

Citation: Landmark Graphics Corporation (Re), 2021 CACP 15

Commissioner's Decision #1568

Décision du Commissaire #1568

Date: 2021-03-25

TOPIC: J00 Meaning of Art
 J10 Computer Programs
 J40 Mental Steps

SUJET: J00 Signification de la technique
 J10 Programmes d'ordinateur
 J40 Processus psychologique

Application No. : 2,879,773

Demande n° 2 879 773

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,879,773 having been rejected under subsection 30(3) of the *Patent Rules* (SOR/96-423) as they read immediately before October 30, 2019 (“the *former Patent Rules*”), has consequently been reviewed in accordance with paragraph 199(3)(c) of the *Patent Rules* (SOR/2019-251). The recommendation of the Patent Appeal Board and the decision of the Commissioner are to refuse the application unless necessary amendments are made.

Agent for the Applicant:

NORTON ROSE FULBRIGHT CANADA LLP/S.E.N.C.R.L, S.R.L.

1 Place Ville Marie, Suite 2500
Montreal, Quebec
Canada
H3B 1R1

INTRODUCTION

- [1] This recommendation concerns the review of rejected Canadian patent application number 2,879,773 (“the instant application”), which is entitled “MULTI-LEVEL RESERVOIR HISTORY MATCHING” and is owned by LANDMARK GRAPHICS CORPORATION (“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*. As explained in more detail below, the Board’s recommendation is that the Commissioner of Patents refuse the application, unless necessary amendments are made.

BACKGROUND

The Application

- [2] The application, based on a previously filed Patent Cooperation Treaty application, is considered to have been filed in Canada on July 29, 2013. It was laid open to public inspection on February 6, 2014.
- [3] The instant application relates generally to history matching of oil and gas reservoir models and simulation of production using well logging data. The application has 22 claims on file as of the date of the Final Action (“FA”). These were received at the Patent Office on June 13, 2017.

Prosecution History

- [4] On June 20, 2018, an FA was written pursuant to subsection 30(4) of the *former Patent Rules*. The FA stated that the instant application is defective because all of the claims on file are directed to subject-matter outside of the definition of invention and therefore are not compliant with section 2 of the *Patent Act*. The FA also indicated that claims 19-22 were indefinite and do not comply with subsection 27(4) of the *Patent Act*.
- [5] In a December 13, 2018 response to the FA (“R-FA”), the Applicant submitted arguments in favour of the patentability of the claims on file as well as a set of claims (the proposed claims) and proposed amended description pages.
- [6] As the Examiner still considered the application not to comply with the *Patent Act*, pursuant to paragraph 30(6)(c) of the *former Patent Rules*, the application was forwarded to the Board for review on February 15, 2019 along with an explanation outlined in a

Summary of Reasons (SOR). The SOR set out the position that the claims on file were still considered to be defective and that the proposed claims addressed the indefiniteness issue but not the subject-matter defect.

- [7] In a letter dated February 18, 2019, the Board forwarded to the Applicant a copy of the SOR and requested that the Applicant confirm its continued interest in having the application reviewed.
- [8] In a letter dated May 28, 2019, the Applicant confirmed its interest in having the review proceed.
- [9] Following the decision of the Federal Court of Canada in *Yves Choueifaty v Attorney General of Canada*, 2020 FC 837 [*Choueifaty*], the Examiner wrote a Supplemental Summary of Reasons on February 2, 2021. The Examiner considered the proposed claims to overcome the subject-matter defect.
- [10] A Panel of the Board (“The Panel”) comprised of the undersigned members reviewed the instant application under paragraph 199(3)(c) of the *Patent Rules*.

ISSUES

- [11] The issues to be addressed by the present review are whether the claims on file are directed to subject-matter which meets the definition of invention found at section 2 of the *Patent Act*, and whether claims 19-22 on file comply with subsection 27(4) of the *Patent Act*.
- [12] We also consider the proposed claims.

LEGAL PRINCIPLES

Purposive Construction

- [13] In accordance with *Free World Trust v Électro Santé Inc*, 2000 SCC 66, 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 Corp v Camco Inc*, 2000 SCC 67 at paras 49(f) and (g) and 52). Purposive construction is performed from the point of view of the person skilled in the art (“POSITA”) in light of the relevant common general knowledge (“CGK”).

