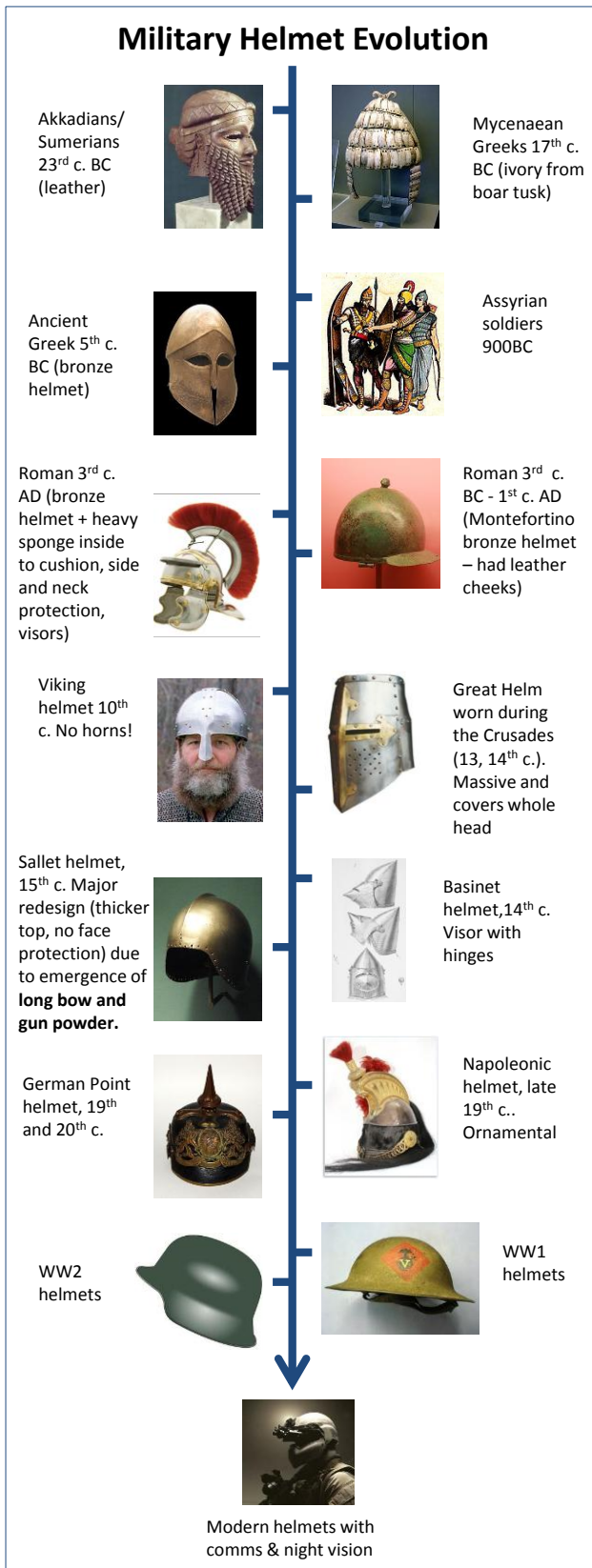


Protective Headgear Technology: A Patent Landscape



Head protection technology has evolved over thousands of years from primarily military applications (see timeline), to today's array of sporting, occupational and transportation uses. The patent system itself is not quite as dated as some of these antiquated helmet designs; however, in light of the recent waves of litigation against helmet manufacturers in the US¹, ClearViewIP have examined the head protection patent landscape from the early 1900s to the present day to determine who the key players are in this field and the filing trends that dominate the last 30 years.

Figure 1, below, shows the patent filing timeline for head protection technologies from all jurisdictions and Figure 2, far below, shows patent applications separated into key jurisdictions:

