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THE PROCEDURE OF FILING A US PATENT APPLICATION

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Abstract

The use of TRIZ and ARIZ analytical tools in US patent applications, including those involving technical systems with elements of artificial intelligence and artificial neural networks, is an optimal approach when preparing application materials for an integrative patent.

The use of modern versions and variations of TRIZ and ARIZ is only one of many possible tools when preparing a patent application. It is important to understand that the effectiveness of the process is largely determined by a set of measures, including the protection of technical solutions, building relationships with investors and strategic partners, and properly presenting the project to experts.

Relationships with investors and potential strategic partners are particularly important in the innovation process. To convince investors of the financial attractiveness of a project, it is necessary to thoroughly explain the essence of the project to experts, including all technological and innovative aspects. Serious protection of the technical solutions underlying the product is essential at all stages of the project's development.

Keywords: *Technical systems; intelligent technical systems; technical subsystems; intelligent technical subsystems; TRIZ analytical tools; ARIZ analytical tools; patent application; application of possible tools in the application; quantum computers; non-obviousness of the claimed technical solution*

Key aspects of preparing a patent application

The title of a proposed invention plays a fundamentally important role in shaping the initial conceptual assessment made by the patent examination authority. It must not only unambiguously reflect the essence of the technical solution but also provide a concise and precise commercial characterization of its potential market impact within the relevant field of application. A key requirement is to avoid any promotional or emotionally charged language, such as "effective," "best," or "unique." Such expressions are not regarded by experts as objective, and their presence may diminish the impartiality of the evaluation, complicate the demonstration of innovation and non-obviousness, and weaken the overall credibility of the application.

The choice of title should be based on a thorough analysis of market conditions,

assessment of current trends, and forecasting of potential technological and commercial developments. The title must reflect not only the current state of the industry but also the prospective applicability of the invention. Furthermore, if the applicant's goal is to attract investment or establish partnerships with technology companies, it is highly recommended that the title be aligned with the interests of potential investors and partners. This ensures strategic coherence in the application, reinforces the perceived commercial significance of the development, and increases the likelihood of a favorable expert review.

Particular attention should be given to the aspect of proving the invention's non-obviousness, which is a key factor for patent examiners, especially in the United States. The title should be formulated in such a way that it lays the groundwork for substantiating the invention's uniqueness and innovative value. It should briefly and clearly convey the distinct technical and functional characteristics that will later be elaborated upon in the application. Moreover, the title can serve as a strategic instrument for positioning the invention within the intellectual property market, ensuring a competitive advantage and facilitating the integration of the patent into commercial and scientific initiatives.

It is also important to recognize that the title forms the first impression for all parties evaluating the patent – including examiners, investors, and potential partners. It should combine technical precision with strategic informativeness, demonstrating that the invention addresses specific problems, possesses high scientific value, and holds potential for practical implementation. Overall, a carefully chosen title not only increases the chances of a successful examination but also helps present the invention as a scientifically grounded and strategically positioned development on the international stage.

Development of Quantum Technologies

The modern market for intelligent technologies is undergoing profound transformation driven by the emergence and implementation of quantum computing systems. The first practical quantum computers have opened new horizons, triggering a global race toward achieving "quantum supremacy." Contemporary models, including devices operating with 20 qubits, employ advanced superconducting technologies and provide computational capabilities unattainable by traditional supercomputers.

"Quantum supremacy" is defined as the ability of a quantum computer to solve problems that cannot be efficiently handled by classical systems. At present, it has been achieved only for a limited set of model problems; however, the ongoing development of quantum computing indicates a steady expansion of solvable tasks and a potential fundamental transformation of the entire computing industry. The leading countries in this domain remain the United States and China, with active research and investment also taking place in Europe, Japan, and other regions – creating a globally competitive environment.

The progress of quantum computing encompasses not only hardware development but also infrastructural solutions: providing remote access to computing power, developing specialized software, integrating quantum and classical systems, building platforms for shared use of computing resources, and forming ecosystems that connect research institutions with commercial enterprises. Investors are actively funding projects in this field, recognizing that quantum technologies represent a strategic resource not only for scientific advancement but also for national security and economic resilience.

Research laboratories and innovation centers working in quantum computing focus on developing algorithms, modeling systems, integrating with existing computational infrastructure, and adapting solutions for practical applications. International collaboration is of particular importance, enabling faster technology adoption, knowledge exchange, and the creation of a global innovation ecosystem. These processes foster both technical progress and economic returns on investment, stimulating the emergence of new industries, services, and startups based on quantum technologies.

Key developers emphasize that quantum technologies are designed to enhance human capabilities across diverse fields such as robotics, autonomous systems, cybersecurity,

artificial intelligence, modeling of complex physical processes, and business process optimization. Their integration into commercial and scientific projects accelerates innovation and enables the creation of high-value technological platforms.

The presentation of the first quantum computer marked an important milestone in the history of technological progress, demonstrating the practical application of scientific research in real-world contexts. This was not an isolated initiative but part of a broader national strategy aimed at maintaining technological leadership, stimulating economic growth, and cultivating a highly skilled scientific and technical workforce. Within this framework, special attention is devoted not only to building devices but also to developing the infrastructure required for practical use of quantum technologies, integrating them into business processes, training specialists, and fostering collaboration between scientific, educational, and commercial institutions.

The advancement of quantum technologies is becoming a key driver of the innovation economy, defining priorities in scientific research, strategic investment directions, and global competitive advantages. Their implementation not only allows for the solution of previously intractable problems but also lays the foundation for the emergence of new industries, the transformation of existing processes, and the deeper integration of intelligent systems into everyday and industrial practice.

In the process of preparing a patent application, both linguistic precision and strategic foresight play crucial roles in determining the success of an invention's evaluation. The title, while seemingly a small element, functions as the conceptual and commercial gateway to the entire application. It shapes the examiner's perception of the invention's essence, establishes its technological relevance, and signals its potential value within the broader innovation ecosystem. A well-formulated title demonstrates not only clarity and objectivity but also an understanding of industry dynamics and market opportunities, positioning the invention as both scientifically grounded and commercially viable.

The rapid development of quantum technologies exemplifies the need for such strategic presentation. As research transitions into commercialization, inventors must articulate the novelty and applicability of their solutions within a competitive, rapidly evolving field. Properly constructed patent documentation ensures that innovative ideas are not only protected but also effectively integrated into global technological and economic frameworks.

Ultimately, the preparation of a patent application extends beyond legal compliance, it is an act of scientific communication and strategic positioning. By aligning technical accuracy with analytical depth, inventors reinforce the credibility of their work, attract potential investors, and contribute to the collective advancement of technology. In this sense, every patent application becomes part of a broader narrative of progress, bridging the gap between invention and real-world impact.

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