

Patent Related Trends in the Automotive Industry

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Introduction

By investigating U.S. patent-related trends relevant to the automotive industry from 2008 to 2013 (the “Study Years”), this study uncovered several noteworthy trends in patent filing and litigation activity. For one, the automotive industry has seen robust patent application filing activity during the Study Years, with an increase in Original Equipment Manufacturer (OEM) filing activity relative to the rest of the industry.

Additionally, this study shows an uptick in automotive litigation activity, driven by Non-Practicing Entities (NPEs), also referred to as patent “trolls.” NPEs have been prolific litigators against automotive companies. Because of the difficulty curtailing NPE litigation, post-grant proceedings may provide one solution to those within this industry.

I. The Study

The authors focused on current patent-related trends within the automotive industry. In particular, the authors studied automotive (1) patents filed and (2) U.S. District Court litigation activity from 2008 to 2013.

1. Application Data

For automotive patent activity, the authors analyzed U.S. patent applications filed within typical international subclasses for automotive technology-related patents. These international subclasses¹ were identified as most likely to contain automotive technology patent applications, exclusive of technology with a wide breadth of unrelated uses. After identifying the Relevant Subclasses, the authors used a commercial provider² to compile the number of U.S. automotive applications filed during the Study Years. In order to identify patent application filings related specifically to OEMs, the authors compiled a list of twenty-two (22) OEMs worldwide and limited their search to these 22 OEMs. In addition, the authors compiled information on the top patent assignees and automotive substantive areas of interest during the Study Years.

2. Litigation Data

For patent-related litigation activity within the automotive industry, the authors compiled a list of 122 automotive corporations (the “OEM and Top Supplier List”), including the 22 top OEMs and 100 top automotive parts suppliers worldwide. The authors generated and analyzed a list of all U.S. District Court (federal) lawsuits filed during the Study Years concerning patent infringement where at least one party was on the OEM and Top Supplier List.³

¹ Utilizing World Intellectual Property Organization’s (WIPO) International Patent Classification (IPC), the search was limited to international subclasses B60, “Vehicles in General,” and B62D, “Land Vehicles for Travelling Otherwise than on Rails; Motor Vehicles; Trailers,” (the “Relevant Subclasses”). While other subclasses contain automotive-related patent applications, the subclasses utilized in this study were most likely to contain patent applications related exclusively to automotive technology. WIPO’s IPC can be found at <http://www.wipo.int/classifications/ipc/en/>.

² In particular, the authors used Thompson Innovation to provide patent filing and patent assignee data in the Relevant Subclasses. Thompson Innovation can be accessed at <https://www.thomsoninnovation.com>.

