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TOPIC:	G00	Utility
SUJET:	G00	Utilité

Application No. : 2,950,696 Demande nº 2 950 696

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,950,696 having been rejected under subsection 199(1) of the *Patent Rules* (SOR/2019-251), has consequently 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.

Applicant:

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INTRODUCTION

[1] This recommendation concerns the review of rejected Canadian patent application number 2,950,696 which is entitled "Perpetual Motion Train Power Plant" and is owned by Xiao-Dong She ("the Applicant"). A Panel of The Patent Appeal Board ("we") reviewed the application pursuant to paragraph 86(7)(c) of the *Patent Rules* (SOR/2019-251). We recommend that the Commissioner of Patents refuse the application for the reasons given below.

BACKGROUND The Application

[2] The application, filed on December 5, 2016, relates generally to a perpetual motion train power plant. There are 10 claims on file, received in the Patent Office on December 18, 2019.

Prosecution History

- [3] On February 10, 2021, the Examiner issued a Final Action according to subsection 86(5) of the *Patent Rules* (SOR/2019-251). The Final Action found the claimed invention to lack utility, contrary to the definition of invention found at section 2 of the *Patent Act*.
- [4] The Applicant submitted a Response to the Final Action, received on June 10, 2021.
- [5] The Examiner was not persuaded by the Applicant's arguments in the Response to the Final Action. Therefore, the application was forwarded to the Patent Appeal Board for review on November 25, 2021 along with an explanation outlined in a Summary of Reasons.
- [6] We reviewed the application on behalf of the Board under paragraph 86(7)(c) of the *Patent Rules*. In a Preliminary Review letter ("PR letter") dated December 2, 2022, we analyzed the utility issue with respect to the specification on file. We also invited the Applicant to make oral and/or written submissions.

[7] The Applicant provided a written Response to the PR letter, received on January 3, 2023, as well as proposed claims, received on January 12, 2023. The Applicant attended a hearing held by audioconference on January 13, 2023.

ISSUES

- [8] The sole issue to be addressed in this review is the one identified in the Final Action:
 - Do claims 1-10 on file encompass subject matter that has utility and complies with the definition of invention found at section 2 of the *Patent Act*?
- [9] We also consider the proposed claims.

ALL CLAIMED ELEMENTS ARE PRESUMED TO BE ESSENTIAL

- [10] The starting point for the analysis is purposive construction of the claims.
- [11] In accordance with *Free World Trust v Électro Santé Inc*, 2000 SCC 66 and *Whirlpool Corp v Camco Inc*, 2000 SCC 67, purposive construction is performed from the point of view of the skilled person in light of the relevant common general knowledge, considering the whole of the disclosure including the specification and drawings. In addition to interpreting the meaning of the terms of a claim, purposive construction distinguishes the essential elements of the claim from the non-essential elements. Whether or not an element is essential depends on the intent expressed in or inferred from the claim, and on whether it would have been obvious to the skilled person that a variant has a material effect upon the way the invention works.
- [12] Purposive construction begins by defining the notional skilled person and their common general knowledge.
- [13] Our view of the skilled person and common general knowledge is as we wrote In the PR letter:

In our preliminary view, the skilled person is an engineer or team of engineers with expertise in electric train designs, batteries, and generators. The skilled person's common general knowledge would include electrical engineering, specifically electric machine and battery technology, mechanical engineering, specifically railway systems and locomotives, generators, steam and diesel engines and transmissions, and basic physics, including the laws of thermodynamics.

- [14] The Applicant did not comment on our characterization of the skilled person and common general knowledge, and we adopt it in our reasons.
- [15] Independent claim 1 is representative of the invention and reads:

Perpetual motion train power plant which is consisted of infinite power battery, electric motor, locomotive, 99 boxcars, 99 infinite power generators, charger, railway, overhead line, electric bows, Its feature is: Battery start electric motor, then locomotive is pulling 99 boxcars drive on railway, at the same time, wheels chain drive 99 generators to generate electricity, and generators can charge battery timely and automatically, like this, battery has becomes the infinite power battery.

[16] Considering the whole of the specification, the skilled person would understand that there is no use of language in claim 1 indicating that any of the elements are optional or one of a list of alternatives. Therefore, in our view, all elements recited in the claim are essential. All elements of claims 2 -10 are similarly essential. In our view, the skilled person would understand that the subject matter of claim 1 is a perpetual motion train that needs no external or depleting energy source once started, through the use of an infinite power battery and infinite power generators. At the hearing, the Applicant confirmed that the intended meaning is perpetual operation of the train with no further energy input once started.

