

Why you need to protect your AI-based inventions

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Spurred by artificial intelligence, the aerospace industry is poised to rapidly accelerate the pace of tech development. Companies that fail to safeguard their AI-based inventions stand to miss out on the full benefits. Attorneys from the Washington, D.C., law firm **Sterne, Kessler, Goldstein & Fox** explain.

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Intellectual property protection has long been intertwined with aerospace innovation, dating at least as far back as the Wright brothers' famous patent dispute with Glenn Curtiss in the early 1900s. Today, breakthroughs in artificial intelligence are ushering in a new wave of technological advancement, just as the breakthrough at Kitty Hawk spurred rapid advancements in aircraft designs in the early 20th century. In fact, while only about 30 years separated the Wright Flyer and the introduction of the Douglas DC-3, widespread investment in AI and the ability to sell AI products independent of manufacturing may accelerate innovation from decades to years or even months.

From startups to established players, aerospace companies are swiftly incorporating AI to increase airspace safety, create advanced autonomous systems, provide critical mission analytics and monitoring capabilities, and improve product validation and verification. In the race to secure their footing in these emerging — and increasingly crowded — fields, some companies might neglect to secure IP protection for innovations and may therefore find themselves blocked out of future opportunities. Indeed, a well-rounded IP portfolio covering AI-based technologies, including utility patents, design patents and trade secrets, will protect shareholder value, provide distinct revenue streams and increase valuations.

Here are the options and their distinct benefits:

Utility patents: protecting novel functionality

Many aerospace companies are pursuing utility patents to secure the functional aspects of AI-based innovations. For example, Reliable Robotics of California filed a patent application in November 2023 that discloses using a computer-vision machine learning model to

estimate an aircraft's relative position and corresponding uncertainty to improve autonomous navigation. The navigational system assesses images, applies various functions with trained weights and parameters to identify information in the pixels of image, and then uses the functions and information to generate a re-constructed image.

As another example, in February 2023, Alphabet subsidiary Wing Aviation patented its invention of a neural network model that determines whether an electric vehicle is able to complete a flight without recharging one or more batteries. The system uses training data from a wide array of battery types such that only a single model is needed to assess all types of vehicle batteries with multiple characteristics, even battery types not included in the training data. The resulting system makes the machine learning model more robust and accurate for predicting range.

Such inventions are certainly not limited to aircraft. In late 2023, Slingshot Aerospace disclosed using its machine learning methods and neural networks to prevent collisions between space objects, including satellites, debris, asteroids and rockets. Around the same time, 3D-printed rocket engine manufacturer Relativity Space described, in a patent application, its various systems leveraging machine learning, neural networks and deep networks to predict material properties and assess quality at various stages of the 3D printing process.

Applications like the above are becoming more and more common, but the U.S. Patent and Trademark Office so far remains reticent to grant rights to inventions that generically apply AI algorithms to existing systems. Accordingly, it is important for aerospace companies seeking utility patents on AI-based inventions to address unique qualities of their AI algorithms.



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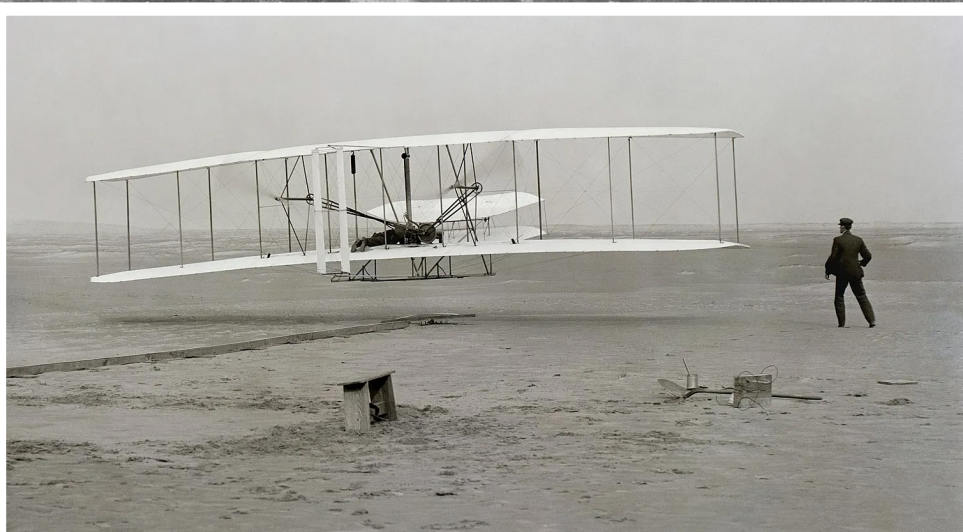
Describing inputs, processing and interoperability unique to the aerospace environment and a specific problem (e.g., space debris collection, airborne collision avoidance, fault detection) can help secure enforceable patent rights.

