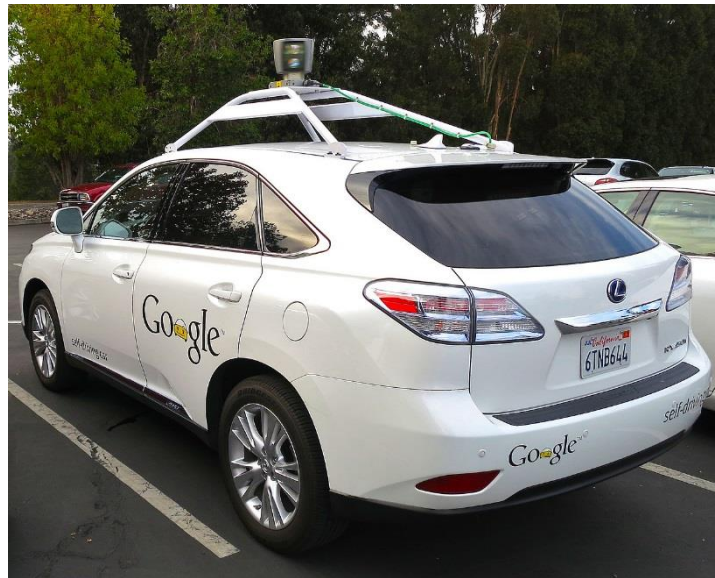


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**HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON INDUSTRY,  
INNOVATION, SCIENCE AND RESOURCES**

**INQUIRY INTO THE SOCIAL ISSUES RELATING TO LAND-BASED  
DRIVERLESS VEHICLES IN AUSTRALIA**



**DR MATTHEW RIMMER**

**PROFESSOR OF INTELLECTUAL PROPERTY AND INNOVATION LAW**

**FACULTY OF LAW**

**QUEENSLAND UNIVERSITY OF TECHNOLOGY**

Queensland University of Technology

2 George Street GPO Box 2434

Brisbane Queensland 4001 Australia

Work Telephone Number: [REDACTED]

## INTELLECTUAL PROPERTY AND AUTONOMOUS VEHICLES IN A GRIDLOCK ECONOMY

Matthew Rimmer

Intellectual property law plays a significant role in respect of the car industry. Patent law provides exclusive rights in respect of scientific inventions. Trademark law plays a critical role in distinguishing car companies from one another in a crowded marketplace. Copyright law offers protection in respect of computer software. However, it has not necessarily proven to be particularly helpful in respect of cars.<sup>1</sup> Technological protection measures have been controversially invoked in the context of vehicles. Trade secrets and confidential information have also been deployed to protect the industry knowledge of car companies.

There is a long history of patent litigation in respect of automobile vehicles. Indeed, Henry Ford faced and defeated allegations of patent infringement from the Association of Licensed Automobile Manufacturers in respect of the Model T.<sup>2</sup> Chuck Tannert noted:

The risks are only going to get greater going forward, as the auto industry is disrupted by four technology-driven trends: diverse mobility, autonomous driving, electrification, and connectivity. Essentially, the very notion of what a car is for is being radically rethought, potentially revolutionizing how industry players operate. Automakers must respond to changing consumer behaviors, develop partnerships, and drive transformational change.<sup>3</sup>

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<sup>1</sup> In *Meshwerks v. Toyota Motor Sales USA*, 528 F.3d 1258 (10th Cir. 2008), Justice Gorsuch – Trump’s Supreme Court of the United States nominee - ruled that digital wireframes of Toyotas are not copyrightable because ‘they depict nothing more than unadorned Toyota vehicles – the car as car.’

<sup>2</sup> Chuck Tannert, ‘In the Auto World, Risk is a Tradition as Old as Racing’, *ArsTechnica*, 2 January 2017, <http://arstechnica.com/cars/2017/01/in-the-auto-world-risk-is-a-tradition-as-old-as-racing/>

<sup>3</sup> Ibid.

There has been much concern about strategic patent litigation in the car industry. More recently, Toyota lost patent litigation against Paice in respect of hybrid vehicles.<sup>4</sup> There have been further actions by Paice against other automobile manufacturers.<sup>5</sup>

The field of intellectual property and autonomous vehicles poses some new challenges. The firm Yoon & Yang LLC noted: ‘As autonomous cars are expected to be in commercial use by 2020, the competition to secure intellectual property rights regarding the key technologies involved is getting fierce.’<sup>6</sup>

The Intellectual Property Science Division of Reuters Thomson has undertaken patent landscapes of autonomous cars.<sup>7</sup> The study observed that there are a number of intertwined technological developments:

The global auto industry is in the midst of three simultaneous, and interconnected, technology revolutions. The first is the quest for cleaner alternatives to internal-combustion engines. The second involves connectivity and linking cars to information or data services. Lastly, the autonomy

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<sup>4</sup> Matthew Rimmer, *Intellectual Property and Climate Change: Inventing Clean Technologies*, Cheltenham (UK) and Northampton (Mass.): Edward Elgar, September 2011.

