Citation: Stanley Victor Campbell (Re), 2024 CACP 18
Commissioner's Decision #1677
Décision du commissaire nº 1677
Date: 2024-10-18

TOPIC:	J00	Subject Matter of Applications—Meaning of Art
	J10	Subject Matter of Applications—Computer Programs

SUJET :	J00	Objet des demandes—Signification de la technique
	J10	Objet des demandes—Programmes d'ordinateur

Application No. 2816107
Demande nº 2 816 107

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2816107, having been rejected under subsection 199(1) of the *Patent Rules*, has subsequently been reviewed in accordance with paragraph 86(7)(c) of the *Patent Rules*. 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] The Patent Appeal Board recommends the refusal of patent application number 2816107, which is entitled “System and method for machine based medical diagnostic code identification, accumulation, analysis and automatic claim process adjudication” and is owned by Stanley Victor Campbell.

[2] The claimed invention relates to systems, methods and apparatuses for automating the identification and processing of medical diagnostic codes. It uses machine-based algorithms to analyze patient data, matching specific medical identified codes with known or reference medical codes, to streamline the adjudication of insurance claims based on those codes.

[3] The application was rejected in a Final Action which indicated that claims 1 to 27, dated June 3, 2021 (“claims on file”), define unpatentable subject-matter. The Response to the Final Action argued that the assessment in the Final Action was incorrect in law and presented arguments in favour of the patentability of the claims on file. The Summary of Reasons disagreed with the submissions in the Response to the Final Action and maintained the rejection. The rejected application was forwarded to the Patent Appeal Board for review on behalf of the Commissioner.

[4] The undersigned was assigned to review the rejected application and make a recommendation to the Commissioner as to its disposition. I sent a Preliminary Review letter which detailed my preliminary analysis that claims 1 to 27 on file define unpatentable subject-matter that is abstract and does not fit within any category of invention. In addition, the Preliminary Review letter provided the Applicant with an opportunity to make oral and/or written submissions.

[5] The Response to the Preliminary Review letter submitted arguments in favour of allowance of the application in view of proposed amendments to the claims on file dated July 16, 2024 (“proposed claims”).

[6] Oral submissions in support of the patentability of the proposed claims were also made at a hearing.

[7] For the reasons that follow, I consider that claims 1 to 27 on file define unpatentable subject-matter. I also assessed the proposed claims and I consider that they do not make the application allowable.

THE ISSUES

[8] In view of the above, I have considered the following issues in this review:

- whether claims 1 to 27 on file encompass subject-matter outside the definition of invention and do not comply with section 2 of the Patent Act; and

- whether claims 1 to 27 define subject-matter prohibited by subsection 27(8) of the Patent Act.

[9] In addition, I have considered whether the proposed claims submitted with the Response to the Preliminary Review letter would make the application allowable and be a necessary amendment under subsection 86(11) of the *Patent Rules*.

PURPOSIVE CONSTRUCTION

Legal background

[10] Purposive construction is antecedent to any consideration of validity: *Free World Trust v Électro Santé Inc*, 2000 SCC 66 at para 19 [*Free World Trust*] and *Whirlpool Corp v Camco Inc*, 2000 SCC 67 at para 43 [*Whirlpool*]. Purposive construction is performed from the point of view of the person skilled in the art in light of the relevant common general knowledge, considering the whole of the disclosure including the specification and drawings: *Free World Trust* at paras 31, 44, 51 to 52 and 55 to 60; *Whirlpool* at paras 45 to 49 and 52 to 53; Patent

Notice: Patentable Subject-Matter under the *Patent Act*" (CIPO, November 2020) [*PN2020–04*] at Purposive Construction.

[11] Regarding the person skilled in the art, several court decisions have provided additional context for their identification. In *Whirlpool* at para 53, the Supreme Court of Canada explained that although the person skilled in the art is deemed to have no scintilla of inventiveness or imagination, a patent specification is addressed to "skilled individuals sufficiently versed in the art to which the patent relates to enable them on a technical level to appreciate the nature and description of the invention". Moreover, "in the case of patents of a highly technical and scientific nature, that person may be someone possessing a high degree of expert scientific knowledge and skill in the particular branch of science to which the patent relates": *Consolboard v MacMillan Bloedel (Sask) Ltd*, [1981] 1 SCR 504 at page 525.

