

Commissioner's Decision No. 1520

Décision du commissaire n° 1520

TOPICS: J-00 Meaning of Art
B-22 Not Supported by Disclosure

SUJETS: J-00 Signification de la technique
B-22 Non appuyée par la divulgation

Application No. 2,307,484

Demande n° 2 307 484

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,307,484, having been rejected under subsection 30(3) of the *Patent Rules* (SOR/96-423) as they read immediately before October 30, 2019, has consequently been reviewed in accordance with paragraph 199(3)(c) of the *Patent Rules* (SOR/2019-251). The recommendation of the Board and the decision of the Commissioner are to refuse the application.

Agent for the Applicant

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INTRODUCTION

[1] This recommendation concerns the review of rejected Canadian patent application number 2,307,484 which is entitled “Predictive modeling of consumer financial behavior” and is owned by KUHURO INVESTMENTS AG, L.L.C. (“the Applicant”). A review of the rejected application has been conducted by the Patent Appeal Board (“the Board”) pursuant to paragraph 199(3)(c) of the *Patent Rules* (SOR/2019-251). As explained in more detail below, our recommendation to the Commissioner of Patents is to refuse the application.

BACKGROUND

The application

[2] The application, with a claimed priority date of May 6, 1999, was filed on May 4, 2000, and was laid open to public inspection on November 6, 2000.

[3] The application relates to analysis of consumer financial behaviour. More specifically, the application is directed to a method of predicting financial behaviour of consumers by feeding transaction data to predictive models to produce predicted spending amounts in different merchant segments.

Prosecution history

[4] On May 11, 2017, a Final Action (“FA”) was issued pursuant to subsection 30(4) of the *Patent Rules* (SOR/96-423) as they read immediately before October 30, 2019 (“the former *Rules*”), in which the application was rejected on the basis of lack of support and non-statutory subject-matter. The FA stated that claims 1 to 21, dated October 21, 2016 (“the claims on file”), did not comply with section 2 of the *Patent Act*, and that claims 19 and 20 were not fully supported by the description and did not comply with section 84 of the former *Rules* (now section 60 of the *Patent Rules*).

- [5] On November 8, 2017, a response to the FA (“R-FA”) was filed by the Applicant. In the R-FA, the Applicant argued that the claims on file constituted an invention as defined in section 2 of the *Patent Act*. In addition, a set of amended claims (“the proposed claims”) was submitted in the R-FA in an effort to overcome the lack of support objection raised in the FA.
- [6] Since the Examiner maintained the position that the application did not comply with section 2 of the *Patent Act* after considering the R-FA, the application was forwarded to the Board on February 2, 2018, along with a Summary of Reasons (“SOR”). In the SOR, the Examiner stated that the proposed claims were still directed to non-statutory subject-matter and did not comply with section 2 of the *Patent Act*.
- [7] The SOR was forwarded to the Applicant on February 9, 2018. On April 5, 2018, the Applicant indicated its continued interest in the application being reviewed by the Board.
- [8] The present panel (“the Panel”) was formed to review the instant application under paragraph 199(3)(c) of the *Patent Rules*.
- [9] In a preliminary review letter dated October 24, 2019 (“the PR letter”), the Panel presented its preliminary analysis and rationale as to why the subject-matter of the claims on file did not comply with section 2 of the *Patent Act*. It was also the Panel’s preliminary view that the proposed claims would not overcome the non-statutory subject-matter defect in the claims on file. In the PR letter, the Panel also considered that claims 19 and 20 of the claims on file and claims 19 and 20 of the proposed claims were fully supported by the specification of the instant application, and thus comply with section 84 of the former *Rules* (now section 60 of the *Patent Rules*).
- [10] In a letter dated November 14, 2019, the Applicant requested an oral hearing. The Applicant made no written submission in response to the PR letter.
- [11] An oral hearing was held before the Panel on November 29, 2019 (“the hearing”).

ISSUES

[12] There are two issues to be addressed in this review:

- Whether the claims on file define statutory subject-matter that falls within the definition of invention in section 2 of the *Patent Act*; and
- Whether claims 19 and 20 on file are supported by the specification and comply with section 60 of the *Patent Rules*.

[13] In this review, we will first address the subject-matter issue. Second, we will consider the lack of support issue. Finally, we will consider the proposed claims.

