

Citation: BGC PARTNERS, INC. (Re), 2022 CACP 15
Commissioner's Decision # 1622
Décision du Commissaire n° 1622
Date: 2022-05-17

TOPIC: J00 Meaning of Art

J10 Computer
Programs

B00 Claims -
Ambiguity or
Indefiniteness

SUJET: J00 Signification de
la technique

J10 Programmes
d'ordinateur

B00 Caractère
ambigu ou
indéfini

Application No. : 2,464,583

Demande n° 2 464 583

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,464,583, having been rejected under subsection 30(3) of the *Patent Rules* (SOR/96-423) as they read immediately before October 30, 2019 (“former *Rules*”) has consequently been reviewed in accordance with paragraph 199(3)(c) of the *Patent Rules* (SOR/2019-251) (“*Patent Rules*”). The recommendation of the Patent Appeal Board and the decision of the Commissioner are to refuse the application.

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INTRODUCTION

- [1] This recommendation concerns the review of rejected Canadian patent application number 2,464,583 (“the instant application”), which is entitled “SYSTEMS AND METHODS FOR PROVIDING DYNAMIC PRICE IMPROVEMENT” and is owned by BGC PARTNERS, 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 was filed in Canada on April 16, 2004 and was laid open to public inspection on October 16, 2004.
- [3] The instant application relates to methods of operating trading systems and the trading systems themselves. In a trading system that receives and stores orders to buy and sell stocks, traders are normally restricted to submitting bids and offers at a set interval or increment such as 1/4 of 1/32nd of a point. The instant application proposes a method and system by which traders may improve their orders by increments less than these set values and which orders, once submitted, may be dynamically adjusted by the trading system to maintain their priority in the available order list.

Prosecution History

- [4] On September 21, 2017, a Final Action (“FA”) was written pursuant to subsection 30(4) of the former *Rules*. The FA stated that the instant application is defective on the ground that all of the claims 1-61 on file at the time of the FA (“claims on file”) encompass subject-matter that lies outside of the definition of “invention” and does not comply with section 2 of the *Patent Act*. The FA also indicated that claims 16, 34, 35, 41 49, 50 and 61 are indefinite and do not comply with subsection 27(4) of the *Patent Act*.

- [5] In a March 21, 2019 response to the FA (“R-FA”), the Applicant submitted a proposed claim set 1-61 and arguments in favour of patentability.
- [6] As the Examiner considered the application not to comply with the *Patent Act*, pursuant to subsection 30(6) of the *former Rules*, the application was forwarded to the Board for review on October 8, 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 as being directed to non-patentable subject-matter and that claims 16, 34, 35, 41, 49, 50 and 61 are indefinite. The SOR also indicated that the proposed claims submitted with the R-FA did not overcome these defects and that they introduced impermissible new matter, contrary to the requirements of section 38.2 of the *Patent Act*.
- [7] In a letter dated October 10, 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 response dated December 10, 2019, the Applicant indicated its desire for the Board to proceed with a review of the application.
- [9] The undersigned panel (“the Panel”) was assigned to review the instant application under paragraph 199(3)(c) of the *Patent Rules* and to make a recommendation to the Commissioner of Patents as to its disposition.
- [10] In a preliminary review letter (“PR letter”) dated February 18, 2022, the Panel set out its preliminary analysis of the patentable subject-matter issue with respect to the claims on file and the proposed claims submitted with the R-FA, based on the revised guidance set out in “Patentable Subject-Matter under the Patent Act” (CIPO, November 2020) [PN2020-04]. With respect to the claims on file, we were of the preliminary view that claims 1-61 on file are directed to non-patentable subject-matter, are therefore non-compliant with section 2 of the *Patent Act*, and are prohibited by subsection 27(8) of the *Patent Act*. We were also of the preliminary view that the proposed claims submitted with the R-FA were directed to non-patentable subject-matter.
- [11] With respect to indefiniteness, we were of the preliminary view that claims 9, 34, 35, 41, 49 and 50 on file are indefinite, while claims 16 and 61 are not. We were

also of the preliminary view that proposed claims 9, 20, 22, 30, 39 and 42 submitted with the R-FA are indefinite.