[12] In addition, the person skilled in the art can represent a composite of scientists—highly skilled and trained persons who conduct scientific research to advance knowledge in an area of interest—and researchers: *Bayer Aktiengesellschaft v Apotex Inc* [1995] 60 CPR (3d) 58 at page 79:

> The notional skilled technician can be a composite of scientists, researchers and technicians bringing their combined expertise to bear on the problem at hand: "This is particularly true where the invention relates to a science or art that transcends several scientific disciplines." (*Per* Wetston J. in *Mobil Oil Corp. v. Hercules Canada Inc.* (unreported, September 21, 1994, F.C.T.D., at p. 5 [now reported 57 C.P.R. (3d) 488 at p. 494, 82 F.T.R. 211].)

[13] Regarding the identification of the common general knowledge, it is well established that the common general knowledge is limited to knowledge which is generally known by persons skilled in the field of art or science to which a patent relates: *Apotex Inc v Sanofi–Synthelabo Canada Inc*, 2008 SCC 61 at para 37; *Free World Trust* at para 31. Accordingly, the common general knowledge is with respect to the subset of patents, journal articles and technical information which

is generally known by persons skilled in the art in the field to which a patent relates.

[14] Established reference works (such as textbooks, review articles, handbooks, etc.) or demonstrated commonality of certain knowledge in a number of disclosures in the field are relevant to the inquiry: Manual of Patent Office Practice (CIPO) at §12.02.02c, revised October 2019.

[15] Furthermore, information in a specification may also be evidence of the common general knowledge as it could be reasonable to consider general or broadly worded assertions of conventional practice or knowledge as common general knowledge: *Corning Cable Systems LLC v Canada (Attorney General)*, 2019 FC 1065 and *Newco Tank Corp v Canada (Attorney General)*, 2015 FCA 47.

[16] 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 person skilled in the art that a variant has a material effect upon the way the invention works.

[17] As indicated under Purposive Construction in *PN2020–04*, “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.”

[18] Since both interpretation of term meaning and identification of the essential elements are done in light of the relevant common general knowledge, the person skilled in the art must first be identified to determine their common general knowledge: Manual of Patent Office Practice (CIPO) at §12.02.01, revised June 2015.

Analysis

[19] The Preliminary Review letter, on pages 6 to 8, stated the following with regard to the identity of the person skilled in the art and their expected common general knowledge:

> The person skilled in the art and the relevant common general knowledge
>
> The Final Action identifies the following three prior art documents as relevant to the determination of the common general knowledge:
>
> D4: Magoulas, G.D., Prentza, A., Machine Learning in Medical Applications. In: Paliouras, G., Karkaletsis, V., Spyropoulos, C.D., eds, Machine Learning and Its Applications (Berlin, Heidelberg: Springer-Verlag, 2001) pages 300 to 307.
>
> D5: Boger, J. et al., “A planning system based on Markov decision processes to guide people with dementia through activities of daily living” (2006) volume 10, issue 2, IEEE Transactions of Information Technology in Biomedicine, pages 323 to 333.
>
> D7: Woodside, J.M., “Neuro-fuzzy CBR hybridization: healthcare application” (2008) IEEE International Joint Conference on Neural Networks (IEEE World Congress on Computational Intelligence), Hong Kong, China, pages 1814 to 1819.
>
> Although the Final Action identifies another prior art document, referred to as D6, there is an error in the citation and the document is unavailable. However, in searching for D6, I discovered the following prior art document by the same authors listed for D6, which is relevant to identifying the common general knowledge of the person skilled in the art:

D8: Hornung, J.H. et al., “Fighting fraud, automatically” (2006) volume 77, issue 3, Journal of the American Health Information Management Association, pages 32 to 36.

D8 provides an overview of the use of automated coding software for health care fraud detection. In particular, D8 discusses how artificial neural networks can predict the potential for fraud in medical claims based on data in the claims and in electronic health records. D8 explains that artificial neural networks use data profiling, advanced analytic models, and rank scoring to understand the characteristics and patterns of both legitimate and illegitimate claim behavior. Over time, these networks become more intelligent and accurate in their detections of fraudulent claims.

The Final Action, on page 2, identifies the person skilled in the art in view of the teachings of the description:

> In view of statements in the description (present description, page 1), the person skilled in the art to whom the application is directed, which may be a team of people, is skilled in the field of medical planning, and in particular, medical claim processing. The person skilled in the art is also skilled in the art of artificial intelligence.