DOES THE CLAIMED INVENTION HAVE UTILITY?

- [17] In our view, the claimed invention lacks utility according to the following analysis.
- [18] Utility is required by section 2 of the *Patent Act* [underlining added]:

invention means any new and <u>useful</u> art, process, machine, manufacture or composition of matter, or any new and <u>useful</u>

improvement in any art, process, machine, manufacture or composition of matter.

- [19] "Useful" means not only would the invention, if it worked, be something useful, but that it works as claimed. There is no question that a train capable of running perpetually and generating electricity would be useful if it worked. The description notes on page 2 the problems of carbon pollution and climate temperature rise. The question is whether the train power plant, as claimed, would actually work perpetually.
- [20] In *AstraZeneca Canada Inc v Apotex Inc*, 2017 SCC 36 at paragraph 53, the Supreme Court of Canada stated that the "[u]tility will differ based on the subject-matter of the invention as identified by claims construction" and outlined the approach that should be undertaken to determine whether a patent discloses an invention with sufficient utility under section 2 of the *Patent Act*:

[54] To determine whether a patent discloses an invention with sufficient utility under s. 2, courts should undertake the following analysis. First, courts must identify the subject-matter of the invention as claimed in the patent. Second, courts must ask whether that subject-matter is useful— is it capable of a practical purpose (i.e. an actual result)?

[55] The Act does not prescribe the degree or quantum of usefulness required, or that every potential use be realized—a scintilla of utility will do. A single use related to the nature of the subject-matter is sufficient, and the utility must be established by either demonstration or sound prediction as of the filing date (*AZT*, at para 56).

Utility has not been demonstrated

- [21] Utility must be established either by demonstration or sound prediction as of the filing date. Utility cannot be supported by evidence and knowledge that only became available after this date (see *Apotex Inc v Wellcome Foundation Ltd*, 2002 SCC 77 [*AZT*] at para 56, cited in the passage above).
- [22] Where the utility of an invention is to be established by demonstration, the demonstration must occur as of the filing date, but need not necessarily be included in the description (see *Eli Lilly Canada Inc v Apotex Inc*, 2015 FC 1016,

at paragraphs 138 to 142). Data demonstrating utility as of the filing date may be provided by the Applicant after the filing date by way of an affidavit.

- [23] The requirement to demonstrate utility or to ensure that it is the subject of a sound prediction is set out more specifically in section 19.01.02 of the *Manual of Patent Office Practice* [*MOPOP*], revised November 2017 (CIPO).
- [24] As we wrote in the PR letter, the application neither describes any demonstration of the perpetual motion train, nor infinite batteries and infinite generators. The Applicant's Response to the Final Action describes, beginning at page 3, an experiment involving pushing a heavy car to the side of the road. This does not demonstrate a train with wheels connected to generators, generating electricity to charge batteries to run an electric motor perpetually. The Applicant did not introduce any demonstration of utility in the Response to the PR letter or at the hearing.

Utility has not been soundly predicted

- [25] Since the Applicant has not demonstrated the perpetual motion train as of the filing date, we therefore look to sound prediction, the alternative means for establishing whether an invention will work as claimed.
- [26] The principle of sound prediction provides for establishing the alleged utility even where that utility has not been fully verified as of the filing date. However, a patent application must provide a "sound teaching" as to how the claimed invention works, as opposed to "mere speculation" (*AZT*, at paragraph 69).
- [27] The issue of whether a prediction is sound is a question of fact (*AZT*, at paragraph 71). The assessment of a sound prediction should be based on three components (*AZT*, at paragraph 70):
 - There must be a factual basis for the prediction;
 - The inventor must have, at the date of the patent application, an articulable and "sound" line of reasoning from which the desired result can be inferred from the factual basis; and

