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PROTECTION OF INTELLECTUAL PROPERTY IN SHIP BUILDING: A COMPREHENSIVE ANALYSIS

The global shipbuilding industry is a complex and capital-intensive sector in which innovation and design are paramount. Ships—ranging from massive container vessels and sophisticated cruise liners to advanced naval destroyers and specialized offshore platforms—are, in essence, intricate technological systems. The knowledge, creativity, and engineering effort invested in their design

and construction constitute valuable Intellectual Property (IP). Protecting this IP is critical for maintaining a competitive advantage, ensuring a return on significant Research and Development (R&D) investments, and fostering



THOUGHT
for the MONTH

Do not wait for the
perfect moment, take
the moment and make it
perfect

ZOEY SAYWARD



continued innovation in the maritime sector. This article delves into the multifaceted landscape of IP protection in ship construction, exploring the specific mechanisms, the inherent challenges of global enforcement, and the emerging opportunities driven by the shift towards sustainable shipping.

The Multilayered IP Framework in Shipbuilding: Safeguarding a IP rights in vessels

The modern ship is the result of intricate engineering, extensive research, and massive capital investment, making the Intellectual Property (IP) embedded within its structure and systems one of the shipbuilder's most critical assets. Given the complexity and multifaceted nature of a vessel—encompassing everything from structural design to control software and manufacturing processes—a single form of legal protection is insufficient. Instead, the industry relies on a strategic, multilayered IP framework where different legal mechanisms are deployed concurrently to safeguard distinct aspects of the ship. This integrated approach is essential for securing a competitive advantage and ensuring a return on significant R&D expenditures in the global maritime sector.

This approach begins with Patents, which form the primary defense for the functional and technological core, securing innovations such as specialized hydrodynamic hull forms, advanced propulsion systems using alternative fuels, and proprietary construction methodologies, thereby securing the return on significant R&D investment. In shipbuilding, this protection extends to critical performance-enhancing features. Furthermore, the race towards decarbonization has made patents vital for protecting proprietary machinery and system innovations. This includes the sophisticated fuel injection and storage systems required for alternative fuels like LNG, methanol, or ammonia, as well as advanced power management systems for integrated electric propulsion (IEP) and shore power integration. By securing patents, shipbuilders can effectively block

rivals from utilizing their breakthrough technologies, justifying the colossal investment needed for marine R&D.

In addition to the role of Patent protection in shipping, it is also important to emphasise the role of copyright in Shipping, which automatically defends the tangible expression of design through technical documentation, including blueprints, CAD files, stability reports, and, increasingly, the highly valuable source code and algorithms that run the vessel's integrated control and navigation software. Copyright protection prevents a competitor from illegally obtaining and using the design files themselves, even if they could legally attempt to reverse-engineer a physical feature that wasn't patented. Crucially, the increasing digitalization of vessels makes copyright indispensable for securing software and algorithms. The complex source code for the ship's navigation systems, dynamic positioning (DP) software, bridge control systems, and integrated platform management systems (IPMS) are all protected by copyright, safeguarding the digital intelligence that runs a modern ship.

Each vessel is designed by the builders with unique features and designs that make it stand out from others hence it is pertinent to protect such designs. The protection of design rights is vital for the shipping and commercial sector, where visual appeal and brand identity are major commercial differentiators. This IP right protection is mostly utilised for luxury vessels, such as yachts and cruise ships. The design right prevents unauthorized copying of the specific non-functional, ornamental features, allowing the shipbuilder or owner to establish a unique and defensible market identity that fosters premium pricing. Even in non-luxury sectors, such as specialized offshore vessels, design rights can protect a distinctive, easily recognizable shape that has become associated with a particular company's reliable brand.

Finally, in the shipbuilding sector, there is a high requirement to protect confidential operational knowledge and proprietary know-how and for the same trade secrets are often

used. Trade secrets offer a layer of perpetual protection for confidential business information that provides a competitive edge, provided that reasonable measures are taken to maintain their secrecy. Unlike Patents, trade secrets are never publicly disclosed. Trade secrets include, but is not limited to, optimised sequences for block assembly, precise in-house specifications for component tolerance, specialised material preparation techniques, or non-public parameters used in shipbuilding. Furthermore, confidential financial data, supplier pricing agreements, performance models derived from internal testing, and customised client specifications are typically maintained as trade secrets. This form of protection relies heavily on internal security protocols, robust non-disclosure agreements (NDAs) with employees and partners, and strict contractual clauses, ensuring that the valuable "know-how" of the shipyard remains proprietary and defensible.

In essence, the multilayered IP framework recognizes that a ship is a complex asset requiring a multifaceted legal defence. By strategically employing patents, copyright, design rights, and trade secrets in shipbuilding, the shipbuilders can achieve a comprehensive and resilient legal barrier against infringement in the highly competitive and geographically dispersed maritime industry.

