Citation: Intercontinental Exchange Holdings Inc (Re), 2020 CACP 27
Commissioner's Decision #1547
Décision du Commissaire no 1547
Date: 2020-06-22

TOPIC:	J00	Meaning of Art
	J10	Computer Programs
SUJET:	J00	Signification de la technique
	J10	Programmes d'ordinateur

Application No. : 2,791,397

Demande n^{o} 2 791 397

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,791,397 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.

Agent for the Applicant:

BORDEN LADNER GERVAIS LLP

Bay Adelaide Centre, East Tower
22 Adelaide Street West
Toronto, Ontario
M5H 4E3

INTRODUCTION

[1] This recommendation concerns the review of rejected Canadian patent application number 2,791,397 ("the instant application"), which is entitled "Curve Engine" and is owned by Intercontinental Exchange Holdings, Inc ("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.

BACKGROUND

The Application

[2] The instant application has a filing date of October 4, 2012. It was laid open to public inspection on April 4, 2013.

[3] The instant application relates generally to pricing of financial instruments. The application has 30 claims as of the date of the Final Action ("FA"). These were received at the Patent Office on August 19, 2016.

Prosecution History

[4] On May 2, 2017, an FA was written pursuant to subsection 30(4) of the *former Patent Rules*. The FA stated that the instant application was defective because all of the claims on file were directed to subject matter outside of the definition of invention and therefore were not compliant with section 2 of the *Patent Act*.

[5] In a November 1, 2017 response to the FA ("R-FA"), the Applicant submitted arguments in favour of the patentability of the claims on file and also submitted a set of proposed claims 1-30 ("proposed claim set-1").

[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 March 8, 2018 along with an explanation outlined in a Summary of Reasons ("SOR"). The SOR set out the position that the specification on file was still considered to be defective.

[7] In a letter dated March 13, 2018, 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 7, 2018, the Applicant confirmed its interest in having the review proceed.

[9] 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*.

[10] In a preliminary review letter ("PR letter") dated February 6, 2020, the Panel set out our preliminary analysis of the issue with respect to the claims on file. We also provided the Applicant with an opportunity to make oral and/or written submissions.

[11] The Applicant provided a written response to the PR letter ("the R-PR") along with a set of 30 proposed claims ("proposed claim set-2") on April 3, 2020.

[12] A hearing was held via audioconference on April 16, 2020.

ISSUE

[13] The sole issue to be addressed by the present review is whether claims on file are directed to subject matter which meets the definition of invention at section 2 of the *Patent Act*. In the event that we find the claims defective, we will also consider proposed claim set-2.

LEGAL PRINCIPLES AND OFFICE PRACTICE

Purposive Construction

[14] 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). 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 person of ordinary skill in the art (the POSITA) and their 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 and R-PR, the Applicant argued that the practice used by the Patent Office for

purposive construction is not in accordance with the principles of *Free World Trust* and that the inventor's intent that an element be essential determines its essentiality. We note, as we did in the PR letter, that in *Canada (Attorney General) v Amazon.com Inc*, 2011 FCA 328 [*Amazon.com*] at para 44, the court stated that the examiner must be "alive to the possibility that a patent claim may be expressed in language that is deliberately or inadvertently deceptive." It follows from this statement that the inventor's intent cannot be the only principle for determining essentiality, as that would lead to *de facto* literal claim construction.

[16] In the R-PR the Applicant further asserted that the inventor's intent as to essential elements can be determined not only from the specification but from correspondence with the Patent Office, according to subsection 53.1(1) of the *Patent Act*.

[17] We note that subsection 53.1(1) of the *Patent Act* applies to actions or proceedings regarding issued patents, such as infringement or invalidity proceedings, and not to claim construction of patent applications during prosecution. Further, the intent of section 53.1 of the *Patent Act* is different. "The mischief at which section 53.1 is directed is that the patentee was previously allowed to 'argue a claim construction that attempts to recapture ground conceded during prosecution of the patent application to avoid prior art'". (See *Bauer Hockey Ltd. v. Sport Maska Inc. (CCM Hockey)* 2020 FC 624 at para 64).

