~~

~~On the other hand, where the a computer program expresses a *per se* is non-statutory method, the non-statutory method itself is and therefore not a patentable contribution, regardless of whether it is novel and inventive. The patentability of the computer claims in such cases will depend on additional elements defining how the computer is adapted to implement the method. These additional elements may or may not be novel and inventive, depending on their nature and complexity and the state of the art in programming at the relevant date. Where inventive effort is needed to enable a computer to implement a method in a novel way, a technological solution to a technological problem has been contributed. In determining whether the program's design is inventive or not, the examiner will be guided by the description. Paragraph 80(1)(d) of the *Patent Rules* states that the description shall "describe the invention in terms that allow the understanding of the technical problem, even if not expressly stated as such, and its solution".~~

Thus, it should be clear from the description what technical (technological) problem is being addressed, and what solution is being proposed by the inventors. Where the examiner is considering whether ingenuity was required in reducing an algorithm to a specific series of operations to be carried out by the computer program, the level of detail included in the description will be informative.

~~Where the application includes no details regarding how the computer program is to operate, this suggests the applicant considers the manner of implementing their method to be uninventive. It can be appropriately concluded by the examiner that there is no invention in the reduction to practice of the method. This conclusion is not prejudicial to the applicant, since even if the applicant were incorrect in considering the development of the program to be uninventive it would nevertheless follow that the description would not be enabling. Given the lack of disclosure, the programmer would be called upon to exercise inventive effort in determining how the program is to operate.~~

~~Where a greater level of detail is provided, the examiner must consider whether the specific implementation is an inventive solution to a technological problem in respect of the operation of the computer, and thereby determine if the computer itself has been contributed.~~

### **16.03.03 Examples**

The following examples illustrate how the guidance in this chapter can be applied in practice, particularly where the subject-matter of the invention lies outside the field of computers *per se*.

*Example 1:*

An application discloses the atomic coordinates of protein X and a crystal structure of said protein. A three-dimensional molecular modelling algorithm is applied to the atomic coordinates to determine the spatial coordinates of the binding pocket of protein X and subsequently, *in silico* screening is performed to search for compounds that interact with protein X.

Prior art document D1 discloses:

- molecular modelling software capable of generating a 3D representation of a binding pocket from the atomic coordinates of a protein,
- that the software is capable of performing *in silico* screening to predict whether known molecules will bind with the binding pocket, and
- databases storing the atomic coordinates of various molecules.

Claims:

1. Atomic coordinates of protein X.
2. A computer readable medium comprising the atomic coordinates of claim 1.
3. A computer-implemented method for identifying compounds that interact with protein X, comprising the steps of:
  - a. generating on a computer a three-dimensional model of protein X from the atomic coordinates of claim 1;
  - b. identifying a binding pocket in the model of protein X;
  - c. searching within a database of structurally defined compounds to identify compounds that are structurally complementary to the binding pocket of protein X;
  - d. calculating the binding energy for each structurally complementary compound identified in step (c) to the binding pocket of protein X; and
  - e. generating an output identifying compounds with binding energies meeting preselected conditions.

Analysis: Claim 1 defines atomic coordinates, which are merely descriptive information relating to the protein. The claim is not, by its form, directed to a statutory invention under section 2 of the *Patent Act*. Claim 2 defines this information when stored on a carrier. It is statutory in its form, but ~~does not include a statutory contribution (the storage medium, as claimed, itself being, is self-evidently, known).~~

Claim 3 defines a method whereby a computer generates a 3D model of a molecule, analyses the model to identify a binding pocket, and attempts to find target molecules whose structures are complementary to the binding pocket and which will bind to the binding pocket. Several of the steps involve computer operations that could potentially be technological innovations in the operation of a computer, including generating the 3D model (step a), analysing the model to identify a binding pocket (step b), and

performing the shape-matching and energy minimization calculations (steps c and d). Claim 3 is directed, by its form, to a statutory method. ~~In view of D1, if, however, these operations are already known from D1 then and therefore do not form part of the contribution the claim fails for lack of novelty.~~ The specific atomic coordinates of protein X do not modify the technological manner by which the computer performs the calculations, and therefore the model of protein X is a discrete element of the claim. The model of protein X is not itself a statutory invention (could not be a statutory contribution). After having set out a contribution analysis, in view of D1, the claim can be found defective under section 2 of the *Patent Act* on the basis that no contributed statutory subject matter has been defined and the model of protein X is not a statutory invention.

