IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,304,195 having been rejected under subsection 30(3) of the *Patent Rules*, has consequently been reviewed in accordance with subsection 30(6) of the *Patent Rules* by the Patent Appeal Board and the Commissioner of Patents. The findings of the Board and the decision of the Commissioner are as follows:

Agent for the Applicant
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INTRODUCTION

[1] This decision deals with a review by the Commissioner of Patents of patent application no. 2,304,195 entitled AMETHOD FOR THE ANALYSIS AND STANDARDIZATION OF BILLS OF RESOURCES.@ The Applicant is DEROYAL BUSINESS SYSTEMS, LLC. The inventors are Brian C. Debusk, Elizabeth C. Debusk and Mark Shanks.

[2] Bills of resources are basically itemized lists of the requirements to perform a particular task or procedure. In its simplest form a bill of resources could comprise a list of parts necessary for the assembly of an item. A bill of resources might also include the tools necessary to complete the assembly. More complicated bills of resources can include parts, tools, equipment and labour resources required for a procedure.

[3] As disclosed by the Applicant, even when performing the same procedure, there can be significant variation in the content of a bill of resources. Factors contributing to this variation include the habits and personal preferences of the individual performing the procedure in relation to the selection of, for example, a particular tool to be used. Such variation can lead to the necessity of stockpiling multiple versions of a component to be used, increasing inventory maintenance costs and reducing available bulk purchase discounts.

[4] The Applicant points to the medical care field in particular as an area where a great deal of variation exists between procedural resource allocation based, for example, on a

surgeon=s personal preference for certain styles or brands of instruments.

[5] In the past, attempts have been made to standardize resource allocation. For example, in the medical field, group purchasing plans for certain supplies, and unitized delivery systems which supply a large portion of the supplies for a given medical procedure have been used. However, such attempts do not address all necessary supplies as well as other resource areas such as labour resources, re-usable supplies and durable equipment.

[6] According to the Applicant, although the benefits of standardization (i.e., inventory reduction, economies of scale, increased certainty in supply, etc.) have been desired for some time, the problem is very complex given the number of variables involved. There exists Ano consistent, logical and proven method for the standardization of procedure based bills of resources@ (see description at page 5)

[7] The Applicant proposes a method for the analysis and optimization of bills of resources which involves mathematically manipulating the data involved in such a way that similarities and differences between each bill of resources for a procedure are more readily discernable. This allows for the selection of an optimum or standard set of resources, or perhaps the compromise of more than one, which would still significantly reduce the procedural variation and realize the known benefits of standardization.

PROSECUTION HISTORY

[8] The application was filed on September 24, 1998 and claims priority based on a US patent application filed September 24, 1997. The application was rejected by the Examiner in a Final Action dated September 2, 2005 which identified defects relating to statutory subject matter under s. 2 of the *Patent Act*, obviousness, utility and indefiniteness.

[9] Subsequent to the Applicant=s response to the Final Action and the transfer of the case to the Patent Appeal Board, the Commissioner of Patents released CD 1290, A*Re Application of Amazon.com*@, which set forth an approach to be followed when assessing statutory subject matter under s. 2 of the Act. In view of this decision and the later decision of the Supreme Court of Canada in *Apotex Inc. v. Sanofi-Synthelabo Canada Inc.*, 2008 SCC 61, [2008] 3 SCR 265 [*Sanofi*], on September 9, 2009 the Applicant was provided with a Supplemental Analysis from the Examiner, updating the s. 2 and obviousness assessments. In accordance with subsection 30(6) of the *Patent Rules*, the Applicant was afforded an opportunity to be heard in the accompanying letter. The Applicant provided written submissions on December 9, 2009, including proposed amendments to claims 25 to 37 to present them as computer readable medium claims (there being 37 claims in total).

[10] As a result of the decision by the Federal Court of Appeal in *Canada (Attorney General) v. Amazon.com Inc.*, 2011 FCA 328 [*Amazon FCA*] , the panel sent a memorandum to the Applicant on July 5, 2012, outlining the issues it saw to be still relevant to the assessment of statutory subject matter, as well as providing comments on

the obviousness analysis under *Sanofi* previously provided by the Examiner and addressed by the Applicant. The Applicant was provided with a further opportunity to be heard on any issues including all those presented in the Final Action.

