

# PATENT EXAMINATION SYSTEM IS INTELLECTUALLY CORRUPT

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Article I, Section 8, of the U.S. Constitution includes the following sentence about the patent system:

"To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

What follows is a statistical analysis of twenty four years of US patent bibliographic data, from which I argue that the patent system in practice is unconstitutional: i.e., it promotes marketing, which is not 'progress', and it is a registration process where no real determination of 'discoveries' is made, other than randomly in an environment where patent quantity is all that matters.

The intellectual corruption, then, is the publicly sanctioned but privately ridiculed fiction that the average patent is novel, unobvious, and enabled. It is time for everyone to stop pretending that the PTO has the resources and management capabilities to insure novelty, unobviousness, and enablement. Specifically I will argue that:

- PTO management explicitly fosters a patent registration system
- PTO ignores all but its large corporate customers
- PTO advisory boards are impotent; NAS patent studies are underfunded
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- Patent novelty/obviousness ignores significant number of prior patents, let alone most non-patent prior art
- Patent citations/concept mappings convey little information
- Patents incent marketing, not the constitutional inventing
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- Patent quality has been and still is dropping as application volume overwhelms the PTO
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- Reform of patent law contradictions is ignored by patent bar/IP schools
- IP groups of accounting firms ignoring quality as well
- Decades of silence in the IP journals about all of these issues
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- Small inventor status is a fiction

[NOTE 1: Numbers below that correspond to PTO data are within 1-5% of PTO numbers. This is due to assumptions I made about the raw data (over 220 megabytes of data for the 24 years) so that I could do these calculations in my spare time. Such assumptions are applied uniformly across all years, which shouldn't affect the nature of the more important trend results. For example, I calculate patent type (M,C,E) by which section of the Gazette they appear in, while the PTO calculates patent type by which class the patent is assigned to. Similar results, but not the same, and neither is perfectly accurate.]

[NOTE 2: A more rigorous analysis would require access to the full text of patents, PAIR data, and random samplings of filewrappers. Due to the PTO's fraudulent overcharging for even just the fulltext data, \$500,000 would be needed to acquire all of this data. In the near future, I hope to have time to approach a private foundation (or seriously interested company) to seek a few million dollars to do

such a rigorous study. Any serious reform of the patent system will cost hundreds of millions of dollars, preceded by this multimillion dollar study of the current and historical workflow of the patent examination system. Anything less is a waste of time and an indication of a general lack of credibility in seeking real patent reform.]

All that said, here is the data and my comments.

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- **PTO MANAGEMENT EXPLICITLY FOSTERS A PATENT REGISTRATION SYSTEM**
- **PTO IGNORES ALL BUT ITS LARGE CORPORATE CUSTOMERS**
- **PTO ADVISORY BOARDS ARE IMPOTENT; NAS PATENT STUDIES ARE UNDERFUNDED**

The first set of data deals with the gross output of the PTO, starting with the number of patents issued each year. The number of examiners is roughly determined by counting all of the examiners who appear on the front pages of issued patents, and patent lawsuits are the number of unique patents in the LIT ALERT database divided by the number of patents issued. These are rough approximations.

Of interest is that over the last twenty years, the PTO has achieved a steady state issuance rate on the average of about 65% of the patents filed (I assume naively that it takes about two years for a patent to issue, so what is filed in 1997 issues in 1999), and that examiners issue about one patent a week. I argue that this is NOT a result of the PTO management policy, but IS the management policy of the PTO - a patent registration system with some minimal examination constrained by the examiners' two-point disposal system. It's why patents will always take over a year to issue - PTO management looks at patent applications in one year to figure out how many examiners they will need the next year. Given the inadequate upfront patent fees, PTO management can't but be running a registration system, since thorough examination is an unknown cost harder to budget for, as opposed to patent registration-like activities.

"% Patents to Large" measures the percentage of patents going to the largest 250 corporations lead by General Electric, IBM, Hitachi, Canon, Toshiba, Kodak, ATT, US Philips, Du Pont, Siemens and Motorola. That about half of all patents go to such large corporations explains why a) PTO management always talks about its customers and cares only about their views of quality, and b) why PTO management ignores everyone else. Why? When such companies are asked by Congress if they are happy, they will answer "yes" as long as the PTO is issuing quantity over quality to them. And as long as Congress hears "yes" and gets its campaign donations, it leaves the PTO alone, which makes the bureaucrats at the PTO satisfied, since Congress is the only outside influence with direct power over the PTO. It is a nice triangle that works as long as we have a patent registration system to support the needs of older-generation multibillion dollar corporations.