- [12] In respect of the new matter issue identified in the SOR, we preliminarily agreed that proposed claims 44, 47-53 and 56-61 submitted with the R-FA contain impermissible new matter, but that proposed claims 1, 11, 24, 32 and 43 did not. We also identified further impermissible new matter issues with proposed claims 4, 5, 8, 14, 15, 18, 19, 27, 28, 31, 36, 37, 40, 41, 50 and 59.
- [13] The PR letter provided the Applicant with an opportunity to make oral and/or written submissions.
- [14] In an email dated March 17, 2022, the Applicant's patent agent confirmed that the Applicant did not wish to proceed with an oral hearing.
- [15] In a response to the PR letter dated March 21, 2022 ("R-PR"), the Applicant submitted a new set of proposed claims 1-61 (identified as "Claimset C" in the R-PR) and indicated that the Panel should not further consider the proposed claims submitted with the R-FA (identified as "Claimset B" in the R-PR). The Applicant also provided arguments in favour of the patentability of both the claims on file and Claimset C.
- [16] The Panel has reviewed the instant application in accordance with paragraph 199(3)(c) of the *Patent Rules* and provide our analysis below.

ISSUE

- [17] The issues to be addressed by the present review are whether the claims on file are directed to patentable subject-matter and whether claims 9, 16, 34, 35, 41, 49, 50 and 61 on file are indefinite.
- [18] After considering the claims on file, we review Claimset C to determine if they are considered a necessary amendment under subsection 86(11) of the *Patent Rules*.

LEGAL PRINCIPLES AND OFFICE PRACTICE

Purposive Construction

- [19] In accordance with *Free World Trust v Électro Santé Inc*, 2000 SCC 66 [*FreeWorldTrust*] 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.
- [20] *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.

Indefiniteness

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

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.

- [22] In *Minerals Separation North American Corp v Noranda Mines Ltd*, [1947] Ex CR 306 at 352, 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.

Patentable Subject-Matter

- [23] 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.

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

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

[25] *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.

[26] *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 process 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.

[27] 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 use of a computer was not determinative of the issue of patentable subject matter; the computer was merely being used to make the kind of calculations it was invented to make and in that case did not lend patentability to the abstract calculations.

ANALYSIS

Purposive Construction

The person skilled in the art

- [28] In the PR letter at page 5, the Panel accepted the characterization of the person skilled in the art set out in the FA and undisputed by the Applicant in the R-FA:

The skilled worker or team is familiar with the programming techniques for building client/server network based application[s]. Furthermore, the skilled worker (team) is also familiar with financial practices; financial instruments trading and processes; processing of bids and offers; automatically setting said instruments pricing; and data management for such applications.

- [29] The Applicant did not dispute the above in the R-PR and we adopt it for the purpose of this review.

The relevant common general knowledge

- [30] In the PR letter at pages 5-6, we preliminarily adopted the characterization of the relevant common general knowledge set out in the FA, with one additional point:

In the FA at page 2, the relevant CGK was set out:

The skilled worker (team) as stated above would be familiar with the common general knowledge as discussed by the applicant and the cited art (D1-D5) listed below:

Firstly, the applicant's description states that electronic trading systems capable of processing orders, such as bids/offers/lift/take, as well as processing price improvement orders so that the traders may submit orders that are competitively priced, is well known in the art (*Original Description: Paras. 0003 and 0004*). Furthermore, the applicant's figures and description disclose a generic networked computer system without providing any details for improvements or issues with said system (*Original Figures and Description: Fig. 7; paras. 0067-0069*). Given the lack of detail in the present description, it is presumed that implementing the claimed subject matter using a general purpose computer would have been within the common general knowledge of the person skilled in the art.