With regard to the common general knowledge, page 2 of the Final Action states the following:

> The person skilled in the art would possess the following common general knowledge (CGK):
>
> — Medical claims processing, management, payment and reconciliation workflows (page 1, lines 15 to 23);
>
> — use of artificial intelligence and neural networks in medical-based applications and systems (D4 and D5, see whole documents), (D6 – page 3, paragraph 4, page 4, paragraph

2). (D7 – abstract, page 1814, right column, paragraph 1, page 815, B. Neural network, and E. Health Sciences).

The Response to the Final Action did not contest or comment on these characterizations of the person skilled in the art and their relevant common general knowledge. Further, the Response to the Final Action did not propose any additional considerations with regard to either the person skilled in the art or the relevant common general knowledge.

Regarding the person skilled in the art, considering the relevant caselaw as indicated above and having reviewed the specification as a whole, I consider that the characterization of the person skilled in the art presented in the Final Action is reasonable. For example, page 1 of the present description identifies that the field of the invention relates to "[m]ethodologies, systems, and apparatuses for performing Medical Code-based decision-making related to matching a given medical identified element against one or more of a set of known or reference medical identified elements". Further, the subject-matter of the claims on file relates to performing Medical Code-based decision-making by matching extracted medical, provider, and patient identifiers with reference elements, applying rule sets to identify codes, generating context-dependent thresholds, and making decisions to reclassify, accept, deny, or further analyze the codes until a final decision is reached.

Regarding the relevant common general knowledge, having reviewed the specification, as well as D4, D5, D7 and D8, I am of the preliminary view that the information regarding medical claims processing and the use of artificial intelligence and neural networks in medical applications as set out in the Final Action would have been generally known by the person skilled in the art as defined above who is "sufficiently versed in the art to which the patent relates to enable them on a technical level to appreciate the nature and description of the invention": *Whirlpoo*l at para 53.

Further, given the limited detail in the specification (e.g. pages 18 to 28 and Figure 1) concerning the implementation of a computer-based system for medical claims adjudication, I preliminarily consider that the person skilled in the art would be able to understand and implement such a system.

In view of the above, I preliminarily consider the following as common general knowledge:

- Knowledge of medical claims processing, management, payment and reconciliation workflows;
- Knowledge of industry standards and compliance requirements related to medical billing and claims processing;
- Knowledge regarding design, operation, and maintenance of conventional computerized systems used in medical claims processing;
- Knowledge of artificial neural networks and machine learning techniques and how to implement continuous learning systems; and
- Knowledge of data profiling techniques and analytical models such as, Least Squares fit, Monte Carlo, Markov chain and Dempster-Shafer.

[20] The Applicant did not address these characterizations of the person skilled in the art and the relevant common general knowledge in either the Response to the Preliminary Review letter or at the hearing. Accordingly, I adopt the above characterizations for my analysis.

The claims on file

[21] The Preliminary Review letter, on pages 9 to 10, summarized the content of the claims on file and expressed my preliminary view that their meaning and scope would have been clear to the person skilled in the art:

> There are 27 claims on file. Independent claim 1 is directed to a system for performing Medical Code-based decision-making, independent claims 10 and 22 are directed to non-transitory computer readable mediums with instructions to perform Medical Code-based decision making and independent claim 16 is directed to a method for performing Medical Code-based decision-making. Claim 1 is illustrative and reads as follows:
>
> 1. A system for performing Medical Code-based decision-making comprising at least one processor, wherein said at least one processor is programmed to perform:
>
> a. a Medical Code processor function configured to match at least one extracted medical identified element from a claim comprising at least one medical code for a medical service against a set of reference medical identified elements;
>
> b. a Medical Provider Code processor function configured to match an extracted Provider identified element associated with a medical claim against a set of reference medical Provider identified elements;
>
> c. a Medical Patient Code processor function configured to match an extracted Patient identified element associated with a medical claim against a set of reference Patient identified elements;
>
> d. a Medical Code selection processor function configure to determine and execute a rule set to the extracted medical identified element and a quantity of reference medical identified elements to determine a total Medical Code identification function;

e. a Medical Code threshold processor function configured to generate a context-dependent threshold for a code decision; and

f. a decision processor function configured to compare the total Medical Code function to the context-dependent threshold by iteratively comparing each extracted medical element against the set of reference medical identified elements until a confidence threshold for an acceptable code decision is reached to determine a result selected from the group consisting of:

(i) render an automatic reclassification,

(ii) execute an auto-accept decision,

(iii) execute auto-deny; and

(iv) accumulate and aggregate further reference medical identified elements and repeat functions (a)-(f) until a decision of (f1)-(f3) is generated.

