RioTinto

United States Patent and Trademark Office Patent Eligibility Jurisprudence Study 86 FR 49521

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Executive Summary

Rejections involving patent ineligibility in the United States exhibit higher variance and inconsistencies compared to other rejections. Certain technology fields such as computer and software related inventions (in particular, algorithmic, modelling, AI-based, and computer-related inventions) also appear subject to a somewhat high level of scrutiny and standard for patent eligibility. This has in part led to Rio Tinto altering its innovation and protection strategies, including altering what is and is not disclosed in patent specifications, the scope of claims, and finding alternative means of protection.

In relative terms, the United States is one of the more consistent jurisdictions in dealing with patent ineligibility issues. Rio Tinto has found the amount and clarity of guidance provided by the courts and the USPTO helpful in developing prosecution strategies and determining likelihood of success; such guidance is lacking in most other jurisdictions.

The United States, together with the rest of the world, still however considers software and computer implemented inventions to somehow be less worthy of patent protection than inventions in other classical fields. The endeavour, science and engineering involved in software design, creation, and implementation is seemingly considered to be of lesser merit, requiring additional redeeming characteristics to pass the standard of patent eligibility.

Rio Tinto encourages the United States to take the global lead in recognizing software and computer implemented inventions as patent eligible in their own right, without need to, for example, demonstrate a physical or tangible end result or nexus. In a world that is increasingly digital, from currencies to signatures to simulated environments, consideration should be given to affording patent eligibility to inventions which reside in an abstract environment.

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Introduction

The Rio Tinto Group (Rio Tinto) comprises mining and metals companies operating across approximately 35 countries. Technological innovation is a key driver in Rio Tinto's business strategy. The ability to protect investment in technological innovation is a contributing factor in our adoption of technology and success.

Rio Tinto has significant commercial interests and investments in the United States (US), including mining operations, mineral processing operations, and research and development facilities. The Rio Tinto patent portfolio comprises thousands of patent matters, of which the US is a jurisdiction of choice. The current state of US patent jurisprudence influences Rio Tinto's innovation and intellectual property (IP) strategies, as well as business conduct, in the US.

Rio Tinto thanks the Commissioner for Patents for this opportunity to comment on Patent Eligibility Jurisprudence in the US. Our responses to each of the 13 topics comprising this study follows.

Section I – Observations and Experiences

Topic 1: Effect of current state of US patent eligibility on conduct of business in Rio Tinto's technology area(s).

Technology and innovation form a core part of Rio Tinto's business model as we constantly seek to improve production and processes, and outperform competitors. The innovations Rio Tinto generates span a variety of technology areas, including advances in mining machines, mining processes, mine planning techniques, modelling and simulation techniques, and information and communications technology (ICT) applications.

Alongside a global rise in computing advancements, Rio Tinto's more recent innovations have increasingly involved the utilisation of mathematical algorithms, machine learning, or other forms of artificial intelligence (AI). One example is the use of Gaussian-like probability distributions in a mining plan method disclosed in US Patent No. 9,449,351 B2. In recent times, patent applications with respect to these kinds of innovations have attracted patent ineligibility objections in increasing measure.

Despite these difficulties, Rio Tinto will continue to innovate and utilise AI regardless of the state of patent eligibility jurisprudence in the US and elsewhere. However, in anticipation of limited or lack of patent protection, decisions have at times been made to protect innovations through alternative mechanisms such as trade secrets and "black-boxing". This requires onerous maintenance measures and stringent controls on all relevant business operations and personnel which would otherwise not be necessary.

The current state of patent eligibility jurisprudence additionally affects business decisions on investments in and acquisition of third-party IP, and partnerships with third parties. The absence of secured patent rights in algorithmic, modelling, AI-based, and computer-related inventions, for example as a consequence of patent ineligibility issues, complicates assessment of the expected current and future value obtainable from such investments.

Topic 2: Impacts experienced as a result of current state of US patent eligibility jurisprudence.

- **Patent prosecution strategy and portfolio management**
  The current state of patent eligibility jurisprudence in the US has at times prevented Rio Tinto from obtaining patent protection for inventions that demonstrated tangible and valuable real-world effects, such as improving sustainability and reducing the impact of climate change. See for example US Patent Publication No. 2013/0249909.

  On occasions where obtainment of such rights was not outright prevented, the scope of protection obtained was significantly curtailed. See for example US Application No. 14/772,522.