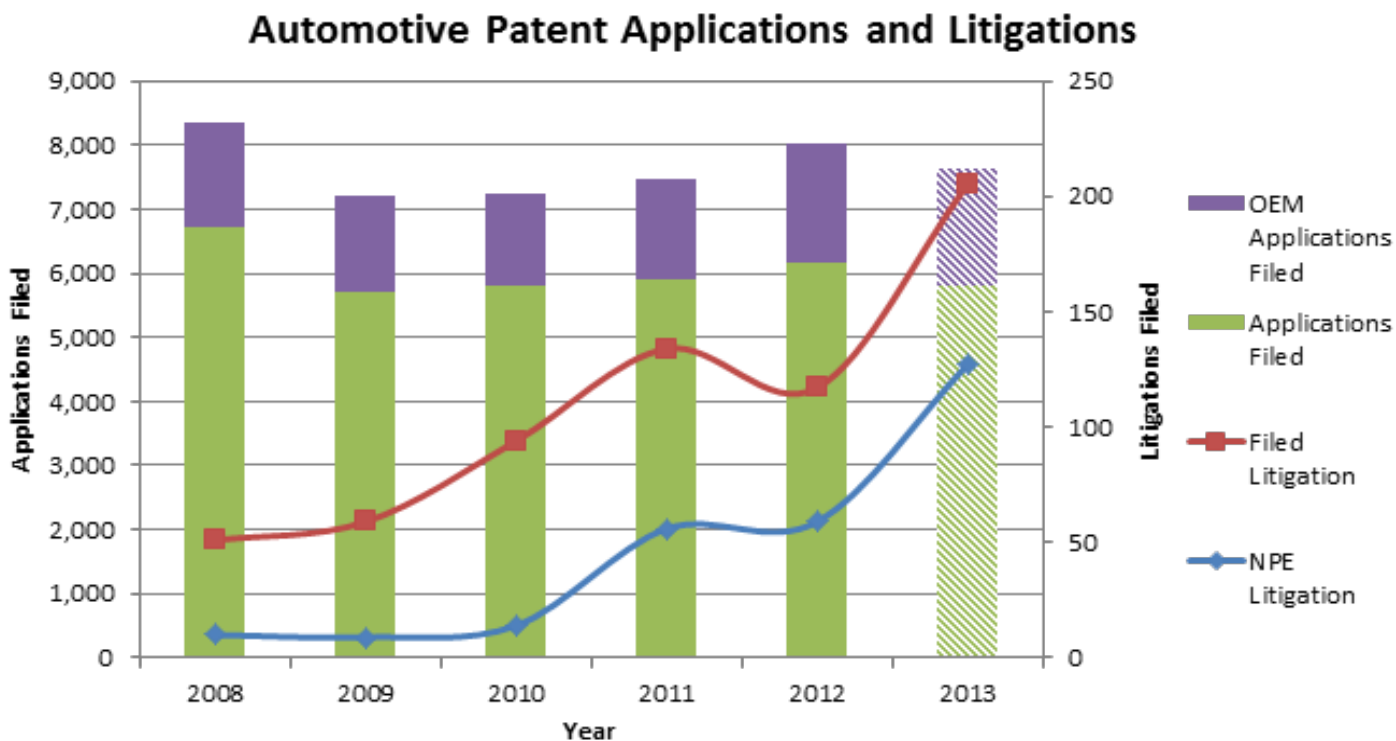
³ The authors used Courtlink® to search for the relevant litigation data during the Study Years. Courtlink® can be accessed through LexisNexis at www.courtlink.com. While the number of overall lawsuits was analyzed, the authors did not identify the total number of plaintiffs or defendants involved in any particular lawsuit or in all lawsuits combined. Therefore, the number of overall lawsuits does not represent the number of total parties involved.

In particular, the authors took special notice of any potential patent NPE litigation. From the overall litigation data, several lawsuits were identified that involved potential patent trolls or NPEs. The potential NPEs were then further analyzed, focusing on eight higher-activity NPEs identified in this study.

II. Automotive Patent Application Filings

The study identified three important patent application filing trends. First, U.S. automotive application filings are on the rise since 2009. Second, OEMs have increased their overall percentage of these filings compared to the industry at large. Third, the top five patent assignees during the Study Years were Toyota, GM, Honda, Ford, and Robert Bosch.

1. Trend 1 - Robust Patent Application Filing Activity



Graph 1: Automotive Patent Applications and Litigations during the Study Years.

Graph 1 shows that patent application filings in the Relevant Subclasses increased from 2009 to 2012. In general, it depicts patent applications and litigations filed during the Study Years. Specifically, the stacked bar graph depicts overall U.S. patent applications filed. Each stacked bar is subdivided into applications assigned to OEMs (shown in purple) and applications assigned to all other entities (shown in green).⁴

In 2008, industry players filed 8,354 applications overall, with 1,628 filings (roughly 19.5%) coming from OEMs. In 2009, this number dropped to 7,211 total filings, with 1,489 (roughly 20.6%) coming from OEMs. This drop likely corresponds to the 2008-2009 economic downturn experienced in the U.S. and worldwide.