<sup>5</sup> Jeff Cobb, ‘Hybrid Patent Lawsuit Settled Between Hyundai/ Kia and Paice’, Hybrid Cars, 16 December 2015, <http://www.hybridcars.com/hybrid-patent-lawsuit-settled-between-hyundaikia-and-paice/>

<sup>6</sup> Yoon & Yang LLC, ‘Intellectual Property Issues Regarding Autonomous Cars’, Lexology, 31 December 2015, <http://www.lexology.com/library/detail.aspx?g=5128c8d6-5340-40b0-9c10-582f1f279cd7>

<sup>7</sup> Paul Ingrassia and Joseph White, ‘Automakers, not Silicon Valley, lead in Driverless Car Patents: Study’, Reuters, 5 January 2016, <http://www.reuters.com/article/us-tech-ces-autos-idUSKBN0UJ1UD20160105>

revolution is the effort to develop self-driving cars that could enable services in which electric cars connected to the Web can be summoned to provide rides on demand.<sup>8</sup>

The study highlighted the sub-categories of patents in respect of autonomous driving, driver assistance, and telematics. The study found that ‘Toyota is, far and away, the global leader in the number of self-driving car patents’.<sup>9</sup> The report noted: ‘Toyota is followed by Germany’s Robert Bosch GmbH [ROBG.UL], Japan’s Denso Corp (6902.T), Korea’s Hyundai Motor Co (005380.KS) and General Motors Co (GM.N).’<sup>10</sup> The report observed that technology companies were well down the rankings: ‘The tech company with the most autonomous-driving patents, Alphabet Inc’s (GOOGL.O) Google, ranks 26th on the list.’<sup>11</sup>

Toyota has been seeking to consolidate its position in respect of autonomous vehicles.<sup>12</sup> Its 1,400 patents related to autonomous vehicles is much larger than any of its competitors or rivals. Toyota has stressed that ‘a fully self-driving car as a long term goal, but one that must wait for autonomous driving systems that never make a mistake’.<sup>13</sup> In the meantime, Toyota has said that it is ‘accelerating efforts to equip cars with automatic braking and other safety systems that can help avoid crashes.’<sup>14</sup>

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<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Megan Guess, ‘Toyota has 1,400 Self-Driving Car Patents – Twice as Many as any other Company’, *ArsTechnica*, 6 January 2016, <http://arstechnica.com/cars/2016/01/toyota-has-1400-self-driving-car-patentstwice-as-many-as-any-other-company/>

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

The patent attorney firm Griffith Hack has focused upon Google's patent records in respect of autonomous vehicles.<sup>15</sup> The study noted:

Google have filed hundreds of US patents that are directed towards autonomous vehicles. Approximately 195 of these Google patents have now been published. The published Google patent applications show that Google is investing heavily in developing computer software for autonomous cars. For example, the most recently published Google patents are directed towards 'vehicle perception systems' and 'vehicle decision making systems'. These include using a fleet of autonomous vehicles to detect unusual or changed road conditions (e.g. bad traffic or changes to lane markers) that are fed into a digital road map to optimise the driving route of other autonomous vehicles in the fleet (US 20150254986 and US 9321461) and a method of determining whether a vehicle should continue through an intersection (US 20160035223). Google have also filed US patent applications that appear to be directed towards ride sharing applications.<sup>16</sup>

Such a portfolio demonstrates an interest in the development of fully and partial autonomous vehicles, and ride-sharing technologies. Analyst Rahul Vijh has observed: 'Alphabet (Google) which has been spearheading autonomous cars holds 238 patents/patent applications, majority of which are in V2V and V2I communications hinting that Google will rely on the same "leading from behind" approach with autonomous cars that it followed with Android OS for the smartphone industry'.<sup>17</sup>

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<sup>15</sup> Griffith Hack, 'What Can Patent Records Tell Us About the World's Second Most Valuable Brand?', 28 June 2016, <http://griffithhack.com/ideas/insights/what-can-patent-records-tell-us-about-the-worlds-second-most-valuable-brand/>

<sup>16</sup> Ibid.