~~The analysis of claim 3 would be guided by the description of the application. The level of detail provided in respect of how~~ On the other hand, if the computer performs the various modelling, analysis, shape fitting and energy minimization steps would be indicative of ~~whether such that~~ technological obstacles were overcome by the inventors in respect of these operations, then. ~~A lack of detail, or for example a reference to the known molecular modelling software of D1, there would be a strong indication that there was no innovation in how the computer performed these operations. Note that if specific details were given in respect of how the computer operations were performed, these would need to be claimed in order to distinguish the method from that of D1.~~

~~Note that the conclusion with respect to claim 3 is arrived at after having performed a contribution analysis, in view of the substance of the claimed invention. This can be contrasted with the statement made with respect to the claim in example 5 in section 7.02.04 of this manual, which indicates only that, by its form, that claim is directed to a statutory method~~

*Example 2:*

An application discloses a vehicle wheel alignment system comprising a vehicle station used for vehicle testing, a set of optical sensors for measuring vehicle wheel alignment angles, an automated tool for adjusting wheel angles, and a computer station. Aligning vehicle wheels is a process which includes measuring and adjusting a number of wheel angles, such as camber, caster and toe angles, as well as the steering axis inclination. The computer runs software which compares angles measured by the optical sensors with manufacturer-recommended specifications stored in a database and produces an output signal which instructs the automated tool to perform a synchronized adjustment of any wheel angles that are outside predetermined limits. The automated tool is a single unit comprising several modules, with each module being capable of adjusting one of the wheel angles.

The prior art search reveals that the following features are known:

- a vehicle station used for alignment of vehicle wheels,
- measuring wheel alignment angles using a set of optical sensors,
- inputting the measured values to a computer,
- searching a database to determine if the measured angles meet manufacturer recommendations,

- the use of a computer to calculate required wheel angle corrections; and
- a tool for adjusting wheel angles.

The prior art does not disclose an automated tool for the synchronized adjustment of multiple wheel angles, comprising several modules in a single unit wherein each module adjusts a specific wheel angle.

Claims:

1. A method for vehicle wheel alignment comprising the steps of:

- a. measuring vehicle wheel alignment angles using a set of optical sensors,
- b. inputting the measured alignment angle values into a computer,
- c. searching for corresponding manufacturer recommended wheel angles stored in an electronic database,
- d. calculating differences between the measured values and the corresponding manufacturer recommended angles,
- e. producing a signal to actuate an automated tool for angle alignment, said signal being based on the calculated differences, and
- f. synchronously aligning wheel angles on the vehicle using the actuated tool.

2. A system for vehicle wheel alignment comprising:

- a. a set of optical sensors for measuring vehicle wheel alignment angles;
- b. an automated tool for the synchronous adjustment of vehicle wheel angles, the automated tool being a single unit comprising several modules, with each module being capable of adjusting a specific wheel angle; and
- c. a general purpose computer in electronic communication with the optical sensors and the automated tool, wherein the computer comprises:
  - i) means for receiving inputted data,
  - ii) means for retrieving manufacturer recommended wheel angle values from an electronic database,
  - iii) means to calculate differences between the measured values of the vehicle wheel alignment angles and the manufacturer recommended angles, and
  - iv) means to output a signal based on the calculated values to actuate the automated tool in order to synchronously align the vehicle wheel angles.

3. A method for calculating a vehicle wheel angle condition comprising the steps of:

- a. inputting measured values of vehicle wheel angles into a computer,
- b. searching for corresponding manufacturer recommended wheel angles stored in an electronic database,
- c. calculating differences between the measured values and the recommended values, and

d. displaying the calculated angle differences on a computer display.

