Select Topics in U.S. Patent Law

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Topics

- USPTO Guidelines on Artificial Intelligence (AI) Inventions
  - USPTO's Inventorship Guidance for AI-assisted inventions
  - USPTO's Update on Patent Subject Matter Eligibility of AI Inventions
- USPTO Proposed Rules for Terminal Disclaimers
- USPTO's Proposed New Official Fees
- Practical Strategies for Requests for Continued Examination (RCEs)

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USPTO Guidelines on AI Inventions

- Inventorship Guidance for AI-assisted inventions
  - Published on February 13, 2024
  - https://www.federalregister.gov/documents/2024/02/13/2024-02623/inventorship-guidance-for-ai-assisted-inventions
- Update on Patent Subject Matter Eligibility of AI Inventions
  - Published July 17, 2024
  - https://www.federalregister.gov/documents/2024/07/17/2024-15377/2024-guidance-update-on-patent-subject-matter-eligibility-including-on-artificial-intelligence

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Inventorship Guidance for AI-Assisted Inventions

- Effective on February 13, 2024 and applies to all applications and patents filed before, on or after February 13, 2024.
- Guidance sets out USPTO's interpretation of inventorship requirements of the Patent Act in view of court decisions
- USPTO requires that inventors and joint inventors named in US patents and patent applications be natural human persons.

Inventorship Guidance for AI-Assisted Inventions

- AI-assisted inventions are not categorically unpatentable
- For AI-assisted inventions:
  - AI cannot be named as an inventor or a joint inventor in a patent application and applications should not list AI as an inventor.
  - The use of an AI system by a human does not preclude the human from qualifying as an inventor if the human significantly contributed to the claimed invention.
  - Each claim must have been invented by at least one named human inventor.

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Inventorship Guidance for AI-Assisted Inventions

- Who is considered an inventor?
  - An inventor is a human person who contributed to the conception of an invention.
  - Each inventor must contribute in some significant manner to the conception or reduction to practice of the invention.

Inventorship Guidance for AI-Assisted Inventions

- Factors for determining inventor(s) in AI-assisted inventions:
  - Merely presenting a problem or a goal to an AI system is not enough for conception of invention.
  - Significant contribution can be shown by the way a human inventor constructs a prompt to an AI system to address a specific problem to obtain a particular solution from the AI system.
  - Merely recognizing the output of an AI system as an invention is not enough.
  - However, taking the output of an AI system and making a significant contribution to the output, e.g., a modification, to create the invention may be enough.

Inventorship Guidance for AI-Assisted Inventions

- Factors for determining inventor(s) in AI-assisted inventions (continued):
  - A human person who develops an essential building block from which the claimed invention is derived may be an inventor.
  - A human person who designs, builds or trains an AI system in view of a specific problem to obtain a particular solution may be an inventor.
  - Owning or overseeing an AI system used to create an invention, without more, is not enough to be an inventor.

Inventorship Guidance for AI-Assisted Inventions

- Practical Recommendations:
  - When AI is used for modelling or predicting some events, it is important to keep track of:
    - Instructions and questions provided to AI system;
    - Who formed the questions;
    - Who provided specific training for AI to address a specific problem; and
    - Any human-driven steps in a multi-step process.

Inventorship Guidance for AI-Assisted Inventions

- Ownership and Assignments of AI-Assisted Inventions
  - AI systems have no rights to assign since they cannot be inventors.
  - Assignments from AI systems should not be recorded with the USPTO.

Update on Patent Subject Matter Eligibility of AI Inventions

- USPTO guidance confirmed that the Alice/Mayo test for analyzing subject matter eligibility under 35 USC 101 has not changed.
- USPTO also confirmed that use of AI in creation of an invention does not bar patentability.
  - How the invention was developed is not relevant to the subject matter eligibility inquiry.

Update on Patent Subject Matter Eligibility of AI Inventions

- Many claims to AI inventions are patent eligible as improvements to functioning of a computer or improvements to another technology.
  - Claims that reflect an improvement to a computer or other technology are eligible.
  - Claims that reflect an improvement to a judicial exception, such as an improved mathematical process, are not patent eligible.
  - Claims that only cover instructions to apply an abstract idea using a general computer or a technological environment are not patent eligible.