Secondly, D1-D5 disclose the common general knowledge related to electronic trading systems capable of processing orders, wherein said orders may be submitted including price improvement rules:

- D1 (Figs. 1, 9B, 10A, and 10b, pg. 1 ln. 13 - pg. 2 ln. 1, pg. 8 Ins. 6-27, and pg. 20 ln. 11 pg. 23 ln. 12);
- D2 (Pg. 37 ln. 5 - pg. 39 ln. 2);
- D3 (Pg. 41 Ins. 6 - pg. 42 ln. 17);
- D4 (Figs. 1 and 2, paras. 0013-0018); and
- D5 (Figs. 2 and 3, paras. 0143 and 0145-0148).

The references above to D1 to D5 refer to the following documents:

D1: WO 00/57307	September 28, 2000	Madoff et al.
D2: WO 00/38093	June 29, 2000	Lutnick et al.
D3: WO 00/67172	November 9, 2000	Fraser et al.
D4: US 2003/0055775 A1	March 20, 2003	McQuain
DS: US 2003/0046218 A1	March 6, 2003	Albanese et al.

The Applicant also did not dispute the above characterization of the relevant CGK and we preliminarily adopt it for the purpose of this review. With respect to the references to portions of D1 to D5, we will not reproduce these points here, but will refer to specific ones if necessary. Further, given that the CGK includes electronic trading systems and general purpose computers, we are of the preliminary view that inputting/outputting information through the use of graphical user interfaces would also have been part of the relevant CGK and used in association with such systems.

[31] The Applicant did not dispute the above in the R-PR and we adopt it for the purpose of this review.

The claims on file

[32] In the PR letter at pages 6-7, we took independent claim 1 to be representative of the subject-matter of the independent claims. We also set out our position that although there were clarity issues with the claims, this did not prevent us from assessing the patentable subject-matter issue:

The instant application contains four independent claims 1, 16, 32 and 48, directed to a method for operating an electronic trading system for the exchange of financial instruments, an electronic trading system for the exchange of financial instruments, a method for operating an electronic trading system for the exchange of instruments and an electronic trading system for the exchange of instruments, respectively. For the purposes of the analysis that follows, we take claim 1 as representative of the independent claims. We address the subject-matter of the other claims as necessary. Representative claim 1 is set out below:

1. A method for operating an electronic trading system for the exchange of financial instruments, the method comprising the steps of:

in an electronic trading system designed to receive and store orders to buy and to sell financial instruments as submitted by traders, and substantially as orders are received, to execute trades between matching buy and sell orders, stored buy and sell orders having order matching priority orderings relative to each other reflecting at least one attribute of the order in addition to or instead of price, the order matching priority ordering used by the electronic trading system to determine priority among orders for matching for execution;

receiving a dynamic price improvement order, being an order to buy or sell an identified financial instrument traded on the electronic trading system, whose order matching priority for execution against contra orders is maintained by the electronic trading system at least in part relative to earlier-submitted orders on the same side of the market by adjusting a price associated with the dynamic price improvement order;

receiving orders contra to the dynamic price improvement order, and matching the contra orders to the stored orders on the same side of the market as the dynamic price improvement order substantially as the contra orders are received, the dynamic price improvement order being matched to the contra orders with the order matching priority relative to other orders as maintained by the electronic trading system; and

executing transactions substantially as orders and contra orders are matched.

We note that although the FA raised issues surrounding the clarity of certain terms and expressions used in the claims, which we address below, we do not view them as issues that prevent us from performing an assessment of patentable subject-matter.

[33] None of the above was disputed in the R-PR and we proceed on this basis.

The essential elements

[34] In the PR letter at pages 7-8, we set out our preliminary view that all the elements of the claims on file are considered to be essential:

The FA presented at pages 2-4 an analysis of the purposive construction of the claims on file in accordance with the guidance set out in the *Manual of Patent Office Practice*, revised June 2015 (CIPO) at §12.02. As this approach has now been superseded by *PN2020-04*, we undertake anew the identification of the essential elements of the claims on file.

PN2020-04 states in respect of the identification of essential/non-essential elements that:

In carrying out this identification of essential and non-essential elements, all elements set out in a claim are presumed essential, unless it is established otherwise or is contrary to the language used in the claim.

