TOPIC: J-00   Meaning of Art

           J-10   Computer Programs

           J-50   Mere Plan

SUJET: J-00   Signification de la technique

           J-10   Programmes d'ordinateur

           J-50   Simple plan

Application No. : 2,744,148

Demande nº 2 744 148

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,744,148, having been rejected under subsection 30(3) of the *Patent Rules*, as they read immediately before October 30, 2019 (former *Patent Rules*), consequently has 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.

Agent for the Applicant:

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INTRODUCTION

[1] This recommendation concerns the review of rejected patent application number 2,744,148, which is entitled "Fair Value Model for Futures." The patent application is owned by ITG Software Solutions, Inc. (the Applicant). The Patent Appeal Board (the Board) has reviewed the rejected application pursuant to paragraph 199(3)(c) of the *Patent Rules*. The outstanding defect to be addressed in this review is whether the claims define patentable subject matter. As explained below, my recommendation is to refuse the application.

BACKGROUND

The Application

[2] The instant application, based on a previously filed Patent Cooperation Treaty application, is considered to have been filed in Canada on November 18, 2009 and was laid open to the public on May 27, 2010.

[3] The instant application relates to securities and futures contract trading. More specifically, it relates to methods and systems for an improved calculation of the fair value prices of futures contracts.

Prosecution History

[4] On January 19, 2018, a Final Action (FA) was written pursuant to subsection 30(4) of the former *Patent Rules*. The FA explained that the application was defective on the ground that claims 1-24 (claims on file) were directed to non-statutory subject matter and therefore do not comply with section 2 of the *Patent Act*.

[5] In a July 19, 2018 response to the FA (RFA), the Applicant submitted arguments for the allowance of the claims on file. The Applicant also submitted a set of proposed claims (proposed claims).

[6] As the Examiner considered the application still did not comply with the *Patent Act* and *Patent Rules*, the application was forwarded to the Board for review pursuant to subsection 30(6) of the former *Patent Rules*, along with an explanation outlined in a Summary of Reasons (SOR) for maintaining the rejection of the application.

[7]   In a letter dated August 7, 2018, the Board forwarded a copy of the SOR to the Applicant. In its response to the SOR of November 6, 2018, the Applicant indicated a continued interest in having the Board review the application.

[8]   The undersigned was assigned to review the application under paragraph 30(6)(c) of the former *Patent Rules* and to make a recommendation to the Commissioner as to its disposition. In a Preliminary Review (PR) letter dated February 15, 2021, I set out my preliminary analysis and rationale as to why, based on the written record, the claims on file are prohibited under subsection 27(8) of the *Patent Act* and the subject matter of the claims on file are not patentable subject matter and fall outside the definition of "invention" in section 2 of the *Patent Act*. The PR letter offered the Applicant the opportunities to attend an oral hearing and to make further submissions.

[9]   The Applicant did not respond to the PR letter.

ISSUE

[10]   The issues to be addressed by this review are whether the subject matter of the claims on file is prohibited under subsection 27(8) of the *Patent Act* and is directed to non patentable subject matter as it falls outside the definition of "invention" in section 2 of the *Patent Act*. I also consider the proposed claims.

LEGAL PRINCIPLES AND PATENT OFFICE PRACTICE

Purposive Construction

[11]   In accordance with *Free World Trust v Électro Santé Inc*, 2000 SCC 66 and *Whirlpool Corp v Camco Inc*, 2000 SCC 67, purposive construction is performed from the point of view of the person skilled in the art in light of the relevant common general knowledge (CGK), considering the whole of the disclosure including the specification and drawings. In addition to interpreting the meaning of the terms of a claim, purposive construction distinguishes the essential elements of the claim from the non-essential elements. Whether or not an element is essential depends on the intent expressed in or inferred from the claim, and on whether it would have been obvious to the skilled person that a variant has a material effect upon the way the invention works.

[12]   "Patentable subject matter under the *Patent Act*" (CIPO, November 2020) [*PN2020–04*] also discusses the application of these principles, pointing out that all elements set out in a

claim are presumed essential unless it is established otherwise or such presumption is contrary to the claim language.

Patentable Subject Matter

[13] 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.

[14] Subsection 27(8) of the *Patent Act* also prescribes that:

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

[15] *PN2020-04* describes the Patent Office's approach to determining if a claim is patentable subject matter::

> 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, meaning those arts involving or concerned with applied and industrial sciences as distinguished in particular from the fine arts or works of art that are inventive only in an artistic or aesthetic sense.