However, the overall applications filed in the Relevant Subclasses rose in each subsequent year since 2009. In 2010, 7,226 applications were filed, with 1,409 filings assigned to OEMs (roughly 19.5%). In 2012, 8,021 applications were filed, slightly below 2008 numbers. Also in 2012, 1,864 applications were assigned to OEMs (roughly 23.2%).

In 2013, there were approximately 7,622 automotive patent application filings, although this number may rise as additional

⁴ It should be noted that the 2013 data point is displayed with hash marking because some applications filed in 2013 may not yet be publicly available. In general, U.S. applications are maintained in confidence until their publication, which occurs 18 months after filing. 35 U.S.C. § 122(b)(1)(A) (2012). As a result, 2013 filing numbers will not be fully available until mid-2015. Therefore, at the time of this publication, 2013 filings remain incomplete.

filings become publicly available.⁵ Overall, U.S. applications filed in the Study Years have increased each year since the 2008-2009 economic downturn, showing robust filing activity and a recovering market.

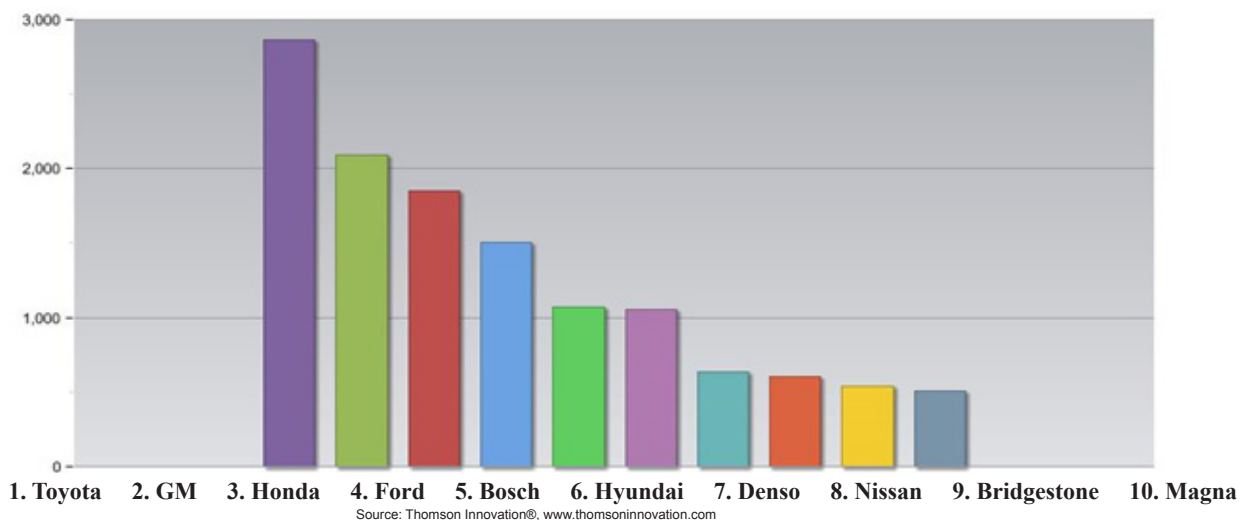
2. Trend 2 - OEMs Increase in Filing Activity Relative to other Filers

Not only does Graph 1 show robust filing activity in the automotive industry, but it also shows OEMs increased in patent application filing activity compared to the rest of the industry during the Study Years. As shown in Graph 1's purple bars, the relative percentage of applications assigned to OEMs is approximately 20% for 2008 to 2011.

However in 2012, the relative percentage of OEM applications rose to 23.2%. Even with the limited information available for 2013⁶, the relative number of applications assigned to OEMs is roughly 23.7%. From 2011 to 2013, OEM increased their relative percentage of applications filed as compared to the remaining applicants. Thus far, the remaining applicants decreased in filing activity from approximately 80% in 2010 to 76.3% in 2013. This demonstrates that OEM filing activity is on the rise in the Relevant Subclasses.

