



# Powering up

Fish & Richardson PC's **Daniel Tishman, Ralph Phillips, and Hyun Jin (HJ) In** explore the strategic IP considerations of batteries and energy storage solutions

**T**he lithium-ion battery, introduced commercially in 1991, has expanded far beyond the consumer electronics industry, sparking a gold rush of research aimed at producing lower-cost, higher-performance batteries that can be used in a wider range of applications.

Over the past decade, developments in battery technology have led to rapid adoption of electric vehicles (EVs) and opened new possibilities for energy solutions. With these technical advances comes an increase in legal activity, including intellectual property (IP) filings and litigation.

## Patent prosecution, portfolio, and strategic patenting considerations

Patents have contributed significantly to the advances in science and technology that make lithium-ion batteries more affordable and efficient today. There has been a sharp increase in battery patenting over the past few years, with battery patent filings growing from 3,773 in 2010 to 5,319 in 2019, see figure 1.

Most of that activity has been focused on improvements to existing technologies, such as innovations in next-generation materials and components, films and coatings, electrolyte solutions and fabrication techniques. But avenues for groundbreaking innovation continue to open up, particularly in the solid-state battery space.<sup>1</sup> For example, Ford and BMW announced in May 2021 that they had invested \$130m in solid-state battery start-up Solid Power to deliver batteries that will be deployed in EVs by 2030.<sup>2</sup>

Competition among disruptive start-ups seeking the next breakthrough, as well as small-scale improvements to existing lithium-ion technologies, are driving battery patenting activity not only in the US Patent and Trademark Office (USPTO), but also in the federal district courts and the US International Trade Commission (ITC) – each of which has seen increased battery litigation activity in recent years.

Obtaining patent protection for battery innovations requires battery companies to file applications with the USPTO. While patent prosecution can be onerous for any company, there is some evidence that battery companies generally face fewer obstacles than other companies in the EV sphere, particularly those developing AI technologies. Unlike AI and other software-based innovations, batteries typically do not raise subject matter eligibility issues, avoiding a hurdle that is common in other corners of the EV industry. The 2019 average allowance rate in CPC Class H10M was 82%, which is higher than the overall USPTO average for all technologies.<sup>3</sup>

Battery and EV companies should focus on patent strategy beyond prosecution and enforcement. Companies should align their patent strategy with their business plan to ensure that a patent portfolio realises its full economic potential and generates revenue by protecting investments. Strategic considerations include what to patent (components, cell assembly or manufacturing processes, etc), where to patent, what patents to abandon or sell, and licensing strategies.

One key strategic consideration in building a robust patent portfolio involves deciding in

which countries to file patent applications. The costs of obtaining and maintaining a global patent portfolio can quickly add up. A popular option, especially in cases where it is not yet clear in which specific countries IP protection is needed, is to first file a Patent Cooperation Treaty (PCT) application, providing an opportunity to later enter the national phase in designated countries/regions.

As for which countries to file in, there are several factors to consider, including costs and relative ease/difficulty of filing and prosecution, length of examination/time to grant, quality of examination, and the ability to enforce one's patents once they are obtained. For battery-related patents, in particular, it is important to consider where and how big the present markets are for the invention. Additionally, one should ask questions such as: where are the customers located? Where is the competition located and where does it manufacture its products? Where will the customers/competition be in five, 10 or 15 years from now?

Another key consideration involves deciding what aspect of the battery to patent: The entire system or specific components/materials? The manufacturing process? While there is not a one-size-fits-all approach, it is worth noting that proving infringement of a manufacturing process can be difficult, and a patent that is directed to a larger system with many different components can be easier for a competitor to design around in order to avoid infringement. Because each aspect is likely to require its own separate application, such decisions must be made carefully. Battery companies evaluating their IP strategy in the

US should also consider importation and supply chains, as a patent can serve as a tool to prevent importation (eg, through enforcement at the ITC).

## Enforcement and litigation considerations

Due to fierce competition and growth in the battery sphere, it is no surprise that IP litigation is seeing commensurate growth. Up from just 10 cases involving patents related to battery technologies in 2011,<sup>4</sup> while in 2020 there were 93 such cases in US district courts, the US Patent Trial and Appeal Board (PTAB) and the ITC. As of the date of this article, there have been more than 40 such cases in 2021.

