Regulatory innovation: an underexplored mine of IP

Regulatory uncertainty over issues such as safety can sometimes lead to patentable innovation – drones are a case in point, say **David St John-Larkin** and **Han-Wei Chen**

For many, the path from innovation to patent has become routine. Inventors meet regularly with patent counsel to assess patent disclosures, discuss current R&D and consider future product development. Committees and others build upon this assessment to make decisions about whether and to what extent to obtain patent protection for certain innovations. Patent applications are filed, patents issued and maintenance fees paid. Minor differences exist, but for many the path from innovation to patent remains predictable and commonplace.

Despite the regularity of disclosure meetings and knowledge that innovation may be widespread within a company, this article addresses yet another (albeit unusual) source of patentable innovation: where technical responses are spurred by a company's efforts in regulatory compliance or regulatory uncertainty mitigation, innovation leading to patentable subject matter may result. A case in point is the unmanned aerial vehicle (UAV) – otherwise known as drones – industry.

The UAV industry

Since images arrived showing an increased military use of drones during the wars in Iraq and Afghanistan, the commercial UAV market has seen an explosive growth. Many companies, large and small, are now racing to produce UAVs in almost every imaginable form from handheld UAVs to those the size that could carry a person, as shown during the 2016 Consumer Electronics Show. Many companies are working to develop novel propulsion, power, and airframe systems while several are working on software to permit coordinated interaction and scalable commercial delivery and monitoring systems.

Yet with all of this activity and promise, the pace of innovation within the UAV industry has resulted in much regulatory uncertainty as lawmakers wrestle with whether, how and how much to regulate this burgeoning industry. Chief among the regulatory concerns is safety - how to craft regulations that will ensure safe operation of UAVs alongside other aircrafts without stifling the potential and possibility of this nascent industry.

Although the evidence is anecdotal, and the extent of any uncertainty is arguable, it would seem that the UAV industry could mitigate regulatory uncertainty by innovating and developing technology related to the very concerns – safety – prompting the uncertainty. Nonetheless, with the caveat that measuring patent filings may be a poor indicator of technological development, there does not yet appear to be any significant increase in patent filings related to this perceived regulatory uncertainty.

Regulatory uncertainty

The regulatory environment facing a given industry may be ill-equipped to handle new technological developments. However, when technology advances so quickly as to create a new industry or displace current technology in an old industry, it may take years for regulations to adequately account for the advancement or displacement. The UAV industry appears to be a prime example of this narrative. Particularly with advancements in battery weight and duration and software control systems, the UAV industry quickly moved from a defence-only marketplace to a commercial marketplace. This shift has greatly expanded the UAV market and has highlighted concerns for some about the safety of UAVs operating within conventionally regulated airspace. As a result, the Federal Aviation Administration (FAA) has expedited its rulemaking and regulations to cover aspects of this burgeoning industry.

For companies in any industry facing what seem to be new, increasing or already sizable regulations that impact their competition, technology often provides an alternative means for diminishing or eliminating risks to a company that are inherent when regulatory uncertainty prevails. The UAV industry, for example, now includes several companies with publicly announced technology aimed squarely at making UAVs safer within airspace shared with commercial flights. From software that prevents fly-away conditions, to mechanical devices that protect people and property from drones falling out of the sky (and that protect the investment made in the drone itself), to notification systems to alert commercial aircrafts to the presence of UAVs, there is much being done to innovate beyond the perceived uncertainty about safety regulations.

UAV regulatory-fuelled innovation

As mentioned, drones have graduated from their traditional images of either being militarised, large and expensive, or being miniaturised, small and limited to recreational use. As technology advances, new applications and commercial markets for UAVs are rapidly emerging. Photography and videography, bridge and construction monitoring, geographical explorations and surveying, disaster relief and emergency responses, news, sports and traffic reporting, merchandise delivery and, perhaps in the future, transportation, are merely a few examples of the potential markets that the future of the UAV industry represents. Consequently, besides the traditional-themed, aeronautical engineering-

related innovations such as autonomous navigation, collision avoidance, communications and controlling systems, and power sources, another group of innovations are being crystalised, not only based on new market applications but also regulatory compliance. At the very least, innovation can be a stopgap to reduce or mitigate risk associated with regulatory uncertainty.

Our brief study of the UAV industry did not exactly match our expectations, however. Take safety as an example. We conducted a search of publicly available, active patents and patent applications with the US Patent and Trademark Office (USPTO) using 'UAV', 'unmanned aerial vehicle' or 'drone' in proximity with safety-related terms such as 'safety', 'crash', 'failure' or 'avoidance' as our search key. Empirical data suggests an increase in safety-related patent filing in the drone/UAV industry during the past decade, although the number of safety-related patent filings remains relatively small. Based on our subjective analysis, while only approximately 50 patent applications related to UAV safety were filed in the US each year about six or seven years ago, that number has more than doubled today. In 2014, more than 120 patent applications that are related to UAV safety were filed with the USPTO.