Last year's patent reform bill included amongst other things the creation of a Patent Public Advisory Committee (for which nominations just closed). Yet, with no effective budget to gather data (such as mine below) to verify whatever PTO management will present to the Committee (even if the large-company-dominated Committee cared to pursue issues of quality), it is unlikely this Committee will be a force for fostering patent quality. Not surprisingly, this same Congress that created this impotent patent advisory committee also underfunded studies of patent quality, for which the National Academy of Sciences is now seeking proposals, made worse by the NAS choosing as reviewers of these proposals the very same people who have ignored the issue of patent quality for too many years. So to patent litigators around the country, I say, do not worry in the least, these people are just going through the motions, and growth rates for patent litigation will continue unabated.

Year	Number Patents	Number Examiners	Patents per Examiner	%Patents per Filed(Y-2)	%Patents to Large	%Patents Litigated
1976	70186	1150	61.0	68		0.94
1977	65205	870	74.9	64		1.19
1978	66084	930	71.1	64		1.15
1979	48839	850	57.5	48		1.38
1980	61812	870	71.0	61		1.37
1981	65766	800	82.2	65		1.20
1982	57878	820	70.6	55		1.25
1983	56862	1030	55.2	53		1.68
1984	67214	1330	50.5	61		1.38
1985	71668	1310	54.7	69	54	1.51
1986	70862	1310	54.1	63	54	1.39
1987	82961	1600	51.9	70	54	1.42
1988	77938	1640	47.5	63	53	1.16
1989	95565	2180	43.8	74	53	1.11
1990	90416	2270	39.8	64	53	1.16
1991	96550	2530	38.2	63	53	1.01
1992	97462	2440	39.9	59	53	0.89
1993	98356	2330	42.2	59	52	0.81
1994	101687	2400	42.4	58	52	0.85
1995	101430	2470	41.1	58	51	0.67
1996	109651	2420	45.3	57	50	0.70
1997	112019	2440	45.9	52	48	0.56
1998	147576	3210	46.0	75	47	0.36
1999	153588	3730	41.2	71		0.13

The lower numbers for the Patents Litigated column for the 1990s just means that there are large numbers of lawsuits yet to be filed, say 1/2% of the 1,000,000 patents issued in the latter part of the 1990s, i.e., about 5000 lawsuits (and patent busts) yet to come (many of which will be over crappy software patents - I hope the PTO doesn't change a damn thing :-).

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- **PATENT NOVELTY/OBVIOUSNESS IGNORES SIGNIFICANT NUMBER OF PRIOR PATENTS, LET ALONE MOST NON-PATENT PRIOR ART**
  - **PATENT CITATIONS/CONCEPT MAPPINGS CONVEY LITTLE INFORMATION**
  - **PATENTS INCENT MARKETING NOT THE CONSTITUTIONAL INVENTING**

With regards to 102/103 patent quality, over the long term, patent examination has mostly ignored the non-patent literature, with slightly less than half of all patents citing no non-patent prior art, and the average patent citing about two non-patent prior art items (while the length of literature bibliographies [such as the IEEE] are in the many dozens and growing). And, in citing less than a dozen prior patents, patent examination considers less than all relevant patents. In short, insufficient amount of prior art is being provided to justify patents being given a presumption of validity with regards to novelty, obviousness and enablement - the courts should stop respecting this intellectually unsupportable belief.

Indeed, the column (MechElec)/NewINSPEC is the ratio of new Mechanical and Electrical patents to new articles in the INSPEC abstract, one of the few databases that abstract most scientific and engineering conferences and journals outside the CAS/MEDLINE world. The ratio seems to indicate that the PTO thinks that about 1/3 of everything published in any one year is novel and unobvious. That is nonsensical.

Additionally, with patents citing few if any non-patent prior art, and non-patent prior art rarely if ever including patent citations, there is almost a complete disconnect between patent literature and non-patent literature. Such a disconnect makes it hard to accept that patent literature inspires and

educates, since scientists and engineers in their real publications make little if any mention of patents as references. This is not surprising to patent searchers, who are asked to find patent references after the research and development has been done and the patent application is being prepared (to be augmented by patent references made by the patent examiner). In short, patent citations are extremely unreliable measures of information flows and patent concept maps fairly useless in many fields for determining key players. Any correlations are not causal, because there is no understanding of the statistics of who is actually citing those patents that are cited.