With respect to the claims on file, the person skilled in the art would understand that there is no use of language in any of the claims indicating that the elements in each claim are optional, alternatives or a preferred embodiment.

Therefore, in our preliminary view, all the elements of the claims on file are considered to be essential, including the computer implementation and computer-related components.

[35] The above position was not disputed in the R-PR and we therefore proceed on the basis that all elements of the claims on file are essential.

Indefiniteness

[36] In the PR letter at pages 8-9, we set out our preliminary view that claims 9, 34, 35, 41, 49 and 50 on file are indefinite, while claims 16 and 61 are not:

In the FA at page 5 it was contended that claim 16 is indefinite because the term “substantially” does not clearly and explicitly define the claimed subject-matter. However, in our preliminary view the use of “substantially” in this case is not indefinite. In the phrase “execute transactions substantially as orders and contra orders are matched”, we take this as meaning to the skilled person that the actual trades are executed almost immediately when the matching of the orders and contra orders is complete, essentially executing the trades as soon as a match is found. As such in our preliminary view, this term is not indefinite. We note that similar language is used in claim 1 on file.

The FA also contends that the phrase “being an order to buy or sell an identified a financial instrument traded” in claim 16 on file is indefinite. The FA contends that there is an extra word in this phrase and that it should read “being an order to buy or sell an identified financial instrument traded.” The Applicant did not contest this position in the R-FA, instead pointing to the proposed claims and the absence of this language in them. However, in our preliminary view, the presence of this extra indefinite article is not sufficient to render the claim indefinite.

The FA contends that claims 34, 35, 49 and 50 on file are indefinite in that the term “the change” used in these claims has no antecedent. The Applicant also did not dispute this position in the R-FA. We preliminarily agree that these claims are indefinite, as it is not clear as to what “the change” refers. Nevertheless, for the purposes of the patentable subject-matter analysis below, we will assume that this refers to the adjustment of the price of the dynamic price improvement order set out in independent claims 32 and 48.

The FA contends that claim 41 on file is indefinite in that this claim refers to “determining includes [ellipsis removed]”, whereas there is no such “determining” step in independent claim 32. The only reference to such a step is in “the order matching priority ordering used by the electronic trading system to determine priority among orders for matching for execution.” We note that the same type of language appears in claim 9, which refers to independent claim 1. Again, the Applicant did not dispute this issue in the R-FA, again pointing to the proposed claims. We preliminarily agree that the subject-matter of claim 41 is indefinite for the reason that there is no reference for the “determining” step. We are also of the preliminary view that claim 9 is indefinite for the same reason. Nevertheless, in our preliminary view, this ambiguity does not prevent us from assessing the patentability of these claims.

The FA further alleges that claim 61 on file is indefinite as the statement “operable to providing to parties” is unclear. It was suggested that this should read “operable to provide to parties”. While the Applicant also did not dispute this point, again pointing to the proposed claims, in our preliminary view such an editorial error would not make a claim indefinite and non-compliant with subsection 27(4) of the Patent Act. In our preliminary view, the skilled person would recognize the obvious error and readily understand the claimed subject-matter.

In light of the above, it is our preliminary view that claims 9, 34, 35, 41, 49 and 50 are indefinite and do not comply with subsection 27(4) of the *Patent Act*.

[37] None of the above was disputed by the Applicant in the R-PR and amendments were proposed as part of Claimset C to address the defective claims.

[38] We conclude that while claims 16 and 61 on file are compliant with subsection 27(4) of the *Patent Act*, claims 9, 34, 35, 41, 49 and 50 are indefinite and therefore non-compliant with subsection 27(4) of the *Patent Act*.

Patentable Subject-Matter

[39] At pages 9-11 of the PR letter, we set out our preliminary view that claims 1-61 on file are directed to non-patentable subject matter:

It is the preliminary view of the Panel that claims 1-61 on file are directed to a series of abstract data manipulation rules and calculations and are not directed to subject-matter that is “something with physical existence, or something that manifests a discernable effect or change” (*Canada (Attorney General) v Amazon.com Inc*, 2011 FCA 328 [*Amazon*] at paragraph 66). As such, claims 1-61 on file are non-compliant with section 2 of the *Patent Act* and are prohibited by subsection 27(8) of the *Patent Act*.

