Chapter 3

WORLDWIDE PATENTING ACTIVITY

This chapter examines worldwide patent activities in terms of patent applications and grants. The statistics mostly cover the five-year period from 2003 to 2007. More current and detailed data from the Four Offices are presented in Chapter 4. Comparable statistics on the usage of the PCT system appear in Chapter 5.

Applications reported hereafter are counted by the calendar year of filing and grants by the calendar year of granting.

Due to the complexity of the patent system, several different representations of the patent filing process can be made. The following scheme can guide the reader to graphs that correspond to the different representations.

<u>Figures 3.1, 3.2, 3.3, 3.4</u> show the numbers of **patent filings** in terms of application forms filled out. All of the following are counted once only: direct national filings, direct regional filings, PCT international filings.

<u>Figures 3.5, 3.6 and 3.12</u> show the numbers of **requests for patents** as they entered a grant procedure. Direct national and direct regional filings are counted once only. PCT national/regional phase filings are replicated over the numbers of procedures that are started.

Figures 3.7, 3.8 and 3.9 show the equivalent numbers of **requests for national patent rights**. Direct national filings are counted once only. The counts for PCT applications entering national procedures are replicated over the number of countries where they enter this phase. The counts for direct regional filings and PCT regional phase filings are replicated over the number of countries designated in the applications at the time that they enter the regional procedure. This gives a representation in terms of national patent rights.

<u>Figures 3.13, 3.14 and 3.15</u> show the numbers of **patent families** that are generated as the set of first filings, counted once each only, and documented in terms of the flows of priority rights from the first filings to subsequent filings in other countries.

Regarding grants, <u>Fig. 3.10</u> shows the numbers of **granted patents**. All grants are counted once only.

Fig. 3.11 shows the numbers of **validated national patent grant registrations**. Direct national grants are counted once only, but counts for regional office grants are replicated over the numbers of countries for which the grant provides valid registrations. This gives a representation in terms of national patent rights.

Attention is drawn to the fact that, in comparison to the previous editions of TSRs, as a bloc of origin Others excludes R. Korea, and as a filing bloc Others excludes KIPO. Therefore, in this FOSR 2008, there has been a large reduction in counts for the "Others" compared with those in the previously issued TSRs.

PATENT FILINGS

This section shows the development of the numbers of patent applications that were filed throughout the world. These can be filed according to the direct national, direct regional or PCT international procedures.

Fig. 3.1 <u>WOR</u>	LDWIDE PATEN	T FILINGS BY F	ILING PROCED	URE
	4 004 000	1 434 983	1 493 480	1 529 913
1 298 491	1 331 398	136 752	149 663	159 930
115 204 56 <mark>049</mark>	122 633 58 784	61 203	61 434	international
1 127 238	1 149 981	1 237 028	1 282 383	Direct 1 307 377 regional
2003	2004	2005	2006	2007

Fig. 3.1 shows the breakdown of the three types of applications filed.

The more than 1.5 million applications filed in 2007 represent a measure of the number of actions taken to assert IP rights around the world. This has increased by 2.4 percent since 2006. In 2007, 85 percent of these applications were filed according to national procedures but the continuing trend towards usage of supranational systems, and in particular the PCT system, has contributed to the growth in filings.

Considering that not all the offices report filing statistics on a regular basis, one should be careful in interpreting these data. It can at least be concluded that there was an increasing tendency to use the patent systems as a whole.



Fig.3.2 below shows the origin of these applications.

The Four blocs have consistently been the origin for more than 82 percent of patent filings in 2003 to 2007.

Most national applications are made by residents of the countries concerned. To a large extent, applications abroad are made using regional or international procedures.



The following figure (Fig. 3.3) shows the proportion of these applications that are filed at home by residents of each bloc.

In most cases, the first filing is made in the country of residence and subsequent applications are made to protect the invention abroad. Worldwide around 70 percent of applications are made at home. This proportion is slightly decreasing which indicates the further internationalisation of the patent system. This is especially the case for Japan and R. Korea and to a lesser extent for EPC residents. The proportion for U.S. is basically stable but might be starting to increase since 2006.

FIRST FILINGS

The process of patent protection starts with the first filing, an initial patent application made to protect an invention or an innovation prior to any subsequent filing to extend the protection to other countries. The development of first filings in the major filing blocs is shown in Fig. 3.4.



Japan recorded 321 375 first filings (about one third of the whole), the highest number of first filings by bloc in 2007; although this was a decline of 4.4 percent from their 2006 total. The EPC states first filings increased by 2 percent to 131 653. The U.S. with 234 043 first filings showed a growth rate of 8 percent from 2006. R. Korea with 128 438 first filings experienced a lower increase of 3 percent.

