MIT technology insider

FROM THE EDITORS OF TECHNOLOGY REVIEW

CONTENTS 9.02

KEY

	FUNDING
$	UNDER $2 MILLION
$$	$2 MIL.-$10 MIL.
$$$	$10 MILLION PLUS
	PATENT STRENGTH
	NO CORE PATENTS
	CORE PROTECTION
	DOMINANT POSITION
	TIME TO MARKET
	LESS THAN 1 YEAR
	1-3 YEARS
	MORE THAN 3 YEARS

SPIN-OFF SPOTLIGHT

Curl's Winding Road

FOUR YEARS AGO, ONE COMPANY SET OUT TO REINVENT THE INTERNET. ALONG THE WAY, IT REINVENTED ITSELF.

Few companies enjoy so lofty a pedigree as Curl Corporation, the MIT spinoff founded in 1998 by several of the world's most famous computer scientists, including Web founder Tim Berners-Lee and Laboratory for Computer Science chief Michael Dertouzos. Their vision: to reinvent the World Wide Web as a more powerful network through a programming language that would redistribute the computing workload from overburdened servers to underutilized client PCs.

But pedigree is no guarantor of success, as Curl has discovered. After spending nearly $50 million of venture capital, the company began 2002 nearly out of money, with few customers and no significant revenue. New management has repackaged Curl's software—originally intended to overthrow Hyper Text Markup Language (HTML), the ubiquitous Web language that tells browsers how to display data—as a powerful intranet solution for large enterprises. The company claims several customers are signing up.

CURL CORPORATION

$$$

In many ways, Curl's story is archetypical nineties fare: visionaries meet venture capital, whose love affair sours in the face of market forces. Yet Curl was no pet-food scheme, no spendthrift Super Bowl-advertiser; it was a new and powerful technology, demonstrably superior to the status quo. Curl's roots date back to 1995, when two colleagues in MIT's Laboratory for Computer Science—electrical engineering professor Steven Ward and senior research scientist David Kranz—saw a problem with the emerging World Wide Web. As design and appearance became more important to a content-driven Web, more and more of the data users downloaded was simply formatting specification, not the actual information they sought. This not only bloated Web traffic, but prevented users from easily importing data to other programs or processing it automatically. Web developers were aware of the problem, but couldn't build the kind of interfaces they wanted using plain old HTML, so they resorted to an amalgam of software plug-ins and server-side applications. That chimera did a sufficient, if kludgey, job of getting information to eyeballs, Kranz says, but made real data sharing difficult, if not impossible. "If the Web is a giant database of information, then two things were missing," recalls Kranz. "First, the programming methods were not very good, and second, the data that was showing up was not very usable."

After looking for a better way to extract information from the morass, Ward and Kranz made a bold—some might say quixotic—decision: HTML had to go. The Web needed a new language, a successor to HTML that could express data with the power and flexibility of programming languages such as C++ or list processing (LISP). The result was Curl, named for the eponymous brackets "{-}" that enclose its commands. Once users downloaded a piece of browser software called Surge, which was capable of executing the Curl language, they could view Web sites written entirely in Curl. Unlike HTML pages that require users to download every line of code every time the page is changed, Curl pages would request the bare minimum of new data, and the user's computer would update the display. Graphics-heavy games and 3-D simulations would run much faster, since the user's PC, not the server, would do most of work.

By the fall of 1997, MIT's Curl team had grown

CONTINUED ON PAGE 2

AN MIT ENTERPRISE TECHNOLOGY REVIEW

AT A GLANCE

NAME
Curl Corporation

CONTACT
617-761-1200
www.curl.com

PRODUCTS
Surge Lab and
Surge Runtime Environment

TECHNICAL FOUNDERS
Timothy J. Berners-Lee
Michael L. Dertouzos (d. 2001)
Robert H. Halstead, Jr.
Mathew J. Hostetter
David A. Kranz
Daniel S. Nussbaum
Christopher J. Terman
Stephen A. Ward

INVESTORS
> Arbor Partners, LLC
> Baker Capital Corp. (principal investor)
> David A. Kranz
> Equity Group Holdings III
> James D. Guzy
> The Ronald J. Ulrich Family Ltd. Partnership

to four developers. Early the following year, encouraged by an angel investor, Ward and Kranz—along with a team of distinguished LCS veterans that included Dertouzos and Berners-Lee—founded the Curl Corporation. In the fall of 1999, Curl raised $42 million in its third round of venture-capital funding.

In March 2001, Curl went to market with a novel business model: to encourage adoption, they gave away Curl's developer tools. As customers deployed Curl-powered Web sites, they would pay Curl Corporation every time a user downloaded Surge. In an economy fueled by Web advertising, Kranz says, the value to customers was clear. For each new user, the customer paid Curl, and the advertiser paid the customer; cost and revenue were directly linked. It also made sense, Kranz says, in an era when potential future profits were more important than current revenue.