Further, in our preliminary view the present situation is akin to the one dealt with in *Schlumberger*. The computer-related elements in this case are being used to process an abstract trading algorithm in an expected well-known manner and like

Schlumberger, such elements and their well-known functions do not lend patentability to the claims.

In our preliminary view, representative claim 1 wholly relates to a trading algorithm processed in a well-known manner by means of a generic computer system.

Claim 1 sets out steps of “receiving a dynamic price improvement order”, “receiving orders contra to the dynamic price improvement order” and “matching the contra orders to the stored orders on the same side of the market as the dynamic price improvement order.” Claim 1 also specifies that transactions are executed as the orders and contra orders are matched. Further, the price of dynamic price improvement orders is adjusted so that their priority for execution against contra orders is maintained. These steps represent the steps of a trading algorithm used to receive, process and execute trades of financial instruments.

There is no indication that the receiving, matching and execution steps are anything other than the generic reception and processing of data in a generic computer network. In the instant application at paragraphs [0067] to [0069], exemplary systems for implementing the described and claimed algorithms are discussed. These exemplary systems represent generic input/output devices, generic workstations/servers and generic computer networking system. Several examples are also given of what types of generic workstations may be employed, such as personal computers, laptops, portable telephones, etc.

Given that the computer-related elements of claim 1 are generic in nature, in accordance with *PN2020-04* and the illustrative examples attached to it, the question then becomes whether or not the computer forms part of the actual invention, the actual invention being the subject-matter against which patentable subject-matter is determined. As indicated in *PN2020-4*, if the processing of an algorithm on a computer improves the functioning of the computer, then the computer and the algorithm 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 is patentable.

In the present case, there is no suggestion that the use of the particular algorithm claimed improves in any way the functioning of the electronic trading system, for example by reducing the resources used in the computer processing of the algorithm in comparison with previous such trading algorithms. Likewise, there is no suggestion that there was some inadequacy with the operation of prior electronic trading systems or that there were any challenges or deficiencies in the previous computer systems themselves. As noted above, the computer systems and components used are generic in nature and there is no detailed discussion of the implementation of the algorithm that would suggest any difficulties to be overcome in that respect. The algorithm merely offers an alternative set of trading rules whereby an order may be designated as a “dynamic price improvement order”, the price of which, once submitted, may be adjusted so as to maintain its priority in the trading market.

In the R-FA at pages 2-3, the Applicant asserts that the claimed subject-matter represents an improvement in electronic trading systems because existing trading systems have limitations on the granularity of the prices at which bids and offers can be submitted, as explained in the disclosure:

[0004] **The prices at which bids and offers can be submitted usually conform to some sort of fixed interval or increment, where the interval is set by the trading system or dictated by the type of item being traded.** For example, if a trader is trading United States Treasuries in a brokerage trading system, that trader can submit bid or offer prices that vary by 1/4 of 1/32nd of a point in Treasuries up to a maturity of under 10 years, and 1/2 of 1/32nd of a point for maturities over 10 years and over. **If traders desire to submit bids or offers that are more competitively priced than other prices, they are limited to submitting bids or offers at the predetermined pricing intervals.** [Emphasis maintained but altered from the R-FA at pages 2-3]

While the Panel recognizes that previously existing electronic trading systems may have limited the price increments for incoming bids and offers, we also recognize that these limitations are not imposed as a result of limitations of the technical capability of the computer systems used for these purposes, but rather are imposed by the applicable trading rules that are embodied in the algorithms processed by the computer systems.

Therefore, the “improvement”, if any, is in the flexibility of pricing permitted by the provision of new trading pricing rules, not in the operation of any electronic trading system itself.

In our preliminary view, given that the computer-related elements and functions of representative claim 1 on file are generic in nature, and the lack of any evidence that the steps that make up the trading algorithm improves the functionality of the electronic trading system, the actual invention is the trading algorithm itself. This group of steps is a series of abstract data manipulation rules and calculations.