4. A system for calculating a vehicle wheel angle condition comprising:  
i) an input means for inputting measured values of vehicle wheel angles,  
ii) a processor means for searching for corresponding manufacturer recommended angles stored in an electronic database and for calculating differences between the measured values and the manufacturer recommended angles, and  
iii) an output means for displaying the calculated angle differences on a computer display.

Analysis: Claim 1 defines a statutory method ~~involving the application of physical steps to solve a technological problem—~~how to align the various wheel angles synchronously rather than sequentially. The method, when considered as a whole, is statutory. The prior art discloses measuring wheel alignment angles, comparing the measured values to a database and performing the alignment sequentially in respect of each angle. There is no prior disclosure of performing the alignment synchronously. The patentability of the method depends on whether the examiner considers step f, which is novel, to also be inventive. Since the patentability of this claim depends on whether a statutory step is considered to be inventive, the critical assessment can be made under section 28.3 of the *Patent Act*.

Claim 2 defines a system to perform the method of claim 1. If the system has been specifically adapted in order to perform the method (in this case, the use of multiple modules in a single unit suggests that this is the case), then its patentability depends on the same factor of inventiveness as claim 1. As noted in 16.02.03, a machine specifically adapted to perform the entirety of a patentable method is patentable.

Claim 3 defines a method for performing calculations in order to obtain information. By its form, the claim includes physical steps that could, in theory, be patentable. It is clear, however, that ~~the technological aspects of each of the steps~~ (how to input data on a computer, how to search databases, how to solve a simple algebraic equation on a computer, how to display a result) are known and form part of the common general knowledge in the art. In view of the common general knowledge in the art, it can be readily concluded that, although the claim in substance, the invention in claim 3 amounts to a mental method performed falls into a statutory by a computer. Following 16.02.01, the addition of a computer does not make a non-statutory method statutory. Having determined that no statutory subject matter has been contributed, the defect associated with claiming a mental method is identified class of subject matter under section 2 of the Patent Act, it lacks patentability for defining an obvious invention.

Claim 4 defines a computer capable of performing the method of claim 3. For it to be patentable, some technological novel and inventive advance would have to have been made in the operation of the computer itself. The claim defines “an input means for inputting”, “a processor means for searching ... and calculating” and “an output means for displaying”. These are the discrete statutory elements of the system and represent

hardware and software components capable of performing the stated functions. The remaining features of the claim pertain to what values are to be inputted, looked up, used in the calculations and displayed. These features have purely intellectual significance and do not define how the system is operated as a technological entity. As drafted, it is self-evident that the technological functionality required of the defined statutory means is present in a general purpose computer. The However, the claimed subject matter lacks novelty would be obvious for the reasons discussed above in connection with claim 3 in view of the common general knowledge in the field of computers. The claim can also be considered defective under section 2 of the *Patent Act* for attempting to distinguish over known subject matter by features having a solely intellectual significance.

## 16.04 Utility

The requirements for utility and subject matter are explored in Chapter 12 of this manual, and apply equally to computer-implemented inventions as to any other. An invention must be useful, in the sense of doing whatever was promised by the inventors. The utility of the claimed subject matter must be established by demonstration or sound prediction, and this subject matter must be operable to produce the promised result in a manner that is controllable and reproducible.

A computer is generally considered to be capable of reproducibly performing whatever operations its hardware and programming enable. The utility of a computer-implemented invention is not guaranteed by this fact, however. Even where the components of the computer are working as intended, the invention as a whole may require other elements for its proper operation.

Where the judgement or interpretative reasoning of an operator is implicated in the proper operation of the claimed invention, such as deciding on suitable computer-aided operations through the exercise of judgement and reasoning, the criterion of reproducibility will not be satisfied. Where an operator's input is required, but there is no judgement associated with the input, the need to rely on the input does not cause a lack of reproducibility [see section 12.08.02 of this manual].<sup>3</sup>

Where a computer implemented method is being claimed, it must be unambiguously clear which steps of the method are being carried out on or by a computer. Specifying in the preamble that a method is "computer implemented" implies that some, but not necessarily all, steps of the method are performed by a computer. Where, in view of the specification as a whole, a given step can be understood as being performed either by a computer or by a person, it should generally not be presumed that the claimed method requires that step to be performed by a computer.

