COMING SOON IN 3-D... EVERYTHING!

IP MARKET REPORT

PATENT DATA SHOWS RISE IN 3-D ENTERTAINMENT INNOVATIONS

THOMSON REUTERS

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Overview

In Hollywood, 2009 will be remembered as the year of the 3-D movie. Among the major feature-length motion pictures released in the 3-D format this year were *Avatar, Bolt, Beowulf, Monsters vs. Aliens, Coraline, Ice Age 3, Harry Potter and the Half-Blood Prince, G-Force, Final Destination 4, Toy Story, Up, Cloudy with a Chance of Meatballs* and *A Christmas Carol*. It is estimated that there will be about 7,000 3-D movie screens operating globally by the end of 2009[1] . What effect has this renewed interest in three-dimensional entertainment had on the business of innovation?

To find out, the IP Solutions business of Thomson Reuters tracked patent activity across the 3-D landscape from 2003 to 2009. By analyzing the total numbers of unique inventions in published patent applications and granted patents between 2003 and 2009, researchers were able to identify the areas of 3-D technology development that have been growing fastest. The research finds that interest in 3-D does not stop in Hollywood. In fact, among the three areas showing the most 3-D-related patent activity, 3-D cinema ranks third behind 3-D television and 3-D photography.

This IP Market Report summarizes the findings of that research, outlining the most actively patenting companies and regions of the world where protection is most sought.

Method

Data for this IP Market Report were aggregated using the Thomson Reuters *Derwent World Patents Index*® (*DWPI*℠) to identify global innovation activity in 3-D technology. Within each category, researchers analyzed the total number of unique inventions issued in published patent applications and granted patents in 2003 and 2008 through the first half of 2009. Results from both time periods were then compared to determine overall growth over the last five years.

Both granted patents and published applications were included in the analysis in order to address the time delay between an invention being accepted as a valid application and the granting of the patent. The lag time between a patent application date and patent issuance can be as long as 4.5 years; by including both published applications and granted patents, Thomson Reuters analysts were able to get a more accurate reading of true innovation within the select categories studied for the chosen time periods covered by this report.

[1] Source: Sony, "Seeing the Future in 3-D Television", *The New York Times*, October 9, 2009

Findings and Observations

Top 3-D Technology Growth Areas

While the blockbuster hits from the likes of Pixar and DreamWorks have commanded the most attention for 3-D in the popular press, the real hot spots of three-dimensional technology innovation are in television and still photography applications, which have both seen sharp increases in patenting activity over the last five years.

The following table depicts the top patent areas in 2003 and in 2008, along with the first half of 2009, both in terms of total patent activity and category growth:

Technology	2003	2008	2009 (Q1 & Q2)	% increase 2003-2008	Ranking
3-D Television	612	1034	486	69%	1
3-D Photography	460	720	368	57%	2
3-D Cinema	103	149	61	45%	3

Source: Thomson Reuters *Derwent World Patents Index®*

3-D Television

The business logic of 3-D technology innovation is straightforward: The advent of the television set drove the invention of 3-D cinema to revitalize movie theaters in the 1950s. Likewise, the widespread popularity of home theaters and film-quality DVDs rekindled Hollywood's recent interest in the new wave of 3-D films. As current levels of patent activity affirm, the cycle is continuing and it will only be a matter of time before 3-D televisions start showing up in the home.

Between 2003 and 2008, patent activity in the 3-D television space grew by 69%, with a total of 1,034 unique inventions filed in 2008. Of those, around 4% were filed by Samsung; about 2% were filed by Panasonic and Toshiba. So far in the first half of 2009, 486 unique inventions have been filed in the space.

The following table depicts patenting activity by company in the 3-D television space in 2008:

Patent Assignees	% of all patents in this technology
Samsung	4.15%
Panasonic	2.22%
Toshiba	1.74%
Seiko Epson	1.54%
Electronics & Telecom Res. Inst.	1.35%
Intel Corp.	1.35%
Fuji Film Co. LTD	1.25%
Philips Electronics	1.25%
Sharp	1.25%
Univ Zhejiang	1.16%

Source: Thomson Reuters *Derwent World Patents Index®*

Among the breakthrough new technologies being developed in the space, 30 of the patents filed in 2008 are related to lenticular lenses, which create a more natural 3-D viewing experience without the need for special glasses. This would be a key development helping to bring 3-D television to the mainstream television consumer market.

In terms of regional pockets where patent protection is being sought most frequently for these technologies, the US leads, followed by Japan and China. The table below breaks down 3-D television patenting activity by priority country for calendar year 2008. Each patent cites a priority country, the country where the invention was first filed. This is normally the home country of the inventor and is different than the country of origin, which is where the company is headquartered. The table below ranks the top 10 priority countries and therefore provides an indication of where the innovation in this technology area is originating:

Priority Country	% of all patents in this technology	Number of patents
US	34%	347
JP	24%	246
CN	15%	159
KR	14%	140
DE	2.2%	23
GB	1.9%	20
WO*	1.9%	20
TW	1.7%	18
EP	1.6%	17
FR	1.5%	16

* WO= World (Patent Co-operation Treaty) patents

Source: Thomson Reuters *Derwent World Patents Index®*

3-D Photography

Worldwide digital camera shipments are expected to decline by about 6 percent to 129 million units in 2009 , signaling the widespread saturation of the market. As the industry continues to push for new innovations that will recharge demand, 3-D is starting to emerge as the new frontier in digital photography. Fujifilm has been the first to dip a toe in the commercial waters in this technology with the launch this year of the FinePix Real 3D W1, which takes 3-D digital photos with 10 megapixel resolution and displays them in 3-D on the camera's lenticular screen. Elsewhere in the camera industry, many companies have grown increasingly active in this space.