Part of this disconnect was due to the Patent Office's apathy throughout the 1980s and 1990s to provide convenient access to the public to patent abstract and fulltext data. How can scientists and engineers search for inspirational patent data they don't have access to? They couldn't and didn't. So that part of the Constitution where the public gives patent rights in order to get disclosed information that they can learn from hasn't been working too well. And between government funding of R&D (such as the DoD/DoE/NASA/NIH) and altruistic efforts (open source movement, public consortia to sequence the human genome), and even more simply the tens of millions of scientists and engineers around the world who invent if for no other reason than to overcome boredom, it is hard to accept that what drives much inventing is the constitutionally provided patent right. Rather, patents are driving the marketing of invented technologies, which, while beneficial and a legitimate reason to provide a property right, is NOT the property right specified by the Constitution - in short, the patent system is no longer constitutional.

Average number of patent and non-patent prior art references

Year	Patent	Non-Patent	%Zero Non-Pats	IEEE BibLen	(MechElec)		Articles citing patents
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					New	INSPEC	
1976	4.81	0.34	76.5	14.2	0.35		<1%
1977	4.94	0.38	75.0	17.6	0.34		<1%
1978	4.98	0.44	71.6	14.1	0.34		<1%
1979	5.11	0.50	69.6	16.2	0.26		<1%
1980	5.51	0.60	66.4	18.4	0.33		<1%
1981	5.76	0.72	63.6	19.7	0.31		<1%
1982	5.90	0.84	61.2	18.7	0.26		<1%
1983	5.98	0.89	59.7	25.9	0.24		<1%
1984	6.10	0.97	57.5	19.1	0.26		<1%
1985	6.39	1.09	55.0	25.4	0.27		<1%
1986	6.48	1.12	53.9	21.0	0.26		<1%
1987	6.74	1.23	52.0	25.2	0.29		<1%
1988	6.99	1.37	49.8	29.3	0.25		<1%
1989	7.37	1.50	49.3	26.8	0.31		<1%
1990	7.37	1.53	49.2	26.0	0.28		<1%
1991	7.43	1.58	48.9	27.0	0.29		<1%
1992	7.81	1.67	47.8	28.0	0.27		<1%
1993	8.17	1.83	46.0	29.0	0.27		<1%
1994	8.72	1.99	44.9	30.0	0.27		<1%
1995	9.29	2.14	44.3	31.0	0.25		<1%
1996	9.81	2.26	44.4	32.0	0.26		<1%
1997	10.30	2.37	44.9	33.0	0.24		<1%
1998	10.52	2.40	47.3	34.0	0.33		<1%
1999	10.72	2.39	48.8	35.0	0.32		<1%

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- **PATENT QUALITY HAS BEEN AND STILL IS DROPPING AS APPLICATION VOLUME OVERWHELMS THE PTO**

A measure of the decreasing quality is the decreasing number of months spent per claims measured by dividing the number of claims by the time from patent filing to the patent appearing in the Official Gazette. (For the most part, these pendencies are only for non-divisional, non-continued patent applications - determining effective pendencies of things like CIPs is always subjective.) The drop is due to more claims being sought, as average pendency hasn't changed much over the decades (again, PTO registration system policy). Thus given the low amounts of non-patent prior art cited (and missed prior patents) as a percentage of all available non-patent prior art, and the decreasing time spent per claim, it is not unreasonable to conclude that patent quality is dropping as the PTO is overwhelmed with patent applications. (NOTE: I assume that the ratio of independent claims to dependent claims has remained constant over the decades, so that I can then divide the total claims by pendency months to get an "average" amount of time spent per claim. Only analyzing full-text patent data can verify this assumption.)