Independent claims 10 and 22 on file describe non-transitory computer readable media with instructions for performing Medical Code-based decision-making.

Independent claim 16 on file describes a method for performing Medical Code-based decision making.

The dependent claims on file introduce analytical systems for context-sensitive analysis and decision-making, incorporating techniques like least squares fit and Monte Carlo sampling, and features such as aggregated ranking, user feedback, and handling large sets of feature vectors with probabilistic thresholds for incomplete data.

Meaning of the terms

> As indicated above, purposive construction is performed from the point of view of the person skilled in the art in light of their relevant common general knowledge and includes interpreting the meaning of the terms of a claim.
>
> There is no indication in the prosecution record of any issues with respect to the claim language, for example, the meaning of terms or claim ambiguity. The claims on file do not appear to include any terms that would be unfamiliar to the person skilled in the art, given their relevant common general knowledge. In my preliminary view, the person skilled in the art would readily understand the claim language and its meaning.

[22] The Applicant did not address these characterizations of the claims on file in either the Response to the Preliminary Review letter or at the hearing. Accordingly, I adopt the above views for my analysis.

Essential elements

[23] The Preliminary Review letter, on page 11, stated the following with regard to the elements in the claims that the person skilled in the art would consider to be essential:

> Page 2 of the Final Action specifies, in accordance with *PN2020–04*: “As there is no indication otherwise in the claims, all elements of the claims are considered to be essential.”
>
> As mentioned above, 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 person skilled in the art that a variant has a material effect upon the way the invention works.
>
> With the above considerations in mind and having reviewed the specification as a whole, it is my preliminary view that the person skilled in the art reading claims 1 to 27 would not view the individual method steps or

> computer-related elements as either optional or non-essential based on the claim language itself. Likewise, it is my preliminary view that the person skilled in the art would recognize that the use of a computerized system to implement the method steps in the claims on file was not omissible or capable of substitution.
>
> Therefore, I preliminarily agree with the assessment in the Final Action and consider all of the elements in the claims on file to be essential.

[24] The Applicant made no submissions on the identification of the essential elements of the claims on file in either the Response to the Preliminary Review letter or at the hearing. Accordingly, I adopt the above identification of all the claim elements as essential in this recommendation.

THE CLAIMS ARE NOT DIRECTED TO PATENTABLE SUBJECT-MATTER

[25] In my view, the actual inventions of claims 1 to 27 on file do not define patentable subject-matter.

Legal background

[26] Any patentable invention must fall within the definition set out in section 2 of the *Patent Act*, including falling within one of the categories defined therein:

> 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.

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

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

[28] *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.

[29] The determination of the actual invention is a relevant and necessary question in assessing patentable subject-matter: *Canada (Attorney General) v Amazon.com Inc*, 2011 FCA 328 at para 42 [*Amazon*]. As stated by the Federal Court of Appeal in *Canada (Attorney General) v Benjamin Moore & Co*, 2023 FCA 168 at para 68 [*Benjamin Moore*], this determination is in line with that Court's statement in *Schlumberger Canada Ltd v Commissioner of Patents*, [1982] 1 FC 845 (CA) at 847 [*Schlumberger*] that a patentable subject-matter assessment involves determining what, according to the application, has been discovered. The actual invention is identified in the context of the new discovery or knowledge and must ultimately satisfy the "physicality requirement" that is implicit in the definition of "invention": *Amazon* at paras 65 and 66.

[30] However, *Amazon*, at para 44, cautions that "a patent claim may be expressed in language that is deliberately or inadvertently deceptive" and that what appears on its face to be an "art" or "process" may in fact be a claim to an unpatentable mathematical formula, as was the case in *Schlumberger*.