Curl signed up several big-name customers. Their most notable coup: replacing Siemens's Enterprise Information System. Siemens had estimated that a new Java-based system would take $1 million and 6 months to build; Curl did it in three weeks at one-tenth the cost.

But other successes were few. Curl had to convince companies that developers should learn a whole new language, one with benefits complicated to describe and antithetical to the conventional model, where Web servers—not PCs—handle the processing. Then the Web advertising bubble popped, and pay-per user became an expensive, and risky, proposition.

In February 2002, Curl was nearly out of money. Its investors—led by New-York-City-based Baker Capital—agreed to infuse the company with another $7 million; they also fired the company's management team. Out was CEO and co-founder Robert Young; in was Thomas Stiling, handpicked by Baker partner Kevin Kilroy. Kilroy and Stiling had worked together as CEO and president, respectively, of Bluestone Software, an e-business software company acquired by Hewlett-Packard in 2000.

"We basically transformed the company," Stiling says of his first few months at Curl. Cost-cutting measures—including a layoff of half its 120 employees—reduced Curl's monthly cash burn by more than $1 million. The new management team abandoned the per-user licensing model—never popular among analysts—and replaced it with a more traditional model where companies pay a licensing fee for their developers to use the technology (a license for a developer's "starter kit" runs around $25,000). And they postponed—if not abandoned—the overthrow of HTML. Instead, they sought to build on Curl's early success with Siemens's Enterprise Information System, and repackaged Curl as a corporate intranet platform, on which customers could develop applications for sharing data internally.

Stiling's new sales force—veterans experienced with big software deals—have brought in five new customers so far in 2002, including a financial-software firm, a systems integrator, and a global accounting firm (The company plans to annouce them in October). The deals together total about $1 million, and the company hopes to raise another $10 to $15 million by October through a preferred stock offering that, Stiling says, should carry Curl until it reaches profitability in early 2004.

Kranz says the plan is to refine Curl as a platform for enterprise information systems. "It's not as glamorous as taking over the Internet," he says, "but we need a beachhead in the marketplace."

MIT technology insider
FROM THE EDITORS OF TECHNOLOGY REVIEW

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AT A GLANCE

- MIT president Charles Vest addresses presidential economic forum (full text) (web.mit.edu/newsoffice/nr/2002/econforumfull.html)
- New faculty members join MIT ranks (web.mit.edu/newsoffice/tt/2002/aug28/faculty.html)
- Professor wins math prize for computer science work (web.mit.edu/newsoffice/nr/2002/nevanlinna.html.

Brain-Machine Interface

Two years ago, researchers at MIT and Duke University amazed the world when they announced that they had built a robot controlled by the thoughts of a monkey. Now, the next stage of their research is set to begin, with the ambitious goal of developing functional "neuroprosthetics," which not only take direction from a wearer's thoughts, but also provide tactile feedback directly to the brain.

In the original experiment, Duke scientists developed a neural interface that translated a monkey's thoughts to commands, which were then relayed to a robot arm developed by researchers in MIT's Laboratory for Human and Machine Haptics (the "Touch Lab"), led by principal research scientist Mandayam Srinivasan. In August, Duke announced the formation of a new center for neuroengineering, funded by a $26 million grant from the Defense Advanced Research Project Agency (DARPA); MIT insiders say arrangements are being finalized for a related five-year, $3.75-million grant to the Touch Lab to continue its side of the study.

The goal, says Srinivasan, is to develop a system that enables a monkey both to control a robot and to receive feedback, at first through virtual reality or haptic interfaces, and ultimately through direct stimulation of the monkey's brain.

"We are hoping that...for paralyzed people there might be a neural chip implanted in the brain that could read motor thoughts and transmit complex sensations," Srinivasan says. The research is funded by DARPA's Controlled Biological Systems program, which also funds artificial muscle research at MIT's Leg Laboratory.

Cartilage Repair

Engineers at MIT's Center for Biomedical Engineering have developed a method to grow cartilage cells in a gel outside the body, then deliver the gel to damaged joints to promote further cartilage growth. The researchers, led by professor Alan Grodzinsky, published their results July 15 in the *Proceedings of the National Academy of Science.*

John Kisiday, a graduate student of Grodzinsky and lead author on the paper, says the gel works like a scaffold, supporting cartilage cells as they grow. The gel, a self-assembling peptide polymer, mimics many of the physical properties of cartilage. After the transplant, the gel would deteriorate, leaving behind tissue that researchers say could work better than tissue created using other techniques.

Today, doctors grow cartilage and other tissue on biological scaffolds, such as cow collagen.