Year	Average pendency(mon.)			Average Number Claims			Months/Claim		
	Mech	Chem	Elec	Mech	Chem	Elec	Mech	Chem	Elec
1976	19.8	24.0	22.5	9.1	9.6	9.9	2.18	2.50	2.28
1977	19.4	22.5	21.0	9.2	10.2	10.1	2.12	2.20	2.08
1978	20.0	21.7	21.5	9.5	11.3	10.4	2.11	1.93	2.06
1979	21.5	21.6	23.0	9.6	11.3	10.5	2.24	1.91	2.19
1980	24.2	24.1	27.5	9.7	11.3	10.6	2.51	2.13	2.58
1981	24.4	22.9	26.0	9.7	11.4	10.5	2.51	2.01	2.46
1982	25.9	23.0	27.5	9.9	11.2	10.4	2.62	2.06	2.63
1983	27.1	23.6	28.6	9.9	11.5	10.6	2.75	2.05	2.70
1984	26.7	23.3	28.6	10.0	11.8	10.7	2.67	1.96	2.66
1985	24.9	23.0	28.3	10.3	12.2	11.0	2.42	1.89	2.58
1986	23.3	22.5	27.7	10.5	12.5	11.1	2.22	1.80	2.48
1987	21.5	23.5	25.3	10.7	12.6	11.4	2.00	1.86	2.23
1988	20.7	23.0	23.2	11.0	12.8	11.7	1.88	1.79	1.98
1989	19.7	22.5	22.1	11.4	12.9	12.6	1.73	1.75	1.76
1990	18.7	22.2	21.4	11.7	12.7	12.9	1.60	1.75	1.66
1991	19.1	22.5	21.6	12.1	12.9	13.2	1.58	1.74	1.64
1992	18.7	22.5	22.4	12.2	13.0	13.7	1.53	1.73	1.64
1993	18.6	22.3	23.5	12.4	12.8	13.8	1.50	1.74	1.70
1994	19.2	21.7	23.4	12.7	13.0	14.2	1.51	1.66	1.65
1995	19.6	21.6	23.1	13.1	13.3	14.6	1.50	1.62	1.58
1996	21.0	22.6	24.0	13.4	13.7	15.3	1.57	1.65	1.57
1997	22.4	25.5	25.5	13.7	14.6	15.8	1.63	1.75	1.61
1998	23.2	26.5	26.4	14.2	15.3	16.6	1.63	1.73	1.60
1999	23.8	27.6	27.5	14.6	16.0	17.1	1.64	1.73	1.61

Again I ask, why in the last twenty years has the PTO not published the above three sets of data (or something similar)? If I can do it with a PC, why can't the PTO do it with its mainframes and statistical analysis packages? Such data can be calculated both historically, and in realtime, for example, the number of months per claim for patents issuing in the month of April 2000, all easily presented on the PTO web pages. And the same question for the AIPLA, ABA, IPO, and IP law schools. How come none of these "professional" organizations have been and are publishing such data? I pose the same question to the IP magazines and newspapers, publications that get lots of advertising dollars from members of the AIPLA, ABA and IPO.

But the most blame is directed towards the PTO, with its Office of Patent Quality Review, Center for Quality Services, Quality Assurance Specialists, and office for statistical analysis. What numbers do they publish each year? Patent quantity numbers (who got the most, how many by each state, how many went to large corporations, etc.) Nothing relevant to patent quality, so their use of "Quality" should honestly be translated as "Quantity" - Office of Patent Quantity Review, Center for Quantity Services and Quantity Assurance Specialists. It is totally unprofessional for the PTO not to be publishing these statistics, and more detailed statistics based on the full-text data - it has no credibility

when it comes to patent quality as defined by those skilled-in-the-art.

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- **REFORM OF PATENT LAW CONTRADICTIONS IS IGNORED BY PATENT BAR/IP SCHOOLS**
- **DECADES OF SILENCE IN THE IP JOURNALS ABOUT ALL OF THESE ISSUES**
- **IP GROUPS OF ACCOUNTING FIRMS IGNORING QUALITY AS WELL**

Given that the majority of patents are either not valid or should have much narrower claims, one would naively guess that the majority of independent patent claims include the Jepson phrase "the improvement comprising", which would be the intellectually honest style to use to reflect the minimal evolutionary nature of most new inventions. Yet a decreasing number of patent claims use the Jepson format (the Percent Jepson column in the table below) to the point that it will probably be abandoned in the years to come, mostly due to warnings provided in books like Landis. Why then doesn't the patent bar and/or IP schools try to resolve this contradiction so a language can be found for patent claims that allows the improvements to be clearly indicated? And why doesn't the patent bar and/or IP schools try to resolve the equally idiotic contradiction between encouraging scientists and engineers to look at and learn from new patents, and discouraging them from doing so out of fear of being liable for triple damages in an infringement lawsuit?