  Furthermore, prosecution costs have increased substantially due to a rise in the frequency of patent ineligibility rejections, multiple rounds of rejections, and continuing revisions of prosecution strategy.

  The effect of these recent experiences is to discourage the pursuit of patent protection for inventions likely to attract patent ineligibility rejections in the US, such as algorithmic, modelling, AI-based, or computer-related inventions.

  Consequently, Rio Tinto's patent strategy has in recent times sought to prioritise inventions that are not likely to attract patent ineligibility rejections from US patent examiners. Inventions that involve mathematical algorithms, AI or are computer-related, such as those directed to mining more sustainably and/or discriminately, are instead being kept confidential and "black-boxed" where possible.

- **Research and development (R&D) and innovation**
  R&D in algorithmic, modelling, AI-based, and computer-related inventions is on-going and unavoidably required, to assist for example with meeting climate and sustainability targets.

  However, such R&D is being subjected to greater confidentiality measures as an alternative to pursuing patent protection. As a result, in certain partnerships between Rio Tinto and universities or other research organisations, the ability for the latter to publish the results of innovation in papers and journal articles is being curtailed by stricter confidentiality impositions.

  Previously, such innovations were made the subject of patent applications, which then allowed universities to publish while maintaining exclusive exploitation rights for Rio Tinto as patent owner. This option is less feasible or no longer available as a result of the current state of US patent eligibility jurisprudence.

- **Investment strategy**
  Exclusive rights, such as those afforded by patents, play an influential role in determining a potential investment's Net Present Value (NPV) calculations, which in turn play an influential role in determining which investments in technology proceed and which are shelved.

  For new mining technologies involving AI, mathematical algorithms or computer implementation, the path to exclusivity through patents is uncertain as a result of the current state of patent eligibility jurisprudence. The lack of exclusive rights in, for example, a technology involving an algorithm that allows a marginally profitable resource to be profitably exploited (see US Application No. 14/772,522) may decrease the likelihood of investment in such opportunities.

The same can be said for potential Joint Venture (JV) partnerships, which are a different form of investment. An inability to protect a technology that Rio Tinto or another Party will bring to a potential JV partnership may renders it more likely that Rio Tinto will avoid entering into such a JV.

Additionally, decisions on whether to invest in start-up enterprises in machine-learning landscapes are also clouded by the current state of patent eligibility jurisprudence in the US. It may be that start-up enterprises are discouraged from the filing of patent applications involving machine-learning and software applications due to a lack of certainty on ultimately securing patent rights. Therefore, when considering investment in such enterprises, it is recognised that those in machine-learning landscapes often rely upon first-mover advantage for a small window of competitive monopoly before fast-followers replicate. Moreover, without having patents and patent applications to demonstrate a secured IP position, procurement practices often dictate for the lowest cost or fastest to commission provider and not necessarily the inventing enterprise.

- **Licensing of patents and patent applications**
  In addition to the above comments regarding investment strategy and JV partnership opportunities, the increased difficulty in obtaining patents for algorithmic, modelling, AI-based, and computer-related inventions has made it more difficult for Rio Tinto to negotiate the licensing of Rio Tinto's technology to other parties, such as original equipment manufacturers (OEMs).

  For instance, it is not uncommon for Rio Tinto to invest in R&D in technological fields related to but not core to mining, such as autonomous machinery and mobile equipment. At times, it has then been considered appropriate and beneficial to transfer the technology in these related fields to OEMs, for example, to use under license.

  OEMs are often reluctant to embark on major "green field" R&D without some pre-existing evidence of commercial viability and need. In such scenarios, Rio Tinto has at times taken the lead to develop technology, and prove the need and commercial viability. Once a technology has achieved an appropriate level of maturity, Rio Tinto seeks to license such technologies to the OEMs to utilise further. Notably, the inability to obtain patent protection for algorithmic, modelling, AI-based, and computer-related inventions has hindered such efforts.

- **Competition**
  The inability or hindrance to obtaining patent protection for algorithmic, modelling, AI-based, and computer-related inventions has put innovative mining companies such as Rio Tinto at a disadvantage to its competitors who adopt a "fast follower" approach to implementing technology.

<u>Topic 3: Impacts of current state of US patent eligibility jurisprudence on particular technology fields.</u>

As mentioned above, Rio Tinto's more recent innovations have increasingly involved the utilisation of mathematical algorithms, AI and other computerised methods in mining applications. The current state of US patent eligibility jurisprudence has made it more difficult to obtain patent rights for inventions in these technology fields. As a result, innovation, investment and partnerships in these areas are undertaken with a much higher degree of caution and risk avoidance, which translates to overall less activity or a slower pace of activity.