Statutory Subject Matter

[18] 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.

[19] "*Examination Practice Respecting Computer-Implemented Inventions*," PN 2013–03 (CIPO, March 2013) [*PN 2013–03*] clarifies the Patent Office's approach to determining if a computer-related invention is statutory subject matter.

[20] As indicated in *PN 2013–03*, where a computer is found to be an essential element of a construed claim, the claimed subject matter will generally be statutory. Where, on the other hand, it is determined that the essential elements of a construed claim are limited to matter excluded from the definition of invention (e.g., the fine arts, mere ideas, schemes or rules), the claimed subject matter will not comply with section 2 of the *Patent Act*.

ANALYSIS

The POSITA and the Relevant CGK

[21] In the PR letter, the Panel adopted the FA's definition of the POSITA:

> …the notional person of skill in the art, or team of persons skilled in the art, would include traders of financial instruments in cooperation with Information Technology personnel skilled in computerized systems for trading financial instruments.

[22] At the hearing, the Applicant stressed that the POSITA should include a data scientist, and in the R-PR the Applicant commented:

> The Panel's preliminary view is that the person of ordinary skill in the art includes an analyst of financial instruments in cooperation with Information Technology personnel. The Appellant agrees with this definition of the POSITA so long as "Information Technology personnel" refers to someone with an expert understanding (advanced science degree) in computers, networks, and data sciences including computer-implemented optimization development. It is not correct to define the POSITA as simply a financial analyst with some support from an IT personnel with a general knowledge of computers. That would be insufficient.

[23] The Panel finds the Applicant's clarification reasonable and hereby adopts this more precise definition of the POSITA as including a data scientist.

[24] In the PR letter, the Panel considered that the POSITA would have the following CGK:

- general-purpose computer hardware and general-purpose computer programming techniques;
- graphical user interfaces;
- databases;
- computer networking, including data communications, client devices and servers, wired and wireless networks, and the internet;
- pricing of financial instruments according to a pricing model that considers each market microstructure independently (instant description at para 0002);
- conventional mathematical optimization algorithms/models and their implementation in a computer system; and
- gathering data concerning financial markets from various sources.

[25] In the R-PR, the Applicant did not disagree with this characterization of the CGK. In both the R-PR and at the hearing, the Applicant asserted that the technical expertise required of the POSITA according to the more precise definition above and the technical computer and networking knowledge listed in the CGK was evidence of the technical nature of the subject matter of the invention. As the Applicant wrote in the R-PR:

> Since an IT professional is needed, it means the invention requires certain technical elements and aspects. The presence of the IT professional provides evidence to the technical (computerized) nature of the invention (discussed in the other points, below). Indeed, if the invention were non-technical, there would be no need for the IT professional.
>
> …
>
> The Appellant notes that each of the above is a technical computer-based factor. Accordingly, knowledge of these requires the technical skill of a POSITA having both the skill of an IT professional and a financial instruments analyst. This further evidences the technical nature of the invention.

[26] According to Office practice, the POSITA and CGK are characterizations that pertain to the audience reading the specification so as to discern the problem and solution being addressed by the invention; however, one cannot draw conclusions about the nature of the invention solely from the POSITA and CGK. To do so would be contrary to the principles of claim construction in *Free World Trust* wherein the claims are to be purposively construed from the point of view of such a person to determine essential elements.

Problem and Solution

[27] In the PR letter we characterized the problem and solution as follows:

> In our preliminary view, the POSITA, reading the specification as a whole and possessing the CGK as indicated above, would view the main problem addressed by the claimed invention as being that prior art pricing models do not consider the effect that financial instruments in one microstructure may have on prices of instruments belonging to other microstructures and vice versa. The claimed solution is to construct a virtual financial complex network comprising one or more interrelated financial markets, blend market colour data related to at least one of the financial markets with price data to determine blended pricing information, then use this blended pricing information to define an objective function that when solved via an optimization model, determines a minimum market price for each financial instrument across the one or more financial markets (instant description, para 0004).