## 16.05 Sufficiency

The general requirements for a sufficient disclosure of an invention are detailed in Chapter 9 of this manual, and apply equally to computer-implemented inventions as to any other.

Certain aspects of a correct and full description of a computer-implemented invention warrant particular attention, and are discussed in the following sections.

### 16.05.01 Written description and enablement

In accordance with subsection 27(3) of the *Patent Act*, the specification must correctly and fully describe the invention. In practice, this requirement relates to the description, which must support the claims in accordance with section 84 of the *Patent Rules*.

The two requirements of a description are i) that it disclose in clear and unambiguous

terms the nature of the claimed invention (written description requirement) and ii) that it provide any teachings necessary to allow a person skilled in the art to operate the claimed invention (enablement requirement). A person skilled in the art must be able to understand, in view of the specification alone when read in light of their common general knowledge, what the invention is, what it does, and how to make it work.

The level of description necessary will depend on the facts of each case. In general, where aspects of common general knowledge are referred to, it may not be necessary to do more than identify a well-known element or technique forming part of this common stock of information. Where specific information is required that does not form part of the common general knowledge, this must be explicitly provided [see 9.0X.0X of this manual]. For example, if certain hardware and software are known in the art at the date of invention, it will be obvious that they can be used to achieve known or predictable results or perform known or predictable operations. It may be possible to describe and enable those aspects of the invention that relate to this known hardware or software simply by identifying the particular hardware or software element to be used and the known or predictable result to be achieved. In contrast, if the desired result requires a novel and unobvious application of hardware or software, a greater level of detail regarding how this result is to be achieved would be necessary.

Computer-implemented inventions are often described in terms of a flow chart that illustrates the algorithm or logic tree on which the operation of the invention is based. Typically, the flow chart will set out the operations performed by a computer. Flow charts are diagrams having a series of boxes, each representing a state or a step in an algorithm, and arrows that interconnect these boxes to describe the order or relationship of the various steps.

It will often be the case that the algorithm or logic performed by the computer lie at the heart of the invention. In such circumstances, a full description of the algorithm or logic tree should be provided. Where the algorithm or logic is described by reference to a flow chart, presented as a drawing, a written explanation of the flow chart is necessary to provide support for any claims that refer to the algorithm or logic.

In order to successfully practice the invention, it is necessary for the person skilled in the art to be able to put each step in the flow chart into operation. For the description to be enabling, the person skilled in the art must be able to do this without recourse to inventive ingenuity or undue experimentation [see section 9.0X.0X of this manual]. The flow chart, and any accompanying description, must therefore provide any information necessary to enable the algorithm to be so practised.

The amount of written description necessary to properly describe and enable an algorithm depends on the relationship of each step to the common general knowledge.

Where the algorithm invokes well-known operations, it may be that very little or no specific description is necessary for the purposes of proper description or enablement. If, in contrast, the specific operations necessary to enable a step in the algorithm would

not be obvious to the person skilled in the art, these operations would need to be fully described.

Furthermore, if the common general knowledge of the person skilled in the art would lead them to attempt to enable the algorithm in ways that would not in fact work, the description should provide sufficient instructions to allow the person skilled in the art to arrive at operable embodiments and avoid inoperative ones.

Where very little explanation is given regarding how a step in a method is to be implemented by a computer, this will generally be understood as an indication that the applicant, rightly or wrongly, does not consider the implementation of that step to require inventive effort on the part of the person skilled in the art [see section 9.0X.0X of this manual].

#### **16.05.02 Source code or pseudocode**

Providing source code listings or pseudocode in the description will generally not be considered, by itself, to be a full or enabling description of a claimed invention. The significance of the commands used in specific code may depend on the intended platform, and the code itself will not generally be a clear and unambiguous description of the invention.

#### **16.05.03 Common general knowledge and programming**

The activities required to reduce a specific series of logic instructions to a computer code are may, in some circumstances, be considered to form part of the common general knowledge of a skilled programmer. It is, therefore, typically not necessary for an inventor to describe how to write computer code, either in general or in respect of a specific computer language.