Kisiday says the gel scaffold is a significant improvement, as it not only mimics cartilage, but also eliminates the risk of contamination posed by biological matter. "The scaffold is what makes this an enticing approach and clearly differentiates it from other systems," he says.

The lab's next step, Kisiday adds, will be to grow other kinds of cells in the gel. A medical application is years away, he says, and must follow extensive clinical trials.

Relieving Magnetic Frustration

Scientists have long been puzzled by a phenomenon called geometric magnetic frustration, in which certain crystalline arrangements of atoms prevent their electrons from lining up accurately. Now, a team of scientists, including Tae Hee Kim, a visiting researcher in MIT's Magnet Laboratory, has suggested that frustrated magnetic atoms reach a state of equilibrium by acting in groups, a finding with implications for understanding complex systems from medical research to the formation of galaxies.

In a paper published August 22 in the journal *Nature*, the researchers suggest their theory may have broader applications. Such principles could help explain emergent phenomena in other applications, such as magnetic resonance imaging and protein folding.

In addition to Kim and Lee, collaborators include researchers from the National Institute of Standards and Technology, Johns Hopkins University, and Rutgers University.

Complex Sugar Decoded

As biology begins its postgenome era, scientists are learning that decoding DNA was the easy part. Far harder is deciphering the proteins and other complex molecules responsible for the work of living. In a development that could benefit new drug design, MIT researchers have described a new method of characterizing complex sugars, arguably the most challenging molecules of all.

The researchers, led by MIT biology professor Robert D. Rosenberg, call their method "ion pair-reverse phase capillary high performance liquid chromatography-microelectrospray ionization time-of-flight mass spectrometry." In a paper published July 24 in the *Journal of the American Chemical Society*, they reported that they had used their method to characterize heparan sulfate—a sugar molecule found on the coat of cells—and heparin, an anti-clotting drug.

Complex sugars are notoriously hard to identify, because tiny structural changes completely change their function, leading to large "families" of similar-looking sugars with significantly different functions.

Next-Generation Networks

THE LABORATORY FOR COMPUTER SCIENCE'S NETWORK AND SYSTEMS GROUP IS BRINGING CABLE TV TO YOUR HANDHELD.

AT A GLANCE

NAME
MIT Laboratory for Computer Science

DIRECTOR
Victor Zue

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www.lcs.mit.edu/index.php3

MAJOR PROJECTS
> Networks and mobile systems
> Parallel and distributed operating systems
> Advanced network architecture
> Computer architecture
> Computation structures
> Programming methodology
> Software design
> Program analysis
> Algorithms
> Cryptography and information systems
> Complexity theory
> Theory of distributed systems
> Applied computing
> Supercomputing technologies
> Computer graphics
> Spoken language systems
> Clinical decision-making
> Oxygen research
> Programming systems research
> Computation and biology
> Project on Mathematics and Computation
> World Wide Web Consortium

Hari Balakrishnan isn't content to surf just the World Wide Web from his handheld computer as he kills time in an airport. He watches cable television on it too.

Balakrishnan, associate professor in the networks and systems division of MIT's Lab for Computer Science (LCS), can log on anywhere there is WiFi wireless to access Oxygen TV, a system he helped develop that translates cable television signals into data packets or streams. He can then "tap" into a digitized stream of his choosing. The result is an image far better than any other current Internet-based video format.

If Balakrishnan has his way, every network provider will use Oxygen TV to broadcast its programs, and in a few years surfing TV on a handheld will be as common as using a cell phone. But, for now, "our present setup is simply proof of concept," he says. Balakrishnan and his team are scaling the technology so that it can work on larger networks. After that, they plan to catch the interest of both television networks and Internet service providers. Eventually, they'd like to incorporate a speech-based interface into the software program, enabling users to simply "ask" their handhelds what's currently showing on, say, C-SPAN or ESPN.

MIT LAB FOR COMPUTER SCIENCE

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Oxygen TV is part of the Network and Systems Group Project Oxygen, an endeavor to move computing beyond the desktop into everyday environs, a notion often called ubiquitous computing. So far the project has accumulated about $50 million from private investors, including Hewlett-Packard, Nokia, and Philips Research.

The group's offices double as a prototype testing facility for much of the research, including another experiment called "Cricket," an indoor tracking system similar to GPS that developers say has the potential to transform warehouse tracking, theft and loss in large institutions, and even patient and equipment tracking in hospitals. While GPS works well in places where the handheld device is in line-of-sight with a satellite, it tends to not work nearly as well in urban contexts, where tall buildings obstruct satellite signals, and not at all indoors. Cricket gets around this limitation. "It's based on the idea that you can estimate distance between two nodes if the nodes are equipped with both radio and ultrasonic hardware," says Balakrishnan. Take, for example, two objects that are set at a fixed distance from each other. If one object simultaneously sends both a sound and a light signal to the other, the light beam will arrive first, followed by the sound signal. An algorithm can then measure the velocity difference between these signals and thus determine the distance between the objects. The same process, done with a network of these beacons tranmitted at various angles, can then also determine location. According to Victor Zue, director of the LCS, "Cricket is incredibly important, and it will catch on, not only in America but all over the world." Already, he notes, Netherlands-based Philips Electronics, one of Project Oxygen's partners, is incorporating Cricket into "Home Lab," a prototype house of the future.