LEGAL PRINCIPLES AND OFFICE PRACTICE

Purposive construction

[14] In accordance with *Free World Trust v Électro Santé Inc*, 2000 SCC 66 [*Free World Trust*], essential elements are identified through a purposive construction of the claims done by considering the whole of the disclosure, including the specification and drawings (see also *Whirlpool v Camco*, 2000 SCC 67 [*Whirlpool*], at paragraphs 49(f) and (g) and 52). In accordance with the *Manual of Patent Office Practice* (CIPO) at §12.02, revised June 2015 [*MOPOP*], the first step of purposive claim construction is to identify the skilled person and his or her relevant common general knowledge (CGK). The next step is to identify the problem addressed by the inventors and the solution put forth in the application. Essential elements can then be identified as those required to achieve the disclosed solution as claimed.

[15] In the R-FA (pages 10 to 13) and during the hearing, the Applicant argued that the Office approach to the purposive construction did not accord with Canadian law. As stated above, the Office approach, described in *MOPOP* (which incorporated the contents of *PN2013-02*, an examination memo describing the Office's approach to purposive construction) and *PN2013-03*, an examination memo describing the Office's approach to computer-implemented inventions, was developed in response to *Canada (Attorney General) v*

Amazon.com Inc, 2011 FCA 328 [*Amazon*] and in light of the relevant Canadian jurisprudence. It reflects the Office’s interpretation of Canadian patent law in respect of purposive construction as applied to the examination of a patent application. The Office practice specifies that a properly informed purposive construction must consider the application as a whole, as read through the eyes of the person skilled in the art, against the background of the CGK in the field or fields relevant to the invention, so as to identify the problem and solution addressed by the application. The solution to that problem informs the identification of the essential elements: not every element that has a material effect on the operation of a given embodiment is necessarily essential to the solution.

- [16] In the R-FA (pages 14 to 17) and during the hearing, the Applicant also contended that the fundamental principle of claims construction is the inventor’s intention regarding the meaning of claim terms and the resulting scope of protection. We agree that all claimed elements must be considered during a purposive construction of the claims. However, the mere presence of a feature in the claims would not automatically render the feature essential to the claimed subject-matter. As explained in *Amazon* at paragraphs 43 and 44:

However, it seems to me that the jurisprudence of the Supreme Court of Canada, in particular *Free World Trust* and *Whirlpool*, requires the Commissioner's identification of the actual invention to be grounded in a purposive construction of the patent claims. It cannot be determined solely on the basis of a literal reading of the patent claims, or a determination of the “substance of the invention” within the meaning of that phrase as used by Justice Binnie, writing for the Supreme Court of Canada in *Free World Trust*, at paragraph 46.

Purposive construction will necessarily ensure that the Commissioner is alive 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) [emphasis added].

- [17] Therefore, as stated in *MOPOP*, while claim construction during examination must remain anchored in the language of the claims, it “cannot be determined solely on the basis of a literal reading” of the claims. A properly informed purposive construction must consider the application as a whole, and the form of the claim language chosen by the inventor cannot override all other considerations during purposive construction of the claims.

Statutory subject-matter

[18] The definition of invention is set out in section 2 of the *Patent Act*:

“[I]nvention” 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.

[19] As indicated in *PN2013-03*, section 2 of the *Patent Act* provides the definition of invention and must be read in conjunction with subsection 27(8) of the *Patent Act*, which excludes mere scientific principles and abstract theorems. Disembodied inventions (e.g. mere ideas, schemes, plans or sets of rules, etc.) are not included within the meaning of section 2 of the *Patent Act*. Where a computer is found to be an essential element of a construed claim, or if the claim is directed to a technical solution to a technical problem, the claimed subject-matter will generally be statutory. On the other hand, if it is determined that the essential elements of a construed claim are limited to only matter excluded from the definition of invention, and does not define “something with physical existence, or something that manifests a discernable effect or change” (*Amazon*, paragraph 66), the claim is not compliant with section 2 of the *Patent Act*, and consequently, not patentable.

Lack of support

[20] Section 60 of the *Patent Rules* requires that the claims be clear and concise and fully supported by the description. It reads:

The claims must be clear and concise and must be fully supported by the description independently of any document referred to in the description.

ANALYSIS

Purposive construction

The person skilled in the art

[21] The PR letter identified the person skilled in the art (POSITA), at page 5, as “[a] team comprising an information technology professional who is skilled in general purpose

computer technologies, a data analyst who is skilled in predictive analysis of commercial data and related predictive models, and an advertising/marketing professional who is skilled in consumer financial behaviour analysis”.