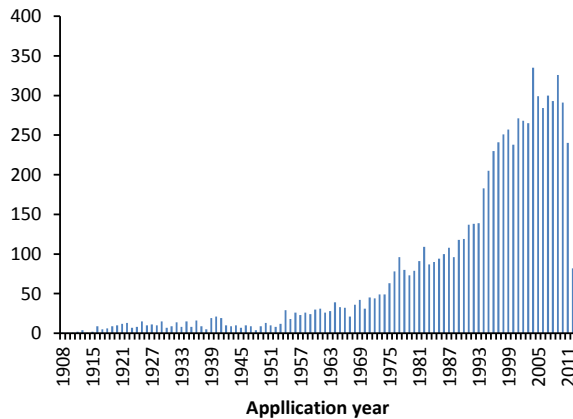


Figure 1: Patent Filing by Year

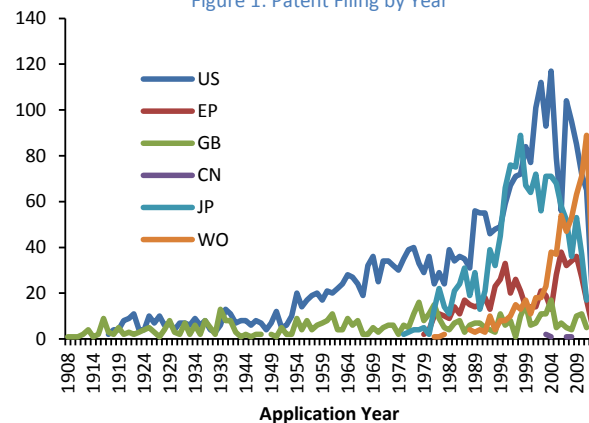


Figure 2: Patent Applications by key Jurisdiction

¹Riddell Helmets Hit with \$3.1 Million Verdict', *NFL Concussion Litigation*, Paul D Anderson (<http://nflconcussionlitigation.com/>, 14/04/2013)

Despite following general global trends across all technology areas², there appears to be a significant drop in European patent filings from 1999–2004. This may be linked to a decrease in applications originating from Japanese companies.

Figure 3, below, shows the filing activity of the top 20 patent assignees in the head protection market:

Row Labels	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Grand Total	
SHOEI CO	9	12	4	5	7	1	3	4	1	1	1	3	5	2	2	2	2	2	1	3		2		72	
SCHUBERTH WERK	2		2	2	2	3		4	1	5	3	3	6	5	2	12	1	1	2	3	4	2			65
ARAI	1	2	3	2	3	5	10	3	3	8	6	1	3	3	1	1	1	1	2		2	2			63
TANIZAWA SEISAKUSHO LTD					1	1	1		3	8	7	2	1		3	6	3	6	1	10	2				55
HONDA				1	1	3	5	7	7	3	2	6		7	7	2	1	1	1						54
YAMAHA	7	1	11	4	5	3	2	3	1	1				1	2	3	2			1					47
MIDORI ANZEN CO						2	4		3		4	1	2	1	2		3	2	4	3	5	3	1		40
SUMITOMO BAKELITE CO		1		4		1		3	4	4	4	3	5	1	1	1			1						33
GALLET SA	1	1	1	1	1	4	1	1	1	3		3	2	1	1	1	4	2	1			2			32
3M		1				1			3	1	3	1	1	1	2	3	3	3	4	1		1			29
BELL HELMETS INC		3	1		2		2		4	1		1		1	6	3			2	1		1			28
HJC CO LTD											1		1	3	3	5	1	3	1	3	3	2			26
SEXTANT AVIONIQUE		5	1	2	2	5		1	2	3															21
SUZUKI MOTOR CO	1	1						1	4	5	1	5													18
BAYERISCHE MOTOREN WERKE AG	2		2			1	2	1	1		3	1	1	1				1	1						17
TORAY INDUSTRIES			1			6	1						1		2	1	2		2		1				17
GENTEX CORP		2	1	1		2				1	1	1			2	2	1	1	1						16
SPORT MASKA INC								1	2							2	5	3	1		2				16
OPTICOS SRL										2		3	1	1	2	1			1	2	1	1			15
MINE SAFETY APPLIANCES CO	1	1		1				1	1	2		1	1	1		1	1	1			1	1	1		15
Grand Total	24	30	27	23	24	38	31	30	41	48	36	35	30	29	38	46	31	27	25	27	21	16	2	679	

Figure 3: Filing activity of top 20 patent assignees

There are notably many Japanese companies included in this list; in particular, Japanese motorbike manufacturers (*Yamaha, Honda, and Suzuki*). Dedicated helmet manufacturers in the list include: *Shoei, Arai, Bell and Helmets Ltd.*

The assignee table shows periods of significant activity in 1999 and 2005. These periods coincide with the introduction of new head protection legislation: Japan JIS T 8133 (2000), ECE Regulation 22 (2001), USA Snell M (2005)³.

² p.39, World Intellectual Property Indicators 2011 (WIPO, http://www.wipo.int/freepublications/en/intproperty/941/wipo_pub_941_2011.pdf, 2011)

³ Belt and Helmets - Legislative Amendments Document (The Governments of the Hong Kong Special Administrative Region of the People’s Republic of China, Transport Department, http://www.td.gov.hk/filemanager/en/content_174/belt_and_helmets-e.pdf, 2013)

From the filing activity, it appears that one of the most significant companies, *Shoei*, were much more active in patenting their inventions in the 1990s than in recent years. The companies who are most actively patenting their technological developments are *Tanizawa* and *Midori Anzen*, companies that produce products for occupational safety. *Mine Safety Appliances* have had a slow and steady filing strategy for head protection technology, while *Sextant Avionique*, an aviation helmet manufacturer, stopped filing under this name in 1999 and is now a part of *Thales Avionics*.