[11] In a letter dated September 7, 2012, the Applicant indicated that they would not be making any further submissions and that the panel should proceed with its review based on the existing written record.

ISSUES

[12] The Final Action and Summary of Reasons raised four issues for review. Our finding in relation to the following issue is dispositive of the case and therefore we need not assess the remaining three:

> Are claims 1-37 directed to non-statutory subject matter and therefore non-compliant with section 2 of the *Patent Act*?

CLAIM CONSTRUCTION

Legal Principles

[13] The following principles are not intended to be exhaustive. They are those that are relevant to the present case in that they provide the basis for considering the essentiality of the computer implemented aspect of the claim, which is the focus of our later analysis.

[14] Claim construction is antecedent to questions of validity, such as novelty and obviousness (*Free World Trust v. Électro Santé Inc.*, [2000] 2 S.C.R. 1024 [*Free World*] at para. 19; *Whirlpool Corp. v. Camco Inc.*, [2000] 2 S.C.R. 1067 at para. 43). Claims are to be construed in an informed and purposive manner in light of the common general knowledge of the skilled person (*Free World* at para. 44) and based on the patent specification itself without resort to extrinsic evidence (*Free World* at para. 66).

[15] Per *Free World*, in order for an element of a claim to be considered Anon-essential@, Ait must be shown either (i) that on a purposive construction of the words of the claim it was clearly not intended to be essential or (ii) that at the date of publication of the patent, the skilled addressee would have appreciated that a particular element could be substituted without affecting the working of the invention@ (*Free World* at para. 55).

[16] In *Amazon FCA*, the Court stated that the Commissioner=s determination of statutory subject matter must be based on a

purposive construction of the claims (*Amazon FCA* at para. 47), as is the case for other validity considerations such as novelty and obviousness.

[17] That said, the Commissioner must be Aalive to the possibility that a patent claim may be expressed in language that is deliberately or inadvertently deceptive. Thus for example, what appears on its face to be a claim for an >art= or a >process= may, on a proper construction, be a claim for a mathematical formula and therefore not patentable subject matter. That was the situation in *Schlumberger Canada Ltd. v. Canada (Commissioner of Patents)*, [1982] 1 F.C. 845 (C.A.)@ (*Amazon FCA* at para. 44).

Analysis

[18] As is seen from the following analysis, our construction focusses on the claim limitation that the methods of the invention be Acomputer implemented@. Because of our finding below on this point, we need not construe the scope of individual steps of the claim, since, as shown later in the section on Statutory Subject Matter, we are able to reach a conclusion as to statutory subject matter based on the nature of the method when viewed without the computer implemented limitation.

[19] Claims 1 and 25 are representative of the claims on file:

> 1. A method for the production of at least one standard bill of resource, from bills of resources which include a list of resources to be utilized in performing a procedure, comprising the computer-implemented steps of:

selecting a plurality of bills of resources from a known universe of bills of resources;

developing a model for each of the selected bills of resources, each of said models including values which correspond to the number of units of given resources from the selected bills of resources;

manipulating said models mathematically to highlight similarities and dissimilarities of defined characteristics in said models;

expressing the manipulated models in a format in which a relative position of each of said manipulated models may be determined, the relative position of each of the manipulated models reflecting the degree of similarity or dissimilarity to the other manipulated modes;

analyzing said selected bills of resources based upon the expression of the manipulated models; and

producing the at least on standard bill of resources based on the analysis of the bills of resources.

25. A computer implemented method for the production of at least one standardized bill of resources, from bills of resources including lists of resources for use in the performance of a procedure comprising the following steps:

defining a set of bills of resources for analysis;

providing the defined set of bills of resources to a computer to develop a set of electronic bills of resources corresponding to the defined set of bills of resources;

mathematically manipulating the electronic bills of resources according to an algorithm selected to characterize the electronic bills of resource according to their degree of similarity relative to each other;

expressing said manipulated bills of resources in a human or machine perceptible form such that the relative similarity or dissimilarity of the bills of resources is apparent;

analyzing said expressed bills of resources in order to enhance or optimize resource utilization; and

producing the at least one standardized bill of resources based on the analysis of the bills of resources.

[20] As noted in the PAB memorandum forwarded to the Applicant, the purposive construction of the claims was not an issue between the Examiner and Applicant. In particular, there were no issues surrounding the meaning to be ascribed to terms in the claims, nor any discussion regarding the essentiality of any claim elements. However, as stated earlier at para. [16], *Amazon FCA* requires our assessment to be based on a purposive construction of the claims.