[31] This observation reflects the position of the Federal Court of Appeal in *Amazon* on the physicality requirement. There is a requirement for something with physical existence, or something that manifests a discernible effect or change. Nonetheless, this requirement cannot be met merely by the fact that the claimed

invention has a practical application: *Amazon* at paras 66 and 69. To illustrate this point, *Amazon* refers to *Schlumberger*, where the claims “were not saved by the fact that they contemplated the use of a physical tool, a computer, to give the novel mathematical formula a practical application”: *Amazon* at para 69.

[32] The patentable subject-matter concerns regarding the well-known use of a computer to process an algorithm, illustrated by *Schlumberger*, are outlined in the factors set out in *PN2020–04* that may be considered when reviewing computer-implemented inventions, namely:

- 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, unpatentable subject-matter and prohibited by subsection 27(8) of the *Patent Act*;
- a computer programmed to merely process an abstract algorithm in a well-known manner without more will not make it patentable subject-matter; and
- if processing an algorithm improves the functionality of the computer, then the computer and the algorithm would together form a single actual invention that would be patentable.

[33] The above factors and the general concerns around the well-known use of a computer to process new abstract algorithms can be seen to involve considerations of novelty or ingenuity. Canadian law does not prohibit considerations of the novelty or ingenuity of elements of a claim in considering patentable subject-matter and finds support in situations like that of *Schlumberger* where a known tool, a computer, is used to give an abstract mathematical formula a practical application: *Benjamin Moore* at paras 69 to 70, referring to *Amazon*. These considerations assist in the determination of the discovery or new knowledge, the method of its application and the actual invention (*Benjamin Moore* at para 89) that is ultimately measured against the physicality requirement.

[34] As noted in *Benjamin Moore* at para 94 (and similarly expressed in *Amazon* at para 61), the physicality requirement will not likely be satisfied without something more than only a well-known instrument, such as a computer, being used to implement an abstract method. The factors set out above from *PN2020–04* assist in determining whether something more is present.

Analysis

[35] The Final Action stated that the actual invention of the claims on file "is considered to be an algorithm to perform medical code-based decision-making, which has no physical existence and does not manifest a discernible physical effect or change."

[36] The Response to the Final Action, on pages 2 to 3, contended that in light of the Federal Court of Canada decision in *Benjamin Moore & Co v Canada (Attorney General)* 2022 FC 923, the concept of an "actual invention" that is distinct from a purposive construction of the claims has absolutely no basis in Canadian law. The Response to the Final Action further evaluated the claims using the three-part test set out by the Federal Court.

[37] As noted in the Summary of Reasons, the Federal Court of Appeal in *Benjamin Moore* rejected and set aside the three-part test set out by the Federal Court. The Federal Court of Appeal also ordered that the *Benjamin Moore* applications be redetermined in accordance with the latest Patent Office practice with the benefit of the Federal Court of Appeal's reasons. The Preliminary Review letter explained that, in my preliminary view, I considered the guidance set out in *PN2020–04*, as applied in the Final Action, to remain relevant and applicable.

[38] The Preliminary Review letter, on pages 17 to 20, also explained why in my preliminary view, claims 1 to 27 on file define unpatentable subject-matter, falling outside the categories of invention defined in section 2 of the *Patent Act* and prohibited by subsection 27(8) of the *Patent Act*:

Having reviewed the claims on file, I agree with the assessment in the Final Action that the actual invention of the claims on file is an algorithm to perform Medical Code-based decision-making. Starting with independent claim 1, in my preliminary view, the claim sets out a computer system to implement a method wherein a processor is programmed to perform the following rules-based data manipulations:

- match at least one extraction medical identified element from a claim comprising at least one medical code for a medical service against a set of reference medical identified elements;
- match an extracted Provider identified element associated with a medical claim against a set of reference medical Provider identified elements;
- match an extracted Patient identified element associated with a medical claim against a set of reference medical Patient identified elements;
- determine and execute a rule set to the medical identified element and a quantity of reference medical identified elements to determine a total Medical Code identification function;
- determine a context-dependent threshold for a code decision; and
- compare the total Medical Code function to the context-dependent threshold by iteratively comparing each extracted medical element against the set of reference medical identified elements until a confidence threshold for an acceptable code decision is reached to determine a result selected from the group consisting of:

    i) automatic reclassification

    ii) auto-accept decision

    iii) auto-deny

iv) accumulate and aggregate further reference medical identified elements and repeat the above steps until a decision of i) to iii) is reached.