[16] In *Schlumberger Canada Ltd v Commissioner of Patents*, [1982] 1 FC 845 (CA) [*Schlumberger*], the court concluded that, although computers were necessary for the invention to be put into practice, the computer did not form part of "what has been discovered" and thus was not relevant in determining whether the claimed invention was patentable subject matter; the computer was merely being used to make the kind of calculations it was invented to make.

[17] *PN2020–04* further describes the Patent Office's approach to determining if a computer-related invention is patentable subject matter. For example, the mere fact that a computer is among the essential elements of the claimed invention does not necessarily mean that the claimed invention is patentable subject matter. An algorithm itself is abstract and unpatentable subject matter. A computer programmed to merely processes the algorithm in a well-known manner without solving any problem in the functioning of the computer will not make it patentable subject matter because 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. On the other hand, if processing the algorithm improves the functionality 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.

ANALYSIS

[18] I note that since the Applicant did not respond to the PR Letter, the preliminary views presented in the PR Letter are considered to not be disputed. My recommendation below therefore provides an overview of my analysis and rationale presented in the PR Letter.

Purposive Construction

The Skilled Person and the Relevant CGK

[19] As for the identification of the skilled person, in the PR letter it was stated:

> I preliminarily characterize the skilled person as a team comprising one or more securities trading and mutual fund professionals, as well as programmers or other technologists experienced with developing and providing the software, tools and infrastructure conventionally used to support the activities and designs of such professionals, especially in the context of electronic trading.

[20] As for the identification of the CGK, in the PR letter I stated:

> …I preliminarily identify the relevant CGK as including:
>
> - procedures for trading securities, futures contracts, and other tradable objects on different exchanges including international exchanges;
>
> - exchange trading strategies, including international trading, as well as their advantages and disadvantages; and
>
> - knowledge of the management of mutual funds;
>
> - the design, implementation, operation and maintenance of computer systems, networks and software, including:
>
>   o electronic trading systems;
>
>   o general purpose and special purpose computers, computing devices, processors and user interfaces;

- o computer hardware and computer programming techniques;

- o computer network and internet technologies and protocols; and

- o automated order entry and trading tools.

[21] I adopt these characterizations in this review.

The Essential Elements of the Claims

[22] The instant application includes 24 claims on file, with independent claims 1, 9, and 17 directed to various embodiments for determining fair-value prices of a futures contract.

[23] Claim 1 is directed to computer-implemented method steps that determines fair-value prices of a futures contract. System claim 9 is directed to a server in a network carrying out the method steps equivalent to those of claim 1. System claim 17 is directed to means for carrying out the method steps equivalent to those of claim 1. Dependent claims 2-8, 10-16, and 18-24 recite refinements of the method steps of claim 1 and defines additional calculations for the determination of the fair-value prices. In the PR Letter, I considered independent claim 1 as representative of the invention:

> 1. A computer implemented method for determining fair-value prices of a futures contract of index i having foreign constituent securities, comprising the steps of:
>
> at a computer, receiving electronic data for the index i;
>
> at a computer, calculating alpha (α) and beta (β) coefficients using a regression analysis, wherein the alpha (α) coefficient represents a risk-adjusted measure of return on the index i, and the beta (β) coefficient represents a metric that is related to a correlation between an overnight return of the index i and a proxy market;
>
> at a computer, receiving a settlement price (SETTi) of the futures contract for index i; and
>
> at a computer, calculating a fair-value adjusted price for the futures contract of index i based at least in part on the alpha (α) and beta (β) coefficients, the settlement price (SETTi) of the futures contract for index i, and at least one return of a predetermined factor (Zt) during a stale period.

[24] In the PR Letter page 6, I considered all the computer-implemented method steps identified in the representative claim 1 to be essential, including the computer-implemented components that are used for carrying out these method steps as recited in the

corresponding system claims:

> Considering the representative claim 1, and the whole of the specification, the person skilled in the art would understand that there is no use of language indicating that any of the steps in each claim are optional, a preferred embodiment or one of a list of alternatives. Nor is there any indication in the record before us that would lead to a determination of any claimed elements being non-essential. Therefore, in my preliminary view, all the computer-implemented method steps identified in the representative claim 1 are considered to be essential, including the computer-implemented components that are used for carrying out these method steps as recited in the corresponding system claims.

> Dependent claims 2 to 8, 10 to 16, and 18 to 24 recite further data inputs and calculations. These features are considered essential.