<sup>17</sup> Rahul Vijh, 'Autonomous Cars – Patents and Perspectives', IP Watchdog, 7 April 2016, <http://www.ipwatchdog.com/2016/04/07/autonomous-cars-patents-perspectives/id=68045/>

Given the wide range of competitors in the field of autonomous vehicles, patent law will play a significant role in mediating disputes and conflicts over priority. No doubt there will be patent litigation between car manufacturers and new technology companies, particularly in respect of valuable, commercial patents related to autonomous vehicles. Greg deGrazia, a Detroit intellectual property lawyer, has commented on the potential for clashes between the automobile and technology industries:

We're running toward a major issue, frankly. While suppliers are scared to sue someone like General Motors because they could go out of business without the orders, companies like Google and Apple are not intimidated by GM, Ford or anyone else. Look at the judgments coming out of the cellphone wars. Imagine what the damages could be for 10 million cars. What if Google or Apple gets boxed out of the industry? Then they go on the offensive. I fully anticipate patent infringement lawsuits in the pipeline. It's a storm on the horizon. Google and the others are going to make money on their patent portfolio. There's no walking it back. Auto patent infringement lawsuits start rising as soon as autonomous vehicles hit the road.<sup>18</sup>

Patent law could also be used for defensive purposes. Companies may take out patents to ward off litigation from opponents. Patent law may also serve an important role in respect of licensing, partnerships, and collaborations. Patent licensing may help form the foundation of various agreements and alliances between key players in the field.

There has been a push back against the heavy use of patents in the automobile industry. Elon Musk has famously adopted an open innovation approach in respect of Tesla Motors. He has

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<sup>18</sup> Dustin Walsh, 'Smart Cars Collaboration Could Raise Risk of Patent Litigation, Experts Say', Automotive News, 22 August 2016, <http://www.autonews.com/article/20160822/OEM06/160829985/smart-cars-collaboration-could-raise-risk-of-patent-litigation>

been willing to license patents in respect of his electric vehicles.<sup>19</sup> Analyst Rahul Vijn has commented Tesla Motors' foray in autonomous vehicles:

Despite the small portfolio size, Tesla oft shares spotlight with Google – and has announced that the new Model 3 cars shipping in 2017 will be able to run in 'Autopilot' mode at least on freeways and to "Summon" itself out of its parking spot. But that's not just why Tesla is dangerous for competition. Tesla's product seems to be the most advanced commercially-viable implementation of autonomous car technology – seeing how the Model 3 is only expected to cost \$35,000, which means the heat is really on for the other larger traditional automobile players (and also on Google and Apple) to commercialize their own autonomous car technology, and make it accessible to regular consumers, before Tesla takes the road from beneath their wheels.<sup>20</sup>

Toyota has also discussed the use of open models in respect of its hydrogen car.<sup>21</sup> The attraction of an open innovation would be that it would help the growth of the clean technology vehicle market, and competition against the traditional car manufacturers.

In addition to autonomous vehicles, there has also been much interest in the application of 3D printing, and the Internet of Things in the automobile industry. There has been the

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<sup>19</sup> Matthew Rimmer, 'Tesla Motors' Open Source Revolution: Intellectual Property and the Carbon Crisis', *Medium*, 16 June 2014, <https://medium.com/@DrRimmer/95259ff867e6>

<sup>20</sup> Rahul Vijn, 'Autonomous Cars – Patents and Perspectives', IP Watchdog, 7 April 2016, <http://www.ipwatchdog.com/2016/04/07/autonomous-cars-patents-perspectives/id=68045/>

<sup>21</sup> Matthew Rimmer, 'Toyota vs Tesla: Eliminating Patent Trolls to Save the Hydrogen Car', *Crikey*, 15 January 2015, <http://www.crikey.com.au/2015/01/15/toyota-v-tesla-eliminating-patent-trolls-to-save-the-hydrogen-car/>

development of 3D Printed cars.<sup>22</sup> There has been much interest in the capacity of 3D printing to enable the customization of cars, and the development of spare parts. The Internet of Things holds out the promise of connected cars.