Design patents: protecting aesthetic features

Going hand in hand with improved functionality, aerospace companies are also developing corresponding human-machine interfaces that can be protected by design patents in addition to, or alternatively from, utility patents. While utility patents protect functional inventions, design patents protect how a product looks.

In some cases, aerospace companies known for developing AI-based technology appear to be filing design patents showing interfaces that may be used to display output from their AI tools. Palantir, headquartered in Denver and known for using AI to enhance aircraft manufacturing and development, has obtained more than 30 design patents for user interfaces, including particular icons and transitions. Meanwhile, Thales, a French company with a U.S. presence, is using AI for commercial air traffic management and large drone control and has design patents illustrating cockpit lighting and animated user interfaces.

A combination of utility and design patents can efficiently protect and allow companies to commercialize multiple aspects of a product that incorporates AI.



Balancing patents and trade secrets

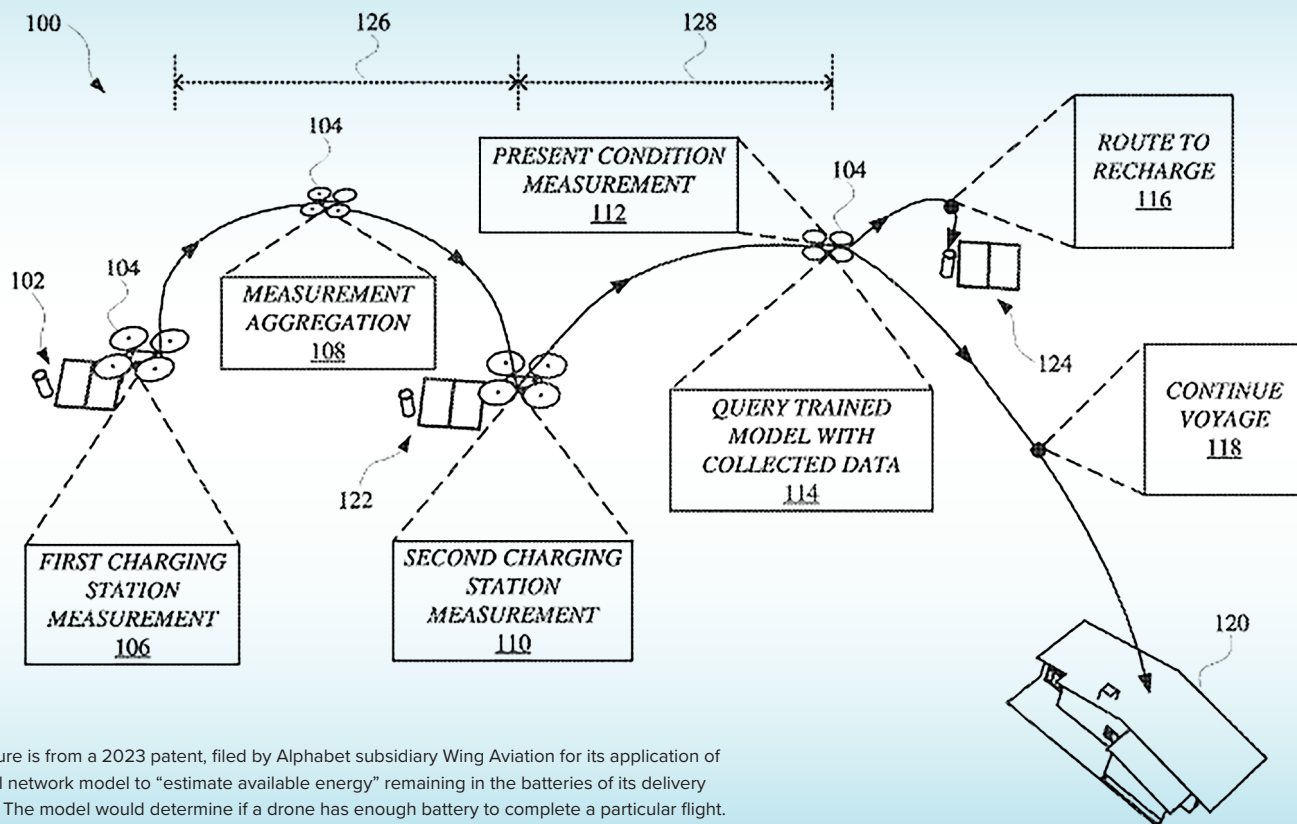
Trade secrets offer yet another form of IP protection, one that is complementary and often supplemental to patents. These can include inventions, similar to patents, but may also include technical information like training data for a machine learning algorithm and test results. Trade secrets can also include business information, such as market studies and customer lists. Broadly, trade secrets are information that provides an economic advantage because it is secret — a key difference to patents, which require public disclosure.

