

Patent Points

NOW STARTING MY 20TH YEAR...

19 years, 450 Patents

This April will mark 20 years since I became a Patent Agent. I took the Patent Bar exam while still working as a Design Engineer in Silicon Valley. A friend's wife was also studying for the Patent Bar exam so we both had a study partner. We studied every weekend for about 4 months, and we were happy to pass the 6-hour exam on the first try. Half of those in the exam room had flunked before.

I wrote my first patent a little less than a year later on an old laptop computer. It was one of the first laptops to have a built-in mouse. My first purchase was for an expensive laser printer. Back then, everything was printed out, marked up, and printed again over and over until the patent was finally mailed to the Patent Office. Paper and postage were major expenses back then.

I got my second case a few weeks later for a CPU startup and began working full time as a Patent Agent as I started my own practice. There were dozens of CPU patents that we wrote. It's amazing all the clever tricks they used to boost their CPU's performance. Unfortunately, they were making CPU's for mac clones, and when Steve Jobs returned to Apple, he killed the mac clones. The CPU start-up lost their market and shut down. They eventually auctioned off their patents.

My first patent issued in just under one year, a record time even back then. This newly issued patent helped convince new clients that I could get a patent issued. As more patents issued, I would walk into meetings with new prospective clients and drop the stack of patents down on

their desk. If they appeared worried or unsure, I would go through the stack and pull out a patent from their same technical area. They got the idea that I could get their patent issued too.

I soon added another client, a graphics chip startup, and a SIMM manufacturer that was being sued by Wang Labs. It's very easy to justify spending money on writing new patents when you are paying lawyers big money to defend against an old patent.

Many more clients were added during the Internet boom of the late 90's. People were starting companies in their living rooms. Each time I would visit, they would have moved to a bigger location. Some would have several programmers sharing a table and bumping elbows as they worked in the cramped quarters.

More recently, bright engineers from Silicon Valley are moving to new locations, seeding new ventures. It's thrilling to see the Silicon Valley synergy popping up in other locations. Sensing this globalization trend in the early 2000's, I made several exploratory trips overseas in the last 10 years and now have clients in Barcelona, Beijing, Shanghai, Hong Kong, as well as LA and Silicon Valley.

It's been a real pleasure working with so many bright and talented engineers. Patents are like stories told about technologies. Writing the stories about the latest technologies is both exciting and invigorating.

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America Invents Act (AiA)

Many new patent rules went into effect in September as some parts of the new AiA were implemented. The AiA is the most comprehensive change to the US patent laws in decades. In March 2013 the US will be moving to a first-to-file system from the old first-to-invent system.

Early filing is even more critical under the new law. Inventors are cautioned not to disclose their inventions without an NDA, and to be careful even with NDA's in place.

New Forms for the AiA

The patent filing process has changed as a result of the new AiA law. Patent filings can now be made by the Assignee (company) rather than only by the inventors as under the prior law.

The PTO has been patient during the transition to the new law, and has helped with new standardized forms. These new forms may be electronically signed, further reducing the 'paperwork' burden. An electronic signature is the person's full name typed between forward slashes, /Like This/.

The PTO has created a new 2-part form that allows the CEO or CFO to sign once, and then the same signed form is used for multiple patent filings in the future.

A new oath/declaration form is greatly simplified from the prior form used. Rather than use a single form that lists all the inventors, multiple forms are used, one for each inventor. Each declaration form lists only one of the inventors, so each inventor signs his own form, then the multiple forms are filed together.

New Micro-Entity Fees

Individual inventors might benefit from a new "Micro-Entity" designation that cuts small-entity fees by half. Individual inventors will pay about one-quarter of what larger companies pay. Individual inventors must earn less than 150K\$ and cannot be named on more than four patents that are not assigned to an employer.

Marvell Hit by B\$ Verdict

A jury found that Marvell Technologies had infringed two patents held by Carnegie Mellon University. The patents relate to reading from hard disk drives. The jury found that the infringement was willful, so the initial \$1.2 Billion dollar award may be tripled. Marvell has about \$2 Billion in cash, so paying the full damages could cripple the company.

Several purchases of patent portfolios last year valued patents at about 750 K\$ per patent, well above the typical 250 K\$ per patent. The Marvell damages work out to be about a thousand times that price per patent. Compared with 600 M\$ per patent in damages, 0.75 M\$ per patent seems an outright bargain.