From a public policy perspective, there has been much debate about optimal policy settings in respect of patent law. The Australian Productivity Commission recently released its report on Intellectual Property Arrangements at the end of 2016.<sup>23</sup> The report stressed:

Patents can advance human knowledge by encouraging socially valuable innovation that would not have otherwise occurred. However, if poorly calibrated, they also impose net costs on the community. By design, patent protection inhibits competitors from freely using an inventor's technology, but over-protection can stifle competition more broadly, leading to reduced innovation and excessive prices. Moreover, by blocking subsequent innovators, patent protection can perversely inhibit the advancement of knowledge through 'follow-on' innovation.<sup>24</sup>

The report highlights the vigorous debate over patentable subject matter – particularly around new technologies, such as information technology. The Productivity Commission maintains: 'Australia's patent system grants exclusivity too readily, allowing a proliferation of low-

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<sup>22</sup> Chris Anderson, *Makers: The New Industrial Revolution*, New York: Random House LLC, 2012; Mark Hatch, *The Maker Movement Manifesto: Rules for Innovation in the New World of Crafters, Hackers, and Tinkerers*, McGraw-Hill Books, 2013; Luis Lopez and Clay Tweel, *Print the Legend*, Audax Films, 2014, <http://www.imdb.com/title/tt3557464/>; and Guy Rundle, *A Revolution in the Making: 3D Printing, Robots and the Future*, Melbourne: Affirm Press, 2014.

<sup>23</sup> Productivity Commission, *Intellectual Property Arrangements*, Melbourne: Productivity Commission, 2016, <http://www.pc.gov.au/inquiries/completed/intellectual-property/report>

<sup>24</sup> Ibid.



quality patents, frustrating follow-on innovators and stymieing competition.’<sup>25</sup> The Productivity Commission suggests: ‘To raise patent quality, the Australian Government should increase the degree of invention required to receive a patent, abolish the failed innovation patent, reconfigure costly extensions of term for pharmaceutical patents, and better structure patent fees.’<sup>26</sup> For emerging technologies such as autonomous vehicles, it is important that the patent system promote high-quality innovation and competition policy.

Academic researchers such as Professor Michael Heller and Professor Rebecca Eisenberg have discussed the problem of the ‘tragedy of the anticommons’ and the ‘gridlock economy’.<sup>27</sup> There are also a number of policy responses to trying to address the problem of patent thickets, generally, and, perhaps specifically, in respect of autonomous vehicles. The option of patent pools have been used to resolve the problem of fragmented, overlapping patent rights in certain crowded markets. Cross-licensing can be used in certain circumstances. Public licensing is helpful in respect of inventions, in which there has been public funding. Compulsory licensing can be used to provide access to key inventions – in return for compensation to the patent holder. Competition law and antitrust law can also be invoked in certain exceptional circumstances in which there has been an abuse of intellectual property rights.

## **Biography**

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<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

<sup>27</sup> Michael Heller and Rebecca Eisenberg, ‘Can Patents Deter Innovation? The Anticommons in Biomedical Research’ (1998) 380 (5364) *Science* 698-701; and Michael Heller, *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives*, New York: Basic Books, 2008.

Dr Matthew Rimmer is a Professor in Intellectual Property and Innovation Law at the Faculty of Law, at the Queensland University of Technology (QUT). He is a leader of the QUT Intellectual Property and Innovation Law research program, and a member of the QUT Digital Media Research Centre (QUT DMRC) the QUT Australian Centre for Health Law Research (QUT ACHLR), and the QUT International Law and Global Governance Research Program. Rimmer has published widely on copyright law and information technology, patent law and biotechnology, access to medicines, plain packaging of tobacco products, intellectual property and climate change, and Indigenous Intellectual Property. He is currently working on research on intellectual property, the creative industries, and 3D printing; intellectual property and public health; and intellectual property and trade, looking at the *Trans-Pacific Partnership*, the *Trans-Atlantic Trade and Investment Partnership*, and the *Trade in Services Agreement*. His work is archived at SSRN Abstracts and Bepress Selected Works.

Dr Matthew Rimmer holds a BA (Hons) and a University Medal in literature (1995), and a LLB (Hons) (1997) from the Australian National University. He received a PhD in law from the University of New South Wales for his dissertation on *The Pirate Bazaar: The Social Life of Copyright Law* (1998-2001). Dr Matthew Rimmer was a lecturer, senior lecturer, and an associate professor at the ANU College of Law, and a research fellow and an associate director of the Australian Centre for Intellectual Property in Agriculture (ACIPA) (2001 to 2015). He was an Australian Research Council Future Fellow, working on Intellectual Property and Climate Change from 2011 to 2015. He was a member of the ANU Climate Change Institute.