Enforcement Challenges in the Global Maritime Ecosystem

The enforcement of Intellectual Property (IP) rights in the global maritime ecosystem presents unique and significant challenges primarily due to the territorial nature of IP law. Patent, design, and trademark rights are strictly limited to the jurisdiction where they are granted, a ship—designed in one country, built in another, and operating under a flag of convenience while traversing international waters—requires IP holders to file and maintain protection in every major shipbuilding nation and port State. This complexity is compounded by the "temporary presence" exception, established under the Paris Convention and UN

Convention on the Law of the Sea, which often restricts the ability of a patent holder in a port State to enforce their rights against a visiting vessel engaged in international trade, thereby facilitating the smooth flow of commerce but simultaneously creating a significant hurdle for enforcing ship-specific patents. Furthermore, the practice of reverse engineering poses a constant threat, as a delivered vessel is a tangible object that competitors can legally analyze to replicate unpatented or trade-secret-protected features, requiring the IP owner to monitor the global supply chain for infringing replacement parts over the ship's entire multi-decade operational life. Finally, cross-border litigation is prohibitively expensive and complex, as it forces IP holders to navigate disparate legal standards, procedural differences, and varying judicial willingness to grant effective remedies, especially in jurisdictions with weaker enforcement regimes, ultimately demanding a proactive, multi-jurisdictional legal strategy to safeguard technological investment.

Strategic IP Management for the Future Maritime Industry

The modern shipbuilding industry stands at a thrilling and challenging inflection point, driven by the global demands for cleaner energy and smarter technology, and for any company investing in this future, protecting their Intellectual Property (IP) is the ultimate competitive battleground. It's no longer sufficient to just build a strong ship; you have to legally ring-fence the innovations that make it smarter and greener. The strategic protection of Intellectual Property (IP) is a fundamental necessity for any company aiming to lead the future of the maritime industry, which is currently defined by global shifts toward decarbonization and digitalization. The strategy prioritizes protecting the substantial R&D investment in green technologies. This involves using Patents to secure innovations in Alternative Fuel Systems, such as the specialized tanks and propulsion methods required for fuels like ammonia and hydrogen, as well as new energy efficiency



devices. This ensures that the competitive advantage gained through sustainable design remains exclusive to the inventor. Simultaneously, a strong defence is mounted around digital and autonomous IP

The sophisticated software and algorithms that enable autonomous navigation and remote control systems are protected by Copyright. Crucially, the sensitive operational data and proprietary internal knowledge such as optimized maintenance schedules and the architecture of the vessel's digital twin, are guarded as highly confidential Trade Secrets. Given the inherently global nature of shipbuilding, this IP strategy must be proactive and international. Companies must file patents in major competing jurisdictions and ensure all collaborative agreements clearly define IP ownership. By strategically using this layered defense, companies effectively translate their technological breakthroughs into defensible, long-term economic dominance in the evolving global maritime market.

Conclusion

The journey through the complexities of Intellectual Property (IP) protection in ship construction underscores a fundamental truth: the modern vessel is an integrated technological system whose value far exceeds the sum of its raw materials. As the maritime industry

accelerates its transition toward decarbonization and digitalization, the strategic defense of this embedded knowledge becomes not merely a legal detail, but a core business mandate. Effective IP management necessitates a multifaceted framework that deploys available legal tools strategically. Patents must protect the functional superiority of green propulsion and energy systems. Copyright is essential for safeguarding the digital heart of the vessel, such as the crucial software, schematics, and design documentation. Meanwhile, Design Rights secure aesthetic distinction, and Trade Secrets maintain a competitive edge through confidential manufacturing know-how and performance data. However, the global mobility of ships and the territorial nature of IP laws present continuous enforcement challenges, demanding a proactive, multi-jurisdictional approach. Future success belongs to those shipbuilders who rigorously file IP in all relevant markets, implement stringent contractual agreements for joint development, and relentlessly monitor the supply chain for infringement. By treating IP as a high-value asset, the industry ensures that its substantial R&D investments yield sustainable, defensible market leadership, successfully navigating the technological currents toward a smarter, greener maritime future ■

RISING THREAT OF HOUTHI BLOCKADE AT BAB AL-MANDEB



The Strait of Hormuz and the Bab al-Mandeb Strait which links the Red Sea with the Gulf of Aden are two key stretches of water essential for global trade. The 18-mile-wide Bab al-Mandeb is an essential gateway at the southerly end of the Red Sea. It is important for dry bulk, tanker, gas, chemical and container trades from Asia to Europe via Suez Canal.

Meanwhile, with tanker traffic out of the Arabian Gulf sharply down and export facilities damaged in various countries across the region, Saudi Arabia's Red Sea port of Yanbu is

now a vital export terminal for crude oil and products. However, this key oil export route is now also under threat and Yanbu itself could be attacked by drones and missiles from the Houthis.

The port is served by Saudi's East-West pipeline which is now said to be operating at its full capacity of seven million barrels a day. However, the renewed threat of Houthi attacks on shipping in the Red Sea could render this export route for oil and products far too risky. This would impose extra strain on the world's energy supply chain and push up

already elevated prices still further.

Major container lines including CMA CGM, Hapag-Lloyd and Maersk had already rerouted vessels around the Cape of Good Hope earlier this year.

The voyage around the Cape adds at least 3,500 nautical miles to container ship voyages which typically take 8-12 days longer and require hundreds of tonnes in extra bunker fuel. For dry and liquid bulk vessels operating at slower speeds, the extra distance can mean voyages take 15-20 days longer ■

Courtesy : www.seatrade-maritime.com

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