

Article

Legal Challenges for the use of AI in Trademarks

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Abstract: IP landscape is being influenced by AI which has nearly taken over design, search and litigation aspects of trademarks. AI tools are more efficient, quick and accurate throughout trademark life cycle. AI is bringing new ideas and concepts in creation and design of trademark logos, in searching trademark repositories before and during registrations, due diligence during maintenance, enforcement and revocation. Current research analyses AI footprints in transforming trademark domain evaluating its legal impact especially regarding improved clearance search and expedited trademark examination. The evolving concept of trademark originality, distinctiveness, algorithmic consumer likelihood of confusion evaluation, algorithmic transparency in decision by IP office and fixing liability in AI-made errors. Trademark legal structure needs to be overhauled for harmonization of generative AI-trademarks governance.

Keywords: AI; trademarks; trademark examination; trademark dispute; trademark life; infringement

1. Introduction

Trademarks are useful for large segment of society as these prevent consumer confusion, serve commercial interests of their owners and are a major chunk of revenue source for IP offices, advocates and courts. Concaving, designing, drafting trademark applications and consequently grant, maintenance and enforcement of trademarks was heavily dependent on human efforts. AI, big data analytics and AI algorithms have nearly replaced the role of humans to a substantially extent as AI tools help from concept till grant replacing manual database searches. AI is a nice and key partner in trademark regime influencing the suggestions and creation of trademark symbols, helping draft trademark applications, and rebuttal and enforcement letters.

Initial steps of trademark development including conceptualization, linguistic construction and legal clearance are nearly done wholly by AI. Hundreds of free and paid AI tools suggest names, types of symbols and slogans by analyzing linguistic and market data to identify phonetic patterns, neologisms and culturally related terms to optimize distinctiveness minimizing generic and descriptive connotations. This predictive modelling creates legally allowable and socially acceptable appealing trademarks. Machine learning (ML) produces logos based on user-defined parameters, commercial conventions and analysis of global visual databases. AI systems compare AI-generated trademarks with available existing trademarks in no time (Gogi 2025). AI search by trademark filer from millions of trademark records helps avoid risks of rejection at later stages by IP office. Human searches pose challenges of oversights in minute aspects especially conceptual, visual, and phonetic (sound, sight, meaning) similarities that are debating backgrounds for likelihood of confusion (Kaagzaat 2024). AI excels in identifying exact, and near-exact matches and architecturally similar trademarks which a human examiner can miss due to keyword-based search limitations (Singh and Richa 2025).

AI is helping tackle backlogs and accelerating decisions-making process to IP offices. AI precisely assigns Nice classification codes, minimizing refusal chances due to incorrect specification of goods and services, facilitating the IP offices (Kaagzaat 2024). USPTO is using ML for pre-examination screening, and automated data entry leaving more time for trademark examiner for technical issues of filed trademarks (PatentPC 2025a). EU IP offices use advanced image recognition system to compare non-traditional marks and figurative marks with EU trademark database increasing consistency in decisions linked with confusing similarity (Kose and Yildeiz 2024). WIPO is developing AI tools for image search and translation for harmonization of trademark filing under Madrid Protocol (Curtis and Platts 2020). Table 1 summarizes use of AI regarding trademarks in various IP offices.

Citation: Mahmud Rahat, Sagheer Abbas, Iqbal Saujan. 2025. Legal Challenges for the use of AI in Trademarks. *Trends in Intellectual Property Research* 3(1), 45-47. <https://doi.org/10.69971/tipr.3.1.2025.86>



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Table 1. Current practice of AI use regarding trademarks.

IP Office	AI Application Area	Primary Benefit
USPTO	Automated classification (Nice), pre-examination filtering, evidence authentication.	Reduction of administrative refusal rates; expedited process.
EUIPO	Figurative mark similarity searching, multilingual translation support.	Enhanced consistency across member states; improved global compliance.
KIPO	Comprehensive image search for apparel and design marks.	High-speed clearance; better detection of subtle design infringement.
WIPO	WIPO Translate, Global Brand Database enhancement.	Facilitates international filing harmonization (Madrid Protocol).

AI has quite significant role in the complex domain of non-traditional marks (NTMs), which includes motion, sound, and olfactory (smell) marks. Its ability to analyze and map sonic characteristics (frequency, rhythm, timbre) allows for a more objective comparison against existing sound marks in the register, moving beyond subjective human listening (Köse and Yıldız 2024). For marks that rely on movement (e.g., animated logos), AI video analysis can track and compare movement patterns, ensuring that the mark is both distinctive and non-confusingly similar to prior registrations (Curtis and Platts 2020). AI is refined enough to assess the acquired distinctiveness of NTMs by analyzing vast amounts of consumer data (e.g., market use, advertising spend, public recognition surveys), a process far beyond the capacity of human examiners in a timely manner.