Where the algorithm to be written out as lines of code only invokes well-known operations, or if specific and unobvious logic operations are required, where these have been clearly described, the act of expressing the specific commands as lines of code is considered not to require inventive ingenuity or undue effort.

Where the description only discloses in broad terms what the program is intended to do, and it would not be clear to the person skilled in the art in view of their common general knowledge what the required operations are or the logic necessary to enable specific required operations, then the skilled programmer has not been given sufficient instructions to create the necessary code. To create a working program, the programmer would first have to exercise ingenuity in order to solve the problem of reducing the concepts disclosed to a series of practical instructions.

#### **16.05.04 ~~Essential elements~~ Describing the Invention**

Paragraph 80(1)(d) of the *Patent Rules* states that the description shall “describe the

invention in terms that allow the understanding of the technical problem, even if not expressly stated as such, and its solution". Thus, it should be clear from the description what technical (technological) problem is being addressed, and what solution is being proposed by the inventors.

To correctly and fully describe the invention, as required by subsection 27(3) of the *Patent Act*, the person skilled in the art must be able to understand and operate the invention through the description alone, as understood in view of their common general knowledge.

The description must describe (and the claims define) all the elements necessary to provide the useful result in a novel and inventive manner, and without which elements the solution would cease to be inventive. It is also necessary that the description provide such instructions as are necessary for the person skilled in the art to understand, where applicable, the interrelationship of the essential elements necessary to provide the practical form of the invention [see section 9.03 of this manual].

Where a claim defines the invention in terms of means-plus-function statements, the nature of the means, and where applicable how they are arranged to provide the stated functionality, must be clear to the person skilled in the art. The level of description necessary to correctly and fully describe the means, and their arrangement where applicable, will depend on the state of the common general knowledge in the art. Where limited description is provided, this is taken as an indication that the applicant (correctly or not) considers that the selection of suitable means to perform the stated function would be obvious to a person skilled in the art.

#### **16.06 Novelty**

~~As with every invention, in order to be patentable a computer implemented invention must not be anticipated by prior art that is relevant under section 28.2 of the *Patent Act*.~~

~~To be anticipatory, a single prior written disclosure, when understood in light of the common general knowledge, must both provide a written description of the claimed invention and sufficient instructions to enable the invention to be practised by the person skilled in the art without recourse to inventive effort or undue burden.~~

~~In considering whether a claimed invention is anticipated, its essential elements must be compared to those taught in a single prior disclosure. If all its essential elements were previously disclosed, the invention is anticipated. The essential elements of an invention are those that have a bearing on what the invention will do and how it does it (i.e. its utility) [see, for example, section 13.05.03 of this manual].~~

~~When considering a computer device (*machine*) claim, the effect of any commands being implemented by software must be carefully considered in order to determine if they lead to a technological effect relevant to the promised utility of the device. If so, those commands are essential elements of the device, and must be considered during~~

the novelty analysis. If the commands are simply an application of functionality the machine was already known to possess, they are not considered to be essential elements of the machine itself.

#### **16.06.01 Anticipation by prior use**

Although the majority of prior art consists of prior written disclosures, a prior sale or use of an invention can also amount to an anticipation, provided it makes available information which describes the claimed invention and amounts to an enabling disclosure.<sup>4</sup>

With regard to computer implemented inventions, software that was available to the public prior to the claim date can be considered as prior art. To be considered to have disclosed the claimed invention, the software must provide to the person skilled in the art information sufficient to comprehend the invention.<sup>5</sup> The use of a product makes the invention part of the state of the art only so far as that use makes available the necessary information.<sup>6</sup> The information made available must be such that if the person skilled in the art were to write down that information, they would have drafted a clear and unambiguous description of the claimed invention.<sup>7</sup>

Thus, if the claimed invention is defined broadly using functional language, any prior art software that achieves the same function could be anticipatory. In contrast, if the claimed invention defines a particular method for arriving at a specific result, prior art software would only be anticipatory if it could be established, on the balance of probabilities, that it was using the same method for arriving at the result.