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Update on Patent Subject Matter Eligibility of AI Inventions

- Patent Eligibility Strategies/Recommendations
  - Describe the AI Invention as a technical solution that improves computer functionality and solves a technical problem.
  - The invention as set forth in the claim should pertain to an improvement to technology (e.g., the computer system); ***not*** to an improvement to the abstract idea itself.

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Update on Patent Subject Matter Eligibility of AI Inventions

- Patent Eligibility Strategies/Recommendations

  (continued)

  - Claims should include the technical details about the AI model, the training process, and how the AI model is integrated into a particular use methodology.
  - The specification should include details about the relevant data structures and algorithms, and explain how select structures/algorithms result in technical improvements and advantages.
    - Exemplary advantages include reduced processing times, shared computer resources, increased network security, etc.

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Update on Patent Subject Matter Eligibility of AI Inventions

- Patent Eligibility Strategies/Recommendations

  (continued)

  - For training models that undergo an iterative process (repeated actions/multiple stages), the specification and claims should include details about the specialized training that occurs at each stage.
    - Differences between the data inputs and other factors for different stages of training should be identified and their resulting benefits should be explained in the specification.

Update on Patent Subject Matter Eligibility of AI Inventions

- USPTO provided 3 new hypothetical AI-implemented inventions with exemplary subject matter eligibility analyses.
  - https://www.uspto.gov/sites/default/files/documents/2024-AI-SMEUpdateExamples47-49.pdf
  - Example 47 – Detection of Network Intrusions Using AI Neural Networks
  - Example 48 – AI for Analyzing Speech Input Signals
  - Example 49 – AI for Personalized Medical Treatment

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Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – Detection of Network Intrusions Using AI Neural Networks**
  - Invention covers use of an artificial neural network (ANN) to identify and detect anomalies such as network intrusions and malicious attacks.
  - Invention also covers ANN training methods with faster training times and more accurate detection.
  - Example 47 discusses 3 hypothetical claims.

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – Claim 1**
  - Claim 1 covers an application specific integrated circuit (ASIC) for an ANN, and recites characteristics and arrangement of a plurality of neurons and a plurality of synaptic circuits.
  - Claim 1 is patent eligible because it recites a plurality of neurons, which are hardware components comprising a register and a microprocessor, and a plurality of synaptic circuits, which together form the ANN.
  - Claim 1 does not recite any abstract ideas.

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – Claim 2**
  - [Claim 2] A method of using an artificial neural network (ANN) comprising:
    - (a) receiving… continuous training data;
    - (b) discretizing… the continuous training data to generate input data;
    - (c) training… the ANN based on the input data and a selected training algorithm… [including] a backpropagation algorithm and a gradient descent algorithm;
    - (d) detecting one or more anomalies in a data set using the trained ANN;
    - (e) analyzing the…detected anomalies using the trained ANN to generate anomaly data; and
    - (f) outputting the anomaly data from the trained ANN.

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – *Claim 2 is ineligible***
  - The claimed discretizing, detecting and analyzing steps (b), (d) and (e) encompass mental evaluations;
  - The claimed discretizing and training using a backpropagation algorithm and gradient descent algorithm encompasses mathematical calculations;
  - The additional receiving and outputting steps (a) and (f) are mere data gathering and output recited at high level of generality;
  - "using the trained ANN" in steps (d) and (e) are instructions to implement abstract idea on a computer;
  - USPTO concluded that claim 2, as a whole, recites abstract ideas applied on a computer without placing any limits on how the steps are performed.

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Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – Claim 3**
  - [Claim 3] A method of using an ANN to detect malicious network packets comprising:
    - (a) training…the ANN…;
    - (b) detecting one or more anomalies in network traffic using the trained ANN;
    - (c) determining at least one detected anomaly is associated with one or more malicious network packets;
    - (d) detecting a source address associated with the one or more malicious network packets in real time;
    - (e) dropping the one or more malicious network packets in real time; and
    - (f) blocking future traffic from the source address.