Why not? Because the patent bar and patent law schools have neglected the issue of patent quality over the last thirty years. I did a survey of the articles in three patent-law-rich publications, IDEA (the IP journal of the Franklin Pierce Law Center), JAIPLA (Journal of the American Intellectual Property Law Association), and JPTOS (Journal of the Patent and Trademark Office Society), from 1976 to 1999. Of approximately 1700 articles over this twenty-four year time period, only about two percent dealt with issues of patent quality (such as problems with prior art, problems with examiners, problems with checking for enablement, problems in claim analysis). It is clear then the apathy of the IP law schools and patent bar to this issue. Two of the very few critical articles appeared in JPTOS - "Is Rule 56/57 leading us to a registration system? Can automation help?" (Dec 1988 JPTOS), and "Is the United States automating a patent registration system for software? A critical review of information management in the USPTO" (Sep 90 JPTOS).

One explanation for the silence of the IP schools is due, indirectly, to Prof. John Barton of Stanford Law School, who in an article in Science magazine, 17 March 2000, page 1933, argues for patent reform. In the middle of the article is a graph of the number of patent lawyers (measured using ABA data) divided by R&D expenditures in billions of dollars, as measured by the NSF. The first sentence of his article? "The number of intellectual property lawyers in the United States is growing faster than the amount of research." No wonder IP schools too busy turning out IP lawyers don't have enough time to do critical studies of the patent system.

The Sloppy Claims column is an anecdotal estimation of the percentage of claims each year that are sloppily issued, by which I mean patents where one or more of the following conditions are true: the antecedent basis is violated, the issued abstract/claims have one or more spelling errors, uses claim language that explicitly violate one or more MPEP rules (like using "for example" in a claim, or use "means for" only once), or where too many "means" clauses are being used, or where the independent claim is excessively long (usually drafted by pro-se inventors who don't realize such claims are easily circumvented). These are sloppy patents in that the errors are unambiguous and semantic free, easily checked with simple computer programs automatically (I have a prototype of such a program at my Web site, which only needs convenient access to the fulltext data to become a real effective tool, a tool which sadly infringes a pathetic patent issued to Aurigin which claims, get this, automatic antecedent basis checking). If I have such a program, it should be quite trivial for the PTO to prepare such a

program, and automatically apply it to all issued patents before the Notice of Allowment is sent out. The PTO doesn't, yet another measure of their apathy towards patent quality.

And to be snide, little if any of all of this patent quality data and critical commentary has its parallel in the publications coming out of Yale Law School or the patent staff of Xerox Corporation. Their credentials are lacking when it comes to being involved with patent quality studies (especially Xerox, which came close to being sanctioned for Rule 56 violations for one of its patents).

Year	Percent Jepson	Percent Critical Law Articles	Patent Lawyers	Sloppy Claims
			----- R&D (billion\$)	
1976	12.8	1% (1/90)	54	~3%
1977	13.1	6% (4/71)	55	~3%
1978	13.7	2% (1/62)	53	~3%
1979	13.7	6% (4/69)	55	~3%
1980	14.5	3% (2/58)	54	~3%
1981	14.4	0% (0/70)	53	~3%
1982	14.1	7% (4/60)	53	~3%
1983	13.1	2% (4/68)	52	~3%
1984	11.9	2% (1/54)	48	~3%
1985	11.1	3% (2/65)	47	~3%
1986	10.5	0% (0/53)	48	~3%
1987	9.6	2% (1/64)	46	~3%
1988	9.2	7% (6/83)	50	~3%
1989	8.4	2% (2/80)	53	~3%
1990	7.8	0% (0/73)	58	~3%
1991	7.2	1% (1/72)	62	~3%
1992	6.6	1% (1/83)	64	~3%
1993	5.8	0% (0/86)	70	~3%
1994	5.3	1% (1/80)	73	~3%
1995	4.6	1% (1/90)	75	~3%
1996	4.1	0% (0/83)	72	~3%
1997	3.7	1% (1/72)	75	~3%
1998	3.1	1% (1/68)		~3%
1999	2.8	1% (1/67)		~3%
(39/1721)				

I find the interest of the intellectual property groups of accounting and management firms just as bad. You would think that people trained in quantitative analysis would be applying such skills to patent data to better inform their clients. But you will find little if any critical quantitative analysis in the publications of these firms, even something as minimal informative as the low probability of finding a patent "Rembrandt in the attic", as opposed to the higher probably of finding a patent "pipe bomb in the neighbor's basement". That's the advice corporate clients need.