[28] In the R-PR, the Applicant disputed the problem being addressed:

> The Appellant submits that at least a part of the problem intended by the inventor is one of resolving a lack of infrastructure that prevents existing systems from linking to and/or communicating with and amongst ordinarily independent market microstructures to capture

> the type of information needed to accurately price instruments. This lack of infrastructure is precisely what prevents existing systems from considering the effects that instruments in one microstructure may have on instruments in other microstructures, and vice versa.

[29] In our view, the POSITA would not see the communications infrastructure as a problem that required solving. The background of the invention indicates that pricing models that consider each market independently were well-known. Such models would necessarily involve gathering data on at least one market. The POSITA's CGK includes knowledge of computer networking. The POSITA would therefore not see any particular problem posed in using existing network infrastructure to gather data from a multiplicity of markets rather than just one market. The POSITA reading the specification would see the problem as one of how to process the data, not how to gather the data.

[30] In the R-PR the Applicant further argued that there was an infrastructure problem requiring a technical solution (referring to the PR letter as the "PPA"):

> By dismissing a crucial portion of the solution to the problem, namely, resolving the lack of infrastructure, the PPA disregards the inventor's intended scope of protection sought. In particular, the specification notes that adding markets, market-specific parameters and/or inter-market relationships to an existing network exponentially expands the size and complexity of that network. (see Fig. 4, para. 56). Thus, it would take a highly skilled IT expert (skilled well beyond general networking knowledge) to create and implement the complex network and architecture needed to account for this level of complexity. The Appellant further adds that this set of assertions may be a case of a hindsight review, where the observer only finds the solution 'obvious' and easy after it is explained to him/her, and is not permitted in purposive claim construction and identification of the essential elements of the claims.

[31] In support of this argument, in the R-PR and at the hearing, the Applicant also pointed towards paras 0131-0133 and Figure 22 as showing the multi-tiered level architecture of an exemplary system as technical in nature.

[32] In our view, adding markets does not pose a particular network problem at the computing level. The description at paras 137 and 147 refers to a variety of ordinary computer devices for implementation and provides no details on the networking technology, hardware or software requirements, indicating that the POSITA would not encounter a problem with implementation, and pointing to no processing speed problem.

Essential Elements

[33] Claim 1 is representative of the invention. Claim 1 reads:

> A method of pricing financial instruments, comprising:

> providing a curve engine system including at least one computing device comprising one or more processors executing computer-executable instructions stored in memory, said instructions causing the at least one computing device to perform the steps of:
>
> constructing a virtual financial complex network comprising two or more interrelated financial markets;
>
> receiving, over a network, active market data from one or more external data sources associated with the two or more interrelated financial markets, the active market data comprising market color data;
>
> blending the market color data related to at least one of the interrelated financial markets with price data to determine blended pricing information based on the collected active market data;
>
> defining an objective function based on the blended pricing information; and
>
> determining a minimum market price for each financial instrument across the two or more interrelated financial markets by solving the objective function using an optimization model.

[34] In our view, the POSITA would understand the elements of claim 1 essential to implementing the solution identified above to be:

- constructing a virtual financial complex network comprising two or more interrelated financial markets;
- receiving active market data from one or more external data sources associated with the two or more interrelated financial markets, the active market data comprising market color data;
- blending the market color data related to at least one of the interrelated financial markets with price data to determine blended pricing information based on the collected active market data;
- defining an objective function based on the blended pricing information; and
- determining a minimum market price for each financial instrument across the two or more interrelated financial markets by solving the objective function using an optimization model.

[35] The POSITA would not consider the computing device, memory and network to be essential to achieve the solution. The CGK indicates that it was well-known to use these items in a conventional way to gather and process financial data and there was no problem in their use in this application. They were not part of the problem, and although they are the normal environment for implementing the solution, they are not essential to the solution itself, which consists of models, data and an objective function.

[36] Independent claim 16, although directed to a system, includes the same essential elements as claim 1.