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 47 – *Claim 3 is eligible***
  - Claimed training step (a) recites mathematical calculations (backpropagation algorithm and gradient descent algorithm) for training the ANN;
  - Claimed detecting and determining steps (b) and (c) cover concepts performed in the human mind;
  - Claimed detecting, dropping and blocking steps (d)-(f) provide for improved network security using information from detection by taking proactive measures to remediate danger;
  - Elements in steps (d)-(f), when considered in combination, integrate the abstract idea into a practical application that improves the functioning of technology.

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Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 49 – AI for Personalized Medical Treatment**
  - Invention covers an AI model designed to assist in personalizing glaucoma medical treatment to the individual characteristics of a particular patient.
  - Invention also describes a new anti-fibrotic drug, Compound X, that reduces scarring around a microstent implantation site in glaucoma patients at high risk of post-implantation inflammation (PI). The AI model calculates a patient's risk score for PI based on the patient's genotype dataset.
  - Example 49 discusses 2 hypothetical claims.

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 49 – Claim 1**
  - [Claim 1] A post-surgical fibrosis treatment method comprising:
    - (a) collecting and genotyping a sample from a glaucoma patient to a provide a genotype dataset;
    - (b) identifying the glaucoma patient as at high risk of [PI] based on a weighted polygenic risk score that is generated from informative single-nucleotide polymorphisms (SNPs) in the genotype dataset by an ezAI model that uses multiplication to weight corresponding alleles in the dataset by their effect sizes and addition to sum the weighted values to provide the score; and
    - (c) administering an appropriate treatment to the glaucoma patient at high risk of PI...

Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 49 – *Claim 1 is ineligible***
  - The claimed identifying step (b) recites a mental process of comparing a patient's score against known top scores, a law of nature describing a relationship between a patient's genotype and phenotype, and a mathematical calculation of multiplication to weight alleles.
  - The claimed collecting and genotyping in step (a) are mere data gathering steps.
  - The claimed administering step (c) covers any possible treatment that a medical professional decides to administer.
  - Claim 1, at best, describes an improvement to the abstract idea of improving risk scores.

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Update on Patent Subject Matter Eligibility of AI Inventions

- **Example 49 – Claim 2**
  - [Claim 2] The method of claim 1, wherein the appropriate treatment is Compound X eye drops.
  - ***Claim 2 is eligible***.
  - The abstract idea is used to identify the patient as belonging to a specific patient population having high risk of PI.
  - The administration of a specific treatment (Compound X eye drops) that is particular to the specific patient population integrates the abstract idea into a practical application.

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USPTO Proposed Rules for Terminal Disclaimers

- Proposed Rules published on May 10, 2024
  - https://www.federalregister.gov/public-inspection/2024-10166/terminal-disclaimer-practice-to-obviate-nonstatutory-double-patenting
  - Public comments were due by July 9, 2024
- USPTO proposes changes to current terminal disclaimer practice for overcoming obviousness-type double patenting rejections.
  - Currently, a terminal disclaimer must include a disclaimer of term beyond the term of a conflicting patent and requires common ownership of both patents to enforce them.

USPTO Proposed Rules for Terminal Disclaimers

- Under the proposed rules, patent applicant filing a terminal disclaimer would have to agree that the patent with the terminal disclaimer will not be enforced if any claim of the second patent is invalidated based on prior art.
  - This agreement is in addition to the current term disclaimer and common ownership requirements.
- USPTO's reasons for proposed rule:
  - Promote competition by reducing the cost of challenging patents tied by terminal disclaimers, reducing barriers to entry and lowering costs to consumers.
  - Solve the problem of requiring multiple challenges of patents tied by terminal disclaimers.

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USPTO Proposed Rules for Terminal Disclaimers

- Potential effects if proposed rules are approved:
  - Applicant filing a terminal disclaimer would have to accept a risk that the entire patent's enforceability could depend on validity of a single claim in another patent.
  - Applicants will more aggressively argue against double patenting rejections, pursue alternative claim amendments, or appeal rejections.
  - Balance of power may shift in favor of patent challengers.
    - Defendants in patent infringement cases might seek to invalidate multiple patents by focusing invalidity arguments on a single patent within a patent family with terminal disclaimers.