Therefore, it is our preliminary view that the actual invention of claim 1 on file is directed to subject-matter that is not “something with physical existence, or something that manifests a discernable effect or change” (*Amazon* at paragraph 66). As such, the subject-matter of claim 1 on file is directed to non-patentable subject-matter and is therefore non-compliant with section 2 of the *Patent Act*. As the actual invention is abstract in nature, it is also prohibited by subsection 27(8) of the *Patent Act*.

The other independent claims 16, 32 and 48, the steps of which are substantially the same as those of representative claim 1, also consist of actual inventions that are directed to a series of abstract data manipulation rules and calculations.

Dependent claims 2-15 relate to further details of the trading algorithm, including price adjustments, order matching priority criteria, the specific dynamic price

increments as a fraction of the displayed price increments, how price improvement levels are assigned and that the designation of an order as a dynamic price improvement order may be the default or an option selectable by a trader. As these dependent claims only add further rules and criteria for the trading algorithm, they too are directed to non-patentable subject-matter.

Dependent claims 17-31, 33-47 and 49-61 on file, like dependent claims 2-15 are directed to further details of the trading algorithm, and likewise are directed to non-patentable subject-matter.

Producing a discernable effect

- [40] At pages 7-9 of the R-PR, the Applicant contends that the claimed subject-matter does indeed produce a discernable effect. The Applicant explains that unlike prior art electronic trading systems where a trader would have to monitor market conditions and enter, retract and re-enter new orders in response, or would interface with the electronic trading system every time an order price change was necessary, in the case of the claims on file no intervention of the trader is necessary. The electronic trading system itself, by means of the dynamic price improvement order, alters the order price and thereby maintains priority of the order in the electronic system.
- [41] The Applicant assimilates such actions to those of a smart missile, where a soldier need only specify an intended target once and the smart missile would hit the target even if it moved after the missile was launched. This is in contrast to a fixed-location missile that would only hit the originally specified location, even if the target has moved in the meantime. In a similar manner to that of the smart missile, the dynamic price improvement order can be set to maintain a certain priority and the system can make adjustments to ensure this occurs, leaving the trader with less of a need to interact with the electronic trading system.
- [42] While we appreciate that a trader may perceive an effect from the operation of the claimed method or system, in our view, this is not the type of discernable effect or change contemplated in *Amazon* at paragraph 66. The alleged effects are outside the scope of the claimed subject-matter, which is itself a method of operating an electronic trading system, or an electronic trading system with such functionality. The discernable effect or change, in our view, must flow from the steps themselves and not from a lack of action on the part of a user due to a computer performing steps that would have been previously performed by a user.

- [43] As the Federal Court of Appeal acknowledged in *Amazon* at paragraph 69, the claims in *Schlumberger* were not saved by the fact that abstract calculations were performed by a computer, calculations that could have been performed manually. The Applicant would seem to agree that the computer was not required in that case, given the suggestion on pages 13-16 that the use of a computer in *Schlumberger* was merely the coating of the claims with a “veneer” that was insufficient to transform unpatentable into patentable subject-matter. In that case, human steps were also eliminated by the programming of a generic computer to perform specific steps, yet this expected result of programming a computer to do something that would have previously been performed by a human was not sufficient to render the claims patentable.
- [44] Likewise, in our view, the fact that in the present case the steps of the claims on file would eliminate steps previously needed to be taken by a trader, is not sufficient to produce the required discernable effect or change needed to satisfy the physicality requirement set out in *Amazon* at paragraphs 65-66.
- [45] Despite the above considerations, we also note that our preliminary analysis in the PR letter identified the actual invention as consisting of the trading algorithm itself, which comprises a series of abstract data manipulation rules and calculations. As such there is no system that would be considered from the point of view of patentable subject-matter with which a trader would have less need of interaction.
- [46] However, we appreciate that as set out at pages 9-13 of the R-PR, the Applicant takes exception with the approach set out in *PN2020-04*, in particular the identification of an actual invention, to which the requirements of patentable subject-matter are applied. We address these submissions briefly below.