As was noted in *Baker Petrolite Corp. v. Canwell Enviro-Industries Ltd.*, in determining whether a publicly available product anticipates a claimed invention, the ability of the person skilled in the art to reverse engineer the product "in accordance with known analytical techniques" may be relevant.<sup>8</sup> Therefore, where relevant, the ability of the person skilled in the art to reverse engineer software, without inventive effort, in order to ascertain what method it implements must be considered. Note that what is considered is the ability to reverse engineer, such as by decompiling; it is not necessary to establish that the product was actually reverse engineered.<sup>9</sup>

In considering whether anticipation by prior sale or use of an invention has occurred, the grace period provided for in paragraph 28.2(1)(a) of the *Patent Act* applies in respect of any making available of the invention by the applicant or by a person who obtained the relevant knowledge directly or indirectly from the applicant.

#### **16.07 Ingenuity**

As with every invention, in order to be patentable a computer implemented invention must not be rendered obvious by prior art that is relevant under section 28.3 of the *Patent Act*.

Obviousness is evaluated in view of the overall state of the art contained in the prior art, when this is considered as a whole in light of the common general knowledge of the person skilled in the art. A claimed invention must be the result of ingenuity, and a conclusion of obviousness is equivalent to a conclusion of lack of inventive step. To be considered obvious, the teachings present in the prior art must be sufficient so that, if combined, they would lead to the claimed invention. Furthermore, it must be uninventive (obvious) to combine the necessary teachings.

As with the assessment of novelty, the assessment of obviousness is based on the essential elements of the claimed invention. There is nothing inventive in adding a non-essential element to an invention, since by definition the non-essential element is irrelevant to the invention's successful operation. See 16.05.04, above, for a discussion of essential elements in the context of computer device claims.

It is considered obvious that computers can be used to automate many manual operations, and the idea of automating a manual process is, in the absence of reasons to conclude the contrary, considered to be uninventive. The inventive step necessary to support a claim to a computer-automated version of a known manual method therefore must typically be found in the solution to specific challenges attendant to enabling the automation.

Where a computer-implemented invention aims to achieve a new unitary result through the use of a combination of known hardware and software, an inventive step may exist by virtue of the recognition that the combination will achieve that result. If, in contrast, using the hardware and software together merely results in a predictable outcome, the alleged invention is a mere aggregation.

## **16.08 Claims**

A computer-implemented invention is typically claimed as a *machine*, a method (an *art* or *process*) or a *manufacture* (computer-readable medium). As with any type of claim, a claim to a computer-implemented invention must meet the requirements of, *inter alia*, subsection 27(4) of the *Patent Act* and section 84 of the *Patent Rules*.

### **6.08.01 Computer-implemented method claims**

Where a claim is directed to a method that is to be implemented in whole or in part by computer, it must be unambiguously clear which steps of the method are being carried out by the computer.

Specifying in the preamble that a method is "computer-implemented" implies that some, but not necessarily all, steps of the method are performed by a computer. Where, in view of the specification as a whole, a given step can be understood as being performed either by a computer or by a person, it should generally not be presumed that the claimed method requires that step to be performed by a computer.

### **16.08.02 Computer claims**

Where a claim is directed to a machine, it must be defined in terms of physical components.

Many computer claims will define the device in terms of means statements that set out what the device will do. Where a means statement is understood to be a software means, it must be specified that the software is stored on a physical memory. This can be done in the claim itself or in the description, with due regard being given to the need for the language of the claim to be clear, concise and unambiguous.

In some cases, it is possible that the means referred to in a means statement can be either hardware or software. In such cases, it may be most convenient to specify in the description that the means statement refers to either hardware or software on a physical memory.

### **16.08.03 System claims**

Claims directed to a "system" can be interpreted in different ways. The term system refers to a collection of elements working together, where the elements can be either the physical parts of a mechanism or interconnected network, or the steps of a method way in which the elements operate together.

In many arts, the use of the term system does not imply something falling within the category machine. In the computer arts, in contrast, the term system is usually reserved for a one or more machines (a device or apparatus or network of devices or apparatuses), and it will generally be presumed that this meaning is intended.