Between 2003 and 2008, patent activity in the 3-D photography space grew by 57%, with a total of 720 unique inventions filed in 2008. Of those, 8% were filed by Fujifilm; about 3% were filed by Sony and Samsung. So far in the first half of 2009, 368 unique inventions have been filed in the space.

The table on page 5 depicts growth in patenting activity by company in the 3-D photography space in 2008.

[1] Source: IDC, "Study: Camera Market Slump to Hit SLRs Too", *CNET*, April 14, 2009

Patent Assignees	% of all patents in this technology
Fujifilm	8.0
Sony	2.9
Samsung	2.6
Seiko Epson	2.5
Nikon	2.2
Panasonic	2.0
Toshiba	1.7
Canon	1.1
Hitachi	1.1
Victor Co.	1.1
NEC	1.1
Nippon Hoso Kyokai	1.1
RealD	1.1
Sanyo	1.1

Source: Thomson Reuters *Derwent World Patents Index®*

Among the breakthrough new technologies being developed in the space are display screens (Seiko Epson and NEC); image capture and display systems (Hitachi, Nippon Hoso Kyokai, Sanyo, Toshiba and Victor).

In terms of regional pockets where patent protection is being sought most frequently for these technologies, Japan is in the lead, followed by the US and China. The table below breaks down 3-D still photography patenting activity by priority country for calendar year 2008. Each patent cites a priority country, the country where the invention was first filed. This is normally the home country of the inventor and is different than the country of origin shown above, which is where the company is headquartered. The table below ranks the top 10 priority countries and therefore provides an indication of where the innovation in this technology area is originating:

Priority Country	% of all patents in this technology	No. of Patents
JP	49%	356
US	19%	138
CN	8.8%	64
KR	8.0%	58
DE	4.3%	31
TW	3.5%	25
WO*	1.7%	12
FR	1.5%	11
GB	1.4%	10
EP	0.8%	6

* WO= World (Patent Co-operation Treaty) patents

Source: Thomson Reuters *Derwent World Patents Index®*

3-D Cinema

Earlier this year, DreamWorks committed to producing all of its films in 3-D. While it's become hard to escape the steady march of new 3-D features coming soon to a theater near you, it is interesting to note that a great deal of 3-D innovation for the cinema has less to do with movie production than it does with ancillary products like glasses and even industrial washing systems for those glasses.

Between 2003 and 2008, patent activity in the 3-D cinema space grew by 45%, with a total of 149 unique inventions filed in 2008. Of those, 10% were filed by Seiko Epson; 6% were filed by Sony; and over 5% were filed by Real D. So far in the first half of 2009, 61 unique inventions have been filed in the space.

The following table depicts growth in patenting activity by company in the 3-D cinema space in 2008:

Patent Assignees	% of all patents in this technology
Seiko Epson	10
Sony Corp	6.0
RealD	5.4
Thomson Licensing	2.7
Panasonic	2.0
Philips Electronic	2.0
Light Blue Optics LTD	1.3
Samsung	1.3
Aisin AW Co. LTD	0.7
Bluvis Inc.	0.7

Source: Thomson Reuters *Derwent World Patents Index®*

Among the breakthrough new technologies being developed in the space are projection technologies (Seiko Epson, Sony and Philips); anti-piracy systems (Thomson Licensing); and 3-D editing apparatus (Bluvis). Real D is notable for covering a wide range of 3-D technologies including projection systems, specialist glasses, cleaning and glass registration systems and polarization for projection.

In terms of regional pockets where patent protection is being sought most frequently for these technologies, the US leads, followed by Japan and Korea. The table below breaks down 3-D cinema patenting activity by priority country for calendar year 2008. Each patent cites a priority country, the country where the invention was first filed. This is normally the home country of the inventor and is different than the country of origin shown above, which is where the company is headquartered. The table below ranks the top 10 priority countries and therefore provides an indication of where the innovation in this technology area is originating:

Priority Country	% of all patents in this technology	No. of Patents
US	46%	69
JP	29%	43
KR	6.0%	9
WO*	5.4%	8
CN	4.7%	7
FR	4.0%	6
EP	2.0%	3
GB	1.3%	2
TW	1.3%	2
DE	0.7%	1

Source: Thomson Reuters *Derwent World Patents Index®*

Conclusion

The flying meatballs and three-dimensional Scrooges that have taken over the Cineplex this year are just the beginning when it comes to consumer applications for 3-D technology. Based on the level of innovative activity in the 3-D space, it appears that we may soon be watching 3-D commercials on our flat-screen televisions and paging through the 3-D memories of our children's photo albums as well.

Further out on the 3-D development curve, a team of University of Tokyo researchers have recently developed a system that displays animated 3-D holograms which respond to human touch. The system uses airborne ultrasound to detect movement and blows air jets onto the user's hand to mimic the feel of the object. The system itself is not yet patented, but it uses patented remote sensor technologies similar to those used in the Nintendo Wii system and hologram display technology newly patented in August 2009 by a firm called Provision Interactive Technologies (US). Developed primarily for the medical field, the technology may represent a new frontier in diagnostic imaging technology. In the right hands, it may also play a leading role in a future summer blockbuster movie.

Either way, we'll be watching. Emerging developments in innovation will continue to be monitored and reported in future installments of the IP Market Report.

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