According to pages 2 to 3 of the description, the above system is intended to automate the review and processing of medical claims, replacing human analysis and decision-making. It also generates metrics to identify and report improper payments and employs continuous machine learning to enhance its accuracy and efficiency over time.

The description on page 29, with reference to Figure 1, outlines a computer system used to perform Medical Code-based decision-making. It describes generic computer elements for data movement, migration, and conversion of legacy data. Also discussed are generic graphical user interface screens for managing data maps and overseeing data conversion.

In my preliminary view, claim 1 sets out a series of data manipulation and analysis steps forming a medical claims adjudication algorithm, implemented by a generic computer processing system. There is no suggestion in claim 1 or the rest of the specification that the input and data processing means associated with the electronic medical claims adjudication system are anything more than the well-known generic inputting and processing of data according to an algorithm, in this case a medical claims adjudication algorithm.

Further, as noted in the Final Action, there is no evidence that the functioning of the computer is being improved by processing the medical claims adjudication algorithm. There is no indication in the specification that the functioning of the computer is actually improved by the claimed steps. Instead, this adaptive learning helps refine the rules and thresholds applied during the adjudication process, ensuring more accurate outcomes over time.

This view is consistent with the teachings of the description, which indicate that the focus is on improving the medical claims adjudication process rather than the general functioning of the computer system. There is no suggestion that changing the rules for medical claims adjudication addresses challenges or deficiencies in the computer system's functionality or performance beyond executing these rules and processes. Specifically, there is no indication that changing the medical claims processing rules targets issues like improving memory usage or overall computer speed in a general computing context.

The iterative, context-sensitive method used to optimize the confidence level of correctness until an acceptable code decision threshold is reached results in specific improvements to the efficiency and accuracy of the medical claims adjudication process. However, it does not change or improve the fundamental speed or performance characteristics of the computer in a general context. In my preliminary view, the generic computer system is processing the algorithm in a well-known manner, executing the instructions provided by the medical claims adjudication algorithm without improving the computer system's functioning.

As stated in *Benjamin Moore* at para 94, "if the only new knowledge lies in the method itself, it is the method that must be patentable subject matter. If, however, the new knowledge is simply the use of a well-known instrument (a book or a computer) to implement this method, then it will likely not fall under the definition found at section 2 without something more to meet the requirement described at paragraph 66 of *Amazon*". In the present case, the computer elements as claimed are merely being used to perform the kind of generic data manipulations they are known to perform: see *Schlumberger*. There is nothing in claim 1 on file to suggest that the computer elements are used beyond well-known generic data processing operations. Therefore, it is my preliminary view that the "new knowledge" or "discovery" does not

include the computer implementation, and the computer elements do not form part of the actual invention.

In my preliminary view, the actual invention of claim 1 is limited to an abstract algorithm for medical claims adjudication. This algorithm includes steps for rules-based data manipulations and analyses for determining whether to reclassify, accept or deny a medical code. It follows that the actual invention, new knowledge or discovery of claim 1 is directed to an abstract idea that does not satisfy the physicality requirement as set out in *Amazon* and *PN2020–04*.

Likewise, independent claims 10 and 22 on file, which describe non-transitory computer readable media with instructions for performing medical claims adjudication and independent claim 16, which describes a method for performing medical claims adjudication, are directed to actual inventions consisting of abstract data manipulations and analyses.

Furthermore, in my preliminary view, the additional features recited in the dependent claims on file, such as analytical systems for decision-making, incorporating techniques like least squares fit and Monte Carlo sampling, and features such as aggregated ranking, user feedback, and handling large sets of feature vectors with probabilistic thresholds for incomplete data, represent variations in the parameters of algorithms for medical claims adjudication. These variations do not change the nature of the actual inventions. Therefore, it is my preliminary view that the dependent claims do not add any features that would satisfy the physicality requirement and render the claims patentable.

In light of the above, it is my preliminary view that the actual inventions of claims 1 to 27 on file are directed to a series of abstract data manipulations and rules that have no physical existence and do not fit within any category of invention in section 2 of the *Patent Act*. Furthermore, since the abstract data operations and rules are akin to a “mere scientific principle or abstract

> theorem," they are also prohibited from patentability by subsection 27(8) of the *Patent Act*.