[21] The Applicant, in the submission of December 9, 2009, did not object to the Examiner=s characterization of the invention as a Ascheme for standardizing bills of resources and the specific mathematical calculations performed.@ The Applicant did however want to reinforce Athat the mathematical calculations are implemented to produce a standardized bill of resources from a plurality of bills of resources.@ It is noted that this characterization does not reflect the Acomputer-implemented@ aspect of the claimed methods, the claims in some cases specifying the use of Aelectronic bills of resources@, a Acomputer model@, Aa database program@ or Aa computer generated matrix.@

[22] In light of the above, we assess below the importance of the computer implementation as a limitation in the claims. If upon a purposive construction, the computer implementation is not essential to the claimed method, then what is left (in accordance with claims 1 and 25) is a series of steps of

organizing, mathematically manipulating, expressing and analyzing data in order to arrive at one or more standard bills of resources (i.e., the scheme referred to above).

[23] The question of the importance of the computer implementation to the claimed method (i.e., whether or not it is an essential part of the claim) might be answered simply by looking to the exchange noted above at para. [21] between the Examiner and Applicant. However, *Free World* instructs us that a purposive construction is based upon the patent specification itself as interpreted by the skilled person in view of their common general knowledge, and so we review it in order to determine the essentiality of the computer implementation.

[24] As the panel noted in the PAB memorandum of July 5, 2012, the description provides little in the way of detail in relation to the computer implementation aspect. The discussion of the field of the invention points to the analysis and development of bills of resources and to a method of depicting relationships among different bills of resources and analyzing them, rather than the computer implementation aspect, as the focus of the invention.

[25] The ABackground of the Invention@ points to known issues surrounding variation in bills of resources and some attempts at standardization. Benefits of standardization are discussed and at page 4 it is stated that Aconsiderable cost savings in the medical and other fields could be realized if there was an automated and convenient method for optimizing resource allocation and usage.@ At page 6, there is a discussion of the

issue that for a even a common procedure such as a heart bypass, hundreds of variables may be involved. This might point to an analysis more conveniently performed on a computer but does not require this to be the case.

[26] The problem sought to be addressed by the Applicant was that Athere is simply no consistent, logical and proven method for the standardization of procedure based bills of resources@ (see description at page 5). It is also noted that the objects of the invention, specified at pages 6-7, make no mention of providing a Acomputer-implemented@ method, consistent with the aforementioned problem.

[27] Under ASummary of the Invention@ the Applicant points to several preferred embodiments of the invention as solutions to the problem, which are not limited to a computer implementation, though considering the calculations involved, one would suppose that the performance of the steps by a computer would save a great deal of time. This was also the case in *Schlumberger* where it was clearly more convenient to have the calculations performed by a computer.

[28] The Applicant also discusses preferred embodiments which are computer-implemented, however the steps performed by the computer (e.g., generating a model, constructing a matrix, mathematically manipulating the data using matrix factorization and rank reduction techniques) are all steps which could also be performed by a human being, granted in a more time consuming manner.

[29] The ADetailed Description of the Invention@ further discusses the steps of the method. The selection of the bills of resources to be analyzed, which may be performed by a computer, is based on user input as to what criteria are used to select the bills of resources. This decision is based on the specific characteristics to be optimized, such as optimizing a particular surgeon=s resource requirements for a procedure or optimizing the resource requirements for a procedure across all users.

[30] The development of a model or computer model , discussed at for example page 16, lines 14-18 of the specification, reflects the data contained in a bill of resources and is performed to organize the bills of resources into a format in which they can be manipulated mathematically. The preferred format is a matrix outlining the resources and the associated quantities, which although possibly very large and complex, nonetheless is capable of manipulation without a computer.

[31] The manipulation of the data in order to highlight the similarities and dissimilarities between models is discussed in terms of preferred embodiments using known matrix factorization and rank reduction techniques to reduce the number of scalar values representing each model to two or more (see e.g., page 18, lines 11-21). Again, such calculations may be more conveniently performed via a computer, but as in *Schlumberger*, A[i]t is precisely in order to make that kind of calculation that computers were invented@ (*Schlumberger* at page 205).