The huge damages award should incite other Universities and patent holding companies to more aggressively license and defend their patents. The two patents were issued about ten years ago, and thus presumably are based on old technology.

Multi-Junction Solar Cell

While most of the patents I write are for circuits, PC's, or software, I occasionally work in other fields. Although I have a MSEE, my Bachelor's degree is in Chemical Engineering, and I have worn a bunny suit and worked inside a wafer fab. My choice for my informal "Patent of the Year", shown on page 3, is from the Semiconductor Materials Science area.

Solar cells having several p-n junctions stacked on top of each other collect more of the sun's energy. These junctions are often made from III-V compounds such as Gallium-Arsenide (GaAs), but the lattice of GaAs does not exactly match the lattice of common silicon substrates, causing lattice defects.

The inventor, Dr. C.C. Hsu of ASTRI in Hong Kong, developed a special initial epi layer that has atoms fit into silicon lattice sites, thus reducing lattice defects when a certain crystal orientation is used. Congratulations Dr. Hsu !



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(12) **United States Patent**
Hsu

(10) **Patent No.:** **US 8,299,351 B2**
(45) **Date of Patent:** **Oct. 30, 2012**

(54) **EPITAXIAL GROWTH OF III-V COMPOUNDS ON (111) SILICON FOR SOLAR CELLS**

(75) Inventor: **Chung Chi Hsu**, Hong Kong (HK)

(73) Assignee: **Hong Kong Applied Science and Technology Research Institute Co., Ltd.**, Hong Kong (HK)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 920 days.

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H01L 31/00 (2006.01)

(52) **U.S. Cl.** **136/255**

(58) **Field of Classification Search** 136/255,
136/261

See application file for complete search history.

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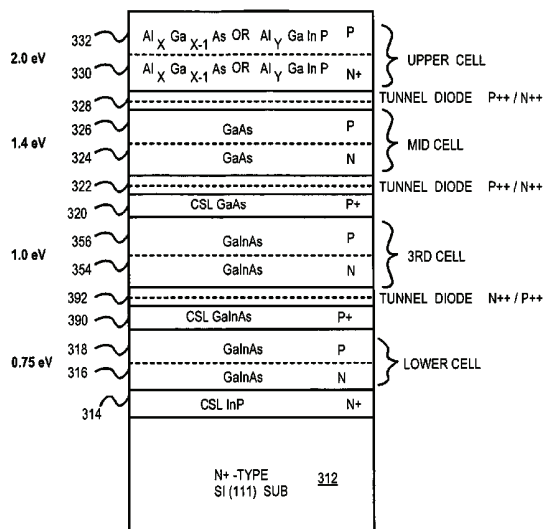
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(57) **ABSTRACT**

A multi-junction device can be used as a high efficiency solar cell, laser, or light-emitting diode. Multiple epitaxial films grown over a substrate have very low defect densities because an initial epitaxial layer is a coincidence-site lattice (CSL) layer that has III-V atoms that fit into lattice sites of Silicon atoms in the substrate. The substrate is a Si (111) substrate which has a step height between adjacent terraces on its surface that closely matches the step height of GaAs (111). Any anti-phase boundaries (APBs) formed at terrace steps cancel out within a few atomic layers of GaAs in the (111) orientation since the polarity of the GaAs molecule is aligned with the (111) direction. A low CSL growth temperature grows GaAs horizontally along Si terraces before vertical growth. Tunnel diode and active solar-cell junction layers can be grown over the CSL at higher temperatures.

20 Claims, 16 Drawing Sheets



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450 Patents Issued

After 19 years of writing patents as a full-time Patent Agent, 450 applications that I've written have now issued as patents. Congratulations inventors!

You can view the 450 issued patents I've written at:

www.gpatent.com

Rates Set for 2013

My hourly rate for 2013 will be \$250 per hour, billed in quarter-hour increments. Fixed-price quotes are available for patent applications to facilitate budgeting and avoid expensive surprises.

Prosecution work such as amendments and other paperwork is billed at the hourly rate. Litigation-support work is billed at a higher rate. Patent searches are billed at a flat \$500 for U.S. abstract searches. Patents can be viewed on-line.

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Address Correction Requested