PATENT APPLICATIONS FILED

This section describes the development of the number of requests for patents that entered a grant procedure. Direct national and direct regional applications enter a grant procedure when filed. In the case of PCT applications this is delayed to the end of the international phase. In the following figures the PCT application numbers count the applications that entered a national/regional stage in the corresponding year. This leads to higher numbers than in the previous section, because one PCT international filing usually enters into several national or regional procedures. For example, one PCT application as reported in Fig. 3.1 may result in an EPO PCT regional phase entry, a U.S. PCT national phase entry, and an Australian PCT national phase entry, thus producing three PCT national/regional entry phase applications.



The development of worldwide patent applications by filing procedure is shown in Fig. 3.5.

From 2006 to 2007, although the number of PCT national & regional entries decreased slightly, on the whole the number of worldwide patent applications increased by 1.5 percent.

Since 2003, the number of filed applications grew at an average compound growth rate of 5 percent per year. Most of the applications were filed according to the direct national route (75 percent in 2007). The PCT national and regional route and the direct regional route accounted for a stable 22 percent and 4 percent respectively.



The following figure (Fig. 3.6) shows the origin of the applications filed in a granting procedure.

Japan remains the bloc from which the largest share of applications was originating. Except for Japan, the number of applications filed increased from all blocs since 2005. Over the five year period, EPC based applications went up on average by 7 percent, those from the U.S. by 9 percent. Applications from R. Korea increased on average by 12 percent.

These data should be interpreted with caution as the origin of the PCT applications entering a national procedure is not reported in detail from all offices.

DEMAND FOR PATENT RIGHTS

With an increasing use of international and regional systems, and also the increasing number of countries joining such systems¹, the applications filed correspond to more and more requests for national patent rights. This is because one application entering a regional system is now equivalent to a request for a patent in all the regional system member countries.

Fig. 3.7 describes the development of the demand for patent rights resulting from the applications filed as presented in the previous section. The direct national applications have effect in one country only, as does any PCT application entering one national phase procedure. But direct regional applications and PCT applications entering in a regional system are requests for each and every individual member country. So, filing counts for regional offices are expanded to cover the numbers of designated countries. This gives an estimate of the maximum number of patents that could be obtained later from the filed applications in the corresponding year.



The sustained large growth over the five year period shows the effect of the centralized procedures (regional and international) to help users of the system to expand their patent protection with a limited number of procedures.

Fig. 3.4 showed that the total number of first filings in 2006 was 995 381. From these first filings, one year later in 2007, a comparison of Fig. 3.1 and Fig. 3.4 shows that 507 758 subsequent filings were filed (1 529 913 - 1 022 155). Thus on average each first filing led to almost 0.5 subsequent applications in the following year. However, a similar comparison with Fig. 3.5 shows that this corresponds to almost 0.7 subsequent applications entering a grant procedure, and Fig. 3.7 shows that it corresponds to 5 subsequent requests for patent rights throughout the world. This illustrates how the greater

¹ At the end of 2008, 83 states were party to a regional patent system, and 139 to the PCT, compared to 73 and 122 respectively in 2003.

usage of the international and regional patent systems allows a broader geographical coverage of the protected inventions even while filing less applications worldwide.

Based on the same data as Fig. 3.7, Fig. 3.8 below shows the trend for the demand of patent rights by blocs of origin of the applicants.



From 2006 to 2007 the total worldwide demand for patent rights increased by 6 percent. Demand from EPC states residents increased by 8 percent. U.S. residents increased their demand by 6 percent. Demand from R. Korea increased by 4 percent; while the demand originating from Japan increased just a little.

The total worldwide demand for patent rights has increased at a compound growth rate of 13 percent per year from 2003 to 2007, but this has slowed down at the end of the period.



Fig. 3.9 shows the distribution of the demand for patent rights according to the targeted regions. This graph is also related to the data described in Fig. 3.7 and Fig. 3.8.

This shows the influence of regional patent systems on the demand for patent rights. It occurs especially in the EPC states which are made up of many countries.

GRANTS

The development of the use of patent systems is shown next in terms of grants. Fig. 3.10 displays the cumulative numbers of patents granted by the various IP offices.



After a period of stabilisation until 2005, the worldwide number of grants increased from 592 106 in 2005 to 733 845 in 2007. The number of patents granted in the EPC states in 2007 decreased by 3 percent since 2006. The JPO increased by 17 percent in 2007. The USPTO granted 9 percent less patents in 2007 than in 2006. The number of patents granted at KIPO increased by 2 percent in 2007.