3. Trend 3 – Top Assignees during the Study Years

Top Automotive Assignees (2008 - 2013)



Graph 2: Top Automotive Assignees.

Graph 2 shows the top ten assignees of the applications in the Relevant Subclasses during the Study Years. The top five are primarily OEMs. As shown, Toyota, GM, Honda, Ford, and Robert Bosch have the highest filing activity during the Study Years. Rounding out the top ten filers are Hyundai (No. 6), Denso (No. 7), Nissan (No. 8), Bridgestone (No. 9), and Magna (No. 10).

In addition to the top assignees in Graph 2, the authors considered the substantive areas in the applications filed during the Study Years.⁷ Using the available information, the authors compiled current areas of interest within the Relevant Subclasses. In particular, the applications filed during the Study Years showed the highest content in vehicle communications. Many of those applications focused on technology in the area of object detection and user alerts, utilizing lights, alarms, projected images, interactive screens, and other communication methods to improve vehicle safety.

In addition, patent filers showed a high interest in vehicle structure and safety, filing applications covering various frames, windows, roofs, and safety devices, both interior and exterior. Similarly, the applications during the Study Years also focused on vehicle powertrain developments, including hybrid and plug-in electric systems. Several applications were filed in this area. Notably, these applications covered various types of energy efficient powertrain systems. For example, many applications related to battery technology for electric and hybrid vehicles.

⁵ See *supra* note 4.

⁶ *Id.*

⁷ See *supra* note 2.

Overall, the study shows an uptick in automotive patent application filings, specifically illuminating which companies have been the most active during the Study Years in the Relevant Subclasses. In addition, the study shows what technology is most prolific in the applications filed, highlighting vehicle communications, interior and exterior structures, and powertrain development.

III. Automotive Patent Litigation

The study also identified four important patent litigation trends. Overall, patent litigation has been on the rise within the automotive industry. While litigation activity between industry players remained steady over the Study Years, litigation initiated by NPEs rose significantly. New patent office procedures, described further below, may be a counterbalance to NPE litigation activity.

1. Trend 4 – Litigation Activity on the Rise

As patent filings have remained fairly steady, patent infringement activity has increased substantially and fairly consistently since 2008, as demonstrated in Graph 1. By the authors' count, automotive companies and their suppliers were named as alleged infringers in 51 lawsuits in 2008, a tally which grew in every subsequent year (except 2012, which saw a slight dip from 2011 numbers) to 205 lawsuits in 2013, greater than a 300% increase.

A number of factors may underlie the reasons for the increase in patent infringement suits targeting automotive players. The first is perhaps that the number of patents in force has increased to the highest levels ever. By one estimate, in 2008, there were fewer than 1.9 million enforceable (issued and not expired) United States patents; by 2013, this had increased sharply, to approximately 2.4 million.⁸

Another factor for the increase is the updated patent litigation rules, which affect the ability to file cases against multiple defendants in a single case, so-called "joinder" rules passed as part of the America Invents Act and effective September 16, 2011. The law states in part that multiple accused infringers are only acceptable to be named in a single suit if their activities pertain to "the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, importing into the United States, offering for sale, or selling of the same accused product or process."⁹ This change has impacted NPEs in particular, as they are now forced to file numerous lawsuits naming each alleged infringer individually and at increased expense rather than filing once and naming all defendants in that suit. NPEs typically operate on investor capital. Therefore, they are highly sensitive to the increased costs associated with the need to file multiple lawsuits.¹⁰

Further, consumer vehicles contain numerous and more sophisticated components than in eras past. With entertainment packages, navigation and global positioning systems, energy efficiency components, automation features, telematics, driver assistance, and networking systems which interconnect all of these and more, there are simply more opportunities for patent owners to make infringement claims on technologies employed by automotive manufacturers and their suppliers. Indeed, many of the patents being enforced by NPEs were not originally filed with an automotive application in mind, but with the increase use of computing, communications, and networking technologies in automobiles, an increased number of patent claims now apply to the automotive industry.