[32] As an alternative to matrix factorization and rank reduction techniques, the Applicant discloses manipulation of the models by averaging them on a row by row basis to develop a Abest fit@ model which can then be compared with other models in order to identify differences and similarities. Such a manipulation is one which can be easily carried out without a computer.

[33] The step of expressing the manipulated data in some graphical format or Ahuman or machine perceptible form@ (see claim 25) which highlights the differences and similarities between models, involves representing the data in e.g., a 2-D or 3-D plot. Depending on the number of dimensions selected to represent the models, it may be more convenient to perform the analysis by computer, although the use of a high dimensional value is not required to produce the at least one standardized bill of resources.

[34] The step of analyzing the expression of the manipulated models can range from simply looking at a 2-D or 3-D plot of the data to identify clusters of similar models, to using vector subtraction inside or outside of a computer embodiment with a threshold value in order to identify similar models. Neither method would necessarily require the use of a computer in its execution.

[35] The step of analysis produces the end result of one or more standard bills of resources.

[36] Another means disclosed of identifying a standard bill of resources is to identify clusters of expressed models and then

the process is Aas simple as identifying an actual expressed model which is near the center of the cluster as the center of mass@ (see description at page 30). Alternatively, this may be calculated, and while more conveniently accomplished via a computer, these calculations may also be done by a human being.

[37] Although as disclosed it is preferred that the method of the invention be practised in the form of computer software, from the above we see nothing in the description of the invention that necessitates the use of computer software. The steps of the method may equally be performed by a human being. There is an advantage to using computer software in the execution of the method, but, as noted earlier in relation to *Schlumberger*, these advantages flow from the known capabilities of computers in performing calculations, and therefore do not point to the computer implementation being an essential feature.

[38] In this case, the skilled person, upon a review of the specification, would realize that the use of a computer system to perform the method, as opposed to the steps being performed by a human, is not an essential limitation of the claimed invention, and similarly, is not a necessary part of the solution. The same claimed method steps, whether performed by a computer or a human being, lead to the same result, at least one standardized bill of resources. The fact that the computer does not perform calculations in the same manner as a human is not in this case material. 2 + 2 still equals 4 regardless of whether the calculations are performed by the computer or a human. This is not to say that an algorithm which causes a computer to perform calculations in a faster or more efficient

manner cannot be patentable. Such a question is not at issue in this case.

[39] The panel therefore finds that the computer implementation of the invention is not an essential feature. Guided by the Court in *Amazon FCA* (see para. 44), we find that this is a case where, upon a purposive construction, taking into account the whole of the specification, the invention is not limited to what on its face has been claimed to be a computer-implemented invention. Our finding extends to the other claims at issue as well which fail to in any way set forth further features which, in view of the specification as a whole, require a computer implementation.

[40] We are therefore left with, as noted earlier, a series of steps of organizing, mathematically manipulating, expressing and analyzing data in order to arrive at one or more standard bills of resources. As noted earlier and as shown in the next section of this recommendation, we need not further construe the claims.

STATUTORY SUBJECT MATTER

Legal Principles

[41] In order to be directed to statutory subject matter an invention must fall within one of the enumerated categories in section 2 of the *Patent Act*:

> Ainvention@ 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.

[42] The invention must not be directed to subject matter which is excluded from protection under the *Patent Act* (e.g., a mere scientific principle or abstract theorem, per subsection 27(8) of the Act, fine arts or works of art (*Amazon FCA* at para. 58), mental operations and processes, (*Schlumberger* at page 206)).

[43] *Schlumberger* is the only Canadian case pre-*Amazon FCA* which dealt with the patentability of computer implemented inventions. In *Amazon FCA* at para. 62, *Schlumberger* was characterized as:

> an unsuccessful attempt to patent a method of collecting, recording and analyzing seismic data using a computer programmed according to a mathematical formula. That use of the computer was a

practical application, and the resulting information was useful. But the patent application failed for want of patentable subject matter because the Court concluded that the only novel aspect of the claimed invention was the mathematical formula which, as a Amere scientific principle or abstract theore

m@, cannot be the subject of a patent because of the prohibition in subsection 27(8).

[44] The claims in *Schlumberger* were not saved by the fact that they contemplated the use of a physical tool, a computer, to give the novel mathematical formula a practical application (*Amazon FCA* at para. 69).