Regional granting procedures lead to multiple patent rights in the various designated states within the region concerned. This affects only the EPC states and "Others". Fig. 3.11 illustrates the development of the validated national grants resulting from the decisions reported in Fig. 3.10.



There has been a steady growth of the number of patent rights granted in the EPC states. A growing number of rights were granted via the regional procedure at the EPO either directly or via the PCT system. The fact that the EPC states is made of many countries explains the larger number of patent rights granted there.

INTERBLOC ACTIVITY

The flows between the different blocs and especially the Four blocs are analysed first in terms of applications and then in terms of patent families.

FLOWS OF APPLICATIONS

The flows of patent applications between the Four filing blocs in 2007 are described in Fig. 3.12, which is based on the distinct applications entering a grant procedure (as in Fig. 3.5). The 2006 figures are given in parentheses.



The filing behaviour in 2007 is quite similar to that in 2006. As a general pattern, applicants filed many more applications in the U.S. than in the other blocs. U.S. applicants applied more in the EPC states than in the other regions. With the exception of the flows from R. Korea to Japan, all flows have increased, in particular the flows of applications between EPC states and U.S. (in both directions) and the flow from U.S. to R. Korea show strong relative growth.

PATENT FAMILIES

The information in this section on flows of patent families was obtained from the DOCDB database of worldwide patent publications. The statistics are based on references to priorities given in published applications and differ to some extent from other statistics in this chapter that were based on counts of patent applications provided by individual patent offices. Due to the delay in publication (from the moment of filing), the figures can only be reported with any degree of accuracy after several years have passed.

The flows of patent families from first filings to subsequent filings between Four blocs are shown in Fig. 3.13. The number given for each bloc is the total number of distinct references to priority filings in 2004. This can be taken as an indicator of the number of first filings in the bloc for that year. The flow figures between blocs of origin and target blocs indicate the numbers of secondary filings in the target bloc that referenced priority filings from the bloc of origin in 2004. The comparable figures for 2003 are given in parentheses.



The following Table 3 shows details of flows of patent families between blocs for the same priority years 2003 and 2004. Historical tables for the years from 1995 to 2004 can be found in the web based annex to this report. From information in Table3, out of all first filings in the Four blocs in 2004 (906 973), only 22 percent formed patent families which included at least one of the remaining blocs (196 857).

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Year of priority filings:

2003

Bloc of origin	First Filings			lows to Sub	sequent Filings					Trilateral	Four Blocs
from which priority	in Bloc of	ш	irst filings in Blo	c of Origin lea	iding to priority o	claims in filings	in:			Patent Families	Patent Families
is claimed	Origin	Any other	Any Trilateral	Any Four					Other	from bloc of origin	from bloc of origin
		Blocs	Blocs	Blocs	EPC States	Japan	R. Korea	U.S.	countries		
EPC States	143 618	49 608	45 599	46 500		22 293	9 366	43 784	28 584	20 478	7 688
		(34.5%)	(31.8%)	(32.4%)		(15.5%)	(6.5%)	(30.5%)	(19.9%)	(14.3%)	(5.4%)
Japan	360 185	69 467	63 534	65 964	31 971	•	19 752	61 727	36 706	30 164	11 547
		(19.3%)	(17.6%)	(18.3%)	(8.9%)		(5.5%)	(17.1%)	(10.2%)	(8.4%)	(3.2%)
R. Korea	89 063	15 278	13 988	13 988	4 866	6 901		13 243	8 148	3 476	3 476
		(17.2%)	(15.7%)	(15.7%)	(5.5%)	(7.7%)		(14.9%)	(9.1%)	(3.9%)	(3.9%)
U.S.	271 472	69 320	56 739	57 228	53 091	34 082	14 541		50 909	30 434	11 977
		(25.5%)	(20.9%)	(21.1%)	(19.6%)	(12.6%)	(5.4%)		(18.8%)	(11.2%)	(4.4%)
Four blocs	864 338	203 673	179 860	183 680	89 928	63 276	43 659	118 754	124 347	84 552	34 688
subtotal		(23.6%)	(20.8%)	(21.3%)	(10.4%)	(7.3%)	(5.1%)	(13.7%)	(14.4%)	(9.8%)	(4.0%)
Others	232 016	15 612	14 999	15 071	4 942	2 903	1 003	13 579		1 630	595
		(6.7%)	(6.5%)	(6.5%)	(2.1%)	(1.3%)	(0.4%)	(2.9%)		(0.7%)	(0.3%)
Global total	1 096 354	219 285	194 859	198 751	94 870	66 179	44 662	132 333	124 347	86 182	35 283
		(20.0%)	(17.8%)	(18.1%)	(8.7%)	(6.0%)	(4.1%)	(12.1%)	(11.3%)	(2.9%)	(3.2%)