[22] The Applicant did not dispute this characterization and we adopt it in this review.

The common general knowledge

[23] The PR letter identified the CGK of the POSITA at page 5. Since the Applicant did not dispute the identification, we adopt the following CGK from the PR letter for this review:

- Knowledge of mathematical modelling and statistics;
- Knowledge of information processing, particularly text retrieval;
- Knowledge of database management systems and database software tools, as well as the design of related software applications;
- Knowledge of designing, training, and implementing conventional data mining methods for predictive purposes, including different kinds of regression models and neural network models; and
- Knowledge of vector operations, vector analysis, and vector representations of text-based documents, as well as their implementations using computers.

Problem and solution

[24] Having considered the statements in the FA, the Applicant’s submissions in the R-FA, the context of the entire specification, and based on the CGK of the skilled person, the PR letter set out what the skilled person would understand as the problem and solution being addressed by the application (pages 5 to 6):

[T]he problem to be solved as seen by the POSITA with their CGK is a need to model consumer financial behaviour based on actual historical spending patterns that reflect the time-related nature of each consumer’s purchase history (see page 3 of the description). And the proposed solution is a method of predicting financial behaviour of consumers comprising the steps of generating a date-ordered sequence of consumer transaction data, and applying known predictive models to consumer transaction data sets selected from the date-ordered sequence for different merchant segments to produce predicted spending amounts in each of the merchant segments.

[25] During the hearing, the Applicant expressed its disagreement with the above identification, and reiterated its own identification of the problem and solution, as previously indicated in the R-FA (page 9):

[A] problem faced by the inventors was: Given the complexity of the computational problem, and that the use of computer technology is essential, how may the computer be configured in order to perform a new function, namely: to process historical transaction data for a population of individuals at a population of different merchants to determine each individual's preferences based on time relations of specific related transactions. It is respectfully submitted that this is a 'computer problem'.

The solution taught and claimed by the inventors involves a specific configuration of the computer whereby the computer: transforms specific data constructs, including transaction data for a plurality of consumers in a master file, to further data constructs, namely a date ordered sequence of transactions for each consumer; to transform these into yet further data constructs, namely groups of input transactions for each consumer based on selection within a co-occurrence; and to transform these into yet further data constructs, namely predicted spending amounts in each merchant segment in a subsequent time interval. This is undoubtedly a desirable, practical result.

[26] During the hearing, the Applicant further stated that "the primary practical problem faced by the inventor was not how to compare or how to process data as such. Instead it was directed to how the computer was configured to perform a new function", and that the problem is both a "colossal computational problem" and a "computer problem".

[27] As explained in the PR letter, "computational problems" are not necessarily "computer problems", many of which involve only improvements on or optimization of abstract algorithms to reduce computational loads required to obtain solutions. Where specific computer hardware is not needed, and the improvement in computation is not peculiar to any computer hardware or software, solving a "computer problem" is not typically involved in the solution of a computational inefficiency problem.

[28] Furthermore, there is no indication in the specification of the instant application regarding how a computer is configured specifically in hardware or software to solve a "complexity" problem regarding computational efficiency. In any case, the degree of complexity of calculations is not determinative of the presence of a "computer problem". Therefore, in our view, the instant application is not directed to a computer problem. Rather, it is

directed to a modeling optimization problem, i.e., a problem regarding how to model consumer financial behaviour based on actual historical spending patterns that reflect the time-related nature of each consumer's purchase history.

[29] Since we are of the view that the instant application is not directed to a computer problem, it is our view that the computer is not part of the solution of this application. We conclude that the problem and solution are as set out in the PR letter.

The essential elements

[30] Claims 1, 18, 19, and 21 are the independent claims on file. For convenience, these claims are reproduced here:

1. A computer-implemented method of predicting financial behavior of consumers, comprising:
 generating, at a system for predicting consumer financial behavior having one or more processors, from transaction data for a plurality of consumers in a master file in communication with the one or more processors, a date ordered sequence of transactions for each consumer;
 selecting for each consumer a set of the date ordered transactions from the master file within a co-occurrence window to form a group of input transactions for the consumer;
 for each consumer, applying the input transactions of the consumer to each of a plurality of merchant segment predictive models, each merchant segment predictive model defining for a merchant segment, a prediction function between input transactions in a past time interval and predicted spending in a subsequent time interval, to produce for each consumer a predicted spending amount in each merchant segment in the subsequent time interval; and
 wherein the method is performed by the one or more processors.