[45] In *Schlumberger* itself, the invention therein was characterized as mathematical formulae and a series of purely mental operations, which were deemed non-statutory since mathematical formulae must be assimilated to a Amere scientific principle or abstract theorem@, prohibited by subsection 27(8) of the Act, and mental operations and processes are not the kind of processes referred to in section 2 of the Act (*Schlumberger* at pg. 206)

Analysis

[46] In the present case, like *Schlumberger*, the method of the invention was given a practical application by including in the claims the feature that it was Acomputer-implemented@. Based on our construction above, we have found that this limitation is not an essential feature of the invention.

[47] We are therefore left with (e.g., in relation to claims 1 and 25) claims to a series of steps which relate to organizing, manipulating and expressing data associated with bills of resources, the results of which are analyzed in order to arrive at a standardized bill of resources. We note that, in this case, this is equivalent to the substance of the invention previously agreed to by the Applicant in their submissions of December 9, 2009.

[48] In her Supplemental Analysis the Examiner felt that Amethods of calculating values, extracting useful information from other information, comparing and analyzing data and performing what would otherwise be mental operations and clerical procedures are unpatentable.@

[49] The Applicant, in the submissions of December 9, 2009, points to the effect of a standardized bill of resources on inventory as evidence that the claims produce some physical effect as opposed to merely one of intellectual significance. The Applicant also stated that the claimed subject matter is not merely mathematical models or formulae per se. Rather, it is Athe application of the mathematical models and formulae to existing bills of resources in order to arrive at a standardized bill of resources.@ By this, inventory reduction and other advantages may be realized.

[50] While the advantages of a standardized bill of resources may be realized by the use of the end product of the claimed method, these features are beyond the invention as claimed and

construed.

[51] Again, the purposively construed claims relate to the steps of organizing, mathematically manipulating and expressing data associated with bills of resources, the results of which are analyzed in order to arrive at at least one standard bill of resources.

[52] This situation is, in our opinion, similar to the facts of *Schlumberger* which the Court in *Amazon FCA* described as Aan unsuccessful attempt to patent a method of collecting, recording, and analyzing seismic data using a computer programmed according to a mathematical formula.@ In *Schlumberger*, the invention was considered to consist of various calculations to be made and of the mathematical formulae to be used in making those calculations. The latter were assimilated to a "mere scientific principle or abstract theorem", while the former were considered to be a series of mental operations. Here, like *Schlumberger*, we have a method which includes a series of calculations and mental operations performed to produce an output , namely, in this case, a standardized bill of resources.

[53] In this case, like *Schlumberger*, the claims are not saved by the fact that they contemplate use of a physical tool, a computer, to give the series of calculations a practical embodiment.

[54] In regard to the other independent and dependent claims, we see no reason why the additional features recited, which relate to

the particular types of calculations and to the selection of the data to be analyzed, would alter our conclusion. The Applicant has not in any case highlighted any additional significance of these features.

[55] We therefore find that claims 1-37 are directed to non-statutory subject matter and therefore do not fall within section 2 of the *Patent Act*.

Proposed amendments to claims 25-37

[56] As noted in respect of the prosecution history for this case, the Applicant, in response to the Examiner=s Supplemental Analysis, submitted proposed claims 25-37 which reframed these claims as computer readable medium claims. In light of our analysis above, we would not change our finding on the patentability of claims 25-37 were they framed as computer readable medium claims. We have already found that it is not essential that the method be computer-implemented. Therefore there is no requirement that it be stored on a computer readable medium so that it may be executed by a computer.

RECOMMENDATION OF THE BOARD

[57] In view of the above findings, the Board recommends that the application be refused for the claims being directed to non-statutory subject matter and therefore being non-compliant with section 2 of the *Patent Act*.

Stephen MacNeil	Ed MacLaurin	Andrew Strong
Member	Member	Member

DECISION OF THE COMMISSIONER

[58] I concur with the Patent Appeal Board=s findings and its recommendation that the application be refused for the claims being directed to non-statutory subject matter and therefore being non-compliant with section 2 of the *Patent Act*.

[59] Accordingly, I refuse to grant a patent on this application. Under Section 41 of the *Patent Act*, the applicant has six months within which to appeal my decision to the Federal Court of Canada.

Sylvain Laporte
Commissioner of Patents

Dated at Gatineau, Quebec,
this 14th day of March, 2013