- There must be proper disclosure of the factual basis and the line of reasoning.
- [28] These components are assessed from the perspective of the skilled person to whom the patent application is directed, taking into account their common general knowledge. Moreover, with the exception of common general knowledge, the factual basis and line of reasoning must be included in the patent application (see *Bell Helicopter Textron Canada Ltd v Eurocopter SAS*, 2013 FCA 219, at paragraphs 152 and 153).
- [29] As we wrote in the PR letter, in our view, the claims require the train to run perpetually, powered by electricity supplied by the generators driven by the wheels of the boxcars. We do not find any factual basis for this prediction beyond the implication that since there are 99 boxcars, there are many generators, presumably supplying a large amount of electrical energy.
- [30] As we wrote in the PR letter, the skilled person, familiar with thermodynamic principles and electric machines, would know that when a generator converts kinetic energy into electrical energy and when a battery stores chemical energy, there is a net loss in energy as some of the energy is lost as heat and sound. The skilled person would also be familiar with electric machines and would know that when a generator turns, current flow out of the generator into a load creates a magnetic field which exerts torque in the opposite direction of rotation (magnetic braking force). As an example, the skilled person would look to electric cars. Such cars contain generators to charge the battery during braking. Generating electricity from the motion of the wheels causes a magnetic braking force to be applied to the wheels in the contrary direction of rotation, slowing the car. Such cars require external charging, as the electricity generated during braking is not enough to supply sufficient electricity to drive the car perpetually. The skilled person would also realize that adding 99 generators increases both the magnetic braking force and friction, and so does not multiply the ability to generate electricity continuously.
- [31] In the Response to the PR letter and at the hearing, the Applicant stressed the numerous generator boxcars. The Applicant asserted that even if one generator

car is only 95% efficient, 99 such cars would have an efficiency of 95% x 99 or 9400% efficiency.

- [32] In our view, the skilled person would recognize that the efficiencies of each car are not additive. Each car adds further friction and magnetic braking force such that the overall efficiency would not achieve 100% or greater.
- [33] In our view, the application provides neither a sound basis for the prediction of utility, nor a sound line of reasoning to predict the utility. The prediction of perpetual motion ignores the laws of physics of the common general knowledge, including magnetic braking force, friction, and thermodynamics.
- [34] Claims 2-10, which depend on claim 1, also lack utility for the same reasons. They also claim sufficient energy generated by the generators to supply at least enough electricity to drive the train, which would be contrary to the laws of thermodynamics known in the common general knowledge.

Conclusion

[35] In our view, the application provides neither a demonstration nor a sound prediction of utility of the claimed invention. The claimed subject matter thus lacks utility and does not comply with section 2 of the *Patent Act*.

THE PROPOSED CLAIMS DO NOT REMEDY THE UTILITY DEFECT

[36] In a submission received on January 12, 2023, the Applicant proposed changing only dependent claim 4 to read:

The perpetual motion train power plant according to claim 1 further comprises: Prepared Locomotives, its feature is: For strengthen motive force of the train, and total have 8 locomotives be prepared, After every group/33 boxcars or 11 boxcars can be inserted/added a locomotive, then the train will more fast and more powerful. At least can add / insert 2 locomotives and at most can add/ insert 8 locomotives to 99 boxcars/99 generators.

[37] In our view, changing the ratio of boxcars to locomotives would not alter the analysis. There is no demonstration that this arrangement would work, and there

is no sound prediction. The skilled person would recognize that the addition of further locomotives would reduce the torque per motor required to start the train, but would require the same or more overall torque as a single locomotive. Therefore, the train would require a corresponding amount of electricity and batteries to provide the overall required energy. The boxcars would not generate sufficient electric energy to replace that required to drive the electric motors.

[38] Therefore, we conclude that the proposed claims would lack utility and would not comply with section 2 of the *Patent Act*.

THE BOARD RECOMMENDS REFUSAL

- [39] We recommend that the Commissioner of Patents refuse to issue a patent for this application because the claimed invention lacks utility and does not comply with the definition of invention found at section 2 of the *Patent Act*.
- [40] The proposed claims do not cure the defect and therefore do not constitute "necessary amendments" according to subsection 86(11) of the *Patent Act*.

Howard Sandler

lain Baxter

Paul Fitzner

Member

Member

Member

DECISION OF THE COMMISSIONER

- [41] I concur with the recommendation of the Board that the application be refused on the ground that:
 - the claimed subject matter lacks utility and therefore does not meet the definition of invention found at section 2 of the *Patent Act*.
- [42] Therefore, in accordance with section 40 of the *Patent Act*, I refuse to grant a patent on this application.
- [43] Under section 41 of the *Patent Act*, the Applicant has six months within which to appeal my decision to the Federal Court of Canada.

Konstantinos Georgaras Commissioner of Patents

Dated at Gatineau, Quebec

this 13th day of March 2023