Often, aerospace products are covered by both patent and trade secret protection. A company may opt to patent a technology that uses a machine learning model to, for instance, estimate a satellite's position, but then also leverage trade secret protection to keep training data and specific parameters from public view.

In some cases, trade secrets may be a preferable

▲ The first flight of a Douglas DC-3 (top) was 32 years to the day after the Wright brothers' flight of the first heavier-than-air craft in 1903 in Kitty Hawk, North Carolina.

Boeing/U.S. National Park Service



This figure is from a 2023 patent, filed by Alphabet subsidiary Wing Aviation for its application of a neural network model to “estimate available energy” remaining in the batteries of its delivery drones. The model would determine if a drone has enough battery to complete a particular flight.

United States Patent No. 11,592,824

alternative to patent protection because they do not require a formal application or examination and can therefore be cheaper to obtain. However, the key to maintaining a trade secret is actually keeping it secret. This can be particularly difficult in aerospace sectors subject to high employee turnover. Further, simply stating that an innovation is a “trade secret” may not be enough. Establishing an effective, enforceable, trade secret typically requires unambiguously identifying it early in development, restricting access on a need-to-know basis, employee training and strong employment agreements.

Last year’s conclusion of the Boeing-Zunum Aero lawsuit illustrates this difficulty. A jury originally ruled in favor of Zunum, a Washington state startup that in 2020 alleged Boeing stole its technology for powering electric aircraft. But three months later, the presiding judge overturned the jury’s verdict and Zunum’s payout of \$72 million. The judge reasoned Zunum did not identify the alleged trade secrets in sufficient detail, nor did it prove that the trade secrets derived economic value from being secret.

Ultimately, a robust and actively implemented trade secret identification and maintenance program can help protect valuable information from walking out the door. And at a higher level, a tailored balance of patents and trade secrets can form a valuable IP portfolio that can protect aerospace companies and provide various commercialization options.

Minimizing risk and increasing value

As the industry continues rapidly developing AI-based technology, neglecting IP protection may leave both startups and established companies open to infringement suits without a counter. This can drain internal resources and deter commercial and government customers.

Proactively filing for patents and securing trade secrets can guard against this. For example, California defense startup Anduril explained in an article on its website that its “patents are not about restricting other companies from building similar non-infringing technology, but for ensuring [its] ability to serve its customers.”

Companies can also license their IP, including patents and trade secrets, to introduce additional revenue streams distinct from product manufacturing and sales. This can be particularly valuable for startups that lack massive manufacturing resources or funding. In addition to providing revenue for continued development, licensing opportunities accelerate innovation and the introduction of new technologies into the public.

Additionally, a well-developed IP portfolio generally increases valuations, as investors are typically more confident in companies that have taken steps to minimize risk and have opportunities for multiple revenue streams.

Ultimately, as AI advancement continues to proliferate, the companies that prioritize conscious and deliberate IP protection will be better positioned to succeed and stand out amid a crowded technology field. ★