[25] I maintain this identification of the essential elements in this recommendation.

Patentable Subject Matter

[26] As stated in the PR Letter at pages 6-8:

> According to representative claim 1 and the specification, it appears that the invention is directed to the retrieval of data regarding an index, the calculation of alpha (α) and beta (β) coefficients using a regression analysis, receiving a settlement price and then processing a fair-value adjusted price for a futures contract.

> Representative claim 1 has two data input steps (receiving electronic data related to an index and receiving a settlement price), and three data processing steps (determining alpha (α) and beta (β) coefficients using regression analysis, and the calculation of a fair-value adjusted price for the futures contract).

> In my preliminary view, all these essential steps of representative claim 1 cooperate together to capture the calculation of the fair-value adjusted price of a futures contract. Together, these steps represent the computer implementation of an abstract idea, theorem, or scheme for this calculation.

> The steps of receiving electronic data related to the index and a settlement price of the futures contract represent typical computer-implemented data input steps. Similarly, the step of determining alpha (α) and beta (β) coefficients using regression analysis is a typical computer-implemented data processing step according to input data. Finally, the step of calculating a fair-value adjusted price for the futures contracts represents another typical computer-implemented data processing step.

> According to *PN2020-04*, "[i]f 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*."

> As explained in [*Canada (Attorney General) v Amazon.com, Inc*, 2011 FCA 328] (paras 61–63, 66, 69), 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. This is the situation in *Schlumberger* at 205–206, where the computer was merely being used to make the kind of calculations it was invented to make.
>
> In my view, this is the situation for representative claim 1, where the abstract theorem is implemented on the computer, but the computer is merely used in a well known manner, does not form a single actual invention with the abstract theorem and thus does not render the theorem patentable subject-matter. The computer is merely being used to make the kind of calculations it was invented to make.
>
> Accordingly, the abstract theorem to determine a fair-value adjusted price for the futures contracts has no physical existence itself and does not manifest a physical effect or change. Nor does the use of the computer in this case cause it to meet the physicality requirement. Thus, in my preliminary view, the actual invention of representative claim 1 is prohibited under subsection 27(8) of the *Patent Act* and the subject-matter of representative claim 1, representing claims 1-24, is not patentable subject-matter and falls outside the definition of "invention" in section 2 of the *Patent Act*.

[27] I maintain my view that the subject matter of claims 1-24 is prohibited under subsection 27(8) of the *Patent Act* and the subject matter of claims 1-24 is not directed to patentable subject matter as it falls outside the definition of "invention" in section 2 of the *Patent Act*.

Proposed Claims

[28] As stated above, the Applicant submitted in the RFA, proposed claims 1-17 in an attempt to overcome the defect identified in the FA. From the claims on file, the proposed independent claims were amended to include certain dependent claims. Claim 1 on file was amended to include dependent claims 7 and 8; claim 9 (proposed claim 6) was amended to include dependent claims 15 and 16; claim 17 (proposed claim 12) was amended to include dependent claims 23 and 24. Original claim 5 has been deleted. The proposed dependent claims were only renumbered, not amended from the claims on file.

[29] As in the PR letter at pages 8-9, I maintain that the essential elements of representative claim 1 are all the features of the claim:

> Similar to the claims on file, I consider independent claim 1 as representative of the proposed claims. It is directed to a computerized method that recites the steps for determining fair-value prices of a futures contract:

1. A computer implemented method for determining fair-value prices of a plurality of futures contracts each of an index i having foreign constituent securities, comprising the steps of:

at a computer, receiving electronic data for the plurality of futures contracts over a data network;

at a computer, for each futures contract, calculating alpha (α) and beta (β) coefficients using a regression analysis, wherein the alpha (α) coefficient represents a risk-adjusted measure of return on the corresponding index i, and the beta (β) coefficient represents a metric that is related to a correlation between an overnight return of the corresponding index i and a proxy market;

at a computer, receiving a settlement price (SETTi) of each futures contract over the data network;

at a computer, calculating a fair-value adjustment coefficient ($1 + \alpha + \beta Z_t$,) for each futures contract based at least in part on the alpha (α) and beta (β) coefficients, the settlement price (SETTi) of the corresponding futures contract for index i, and at least one return of a predetermined factor (Z_t) during a stale period; and

outputting to the data network, the plurality of adjustment coefficient so as to be accessible by an investment computer system for automated portfolio management.