[39] The Applicant did not address my preliminary assessment of patentable subject-matter in either the Response to the Preliminary Review letter or at the hearing. Accordingly, I adopt the above reasons here. The actual inventions of claims 1 to 27 on file are directed to a series of abstract data manipulations and rules that have no physical existence and do not fit within any category of invention in section 2 of the *Patent Act*. Furthermore, since the abstract data operations and rules are akin to a "mere scientific principle or abstract theorem," they are also prohibited from patentability by subsection 27(8) of the *Patent Act*.

CLERICAL ERRORS

[40] As explained on page 20 of the Preliminary Review letter, in claim 1, in the sub-steps under step f, Roman numerals (i-iv) are used, but within sub-step (iv), Arabic numerals (f1-f3) are used. A consistent number format should be used.

THE PROPOSED CLAIMS

[41] In my view, the proposed claims are not a necessary amendment because they would not make the application allowable.

Legal background

[42] According to subsection 86(11) of the *Patent Rules*, an application that has been rejected in a Final Action can only be amended if the Commissioner informs the Applicant that certain amendments are needed to make the application allowable:

> If, after review of a rejected application for a patent, the Commissioner has reasonable grounds to believe that the application does not comply with the

> Act or these Rules and certain amendments are necessary in order to make the application allowable, the Commissioner must by notice inform the applicant that those amendments must be made not later than three months after the date of the notice.

Analysis

[43] With the Response to the Preliminary Review letter the Applicant submitted proposed claims 1 to 27. According to page 2 of the Response to the Preliminary Review letter, proposed claim 1 has been amended to indicate that the Medical Code-based decision making is “by an artificial intelligence (AI) based system utilizing neural computational logic” and further includes “a user interface configured to receive self-monitoring patient data that is used to further determine whether an acceptable code decision is reached”. Proposed claims 10, 16 and 22 have been amended in a similar manner to proposed claim 1.

[44] In addition, proposed claim 1 has been amended to address the clerical error identified in claim 1 on file.

Patentable subject-matter

[45] According to page 2 of the Response to the Preliminary Review letter, the proposed claims recite patentable subject-matter because the proposed amendments to the independent claims have physical existence and exhibit physical effects:

> [emphasis in original] Proposed amended claim 1 is directed to “A system for performing Medical Code-based decision-making <u>by an artificial intelligence (AI) based system utilizing neural computational logic</u> comprising at least one processor”. The corresponding element has been removed from proposed amended claim 2. The AI based system is a

physical device including a computer processor and is not a generic computer element.

Claim 1 has been further amended to add to the claimed system "a user interface configured to receive self-monitoring patient data that is used to further determine whether an acceptable code decision is reached". Similar proposed amendments [have] also been made to independent claims 10, 16 and 22. The amendments are supported by the description as filed at page 19, line 24, to page 20, line 2, which states

> "The system may further comprise a user interface configured to permit human feedback to enhance automated system learning … Additionally, human feedback from pat[i]ents related to self-monitoring can be used to enhance the baseline of the individual beyond that of the generalized norm established by the history file".

See also page 3, lines 20-24, which states ""baselines and the dynamic update of those baselines [are used] for determining whether a given medical code is accurate".

A user interface as recited in the amended claims comprises physical elements that a user physically interacts with. The applicant submits that the claimed artificial intelligence (AI) based system that includes a physical user interface that is essential to permit human feedback by physical interaction of a user with the system clearly has physical existence and exhibits physical effects, and clearly is not akin to a "mere scientific principle or abstract theorem". For at least this reason, the invention by the proposed amended claims is submitted to [recite] patentable subject matter.

[46] I respectfully disagree that the proposed claims recite patentable subject-matter. In my view, the proposed amendments do not transform the underlying abstract nature of the claims. The actual inventions remain the series of abstract data manipulations and rules related to medical claims adjudication.

Artificial intelligence based system utilizing neural computational logic

[47] Although the proposed claims reference an “AI-based system utilizing neural computational logic,” the processing steps described remain the same as those set out in the claims on file. These steps, such as matching extracted elements to reference elements, applying rules, and making decisions based on thresholds, are standard data manipulation processes that can be executed by any general-purpose computer system. There is no indication in either the proposed claims or the specification that the claimed system introduces anything more than the routine inputting, processing, and analysis of data for medical claims adjudication.