Year of priority filings:

2004

Bloc of origin	First Filings			-lows to Subs	equent Filings					Trilateral	Four Blocs
from which priority	in Bloc of	F	First filings in Blo	c of Origin lea	ding to priority c	laims in filings	in:			Patent Families	Patent Families
is claimed	Origin	Any other	Any Trilateral	Any Four					Other	from bloc of origin	from bloc of origin
		Blocs	Blocs	Blocs	EPC States	Japan	R. Korea	U.S.	countries		
EPC States	153 239	49 089	45 286	46 744		22 993	8 849	41 486	28 416	19 193	6 485
		(32.0%)	(29.6%)	(30.5%)		(15.0%)	(2.8%)	(27.1%)	(18.5%)	(12.5%)	(4.2%)
Japan	364 733	74 232	68 880	71 538	33 335		20 420	66 012	36 411	30 467	11 038
		(20.4%)	(18.9%)	(19.6%)	(9.1%)		(2.6%)	(18.1%)	(10.0%)	(8.4%)	(3.0%)
R. Korea	102 893	19 268	17 530	17 530	6319	8 158		16 180	8 6 1 4	3 829	3 829
		(18.7%)	(17.0%)	(17.0%)	(6.1%)	(2.9%)		(15.7%)	(8.4%)	(3.7%)	(3.7%)
U.S.	286 108	71 018	60 459	61 045	56 517	36 266	15 619		50 550	32 324	12 721
		(24.8%)	(21.1%)	(21.3%)	(19.8%)	(12.7%)	(2.5%)		(17.7%)	(11.3%)	(4.4%)
Four blocs	906 973	213 607	192 155	196 857	96 171	67 417	44 888	123 678	123 991	85 813	34 073
subtotal		(23.6%)	(21.2%)	(21.7%)	(10.6%)	(7.4%)	(4.9%)	(13.6%)	(13.7%)	(9.5%)	(3.8%)
Others	246 859	16 348	15 930	16 026	5 206	3 041	1 143	14 035		1 554	570
		(8.6%)	(6.5%)	(6.5%)	(2.1%)	(1.2%)	(0.5%)	(2.7%)		(0.6%)	(0.2%)
Global total	1 153 832	229 955	208 085	212 883	101 377	70 458	46 031	137 713	123 991	87 367	34 643
		(19.9%)	(18.0%)	(18.5%)	(8.8%)	(6.1%)	(4.0%)	(11.9%)	(10.7%)	(7.6%)	(3.0%)

Source: EPO DOCDB database Percentages are the counts expressed as proportions of the numbers of First Filings in the countries/blocs of origin.

Table 3: NUMBERS OF PATENT FAMILIES

The development over time of Trilateral patent families is shown in Fig. 3.14. Due to the delay in publication (from the moment of filing), the figures can only be reported with any degree of accuracy after several years of delay. The references to priorities and flows between the Four blocs in Fig 3. 13 and Table 3 are fairly accurate up to the year 2004. But the numbers for Trilateral patent families the year 2003 may not be complete because more time is needed to gather all the evidence of activity in the Four blocs.



After a period of stabilisation, the total number of Trilateral Patent Families increased after 2001. The number of those originating from the EPC states kept decreasing, while those from Japan, R. Korea and most particularly U.S. started to increase again.

The total number of Trilateral patent families in 2003 was 86 182, of which 24 percent originated from the EPC states, 35 percent from Japan, 4 percent from R. Korea, 35 percent from the U.S. and 2 percent from Others.

Out of all priority forming filings in the Four blocs area in 2003, 10 percent formed Trilateral patent families. The proportions differed considerably according to the bloc of origin of the priority forming filings. For the EPC states, 14 percent of priority forming filings formed Trilateral patent families; for the U.S. 11 percent; for Japan 8 percent, for R. Korea 4 percent, and for "Others" 1 percent.

It is also possible to consider Four blocs patent families, a more select group where there is evidence of activity from a priority forming first filing in all Four blocs. The development over time of Four blocs patent families is shown in Fig. 3.15.



What is clear from this graph is that the numbers of Four blocs patent families are expanding rapidly from a low base towards the end of the period that is considered. This reflects increasing interest in obtaining patents in R. Korea. Since the rate of increase of Trilateral families in Fig. 3.14 is not as great as that for Four blocs patent families in Fig. 3.15, this shows that the proportion of Four blocs patent families among Trilateral patent families is itself increasing over the period.