2. Trend 5 – Activity between Industry Players

Despite this steady increase in overall litigation filings, as in years past, major players in the automotive industry have been slow to sue, generally being targeted by, rather than initiating, patent infringement lawsuits. Of the cases considered by this study, by the authors' calculations, only 71 (10.8%) were initiated by large automotive suppliers or OEMs. Of these 71 cases, just 25 were considered to be between two large industry players (e.g. OEM v. supplier).

⁸ See Ron D. Katznelson, *A Century of Patent Litigation in Perspective*, Social Science Research Network, Nov. 17, 2014, at 5-6, Fig. 3, available at <http://ssrn.com/abstract=2503140>.

⁹ 35 U.S.C. § 299(a)(1).

¹⁰ As stated previously in Section I, the authors did not analyze the total number of plaintiffs or defendants. Therefore, this litigation trend simply relates to the number of lawsuits filed in the various U.S. district courts. Further study would be necessary to analyze the full effect of the change in joinder rules.

This represents the continuation of a trend that was observed in the early 2000s. Previously, automotive companies and suppliers almost exclusively resolved their disputes regarding intellectual property outside of the court system, with a grand total of six patent infringement suits filed between 1990 and 1998, inclusive.¹¹ Two such cases were filed in 1999, and then seven in 2000.¹² Every year between 1999 and 2013 has seen the filing of anywhere between a low of two (1999, 2006, 2010) and a high of nine (2007) patent infringement cases filed by a large supplier or OEM against another.¹³

Year	Number of suits initiated by top companies/suppliers	Number of suits between two or more top companies/suppliers
2008	10	6
2009	7	3
2010	17	2
2011	16	4
2012	8	3
2013	13	7

Table 1: Recent Automotive Litigation Activity.

As shown in Graph 1, litigation activity rose over the Study Years. Additional litigation data may be seen in Table 1. Specifically, Table 1 depicts suits initiated by identified top companies or suppliers and the number of suits between two or more top companies or suppliers. Cases initiated by top suppliers and OEMs have seen patents asserted that cover components as diverse as AC compressors, regenerative air pumps, titanium components for turbochargers, wheels, drivetrains, airbags, seating, diagnostic tools, and remote tire pressure monitoring. Robert Bosch was the most active initiator of patent lawsuits in this group, filing 19 of the 71 identified. In fifteen of these cases, a variety of manufacturers and importers were accused of infringing patents covering wiper blades and wiper blade motors; 14 of the 15 were filed in 2010 and 2011.

3. Trend 6 – Activity with NPEs

As mentioned, intra-industry disputes have remained steady over the past half-decade, but the total number of suits involving auto suppliers and OEMs has risen dramatically. The reason for this is partly due to the activity of NPEs, as has been the case in many other industries.

In March 2011, the Federal Trade Commission’s (FTC) patent report used the term “‘patent assertion entity’ [PAE] . . . to refer to firms whose business model primarily focuses on purchasing and asserting patents.”¹⁴ The NPEs identified in this study are all PAEs. While a small number of NPEs filed cases against OEMs and auto suppliers in the years 2008-2010, it was not until 2011 that they started exerting greater force (depicted in Graph 1).

In October of that year, the Swiss NPE Beacon Navigation filed lawsuits against nearly every automotive manufacturer¹⁵ for allegedly infringing patents covering features of global positioning system units that it had acquired from Magellan GPS. Beacon Navigation followed with a similarly large round of suits in 2013, once again making use of former Magellan patents. In all, it took Beacon Navigation approximately seven days¹⁶ to file nearly as many patent infringement cases (69) against automobile manufacturers as the top manufacturers and suppliers, combined, filed in six years (71 through all of 2008-2013).