…

Considering the representative proposed claim 1, and the whole of the specification, the person skilled in the art would understand that there is no use of language indicating that any of the steps in each claim are optional, a preferred embodiment or one of a list of alternatives. Nor is there any indication in the record before us that would lead to a determination of any claimed elements being non-essential. Therefore, in my preliminary view, all the computer-implemented method steps identified in the representative proposed claim 1 are considered to be essential, including the computer-implemented components that are used for carrying out these method steps as recited in the corresponding proposed system claims.

Dependent claims 2 to 5, 7 to 11, and 13 to 17 recite further data inputs and calculations. These features are also considered essential.

[30] Regarding patentable subject matter of the proposed claims, as stated in the PR letter at pages 9-10,

In the RFA at page 3, the Applicant stated that the proposed claims provided a data stream format to brokers and fund managers, this being a tangible technology that is reliant on computers. The Applicant submitted that the invention is not directed only to the fair value calculation itself but includes the data stream providing the coefficients.

…

According to representative proposed claim 1 and the specification, it appears that the invention is directed to the retrieval of data regarding an index, the calculation of alpha (α) and beta (β) coefficients using a regression analysis, receiving a settlement price, calculating a fair-value adjusted coefficient for a futures contract, and outputting the plurality of adjustment coefficients to be accessible by investment computer systems for automated portfolio management.

Representative proposed claim 1 has two data input steps (receiving electronic data related to an index and receiving a settlement price), three data processing steps (determining alpha (α) and beta (β) coefficients using regression analysis and the calculation of a fair-value adjusted coefficient for a futures contract) and an output step (outputting the plurality of adjustment coefficients).

I note that the Applicant at the RFA page 3, stated that the customers already subscribe to the fair-value data feed. The actual invention is an improved calculation for the fair value coefficients, not a new or improved method to share the information related to coefficients to customers.

In my preliminary view, all these essential steps of representative proposed claim 1 cooperate together to capture the calculation of the fair-value adjustment coefficients. Together, these steps represent the computer implementation of an abstract idea, theorem, or scheme for this calculation.

The steps of receiving electronic data related to the index and a settlement price of the futures contract represent typical computer-implemented data input steps. Similarly, the step of determining alpha (α) and beta (β) coefficients using regression analysis is a typical computer-implemented data processing step according to input data. The step of calculating a fair-value adjustment coefficient for each futures contract represents another typical computer-implemented data processing step. Finally, the step of outputting the plurality of adjustment coefficients represents a typical computer-implemented data output step.

In my view representative proposed claim 1 is also an abstract theorem that is implemented on the computer, but the computer is merely used in a well known manner, does not form a single actual invention with the abstract theorem and thus does not render the theorem patentable subject-matter. The computer is merely being used to make the kind of calculations it was invented to make.

Accordingly, the abstract theorem to determine fair-value adjustment coefficients has no physical existence itself and does not manifest a physical effect or change. Nor does the use of the computer in this case cause it to meet the physicality requirement. Thus, in my preliminary view, the actual invention of representative proposed claim 1 is prohibited under subsection 27(8) of the *Patent Act* and the subject-matter of representative proposed claim 1, representing proposed claims 1 to 17, is not patentable subject-matter and falls outside the definition of "invention" in section 2 of the *Patent Act*.

[31] I maintain this analysis in this recommendation. Accordingly, I consider that the subject matter of proposed claims 1-17 is prohibited under subsection 27(8) of the *Patent Act* and the subject matter of claims 1-17 is not directed to patentable subject matter as it falls outside the definition of "invention" in section 2 of the *Patent Act*. It follows that the proposed claims are not considered a necessary amendment under subsection 86(11) of the *Patent Rules*.

RECOMMENDATION OF THE BOARD

[32] In view of the above, I recommend that the application be refused on the basis that the subject matter of the claims on file is prohibited under subsection 27(8) of the *Patent Act* and the subject matter of the claims on file is not patentable subject matter as it falls outside the definition of "invention" in section 2 of the *Patent Act*.

Mara Gravelle

Member

DECISION OF THE COMMISSIONER

[33] I concur with the findings of the Board and its recommendation to refuse the application on the basis that the claims on file are prohibited under subsection 27(8) of the *Patent Act* and the subject matter of the claims on file is not patentable subject matter as it falls outside the definition of "invention" in section 2 of the *Patent Act*.

[34] 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.

Virginie Ethier
Assistant Commissioner of Patents

Dated at Gatineau, Quebec

this 4th day of May, 2021