Although we noticed an increasing number of safety-related cases, the overall volume of cases remains very low – in comparison, there were 578,802 original utility-patent applications filed in 2014 alone. Not only that, but a closer look at the data reveals that most safety-related patent applications recite heavily functional inventions, such as inventions related to collision detection and avoidance as well as flight controls. While there are over 600 UAV safety-related, published patent applications in the past decade, there are only a few that are expressly regulation related. This may be simply because there were not too many regulations in existence in the past, or this may hint that there could be a disconnection between the conventional, engineering-heavy patent review process and the regulatory compliance efforts. For instance, only until recent years did Section 333 of the FAA Modernisation and Reform Act of 2012 (FMRA) provide an exemption process (ie, prior to the finalisation of the Small UAV Rule) to operators who wish to use unmanned aircrafts to perform commercial operations and only until very recently (namely, 21 December 2015) did the FAA require all UAVs of more than 0.55 pounds to register. Yet among the 600-plus applications, only a handful of them are related to flight restriction assistance and compliance, like providing visual guidance of temporary flight restrictions and/or statutory limitations in augmented reality helmets for UAV operators. We would expect to see higher numbers if companies were filing patents based upon their efforts to mitigate regulatory uncertainty.

Similar to automatically disabling the GPS guidance function on a car when the car is detected to be moving, or automatically preventing a driver from writing text messages while driving, regulatory compliance may not provide additional, marketable functions to the UAV industry, but such an area can certainly become a key battleground (though an artificial one it may appear) for strategic innovation and IP protections. The result from our brief study of the UAV industry was surprising because we expected to see a significant increase in the number of safety-related patent applications. Our study suggests that either a more intensive study is necessary to find additional cases, that cases were only recently filed but not yet published or that companies have been unable to or at least not affirmatively filed patents related to technological mitigation efforts.

How to recognise innovation resulting from regulatory uncertainty

It seems unlikely that patent disclosure meetings would necessarily, or as a matter of course, yield disclosure of patentable subject matter related to efforts to avoid regulatory uncertainty. Often companies reeling from uncertainty focus efforts on changing laws or regulations, rather than iterating over the uncertainty with a technological solution. For those involved in the patent ecosystem, however, it would be wise to stay aware of the regulatory uncertainty facing a company and of its efforts or competitors' efforts to mitigate any such uncertainty.

As a general rule, what can be done to issue-spot innovation that results from regulatory uncertainty?

- Interview business executives and attorneys who handle regulatory compliance with a company. What are the regulatory problems that affect the company and are they similar to the problems faced by competitors of the company? What is the company or its competitors doing from a technological standpoint to mitigate the uncertainty?
- Review financial documents (eg, Securities & Exchange Commission filings) describing future business risks. What R&D relates to the business risks?
- Consider whether standards organisations are being discussed or formed to mitigate regulatory uncertainty within an industry. Are there common practices companies could employ to reduce the impact of certain regulations or better control compliance with regulations?
- Review whether there are any technical requirements within regulations, particularly those regulations requiring oversight, registration or active compliance.
- Educate technical staff about patentability and encourage discussion on innovation to overcome potential regulatory limitations. A flag should be raised when there are engineering modifications for regulatory concerns to identify any potential for IP protection.

Innovation attributed to regulatory uncertainty as a potential crown jewel

For innovation stemming from efforts to reduce regulatory uncertainty two truisms seem apparent. First, innovation resulting from efforts to mitigate regulatory uncertainty for one company is likely to apply to other companies facing similar problems. As a result, patents obtained related to this type of innovation may quickly become the crown jewels of a company, particularly if practising the innovation (ie, infringing the patent) becomes the only possible way to avoid or lessen the impact of the regulation. Secondly, an industry-applicable solution runs the risk of becoming formally standardised by a regulator for application across the industry. In some cases, standardising adoption of a patent innovation may neuter the value a company would otherwise have obtained (eg, by limiting licensable revenue). In other cases, standardisation could signal a boon where the industry must pay a minimum royalty or adopt a platform related to the innovation.

Discussion

Consideration of a company's regulatory environment should be an essential part of developing an informed innovation and patent strategy for a company. As evidenced by the UAV and other similarly situated regulated industries, there is much to gain from considering the technological efforts companies can or could employ to neuter or at least mitigate regulatory uncertainty.

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