Applicant's submissions on the patentable subject-matter assessment

- [47] With respect to the approach set out in *PN2020-04*, the Applicant submitted in the R-PR that, as acknowledged by the Federal Court of Appeal in *Amazon*, an inquiry as to the nature of the actual invention may be relevant, but that as set out by the Court, any determination of an actual invention must be grounded in a purposive construction of the patent claims.
- [48] Further, according to the Applicant, any determination of the actual invention is not

itself determinative of how to assess patentable subject-matter. The Applicant pointed to *FreeWorldTrust* at paragraph 46 to make the point that determining an actual invention is like performing the forbidden second step discussed by Justice Binnie that asks if “in substance” the invention was wrongfully appropriated. The Applicant contends that such a step impermissibly strips the claimed invention of content that is not equivalent to the “veneer” that was present in the claims of *Schlumberger*.

[49] While we appreciate the above points made by the Applicant in the R-PR, in *PN2020-04* the Commissioner of Patents has set out the guidelines to be used in assessing patentable subject-matter. These guidelines require the determination of the actual invention subsequent to a purposive construction of the claims.

[50] *PN2020-04* states that the determination of the actual invention must be grounded in a purposive construction of the claims and, as stated by the Applicant in the R-PR, cannot be a determination of the “substance of the invention” as prohibited by *FreeWorldTrust*.

For each claim, the identification of the actual invention must be grounded in a purposive construction of the claim and cannot be determined solely on the basis of a literal reading of the claim, or a determination, not anchored in the language of the claim, of the “substance of the invention” within the meaning of that phrase as used by the Supreme Court of Canada in paragraph 46 of *Free World Trust v Électro Santé Inc.*, 2000 SCC 66. [citations omitted]

Whether the claims recite a generic computer system

[51] In the R-PR at pages 17-20, the Applicant contends that the claims on file do not recite a generic computer system, contrary to the preliminary view of the Panel in the PR letter, set out at paragraph [39] above. In the Applicant’s view, they set out an electronic trading system with particular capabilities. The Applicant contends that generic computer systems are not capable of performing the specific tasks set out in the claims.

[52] While we recognize that a generic computer system does not, without being suitably programmed, perform the specific tasks set out in the claims on file, the fact that a generic computer system is used to process an algorithm comprising those tasks is not sufficient to make the claim patentable, as set out in *PN2020-04*:

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*.

- [53] As the Applicant indicates at pages 18-19 of the R-PR, under *PN2020-04* some improvement in the functioning of a generic computer system beyond the mere execution of an algorithm in a well-known manner is required and is, in the Applicant's view, embodied by the dynamic price improvement order. As discussed in the "Examples of Patentable Subject-Matter Analysis" that accompanied the publication of *PN2020-04*, in particular with respect to "Computer-implemented Example 1" therein, factors that may indicate an improvement in a computer system may include whether a computer problem is solved by the use of the algorithm or whether the use of the particular algorithm reduced the resources used in the computer processing.
- [54] In the present case, we see no such indications that the algorithm that is part of the claims on file effects any improvement to the functioning of the generic computer system itself, such that the algorithm and computer system form an actual invention that satisfies the requirements of section 2 and subsection 27(8) of the *Patent Act*.
- [55] The Applicant submitted at pages 19-20 of the R-PR that the skilled worker would perceive a patentable discernable effect from the reduced need for trader interaction with the trading system, since the system itself adjusts prices to maintain order priority. The Applicant contends that this an improvement to trading and that the focus of the improvement should not be on a computer science improvement.
- [56] However, in accordance with *PN2020-04*, while the actual invention, namely the trading algorithm itself, which comprises a series of abstract data manipulation rules and calculations, may be an improvement to the steps of a trading scheme, this is not sufficient for compliance with section 2 and subsection 27(8) of the *Patent Act*. As discussed above in relation to the discernable effect issue, the lack

of action on the part of a user due to a computer performing steps that would have been previously performed by the user is not the kind of discernable effect or change contemplated by the Federal Court of Appeal in *Amazon*.