[37] Dependent claims 2-5 and 17-20 recite further details concerning how the data is grouped and processed.

[38] Dependent claims 6-11 and 21-26 recite further details of the blending calculation.

[39] Dependent claims 12-14 and 27-29 recite further details of the optimization modelling.

[40] Dependent claims 15 and 30 recite further details of the computing device, network and data sources. The computing device and network would not be considered by the POSITA to be essential to achieving the solution, as noted above.

Subject Matter

[41] As construed above, the essential elements of claims 1-30 comprise data and a series of data manipulation steps. The computerized elements are not essential. In the language of *Amazon.com* at para 66 the essential elements are not "something with physical existence," and are not "something that manifests a discernible effect or change." Such matter is outside the categories of invention in section 2 of the *Patent Act*.

[42] In the R-FA, the Applicant referred to *Schlumberger Canada Ltd v Canada (Commissioner of Patents)*, [1981] FC 845, 38 NR 299, 56 CPR (2d) 204 (FCA) [*Schlumberger*], stating that *Schlumberger* must now be considered overruled. We do not consider that any court decision has overruled *Schlumberger*. In *Amazon.com*, the Federal Court of Appeal did not overrule *Schlumberger* but rather asked whether a purposive construction in the claims before them would or would not distinguish from *Schlumberger* (*Amazon.com* at para 62).

[43] At the hearing, the Applicant also stated that the facts of the instant case appeared to be closer to *Amazon.com* than to *Schlumberger*. The Applicant noted that unlike in *Schlumberger*, in the instant case it was important to provide output data to traders quickly.

[44] We do not note any need for speed recited in the specification. In our view, the POSITA would not see the invention as solving a problem of slow processing or data gathering. We note that in the instant case, as in *Schlumberger*, the actual invention appears to be a mathematical algorithm and mental steps, whereas in *Amazon.com*, the actual invention was the use of "cookies", a computer technique to solve a problem of storing user information.

[45] In our view, claims 1-30 are not directed to statutory subject matter and thus do not comply with section 2 of the *Patent Act*.

PROPOSED CLAIMS

[46] In proposed claim set-2 only independent claims 1 and 16 are changed. These claims have been changed in several respects:

- the preambles of these claims are directed to integrating multiple market microstructures rather than to pricing financial instruments;
- the query for data is generated and transmitted automatically over a network and the data is received over the network;
- the curve engine system involves defining a multi-tiered system architecture; and
- the step of constructing a virtual financial complex network is by linking.

[47] At the hearing, the Applicant clarified that "linking" can be construed as associating markets which share interrelated products (with reference to para 139 of the description).

[48] In our view, the change to the preamble of these claims does not change the essential elements. Automatic queries for data and the transmission of such data were well-known in financial modelling and were not part of the problem or solution being addressed by the invention. These elements are not considered essential to achieving the solution. The multi-tiered architecture of the curve engine system is abstract in nature and further, could be substituted by other architectures without changing the nature of the solution. The linking step is making an association which is a mental step. Therefore, in our view, the proposed amendments would not add any essential elements comprising statutory subject matter.

[49] Therefore, in our view, proposed claim set-2 would not overcome the statutory subject matter defect and cannot be considered to be "necessary" amendments under subsection 86(11) of the Patent Rules.

CONCLUSION AND RECOMMENDATION OF THE BOARD

[50] For the reasons set out above, we recommend that the Commissioner of Patents refuse this application as the claims on file are directed to non-statutory subject matter and are therefore non-compliant with section 2 of the *Patent Act*.

Howard Sandler	Iain Baxter	Paul Fitzner
Member	Member	Member

DECISION OF THE COMMISSIONER

[51] I concur with the conclusions and recommendation of the Board that the application be refused on the ground that the claims on file are directed to non-statutory subject matter and are therefore non-compliant with section 2 of the *Patent Act*.

[52] Therefore, in accordance with section 40 of the *Patent Act*, 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.

Johanne Bélisle
Commissioner of Patents

Dated at Gatineau, Quebec

this 22nd day of June, 2020.