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USPTO's Proposed New Official Fees for 2025 Fiscal Year

- Proposed Rule regarding USPTO Official Fees for 2025
- Published on April 3, 2024
- Proposed Rule proposes overall fee increases and introduces new USPTO fees

USPTO's Proposed New Official Fees

- Significantly Higher Fees:
  - 25% increase in excess independent claims over 3 claims ($480 to $600 per independent claim)
  - 100% increase in excess total claims over 20 ($100 to $200 per claim)
  - RCE fees
    - 10% increase for 1st RCE ($1360 to $1500)
    - 25% increase for 2nd RCE ($2000 to $2500)
    - 80% increase for 3rd RCE ($2000 to $3600)
  - 27.5% increase in design patent application filing fees ($1020 to $1300)
  - 76% increase in design issue fee ($740 to $1300)

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USPTO's Proposed New Official Fees

- Proposed New Fees:
  - Surcharge for continuation application benefit claim
    - Continuing application filed 5 or more years after earliest priority date: $2200
    - Continuing application filed 8 or more years after earliest priority date: $3500
  - Information Disclosure Statement size fee:
    - 51-100 references cited: $200
    - 101-200 references cited: $300
    - More than 200 references cited $800

USPTO's Proposed New Official Fees

- Proposed New Fees:
  - Terminal Disclaimer Escalated Fee Structure:
    - Filed prior to first action on the merits: $200
    - Filed prior to final action or allowance: $500
    - Filed after final action or allowance: $800
    - Filed on or after a notice of appeal: $1100
    - Filed in a patented case or reissue application: $1400
  - AFCP 2.0 Request Fee: $500*
    - However, on September 30, 2024, USPTO announced that since the public was not receptive to the proposed fee, the USPTO will terminate AFCP 2.0 on December 15, 2024.

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Practical Strategies for Requests for Continued Examination (RCEs)

- Most Second Office Actions are Final Office Actions
  - After Final Office Action issues, response options are limited.
  - Without RCE, substantive amendments are rarely allowed by Examiners.
  - RCE fee is high, especially for 2nd and subsequent RCEs.
- Options for response after Final Office Actions:
  - File amendment or request for reconsideration.
  - File a narrowing amendment with AFCP 2.0 request.
  - File RCE with claim amendment or IDS.
  - File Notice of Appeal.
  - File Continuation application.

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Practical Strategies for Requests for Continued Examination (RCEs)

- Strategies to avoid or minimize RCEs:
  - In initial application, include a range of dependent claims with different scopes and different features that applicant would consider incorporating into independent claims, if needed.
    - Include dependent claims that cover all novel features applicant may want to use to distinguish from prior art.
    - Include a narrow claim that uses concrete terms, covers a preferred embodiment of applicant's commercial product and is unlikely to be covered by generic prior art.
    - If a dependent claim is allowable, then Final Office Action may be avoided by incorporating dependent claim features into independent claims.
    - Incorporating some, but not all, features from an allowable dependent claim may be enough for allowance.

Practical Strategies for Requests for Continued Examination (RCEs)

- Strategies to avoid or minimize RCEs:
  - Conduct telephone interview(s) with Examiner.
    - Interview after First Office Action is beneficial to discuss potential amendments and invention features that may result in allowance.
    - Interview after Final Office Action is helpful to determine whether claim amendments would overcome rejection and/or whether RCE is needed.
    - Interviews before filing a formal response are usually preferred to avoid filing a supplemental response.
    - Interviews are generally helpful to understand Examiner's willingness to discuss invention features and to propose claim amendments to get the application closer to allowance.

Practical Strategies for Requests for Continued Examination (RCEs)

- Strategies to avoid or minimize RCEs:
  - After Final Office Action issues, check whether the Office Action was properly made final.
    - If Examiner cited new prior art and the need for the new prior art was not caused by claim amendments in previous response, then rejection should not be final.
  - File AFCP 2.0 request with a narrowing amendment and conduct an AFCP interview with Examiner (before December 15, 2024).
  - File Notice of Appeal with Pre-Appeal Brief Review Request (PABR) if there is a clear factual or legal error in the rejection.
    - PABR should not be used to argue interpretation of a reference or claims, or to argue obviousness.
    - If PABR is successful, Examiner usually issues Notice of Allowance.

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Thank you!