The following table shows the percentage of patents examiner by primary examiners solely, around 60% or so for mechanical and chemical patents, around 50% or so for electrical patents, reflecting the greater turnover of examiners in those arts. Again, the minimally fluctuating averages in the 1990s is more evidence of PTO management trying to maintain steady rates of patent issuances as a percentage of filed applications.

Patents examined only by Primary Examiners						
Year	% % %			# # #		
	ME	CH	EL	Mchncl	Chemcl	Electl
1976	52	59	67	17529	15172	7751
1977	59	66	73	19421	13793	8832
1978	65	72	73	21490	15638	8444
1979	71	76	74	17834	11939	6120

1980	76	80	76	24384	15792	7948
1981	78	82	78	25443	18292	8878
1982	78	84	79	21766	15617	9267
1983	70	81	77	19645	15020	8317
1984	62	76	63	21465	15496	8190
1985	60	72	57	21905	15113	8417
1986	57	72	53	20939	13764	8215
1987	55	68	50	23505	14759	9792
1988	57	64	46	21719	14056	8694
1989	59	61	45	26577	16928	10840
1990	61	60	50	26248	15888	11005
1991	56	52	48	25618	14529	11383
1992	54	46	47	23627	13536	11912
1993	54	47	47	21425	15031	13008
1994	56	49	45	23585	14131	14243
1995	61	54	44	24136	16137	14322
1996	66	63	46	27280	19700	17165
1997	67	68	48	26682	24081	18218
1998	69	70	52	35075	28234	29997
1999	60	68	53	34038	29127	29082

Data on the distribution of patents by general type. Over the decades, about a third of the patents have been chemical, with little change. But while mechanical patents used to dominate (about 50% in the 1970s and early 1980s), and electrical patents were 20%, they are both now about equal in their percentages, reflecting the growing importance of electronics and computing and diminishing importance/value of mechanical inventions (New Economy versus Old Economy).

Year	Number Patent	% ME	% CH	% EL	Number Mchncl	Number Chemcl	Number Electl
1976	70186	47	36	16	33414	25299	11473
1977	65205	49	31	18	32491	20713	12001
1978	66084	49	32	17	32938	21623	11523
1979	48839	51	32	16	25035	15636	8168
1980	61812	51	31	16	31859	19552	10401
1981	65766	49	33	17	32346	22063	11357
1982	57878	48	31	20	27844	18402	11632
1983	56862	48	32	18	27777	18352	10733
1984	67214	50	30	19	34168	20172	12874
1985	71668	50	28	20	36196	20776	14696
1986	70862	51	26	21	36543	19024	15295
1987	82961	50	25	23	42130	21447	19384
1988	77938	48	28	23	37480	21909	18549
1989	95565	46	28	24	44540	27359	23666
1990	90416	46	28	24	42480	26112	21824
1991	96550	46	28	24	45292	27616	23642
1992	97462	44	29	25	43450	28820	25192
1993	98356	39	31	28	39294	31423	27639
1994	101687	40	28	30	41635	28812	31240
1995	101430	38	28	32	39526	29406	32498
1996	109651	37	28	34	41241	31103	37307
1997	112019	35	31	33	39448	35039	37532
1998	147576	34	27	38	50365	40261	56950
1999	153588	36	27	35	56207	42532	54849

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- **SMALL INVENTOR STATUS IS A FICTION**



Corporations (large and small) continue to be assigned the vast majority of patents, over 90% of the electrical and chemical patents, but, reflecting that independent inventors are more likely to be mechanical tinkerers, only about 70% of the mechanical patents. Given that PTO application fees are a fraction of what applicants pay their lawyers, that most applicants work for corporations, and that the concept of a small entity beyond a few individuals is meaningless (is a Web startup of 30 employees with a billion dollar valuation a small entity?), why not get rid of the small entity distinction? It wouldn't affect the economy, probably save some individual inventors from wasting their money, and simplify PTO operations.