18. A computer-readable medium having instructions stored therein for execution by a computer to carry out the method of any one of claims 1 to 17.

19. A system for analyzing consumer transaction data comprising:
 one or more processors;
 a first memory storing statements and instructions for execution by the one or more processors to provide a data preprocessing module configured to generate a plurality of master files based on transaction data for a plurality of consumers, the master files including a date ordered sequence of transactions for each consumer;
 a second memory configured to store the plurality of master files;
 a third memory storing statements and instructions for execution by the one or more processors to provide a data post processing module configured to select, from the plurality of master files stored in the second memory and for each consumer, a set of the date ordered transactions within a co-occurrence window to create a group of input transactions for the consumer;
 a fourth memory configured to store a plurality of merchant segment predictive models;
 a fifth memory storing statements and instructions for execution by the one or more processors to provide a profiling engine configured to, for each consumer, apply the input transactions of the consumer to each of the plurality of merchant segment predictive models, each merchant segment

predictive model defining, for a merchant segment, a prediction function between input transactions in a past time interval and predicted spending in a subsequent time interval, to produce for each consumer a predicted spending amount in each merchant segment in the subsequent time interval; and

a sixth memory configured to store the predicted spending amounts produced by the profiling engine[.]

21. A system for analyzing transaction data to predict consumer financial behavior comprising:
one or more processors; and

a memory storing statements and instructions for execution by the one or more processors to:
generate, at the system, from transaction data for a plurality of consumers in a master file in communication with the one or more processors, a date ordered sequence of transactions for each consumer;

select for each consumer a set of the date ordered transactions from the master file within a co-occurrence window to form a group of input transactions for the consumer;

for each consumer, apply the input transactions of the consumer to each of a plurality of merchant segment predictive models, each merchant segment predictive model defining for a merchant segment, a prediction function between input transactions in a past time interval and predicted spending in a subsequent time interval, to produce for each consumer a predicted spending amount in each merchant segment in the subsequent time interval; and

wherein the acts of generating, selecting and applying are performed by the one or more processors.

[31] In the PR letter, the Panel agreed with the identification in the FA of the essential elements of the independent claims 1, 18, 19, and 21 as:

- generating from transaction data for a plurality of consumers in a master file, a date ordered sequence of transactions;

- selecting, for each consumer a set of the date ordered transactions from the master file within a co-occurrence window to form a group of input transactions for the consumer;

- for each consumer, applying the input transactions of the consumer to each of a plurality of merchant segment predictive models, each merchant segment predictive model defining for a merchant segment, a prediction function between input transactions in a past time interval and predicted spending in a subsequent time interval, to produce for each consumer a predicted spending amount in each merchant segment in the subsequent time interval.

[32] In the R-FA (page 20), and during the hearing, the Applicant disagreed with this identification and contended that the computer elements as claimed are essential. The Applicant contended that the “complexity of the computational problem” and the usage of “a special kind of data construct, namely vectors, and related vector operations” render the employment of computer technology essential, and that the solution taught by the inventor

involves a specific configuration of the computer to perform “a new function” comprising the claimed method steps.

[33] Furthermore, during the hearing, the Applicant reiterated that “any practical solution to the problem must employ computer technology in view of the enormous data processing complexity required”, which pointed to the essentiality of the computer elements.

[34] In our view, the instant application does not set out to solve a problem of computational inefficiency using computers, which is supported by the lack of disclosure in the specification regarding the requirements of computer technology due to computational inefficiency. Moreover, as explained earlier, we are of the view that the instant application is not directed to solve challenges relating to implementation or operation of computer hardware or software.

[35] With respect to the “new function”, as represented by the claimed method steps, it is our view that it does not amount to more than a new data modeling algorithm, which may be passed to a conventional computer to obtain calculation results. For this algorithm, using a computer for implementation may be preferred, but not required. In this case, the computer does nothing more than calculations and data processing, in an expedited way as expected. As explained in *Schlumberger Canada Ltd v Canada (Commissioner of Patents)*, [1982] 1 FC 845 (CA), “it is precisely in order to make that kind of calculation that computers were invented”. Therefore, it is our view that there is no “new function” disclosed in the specification that would render the computer elements essential.