2. Legal Challenges

2.1 Authorship and Originality

AI-generated trademarks pose challenges originality and ownership. Trademark laws usually are source-agonistic. However, ownership and liability issues exist for AI-generated trademarks (Bainbridge 2024). If an AI, guided by human prompts, generates a highly successful logo, who owns the copyright in that design, which often co-exists with the trademark right? Current jurisprudence generally holds that only human creators can own copyright, but the lines blur when the creative output is derived from a machine's algorithmic execution. This creates a legal uncertainty for asset transfers and licensing (Kaagzaat 2024). AI can be instructed to prioritize certain legal characteristics, such as inherent distinctiveness (e.g., arbitrary or fanciful marks), by avoiding proximity to descriptive or generic terms in a database (Singh and Richa 2025). In this case, the question that the process of AI generation inherently confers greater distinctiveness than human ideation, or is the mark's registrability judged solely on its final form and commercial use remains unanswered.

2.2 Algorithmic Clearance and Scope of Search

AI has fundamentally optimized the pre-filing clearance search, transforming it from a time-consuming, subjective human task into a rapid, data-intensive analysis. Advanced NLP models go beyond phonetic and visual matching to detect conceptual equivalence, i.e., marks that, while distinct in spelling or appearance, convey the same meaning or idea (Singh and Richa 2025). This capacity significantly reduces the risk of legal challenges based on subtle conceptual confusion. AI image recognition systems are essential for clearance of trade dress (product packaging and configuration) and complex figurative marks, processing three-dimensional shapes and color combinations far more efficiently and comprehensively than manual searchers.

2.3 AI and Likelihood of Confusion

AI has challenged likelihood of confusion in trademark which was traditionally evaluated from the prospect of "average consumer", a reasonably prudent individual having imperfect recollection (Brainbridge 2024, Curtis and Platts 2017). AI-driven shopping, particularly voice commerce and recommendation engines, demands a doctrinal shift in the "likelihood of confusion" test (Curtis and Platts 2017). Infact, AI-powered assistants are "consumers" in purchasing decisions. If a customer asks his smart speaker for "a Coca-Cola," and the AI selects a similarly-named soft drink due to insufficient distinctiveness, this is not human customer "confusion" but is AI originated. Algorithmic distinguishability should be defibrated to replace human imperfect memory. AI algorithms having perfect memory for all competing marks don't need "imperfect recollection" test. Likelihood of confusion can be renamed as "algorithmic confusion" reflecting when AI erroneously selects a wrong brand due to TM similarity (Curtis and Platts 2017).

2.4 Promoting Genericity

If the AI search engine considers a highly-used TM as a descriptive term for the entire product category (e.g., using "Band-Aid" for all adhesive bandages), it promotes the genericity of TM risking its legal protection.

AI tools by analyzing massive linguistic datasets, and consumer discourse from online platforms can suggest the generic nature of a trademark for that product class supporting cancellation application based on genericity.

AI based tools can fails to identify a conflicting TM leading to TM registration, there will be liability issues. Its hard to fix liability on software provider, attorney or the AI. Since AI is not considered a legal personality in most jurisdictions, software provider can be accountable under product liability law (Kaagzat 2024).

2.5 AI as evidence tool

TM registrations are cancelled if they have not been genuinely used for a specified period (typically 3–5 years). AI can provide indisputable evidence in non-use cancellation actions (PatentPC 2025b). AI scrutinizes millions of social media ads, domain registrations, e-commerce sites and internet resources for textual, visual and conceptual similarities to identify counterfeits and infringements (IIPRD Blogs 2024). AI-based granular evidence of infringement and duration of use helps in opposition proceedings and

revocation actions based on non-use or descriptiveness (Kaagzat 2024). AI scanned sales data, social media campaigns and e-commerce activities can prove the bonafide use of trademark helping in no-use cancellation actions of IP offices (PatentPC 2025b). Legal standards need to be established to validate the reliability of the AI tool that collected or processed the evidence, i.e., demonstrating that the underlying algorithm is scientifically sound, correctly applied, and based on untainted data (Kaagzat 2024).

2.6 AI Transparency and Bias

The inherent black box problem of AI, i.e., difficulty in explaining or reproducing the reason behind decisions (Singh and Richa 2025) is a big problem in all fields where its deployed including trademark domain. If IP office refuses a trademark based on IP decision which does not explain refusal logic, applicant can challenge procedural fairness and the right to appeal (Kaagzat 2024). If the data used to train examining AI models is biased, the refusal decision can lead to unfair results (Singh and Richa 2025). Post-registration management, surveillance, opposition and revocation proceedings being managed IP very effectively than manual efforts.

3. Conclusions

AI has become integral part of trademark life due to its efficiency, analytical power, speed and preciseness. However, trademark law is not prepared for this paradigm shift. Ownership and liability issues of AI-generated trademarks, opaqueness of algorithmic explainability in decision making, adjusting likelihood of confusion test for algorithmic consumer and mitigating AI biases are the core issues that need to be fixed to avail AI potential in trademark life. TM rights are inherently territorial, but commerce is global. The lack of a unified international approach to AI in IP creates friction and confusion. The World Intellectual Property Organization (WIPO) should develop international treaties or guidelines on core issues, such as standardizing AI's role in the Madrid System for international registration and establishing cross-border data ethics standards. The key principles of IP protection, consumer trust and fairness should not be ignored.

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