Patentable Subject-Matter

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

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.

[15] In accordance with subsection 27(8) of the *Patent Act*:

No patent shall be granted for any mere scientific principle or abstract theorem.

[16] Following the decision of the Federal Court of Canada in *ChouEIFaty*, the Patent Office issued “Patentable subject-matter under the Patent Act,” (CIPO, November 2020) [PN2020-04]. This practice notice clarifies examination practice with respect to the Patent Office’s approach to determining whether the subject-matter defined by a claim is patentable subject-matter. This includes the assessment of patentable subject-matter for computer-implemented inventions.

[17] As stated in PN2020-04, “To be both patentable subject-matter and not be prohibited under subsection 27(8) of the Patent Act, the subject-matter defined by a claim must be limited to or narrower than an actual invention that either has physical existence or manifests a discernible physical effect or change and that relates to the manual or productive arts”, referencing, in part, *Canada (Attorney General) v Amazon.com Inc*, 2011 FCA 328 [Amazon] paras 42 and 66-69.

[18] Regarding computer-implemented inventions specifically, PN2020-04 states the following:

The mere fact that a computer is identified to be an essential element of a claimed invention for the purpose of determining the fences of the monopoly under purposive construction does not necessarily mean that the subject-matter defined by the claim is patentable subject-matter and outside of the prohibition under subsection 27(8) of the Patent Act. In such a case, it is necessary to consider whether the computer cooperates together with other elements of the claimed invention and thus is part of a single actual invention and, if so, whether that actual invention has physical existence or manifests a discernible physical effect or change and relates to the manual or productive arts.

In addition, the fact that a computer is necessary to put a disembodied idea, scientific principle or abstract theorem into practice does not necessarily mean that there is patentable subject-matter even if the computer cooperates together

with other elements of the claimed invention. If a computer is merely used in a well-known manner, the use of the computer will not be sufficient to render the disembodied idea, scientific principle or abstract theorem patentable subject-matter and outside the prohibition under subsection 27(8) of the Patent Act.

In the case of a claim to a computer programmed to run a mathematical algorithm, if the computer merely processes the algorithm in a well-known manner and the processing of the algorithm on the computer does not solve any problem in the functioning of the computer, the computer and the algorithm do not form part of a single actual invention that solves a problem related to the manual or productive arts. If the algorithm by itself is considered to be the actual invention, the subject-matter defined by the claim is not patentable subject-matter or is prohibited under subsection 27(8) of the Patent Act.

On the other hand, if running the algorithm on the computer improves the functioning of the computer, then the computer and the algorithm would together form a single actual invention that solves a problem related to the manual or productive arts and the subject-matter defined by the claim would be patentable subject-matter and not be prohibited under subsection 27(8) of the Patent Act.

Indefiniteness

[19] Subsection 27(4) of the *Patent Act* requires claims to distinctly and explicitly define the subject-matter of the invention:

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.

[20] In *Minerals Separation North American Corp v Noranda Mines Ltd*, [1947] Ex CR 306, 12 CPR 99 at 146, the Court emphasized both the obligation of an Applicant to make clear in the claims the ambit of the monopoly sought and the requirement that the terms used in the claims be clear and precise:

By his claims the inventor puts fences around the fields of his monopoly and warns the public against trespassing on his property. His fences must be clearly placed in order to give the necessary warning and he must not fence in any property that is not his own. The terms of a claim must be free from avoidable ambiguity or obscurity and must not be flexible; they must be clear

and precise so that the public will be able to know not only where it must not trespass but also where it may safely go.

[21] Further elaboration of this requirement is found in the Manual of Patent Office Practice (CIPO) at §16.03 [*“MOPOP”*], revised March 1998.

ANALYSIS

Purposive Construction

[22] The FA at page 2 characterized the POSITA and CGK as follows:

The person who may be a team skilled in the art would be a person skilled in the field of reservoir operations and management. The person or team is also skilled in the field of general purpose computing technologies.