Topic 4: Comparison of subject-matter eligibility requirements in other jurisdictions.

Despite the comments above, US jurisprudence in the area of patent eligibility is generally better than most other jurisdictions in which Rio Tinto files patent applications. By comparison, the US offers relatively clear guidelines and precedents, and handles algorithmic, modelling, AI-based, and computer-related inventions openly. This has allowed Rio Tinto to better predict chances of success, argue cases, and manage risk.

As with other jurisdictions such as Australia, it has become more difficult to address ineligibility objections in the US. However, using the USPTO's guidelines and guidance from US attorneys, some cases such as US Application No. 16/197,199 have eventually satisfied patent eligibility following several rounds of rejections and responses.

On a few occasions, patent ineligibility rejections in the US have been overcome with relatively minor claim amendments, for example, to recite a real-world application more explicitly. See for example US Patent No. 9,449,351. However, these occurrences are rare and not recent.

In contrast, the European Patent Office (EPO) applies a relatively low threshold of patent eligibility. While computer programs and mathematical methods "as such" are excluded from patentability in Europe, the patent eligibility exclusions can be circumvented by claiming technical methods with real-world technical application having a technical effect that goes beyond the normal physical effects of the execution of a program. Instead, software-related inventions are more often objected to for lack of inventive step.

In an increasingly digitized world where digital 'constructs' (e.g. currencies, contracts, and signatures) are becoming more prevalent, and their relationship to an equivalent in the real, tangible world are becoming less meaningful, the US is encouraged to take a global lead in recognising such inventions as patent eligible in their own right.

Topic 5: Instances where patent protection was denied in the US solely based on patent subject matter ineligibility, but obtained elsewhere.

While we consider US jurisprudence in the area of patent eligibility to be generally better than most other jurisdictions, there are some cases where a US grant of patent has been delayed compared to family members in other jurisdictions.

For example, US Application No. 13/577,233, the invention of which is now pursued in a continuation application, was abandoned after recurring subject-matter eligibility rejections and an unsuccessful pre-trial conference. Meanwhile, corresponding cases in Australia, Brazil and Canada either did not encounter subject-matter eligibility issues or they were overcome.

Topic 6: Modification or shift of investment, research and development activities, due to current state of US patent eligibility jurisprudence.

Please see our comments above under Topics 1, 2 and 3 in relation to investments, R&D and innovation.

Topic 7: Change of business strategies for protection of intellectual property due to current state of US patent eligibility jurisprudence.

Please see our comments above under Topic 2 in relation to R&D and innovation, and licencing of patents and patent applications. The strategy for protecting Rio Tinto's IP has changed such that there is now an increased reliance on protecting our IP through confidentiality, trade secrets or other contractual and legal instruments.

Topic 8: Change of behaviour with regard to filing, purchasing, licensing, selling, or maintaining patent applications and patents in the US.

Please see our comments above under Topics 1 and 2. Uncertainty in the ability to obtain patent protection for algorithmic, modelling, AI-based, and computer-related inventions results in a reduced likelihood of filing patent applications for these kinds of inventions.

Topic 9: Effect of current state of US patent eligibility jurisprudence on litigation for patent infringement in the US.

We submit no comments for this section.

Section II – Impact of Subject Matter Eligibility on the General Marketplace

Topic 10: Impact of current state of US patent eligibility jurisprudence on global strength of US intellectual property.

We submit no comments for this section.

Topic 11: Effect of current state of US patent eligibility jurisprudence on US economy as a whole.

In comparison to other jurisdictions, the guidelines and relative openness in the handling of patent eligibility issues for algorithmic, modelling, AI-based, and computer-related inventions by the USPTO and US courts makes the US market a relatively attractive jurisdiction to conduct business. Increased openness in this regard would see further positive correlation.

Topic 12: Effect of current state of US patent eligibility jurisdiction on global strength of US in the area of computer-related inventions.

It would be expected that increased likelihood of patent protection for AI-related and computer-related would result in the US become a R&D, engineering, and commercialising hub for such technologies.

Topic 13: Effect of current state of US patent eligibility jurisprudence on the public.

We submit no comments for this section.

Thank you for reviewing our submission.

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