11 See Steve Oberholtzer and Brad Smith, *More Fights Over Intellectual Property: Auto Industry throws away Henry Ford’s Rulebook*, Brinks Gilson and Lione (2007), at 1, available at http://www.brinksgilson.com/files/oberholtzer_smith_article.pdf.

12 *Id.*

13 *Id.*

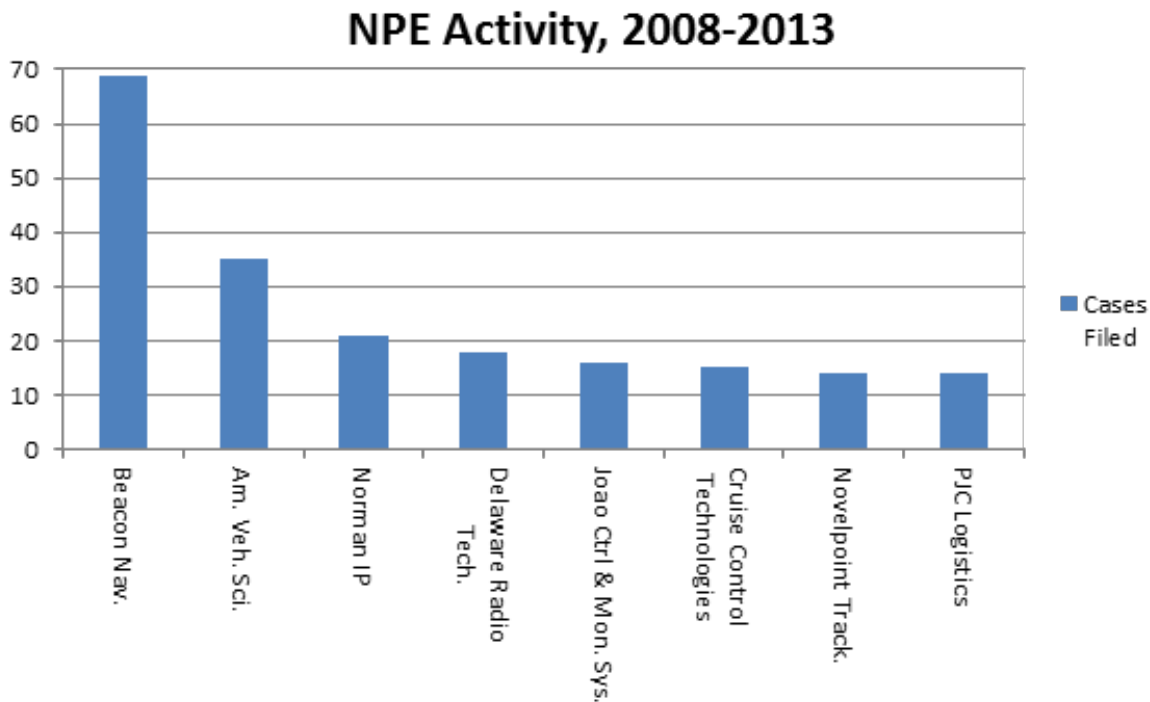
14 Fed. Trade Comm’n, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 8 n.5 (Mar. 2011), available at <http://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf>.

15 For the purposes of this article, we count 17 pairs of suits, all filed in Delaware on October 11, 2011.

16 October 11, 2011, and the week of March 28, 2013 – April 3, 2013.

Beacon Navigation, the most prolific of the NPEs identified, is one of eight that has filed at least ten patent infringement lawsuits against an automotive manufacturer or supplier since 2011. American Vehicular Sciences LLC, a subsidiary of Acacia Research Corporation, has filed 35 suits in that span, targeting manufacturers for allegedly infringing its patents on weight measuring systems, impact sensors, and the like. Norman IP Holdings, which acquired a portfolio of patents related to local area wireless circuitries, is responsible for filing 21 similar lawsuits.

The next five most-prolific NPEs have filed between 14 and 18 lawsuits each on technologies that include analog and digital signal processing, voice and data transmission, security applications, cruise control indicators, and more. Altogether, the eight NPEs filed over 200 lawsuits against OEMs and major suppliers between 2011 and 2013 (see Graph 3).