The skilled person or team is further familiar with reservoir history matching, which is typically performed by computers.

The skilled person or team is also familiar with general purpose computer hardware and general purpose computer programming techniques. Given the level of detail in the specification, it is presumed that the implementation of the claimed features falls within the common general knowledge in the art.

[23] The Applicant did not dispute this characterization in the R-FA. We adopt it for this review.

[24] The FA at pages 2-3 performed a purposive construction that resulted in a set of essential elements for certain claims according to a previous Patent Office practice, now superseded by *PN2020-04*. We undertake anew the identification of essential elements.

[25] According to *PN2020-04*, purposive construction is conducted by considering where the POSITA would have understood the Applicant to have intended to place the fences around the monopoly being claimed.

[26] The independent claims on file are claim 1, directed to a method, claim 10, directed to a system, and claim 19, directed to a non-transitory information storage medium. We consider claim 1 as representative.

[27] Claim 1 reads:

A multi-level reservoir history matching method that comprises:

acquiring measurements from one or more wells in a reservoir;
generating a first history-matched model using the measurements and at least one updated model parameter derived from one or more existing model parameters; generating a plurality of second history-matched models by applying a probabilistic inversion to the first history-matched model;
deriving a plurality of third history-matched models from the plurality of second history-matched models;
generating a plurality of dynamic simulation realization sets using each of the plurality of third history-matched models;
ranking the plurality of third history-matched models based at least in part on the plurality of dynamic simulation realization sets to identify a highest ranked third history-matched model; and
presenting, by a computer, a production forecast via a display to a user based on the highest ranked third history-matched model.

- [28] Considering the whole of the specification, the POSITA would understand that there is no use of language indicating that any of the elements in each claim are optional, one of a list of alternatives, or non-essential. Therefore, in our view, all elements recited in each of the claims are considered to be essential.
- [29] Purposive construction is also used to construe the meaning of terms used in the claims. We note that the term “acquiring” in claim 1 would be reasonably construed by the POSITA to include accessing or importing data, and not necessarily using the well-logging tool to make the underlying measurement. For example, the description at page 7, lines 7-12 describes a general-purpose computer system that acquires data, a data acquisition subsystem 510 that does not appear to include the measurement tool, and a data storage subsystem 520 that can also be accessed for stored measurement data. This has an important bearing on the analysis below.

Patentable subject-matter

- [30] In the FA at page 4, having identified that the essential elements of the claims are directed to an abstract scheme, the Examiner concluded that the claims encompass subject-matter that lies outside the definition of “invention” and do not comply with section 2 of the *Patent Act*.
- [31] Given that our view of essential elements differs from that of the FA, and in view of the updated Patent Office practice, we undertake anew the assessment of patentable subject-

matter according to *PN2020-04*.

[32] As described above in the section “Legal Principles and Office Practice” we assess for each claim whether the subject-matter it defines forms a single actual invention having physical existence or causing a discernible physical effect or change, and that relates to the manual or productive arts.

[33] The steps of the method defined by claim 1 are:

- acquiring measurements from one or more wells in a reservoir (data input);
- generating a first history-matched model using the measurements and at least one updated model parameter derived from one or more existing model parameters (data processing);
- generating a plurality of second history-matched models by applying a probabilistic inversion to the first history-matched model (data processing);
- deriving a plurality of third history-matched models from the plurality of second history-matched models (data processing);
- generating a plurality of dynamic simulation realization sets using each of the plurality of third history-matched models (data processing);
- ranking the plurality of third history-matched models based at least in part on the plurality of dynamic simulation realization sets to identify a highest ranked third history-matched model (data processing); and
- presenting, by a computer, a production forecast via a display to a user based on the highest ranked third history-matched model (data output).

[34] As noted above, we construe “acquiring measurements” broadly, which would include the computer accessing stored information. The other steps of the method all correspond to a generic computer processing data and presenting an output. There are no other elements defined in the claim.