Rimmer is the author of *Digital Copyright and the Consumer Revolution: Hands off my iPod* (Edward Elgar, 2007). With a focus on recent US copyright law, the book charts the

consumer rebellion against the *Sonny Bono Copyright Term Extension Act* 1998 (US) and the *Digital Millennium Copyright Act* 1998 (US). Rimmer explores the significance of key judicial rulings and considers legal controversies over new technologies, such as the iPod, TiVo, Sony Playstation II, Google Book Search, and peer-to-peer networks. The book also highlights cultural developments, such as the emergence of digital sampling and mash-ups, the construction of the BBC Creative Archive, and the evolution of the Creative Commons. Rimmer has also participated in a number of policy debates over Film Directors' copyright, the *Australia-United States Free Trade Agreement* 2004, the *Copyright Amendment Act* 2006 (Cth), the *Anti-Counterfeiting Trade Agreement* 2011, and the *Trans-Pacific Partnership*. He has been an advocate for Fair IT Pricing in Australia.

Rimmer is the author of *Intellectual Property and Biotechnology: Biological Inventions* (Edward Elgar, 2008). This book documents and evaluates the dramatic expansion of intellectual property law to accommodate various forms of biotechnology from micro-organisms, plants, and animals to human genes and stem cells. It makes a unique theoretical contribution to the controversial public debate over the commercialisation of biological inventions. Rimmer also edited the thematic issue of *Law in Context*, entitled *Patent Law and Biological Inventions* (Federation Press, 2006). Rimmer was also a chief investigator in an Australian Research Council Discovery Project, "Gene Patents In Australia: Options For Reform" (2003-2005), an Australian Research Council Linkage Grant, "The Protection of Botanical Inventions" (2003), and an Australian Research Council Discovery Project, "Promoting Plant Innovation in Australia" (2009-2011). Rimmer has participated in inquiries into plant breeders' rights, gene patents, and access to genetic resources.

Rimmer is a co-editor of a collection on access to medicines entitled *Incentives for Global Public Health: Patent Law and Access to Essential Medicines* (Cambridge University Press, 2010) with Professor Kim Rubenstein and Professor Thomas Pogge. The work considers the intersection between international law, public law, and intellectual property law, and highlights a number of new policy alternatives – such as medical innovation prizes, the Health Impact Fund, patent pools, open source drug discovery, and the philanthropic work of the (Red) Campaign, the Gates Foundation, and the Clinton Foundation. Rimmer is also a co-editor of *Intellectual Property and Emerging Technologies: The New Biology* (Edward Elgar, 2012).

Rimmer is a researcher and commentator on the topic of intellectual property, public health, and tobacco control. He has undertaken research on trade mark law and the plain packaging of tobacco products, and given evidence to an Australian parliamentary inquiry on the topic.

Rimmer is the author of a monograph, *Intellectual Property and Climate Change: Inventing Clean Technologies* (Edward Elgar, September 2011). This book charts the patent landscapes and legal conflicts emerging in a range of fields of innovation – including renewable forms of energy, such as solar power, wind power, and geothermal energy; as well as biofuels, green chemistry, green vehicles, energy efficiency, and smart grids. As well as reviewing key international treaties, this book provides a detailed analysis of current trends in patent policy and administration in key nation states, and offers clear recommendations for law reform. It considers such options as technology transfer, compulsory licensing, public sector licensing, and patent pools; and analyses the development of Climate Innovation Centres, the Eco-Patent Commons, and environmental prizes, such as the L-Prize, the H-Prize, and the X-

Prizes. Rimmer is currently working on a manuscript, looking at green branding, trade mark law, and environmental activism.

Rimmer has also a research interest in intellectual property and traditional knowledge. He has written about the misappropriation of Indigenous art, the right of resale, Indigenous performers' rights, authenticity marks, biopiracy, and population genetics. Rimmer is the editor of the collection, *Indigenous Intellectual Property: A Handbook of Contemporary Research* (Edward Elgar, 2015).

Rimmer is currently working as a Chief Investigator on an ARC Discovery Project on “Inventing The Future: Intellectual Property and 3D Printing” (2017-2020). This project aims to provide guidance for industry and policy-makers about intellectual property, three-dimensional (3D) printing, and innovation policy. It will consider the evolution of 3D printing, and examine its implications for the creative industries, branding and marketing, manufacturing and robotics, clean technologies, health-care and the digital economy. The project will examine how 3D printing disrupts copyright law, designs law, trade mark law, patent law and confidential information. The project expects to provide practical advice about intellectual property management and commercialisation, and boost Australia's capacity in advanced manufacturing and materials science.

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