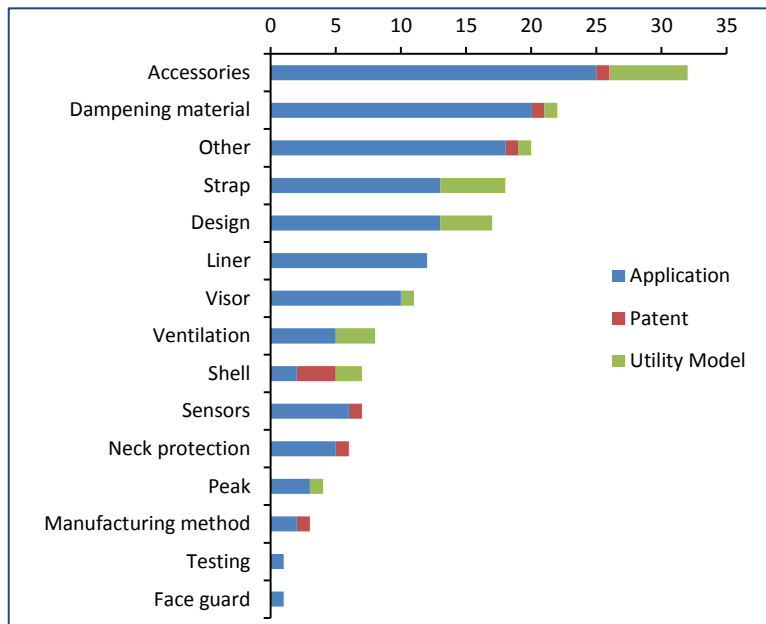


Figure 4: Patents by category filed in last 2 years

In order to elucidate the current patenting trends from the landscape, the applications, patents and utility models, that have a priority date within the last 2 years, were categorised as shown in Figure 4.

Categorisation reveals that recent filing trends indicate accessories that can be used with helmets, such as MP3 players, mobile phones and cameras are the most dominant market, as well as their associated integration devices. There have also been a significant number of filings

relating to dampening materials, such as, foams and mesh-like structures, as well as strap devices and additional design elements.

Some patents that may indicate what the future holds for head protection technology, include: helmets which have sensors and pneumatics to selectively direct cushioning during impact ([US8127373B1](#)); helmets that can attenuate the rotational acceleration of the head during impact ([WO2012151518A2](#)); helmets that include wireless monitoring capabilities ([US2012188083A1](#)); and helmets that comprise of two sections which may be de-coupled following an accident, thus avoiding potential neck damage ([GB2481522A](#)).

Overall, the patent landscape shows the dominance of Japanese companies in this area and that there is correlation between patent filing peaks and the introduction of new legislation. Most significant, however, is the large proportion of recent filings that relate to helmet accessories suggesting that even this relatively specific market application is starting to be influenced by the *Internet of Things*⁴ and relentless connectivity of devices.

⁴ 'Internet of Things' (http://en.wikipedia.org/wiki/Internet_of_Things, 04/04/2013, 15:16)

In addition, the recent bout of NFL concussion litigation⁵ has accelerated the research and development in this area⁶. As Phil Jones, President of a leading US rehabilitation centre⁷ stated in March 2013: “[The litigation]...has caused a wonderful thing to happen, \$100 million of funds have been delivered to do research to get ahead of the game. The strength of the concussion business is that the NFL is the penultimate sports organization in North America, and they are not going to just fold the tent and not play football anymore. The really good news is that it has caused a revenue industry to form”⁶.

For further information on our IP Landscaping services, or a more detailed analysis of Protective Headgear Technology call +44 (0) 845 680 1953 or email info@clearviewip.com



⁵ ‘Riddell Helmets Hit with \$3.1 Million Verdict’, *NFL Concussion Litigation*, Paul D Anderson (<http://nflconcussionlitigation.com/>, 14/04/2013)

⁶ ‘The NFL and The Booming Business of Concussions’, *Forbes*, Darren Heitner (<http://www.forbes.com/sites/darrenheitner/2013/03/06/the-booming-business-of-concussions/>, 06/03/2013, 08:03)

⁷ Dynavision (<http://dynavisiond2.com/>, 2013)