#### Patents assigned to Corporations

	% % %			#	#	#
Year	ME	CH	EL	Mchncl	Chemcl	Electl
1976	70	91	89	23592	23113	10218
1977	68	92	88	22186	19185	10611
1978	68	92	87	22571	19984	10121
1979	68	92	87	17272	14395	7180
1980	68	91	87	21780	17852	9110
1981	68	91	87	22247	20166	9954
1982	69	91	88	19468	16901	10261
1983	72	92	90	20263	16976	9680
1984	73	93	90	25148	18796	11669
1985	73	93	91	26749	19353	13460
1986	72	93	91	26583	17693	14033
1987	72	92	92	30729	19937	17846
1988	71	93	91	26978	20425	16964
1989	70	93	91	31440	25452	21555
1990	70	92	91	29906	24266	19901
1991	70	93	91	31896	25778	21660
1992	71	93	92	31045	26860	23200
1993	70	93	92	27767	29450	25561
1994	70	93	93	29261	26980	29091
1995	69	92	92	27623	27296	30081
1996	69	92	92	28810	28901	34678
1997	70	93	93	27774	32662	34905
1998	70	93	93	35501	37562	53234
1999	72	92	93	40931	39549	51480

More detailed data on prior art references. Insufficient number of foreign patents (particularly from EPO/PCT/JPO) are being cited. Electronic patents have and continue to do worst at citing non-patent prior art, though all three technology areas have inadequate levels.

#### Average number of prior art references

Year	Mechanical			Chemical			Electrical			IEEE BibLen
	USA	FOR	NON	USA	FOR	NON	USA	FOR	NON	
1976	5.40	0.07	0.51	4.42	0.46	0.36	4.62	0.19	0.16	14.2
1977	5.48	0.07	0.55	4.59	0.50	0.39	4.75	0.20	0.19	17.6
1978	5.53	0.08	0.64	4.77	0.55	0.46	4.63	0.22	0.23	14.1
1979	5.59	0.10	0.67	5.00	0.62	0.55	4.74	0.27	0.30	16.2
1980	6.02	0.13	0.77	5.30	0.72	0.67	5.19	0.35	0.34	18.4
1981	6.28	0.16	0.88	5.65	0.83	0.84	5.36	0.42	0.43	19.7
1982	6.55	0.20	1.01	5.67	0.94	0.94	5.49	0.46	0.57	18.7
1983	6.56	0.23	1.07	5.89	0.93	0.99	5.49	0.52	0.62	25.9
1984	6.82	0.25	1.16	5.90	1.05	1.04	5.59	0.59	0.70	19.1
1985	7.03	0.26	1.29	6.21	1.15	1.14	5.93	0.67	0.83	25.4
1986	7.15	0.28	1.36	6.27	1.28	1.16	6.00	0.71	0.85	21.0
1987	7.52	0.32	1.49	6.46	1.46	1.28	6.24	0.72	0.93	25.2
1988	7.85	0.35	1.63	6.66	1.58	1.45	6.46	0.78	1.02	29.3
1989	8.29	0.39	1.68	6.93	1.83	1.67	6.88	0.91	1.15	26.8
1990	8.34	0.43	1.68	6.86	1.95	1.75	6.90	0.97	1.16	26.0

1991	8.59	0.42	1.71	6.86	2.13	1.83	6.85	0.94	1.20	27.0
1992	9.07	0.50	1.80	7.04	2.33	1.91	7.32	1.03	1.30	28.0
1993	9.72	0.49	1.89	7.33	2.88	2.20	7.47	1.16	1.41	29.0
1994	10.36	0.59	2.00	8.03	3.14	2.47	7.77	1.38	1.52	30.0
1995	11.01	0.68	2.10	8.53	3.69	2.71	8.35	1.48	1.62	31.0
1996	11.25	0.70	2.10	9.21	4.75	2.97	8.95	1.63	1.70	32.0
1997	11.87	0.79	2.11	9.60	6.24	3.35	9.42	1.87	1.66	33.0
1998	12.16	0.87	2.14	9.57	7.05	3.36	9.83	1.99	1.71	34.0
1999	12.48	0.91	2.06	9.72	6.90	3.43	9.96	1.91	1.67	35.0

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The conclusions above are most pertinent to Electronics patents (which should be presumed to be invalid), which is my area of expertise, a technology area where patent examination is far worse off than for Chemical or Mechanical patents. Also, I suspect these statistics will hold true for the European and Japanese Patent Offices if their data were similarly analyzed, especially as their volumes and practices converge to those of the United States. In short, no patent office around the world has really ever mastered the process of large scale patent examination.