[35] In *Amazon* (paras 61–63, 66, 69) the Court explained that a computer cannot be used to give an abstract idea a practical application satisfying the physicality requirement implicit in the definition of invention in section 2 of the *Patent Act* simply by programming the idea into the computer by means of an algorithm. *Amazon* notes that this was the situation in *Schlumberger Canada Ltd v Commissioner of Patents*, [1982] 1 FC 845 (FCA) at 205-206, where the computer was merely being used to make the kind of calculations it was invented

to make.

[36] The computer in claim 1, operating in a well-known manner, is therefore not part of the single actual invention. The algorithm does not improve the functioning of the computer. Rather, the actual invention is an algorithm for processing well-logging data, and presenting output information. This does not distinguish from *Schlumberger*. In our view, the actual invention is the abstract algorithm without physicality and does not comply with the definition of “invention” according to section 2 of the *Patent Act*. The subject-matter is prohibited under subsection 27(8) of the *Patent Act*.

[37] Independent claims 10 and 19 recite the same actual invention as independent claim 1.

[38] Dependent claims 2-9, 11-18 and 20-22 recite additional algorithmic details of the scheme, but the elements of the actual invention remain abstract.

[39] We conclude that claims 1-22 neither comply with section 2 nor subsection 27(8) of the *Patent Act*.

Indefiniteness

[40] In the FA at page 4, the Examiner considered claims 19-22 indefinite:

Claims 19-22 recite "A non-transitory information storage medium having multi-level reservoir history matching software that comprises: a first history matching module". First of all, it is not clear if the word "that" refers to the software or the storage medium. Note that both "software" and "software module" are defined in abstract terms and cannot form machine components (see MOPOP chapter 16).

[41] We agree insofar as *MOPOP* (now at §22.08.04) notes that the proper form for claiming software on a storage medium should be “machine-executable code” to distinguish from non-executable code such as source code which is mere descriptive matter.

[42] Therefore, in our view, claims 19-22 do not comply with subsection 27(4) of the *Patent Act*.

Proposed Claims and amendments to the description

[43] Proposed independent claim 1 recites “acquiring, using a production logging tool...”. This uses more specific language than the claims on file and includes the production logging

tool as an element of the claim. This element is distinct from the general purpose computer which processes the data. The production logging tool cooperates with the computer and algorithm to provide the solution of the invention. The production logging tool is therefore part of the actual invention and provides the necessary physicality. Therefore, in our view, proposed claim 1 would comply with section 2 and subsection 27(8) of the *Patent Act*.

[44] Proposed independent claims 10 and 19 recite similar language to claim 1. Dependent claims 2-9, 11-18 and 20-22 depend on these independent claims. Therefore, all the proposed claims would comply with section 2 as well as subsection 27(8) of the *Patent Act*.

[45] Proposed independent claim 19 recites "...program code executable by a processor..." which addresses the indefiniteness issue in the claims on file. In our view, proposed claims 19-22 would comply with subsection 27(4) of the *Patent Act*.

[46] We note that the Applicant proposed amendments to the description which address the clerical errors noted by the Examiner in the FA.

[47] We conclude that the proposed claims and proposed description would appear to meet all requirements of the *Patent Act* and *Patent Rules*.

CONCLUSION AND RECOMMENDATION OF THE BOARD

[48] For the reasons set out above, we recommend that the Applicant be notified, in accordance with subsection 86(11) of the *Patent Rules*, that the following amendments are necessary for compliance of the application with the *Patent Act* and *Patent Rules*:

- the deletion of the claims and description on file;
- the insertion of claims corresponding to the proposed claims; and
- the insertion of the description proposed with the RFA.

Howard Sandler

Mara Gravelle

Andrew Strong

Member

Member

Member

DECISION OF THE COMMISSIONER

[49] I concur with the conclusion and recommendation of the Board. In accordance with subsection 86(11) of the *Patent Rules*, I hereby notify the Applicant that the following amendments and only the following amendments must be made in accordance with paragraph 200(b) of the *Patent Rules* within three (3) months of the date of this decision, failing which I intend to refuse the application:

- the deletion of the claims and description on file;
- the insertion of claims corresponding to the proposed claims; and
- the insertion of the description proposed with the RFA.

Virginie Ethier
Assistant Commissioner of Patents

Dated at Gatineau, Quebec

this 25th day of March, 2021