Graph 3: Number of cases filed against automotive companies by select NPEs.

NPE activity has proven a major disruption to the usual patent litigation activity in the automotive industry and well beyond. The assertion of patents by NPEs has drawn the ire of not only the business community but also the general public, even to the point of leading the President to specifically call on Congress to pass patent reform legislation in order to curb the power of NPEs in his 2014 State of the Union address. However, doing so will be a difficult task. The fact remains that no patent holder is obligated to practice his or her invention, and indeed many patents are not practiced for a variety of good reasons. There is, after all, no absolute standard for deeming certain patents “good” or “bad,” or certain entities as “trolls.”

4. Trend 7 – Post-Grant Proceedings

The America Invents Act of 2011 provided a number of processes which may help manufacturers and suppliers find relief from being targeted with patent infringement lawsuits. Two new tools at the public’s disposal are known as inter partes review (IPR) and post-grant review (PGR). Both of these proceedings are used to investigate whether the claims of an issued patent are valid and; therefore, enforceable.

In a well-publicized case, the first ever IPR case to be decided on the merits was filed in response to a lawsuit that named an automotive manufacturer.¹⁷ On the first day that such reviews could be filed, Garmin Inc. contested the validity of

¹⁷ Petition for Inter Partes Review Garmin Int’l, Inc. v. Cuozzo, U.S. Patent No. 6,778,074 (2012) (No. IPR2012-00001).

claims to speed limit indicators and methods for determining speed that Cuozzo Speed Technologies LLC held and was asserting against Garmin and Chrysler in a suit filed in New Jersey. Similar cases targeted GM, Mazda, and other companies making and using navigation technologies.

Other examples exist of automotive companies successfully using IPR to knock out patents that were being asserted against them. Because of the potential cost savings involved in an IPR proceeding as compared to a full-blown litigation, as well as the fact that infringement litigations can be put on hold while an IPR is resolved, it is expected that IPR will continue to be one way of handling patents that have been asserted against OEMs and suppliers.

However, this strategy is not without its downside: a favorable outcome is never guaranteed in any post-grant proceeding. In addition, those considering initiating an action should not overlook the fact that IPRs and other patent office procedures do not allow the same strategic options as those available in U.S. District Court litigation.

Moreover, IPR is available for use against NPEs and practicing entities alike. No part of an IPR attempts to identify if a patent holder is an NPE. Although many NPEs have recently faced IPRs that could result in an invalidation of their patents, automotive supplier Magna Electronics was the sixth-most targeted entity. Twenty four (24) of its patents faced proceedings that could result in invalidation.¹⁸ Thus, while these proceedings may assist OEMs and suppliers in invalidating the patents of NPEs who are threatening them with litigation, patents held by these OEMs and suppliers may also, in turn, be subject to invalidation by these same proceedings.

Conclusion

In sum, automotive patent filings were steady over the Study Years. Likewise, consistent numbers of intra-industry patent infringement lawsuits have been observed, with two to nine such lawsuits being filed annually, a range which appears to have stabilized since filings first began to increase fifteen years ago. However, the new frontier in auto industry litigation appears to be battling NPEs, possibly setting the stage for an increase in post-grant proceedings between industry players and NPEs. Pressure continues to mount on policymakers to provide the industry with some relief from NPE lawsuits. With the recent dramatic emergence of new technologies in the automotive industry, the future will likely yield vigorous patent application filing activity and related litigation.

About the Authors

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¹⁸ Michelle Carniaux and Michael E. Sander, *The Top 10 Patent Owners at the PTAB: A Who's Who of IPR and CBM Proceedings*, Kenyon & Kenyon LLP IPR Blog, June 9, 2014, available at <http://interpartesreviewblog.com/top-ten-patent-owners-ptab-whos-ipr-cbm-proceedings/>.

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