To avoid ambiguity, where a claim to a computer implemented invention is intended to define something other than a machine, the term system should not be used. Rather, the preamble should define the subject matter of the claim unambiguously, for example as a method, process or software product.

### **16.08.04 Software product claims**

A computer program (software), when claimed per se, is considered by the Office to be an abstract scheme, plan or set of rules for operating a computer disembodied [see section 12.06.02 of this manual], and consequently not to be an invention within the meaning of section 2 of the Patent Act.

Under certain circumstances, software can be claimed by directing the claim to a physical memory upon which the computer program has been stored. A claim to a physical memory falls within the category manufacture.

In defining a software product, the form of the claim is important. The preamble must clearly direct the claim to a physical product limited by the computer program stored thereon, and not to a computer program limited by having been stored on a memory. Thus, the preamble “a physical memory having stored thereon...” directs the claim to a statutory embodiment, whereas “a computer program stored on a physical memory” directs the claim to a computer program and thus to excluded subject-matter.

Furthermore, it must be explicitly defined that the computer program is present as machine-computer-executable code. Only machine-computer-executable code can change the technological functionality of the physical memory storing the program. ~~Non-machine-executable code is considered to be mere descriptive matter [see section 12.06.04 of this manual].~~

~~Where the computer program would cause the device it controls to provide a technological solution to a problem, the “software-modified physical memory” is a single discrete element. Where the program is novel and inventive, the claim will include a statutory contribution [see section 12.06.07 of this manual]. These, then, are the circumstances under which a physical memory having executable code stored thereon can be patented.~~

Example:

1. An application is directed to a computer-implemented method for determining a channel assignment in a Code Division Multiple Access (CDMA) network. The method improves CDMA networks by determining CDMA channel assignments according to predetermined constraints. It has been discovered that appropriate predetermined constraints improve efficiency in the network.

The prior art search reveals that the following features were known from D1:

- CDMA network with channel assignments
- A computer-implemented method for performing the channel assignment

D1 does not disclose the use of predetermined constraints to modify channel assignments

Claims:

1. A computer-implemented method for optimising channel assignments in a CDMA network, comprising the steps of:

- a. performing an initial channel assignment;
- b. comparing the channel assignment with predetermined constraints to determine a difference;
- c. modifying said initial channel assignment in accordance with said difference;

and

d. changing the channel assignment in the CDMA network in accordance with the modified channel assignment.

2. A computer program for optimising channel assignments in a CDMA network according to the method of claim 1.

3. A computer readable memory having recorded thereon statements and instructions for execution by a computer, said statements and instructions comprising:

a. code means for performing an initial channel assignment;

b. code means for comparing the channel assignment with predetermined constraints to determine a difference;

c. code means for modifying said initial channel assignment in accordance with said difference; and

d. code means for changing the channel assignment in the CDMA network in accordance with the modified channel assignment.

4. A computer program product comprising a computer readable memory storing computer executable instructions thereon that when executed by a computer perform the method steps of claim 1.

Analysis: Claim 1 defines a technological method comprising physical steps, and is therefore statutory in form. Assigning channels in a CDMA network according to the method results in an improved communications network; the method therefore provides a technological solution to a practical problem and the steps pertaining to the predetermined constraints are technologically distinct from similar steps performed without the constraints. The prior art does not disclose the feature of using predetermined constraints to modify an initial channel assignment in a CDMA network. ~~Presuming that the examiner determines this to be an inventive feature, at least one physical step in the method will have been contributed. The claim would then include a statutory contribution and be allowable. Note that, to avoid indefiniteness, it would be necessary in an actual claim to define the actual "predetermined constraints" being relied on.~~

Claim 2 defines a computer program per se and is therefore directed to non-statutory subject matter by its form. The claim is objected to under section 2 of the Patent Act.

Claims 3 and 4 are alternative ways for defining a computer product. Both are acceptable in their form. To be patentable, the physical memory must be considered to be technologically distinct from other physical memories. This is considered to be the case where the computer program stored on the memory would cause a computer running the program to itself be a technological solution to a technological problem. A computer programmed in a novel way to implement the entirety of an inventive method is patentable in its own right [see section