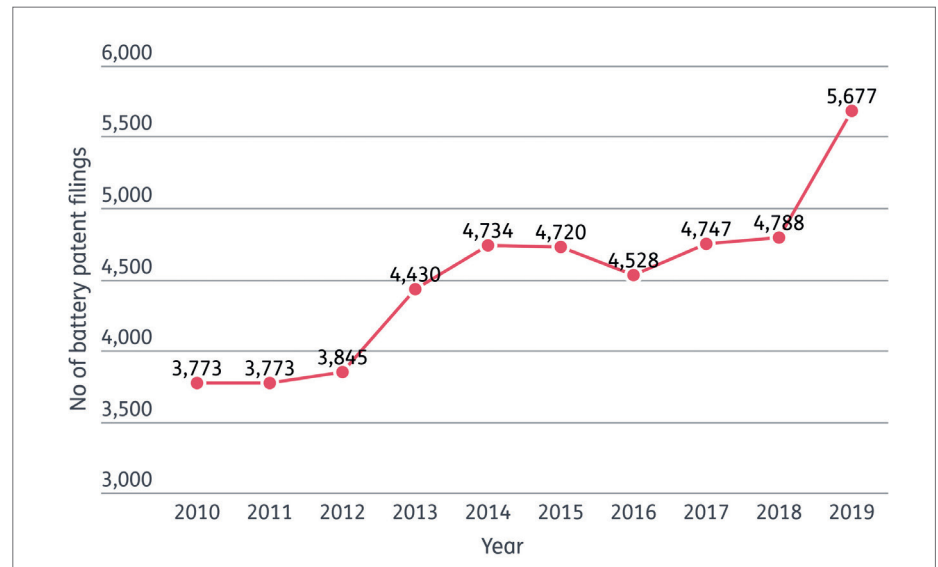
The past few years have seen a flurry of activity in patent litigation between battery manufacturers and component suppliers in high-stakes competitor-on-competitor litigations. Indeed, from 2019 to 2021, LG Chem and SK Innovation engaged in a series of litigations including cases at the ITC, district courts and the PTAB involving batteries, modules, separators, cathode materials and more. The litigation caught the attention of the industry and the government at a time when President Biden introduced a \$2trn infrastructure plan with \$174bn earmarked for EVs specifically.<sup>5</sup> The industry is sure to see more battery wars in the coming years, including litigation among battery companies, EV companies, component suppliers and others. To date, however, the industry has not seen significant litigation from non-practising entities.

There are many details that battery companies should consider when seeking to initiate patent litigation, or when faced with a lawsuit. First, companies seeking an injunction should be aware that there are limitations on when a district court can issue an injunction, which is limited to cases involving “irreparable harm”, among other requirements, including that an injunction would not disserve the “public interest”.<sup>6</sup>

A proceeding under Section 337 at the ITC can offer import bans for companies who can prove infringement, and that a domestic industry exists with respect to the patented article. When considering the ITC, although there are many different ways to satisfy the domestic industry requirement, a patent holder should ideally target patents covering articles that it uses in US manufacturing or assembly activities, and which an alleged infringer cannot easily purchase in the US. Moreover, with ever-increasing attention on green energy, patent holders should be mindful of public interest concerns – whether in the district court or in the ITC. For example, a patent holder who has the ability to meet

Figure 1: Battery patent filings with the USPTO between 2010 and 2019

Source: Juristat as of 17/8/21



demand for any competitor they may displace will be better positioned to overcome public interest challenges.

Secondly, battery companies seeking to assert their patents, or accused infringers, should be mindful of the basics of patent damages. Section 284 of the patent statute provides that a patentee is entitled to damages adequate to compensate for any infringement and “in no event less than a reasonable royalty...”. Damages models associated with extending battery life, or the range of an EV, have a potential to yield significant royalties. Battery companies should also be mindful of the patent “marking” requirement, whereby a patent owner is required to mark its product with the patent number of a patent that covers the product, in order to avoid a limitation on damages under Section 287 of the patent statute.

## Summary

With the spike in economic growth in the battery industry and EV industry, the IP world is seeing a commensurate spike in battery activity. For example, battery-related patent filings are gaining speed, as are litigations involving battery patents. This growth is expected to continue in the coming years and companies should be prepared to protect their own IP, as well as defend themselves against IP enforcement actions from rivals and non-practising entities. Battery companies, EV companies and suppliers should carefully evaluate their IP policies and practices to best position themselves competitively.

## Footnotes

1. [https://www.wsj.com/articles/solid-power-quantumscape-and-the-battle-for-next-](https://www.wsj.com/articles/solid-power-quantumscape-and-the-battle-for-next-generation-batteries-11623847059)

generation-batteries-11623847059.

2. <https://www.caranddriver.com/news/a36321196/bmw-ford-solid-state-battery-investment-announced/>.
3. Source: Juristat as of 07/16/2021
4. The statistics regarding cases involving a patent related to battery technology in this section are derived from Docket Navigator and refer to cases involving any patent that references “battery”, “anode”, “cathode”, “separator”, “electrode”, or “electrolyte”, with false positives eliminated.
5. <https://www.npr.org/2021/04/11/986234531/south-korean-electric-vehicle-battery-makers-reach-1-8b-deal-to-end-trade-dispute>.
6. *eBay Inc v MercExchange, LLC*, 547 US 388, 391 (2006) (citations omitted).

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