[48] While the proposed claims introduce AI terminology, the neural computational logic simply implements the existing medical claims adjudication algorithm without changing the nature of the computer system itself. As described, the AI algorithm refines the medical claims adjudication process, but in this case the algorithm is focused on improving the accuracy of the results rather than the computer’s performance or efficiency. As previously observed in respect of the claims on file, the specification does not address improvements to technical aspects such as memory usage, processing speed, or computational efficiency, indicating that the AI-based system utilizing neural computational logic remains part of routine data processing.

[49] The system is performing standard data processing tasks, using an AI-based algorithm for adjudicating medical claims. However, there is no novel or unconventional use of the computer hardware itself, nor any demonstrated improvement to the functionality or efficiency of the processor or computing system. The mere inclusion of AI and neural network terminology does not elevate the system beyond a generic data processing tool.

[50] Without evidence of a specific improvement to the computer’s functioning, the system remains a generic computer system executing an abstract idea. As such, it does not form part of the actual inventions of the proposed claims and does not

help the actual inventions meet the physicality requirement of section 2 of the *Patent Act* or avoid the prohibition of subsection 27(8) of the *Patent Act*.

User interface configured to receive self-monitoring patient data

[51] Similarly, the reference to a user interface for receiving self-monitoring patient data does not change the abstract nature of the proposed claims. The proposed claims continue to relate to the manipulation and processing of data for medical claims adjudication, and the addition of a physical interface does not alter this. The user interface is used simply to input data, which is then processed by the same underlying medical claims adjudication algorithm. While this interaction involves a physical device, it does not address improvements to technical aspects such as memory usage, processing speed, or other technical aspects of the computer's operation.

[52] Although the proposed claims use patient-specific data to refine the medical code decision-making process, the actual inventions remain an abstract idea, akin to rule-based data manipulations, which merely adjusts how input data is interpreted. The data input from patient feedback is simply another data point used in the decision-making process without affecting how the system operates. The refinement of medical claims adjudication outcomes based on self-monitoring data still revolves around the same abstract method, with no improvement to the functionality of the computer system.

[53] The user interface configured to receive self-monitoring patient data remains a generic input device. It allows for additional information to be entered into the algorithm but does not alter the way the computer system functions. The role of the user interface is limited to data input, and its inclusion does not elevate the system beyond the abstract processing of information.

[54] Without evidence of a specific improvement to the computer's functioning, the interface remains a generic input mechanism. As such, it does not form part of

the actual inventions of the proposed claims and does not help the actual inventions meet the physicality requirement of section 2 of the *Patent Act* or avoid the prohibition of subsection 27(8) of the *Patent Act*.

[55] Additionally, my analysis and conclusions regarding the unpatentable subject-matter of claims 1 to 27 on file also extend to the proposed claims. Therefore, it is my view that the actual inventions of proposed claims 1 to 27 are directed to a series of abstract data manipulations and rules that have no physical existence and would not fit within any category of invention in section 2 of the *Patent Act*. Furthermore, since the abstract data operations and rules are akin to a "mere scientific principle or abstract theorem," they would also be prohibited from patentability by subsection 27(8) of the *Patent Act*.

Clerical errors

[56] Proposed claim 1 has been amended to refer to "f(i)-f(iii)".

[57] I agree that the proposed amendment addresses the clerical error with the number format in claim 1 on file.

Conclusion on proposed claims

[58] In view of the above, the proposed claims do not make the application allowable, and therefore cannot be a necessary amendment under subsection 86(11) of the *Patent Rules*.

RECOMMENDATION OF THE BOARD

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

- claims 1 to 27 on file encompass subject-matter outside the definition of invention and do not comply with section 2 of the *Patent Act*; and

- claims 1 to 27 define subject-matter prohibited by subsection 27(8) of the *Patent Act*.

Christine Teixeira

Member

DECISION OF THE COMMISSIONER

[60] I agree with the findings of the Patent Appeal Board and its recommendation to refuse the application on the grounds that:

- claims 1 to 27 on file encompass subject-matter outside the definition of invention and do not comply with section 2 of the Patent Act; and
- claims 1 to 27 define subject-matter prohibited by subsection 27(8) of the Patent Act.

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

Konstantinos Georgaras

Commissioner of Patents
Dated at Gatineau, Quebec
this 18th day of October, 2024.