[36] With respect to vectors and vector operations, as we explained in the PR letter, the concept of vectors and vector operations, such as dot products, existed in the field of mathematics long before computers were invented. Utilizing abstract data structures such as vectors in a modeling algorithm does not necessarily require the involvement of computer hardware or software. Since the instant application does not set out to solve a problem related to computer implementation of vectors or vector operations, the mere presence of vectors and vector operations in the claimed algorithm would not automatically render computer essential to the claimed subject-matter.

[37] In summary, we consider the computing components of the claims, including the computer storage medium, non-essential to the claimed subject-matter.

[38] Dependent claims 2 to 17, and 20 recite further data manipulation features that reflect different embodiments of the same set of the essential elements as identified above. These claims recite features such as transaction statistics determinations, and vector data manipulations including calculating relationship strengths between pairs of merchants. In our view, all features of these claims are directed to data manipulations and calculations.

Subject-matter

[39] The essential elements of the claims on file are directed to abstract data manipulation steps and calculations of a method of predicting financial behaviour of consumers. Such subject-matter is directed to an abstract algorithm, which does not comprise matter that manifests a discernible effect or change, and is outside the meaning of invention in section 2 of the *Patent Act*.

[40] Therefore, claims 1 to 21 on file do not define statutory subject-matter and thus do not comply with section 2 of the *Patent Act*.

Lack of support

[41] In the PR letter, the Panel provided our preliminary view with the following rationale:

Although the specification does not explicitly recite seven distinct memory units, it does disclose that the claimed components may be stored in or connected to different memory units (see Fig. 4a and Fig. 4b, and pages 15 to 23 of the specification). In this case, the memory units storing these components and computer instructions are logically, or physically, connected. Fig. 4a and Fig. 4b depict one of possible embodiments of the instant application. Whether memory units storing system components and computer instructions are different logical parts of a single physical memory, or separate but connected physical memory units, does not change how the invention works. These are simply different embodiments of what is disclosed by the instant application. Therefore, the claimed statements and instructions, master files, merchant segment predictive models, and generated predicted spending amounts being stored in different logically or physically-connected memory units are fully supported by the specification, and a “correct and full description” is provided by the

specification in this regard. Consequently, we are of preliminary view that claims 19 and 20 on file comply with section 84 of the *Patent Rules*.

[42] The Applicant did not dispute this view. Therefore, it is our view that claims 19 and 20 on file comply with section 60 of the *Patent Rules*.

Proposed claims

[43] In the proposed claims, only claims 19 and 20 were amended in an effort to overcome the lack of support objection raised in the FA. In the amendment, the seven separate “memory” units have been replaced with one single memory unit.

[44] As explained in the PR letter, it is our view that the proposed claims would not change our identifications of the POSITA, CGK, problem/solution, and the essential elements. Therefore, the proposed claims 1 to 21 would not comply with section 2 of the *Patent Act*, for the same reasons stated above in our analysis.

[45] With respect to the lack of support issue, as explained in the PR letter, the proposed claims 19 and 20 recite utilizing one generic memory unit to perform essentially the same method steps of claim 1. These claims recite that the one memory unit stores system components such as master files, and instructions for execution by the processors. As stated in the PR letter, how the memory units are implemented, logically or physically, does not change the nature of the invention or how the invention works. Therefore, it is our view that the proposed claims 19 and 20 are directed to another embodiment of the invention, which is fully supported by the specification as originally filed, and thus comply with section 60 of the *Patent Rules*.

[46] The proposed claims cannot be considered to be “necessary” amendments under subsection 86(11) of the *Patent Rules*, because they do not comply with section 2 of the *Patent Act*.

RECOMMENDATION OF THE BOARD

[47] In view of the above, the Panel recommends that the application be refused on the grounds that the claims on file are directed to non-statutory subject-matter and are therefore non-compliant with section 2 of the *Patent Act*.

[48] Further, the proposed claims do not overcome the subject-matter defect and therefore the introduction of these claims does not constitute “necessary” amendments pursuant to subsection 86(11) of the *Patent Rules*.

Liang Ji
Member

Stephen MacNeil
Member

Leigh Matheson
Member

DECISION OF THE COMMISSIONER

[49] I concur with the findings of the Board and its recommendation to refuse the application. The claims on file do not comply with section 2 of the *Patent Act*.

[50] Accordingly, I refuse to grant a patent for this application. Under section 41 of the *Patent Act*, the Applicant has six months to appeal my decision to the Federal Court of Canada.

Johanne Bélisle
Commissioner of Patents

Dated at Gatineau, Quebec,

this 12th day of February 2020