Conclusions on patentable subject-matter

[57] In light of the above considerations, we conclude that claims 1-61 on file are directed to non-patentable subject-matter and are therefore non-compliant with section 2 of the *Patent Act*. Further, as the actual invention of the claims on file is abstract, the claims are prohibited by subsection 27(8) of the *Patent Act*.

Proposed Claims

[58] With the R-PR, the Applicant submitted Claimset C.

[59] Amendments were proposed to the claim language that would, in our view, overcome the indefiniteness defects present in claims 9, 34, 35, 41, 49 and 50 on file.

[60] With respect to the patentable subject-matter issue, we comment briefly below on the proposed changes to claim 1, which we take as representative of the proposed independent claims.

[61] Claim 1 of Claimset C includes some changes to the language of the claim that relate to the functions of the electronic trading system and attempts to make it clearer that it is the system that is maintaining order matching priority and dynamically adjusting the price of a price improvement order, dependent on market conditions, prior to matching an order with one or more contra orders.

[62] In our view, these changes do not significantly alter the subject-matter of claim 1 on file, where it is clear that such functions were already stated in the claim as being performed by the electronic trading system itself. This would not affect our assessment of the actual invention and consequently would not affect the conclusions in respect of patentable subject-matter.

[63] The other change to proposed claim 1 and the other independent claims of Claimset C is the addition of a step of communicating the data regarding executed transactions to a clearing center for use in clearing the transactions.

- [64] While this additional step would add a communication output step to the claims on file, in our view, it would not add anything that would change our assessment of the actual invention. In our view, such a communication step represents a generic output of a computer system, in this case the transfer of output data resulting from the trading algorithm to another system. Such generic outputs are not sufficient to lead to a conclusion that the computer system and algorithm form a single actual invention that has physical existence or that manifests a discernable effect or change (*Amazon* at paragraph 66).
- [65] As the other proposed independent claims comprise similar changes, they too would not overcome the patentable subject-matter defect. Amendments to the dependent claims were proposed to address the indefiniteness defects, as discussed above.
- [66] In light of the above, the substitution of Claimset C for those on file would not overcome the patentable subject-matter defect and therefore is not considered a “necessary” amendment for compliance with the *Patent Act* and *Patent Rules*, as required by subsection 86(11) of the *Patent Rules*.

CONCLUSIONS

- [67] We have determined that claims 1-61 on file are directed to non-patentable subject-matter, are non-compliant with section 2 of the *Patent Act* and are prohibited subject-matter under subsection 27(8) of the *Patent Act*.
- [68] We have also determined that claims 9, 34, 35, 41, 49 and 50 on file are indefinite and therefore non-compliant with subsection 27(4) of the *Patent Act*, while claims 16 and 61 on file are compliant with subsection 27(4) of the *Patent Act*.
- [69] In our view, Claimset C submitted with the R-PR would not overcome the patentable subject-matter defect and is therefore not considered a “necessary” amendment for compliance with the *Patent Act* and *Patent Rules* as required by subsection 86(11) of the *Patent Rules*.

RECOMMENDATION OF THE BOARD

[70] In view of the above, the undersigned recommend that the application be refused on the grounds that:

- Claims 1-61 on file are directed to non-patentable subject-matter and are non-compliant with section 2 and subsection 27(8) of the *Patent Act*, and
- Claims 9, 34, 35, 41, 49 and 50 on file are indefinite and therefore non-compliant with subsection 27(4) of the *Patent Act*.

Stephen MacNeil
Member

Iain Baxter
Member

Lewis Robart
Member

DECISION OF THE COMMISSIONER

[71] I concur with the conclusions and recommendation of the Board that the application be refused on the grounds that:

- Claims 1-61 on file are directed to non-patentable subject-matter and are non-compliant with section 2 and subsection 27(8) of the *Patent Act*, and
- Claims 9, 34, 35, 41, 49 and 50 on file are indefinite and therefore non-compliant with subsection 27(4) of the *Patent Act*.

[72] 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.

Virginie Ethier
Assistant Commissioner of Patents

Dated at Gatineau, Quebec

this 17th day of May, 2022