Not everyone feels that ubiquitous systems like Oxygen TV and Cricket are inevitable. Andrew Odlyzko, director of the University of Minnesota's Digital Technology Center, has long been a critic of such initiatives. Regarding Oxygen TV, he questions the utility of having lots of streaming channels available on your handheld. The practice may ultimately work for small niche applications in certain industries, but not for broader commercialization. "Even if it goes beyond such niche groups, it will still take people a while to figure out how to incorporate these sorts of technologies into their lives," says Odlyzko. "Penetration takes a very long time."

Zue, on the other hand, is confident that these ubiquitous technologies will be essential to our culture. "More and more, we're becoming nomadic," he says. "Eventually we'll all be like true road warriors, with belts filled with zillions of little electronic things. And in America at least, computers eventually will basically be free. What are we going to do with all that available bandwidth?"

Balakrishnan and his colleagues are sure to think up something.

DATEBOOK

September 18, 2002 7:00 pm
Kresge Auditorium
Entrepreneurship in a Global Economy featuring Lester Thurow

617-253-0015
mitef@mit.edu
web.mit.edu/entforum/www/

October 2, 2002 6:00 pm
MIT Faculty Club. 50 Memorial Drive 6th Floor
Start-up Clinic

617-253-8240
www.mitforumcambridge.org/calendar/index.html

October 10, 2002 5:00 pm
Tang Center, Wong Auditorium
Speaker: Louis V. Gerstner, Jr., chairman of the IBM Board of Directors

ilp.mit.edu/ilp/Conferences/Industry.html

October 26, 2002
MIT Enterprise Forum of Cambridge
How the @#&!#$ Did They Do That? Fall Workshop 2002 Speaker: Gururaj "Desh" Deshpande, founder and chairman, Sycamore Networks, Inc.*

www.mitforumcambridge.org/events/workshops.html

A New Life for Cell Phones

In July, Woburn, MA-based Lilliputian Systems licensed the rights to a micro fuel-cell technology, developed at MIT's Microsystems Technology Laboratory, that could end the untimely deaths of millions of mobile phone batteries. The founders of Lilliputian—who are also co-inventors of the technology—believe they can expand the power capacity of small electronic devices such as cell phones five to ten times, which would extend the operation time of portable devices by many hours.

The patented technology enables the company to develop new micro fuel-cell batteries by performing high-temperature chemical processing on a silicon chip. "There are all kinds of different fuel cells and fuel-cell systems," says Aleksander Franz, company president. "We've figured out how to insulate the high-temperature zones in those systems into a very small space." Lilliputian is funded by a syndicate of investors led by Atlas Venture. Franz can be reached at AlFranz@LSInc.biz.

Better Cleanser for Bio Equipment

Sterilizing traditional medical equipment such as metal scalpels is a fast and easy process. The same cannot be said for newer plastic and polymer devices like endoscopes that are increasingly used in practice. To clean these sorts of instruments, labs must use the industrial chemical ethylene oxide, which is hazardous, expensive, and time consuming. Now, Ithaca, NY-based Novasterilis has licensed a patent, created by MIT professor of chemical and biological engineering Robert Langer, that involves a means to use highly pressured CO2 to sterilize such equipment. If successful, plastic instruments could be sterilized in a doctor's office in less than an hour—as opposed to the three days it usually takes now.

"This is an emerging market that needs this type of technology," says David Burns, company founder and CEO. In addition to the endoscope market, Burns believes this process can be used for preparing a new class of drug-delivery devices called microspheres, in which plastic spheres are impregnated with medications (current sterilization processes don't work at all for these devices). Another market is tissue banks, where the process can be used to sterilize human tissue samples. Burns is currently partnering with the Utah Medical Center to present the National Institutes of Health with a proposal for this application. Novasterilis licensed this technology last May. Currently the company is operating from a combination of seed money and angel investments. Burns can be reached at dburns3@twcny.rr.com.

Improving Chip Testing

U.K.-based Trikon Technologies acquired the rights to what Keith Buchanan, process integration manager for the company, describes as "an R&D tool" for producing silicon chips. The company, which manufactures equipment for chip makers such as Intel, will now be able to create a prototype device that allows its customers to test schemes on advanced silicon chips far more accurately. The patented technology, licensed last April, was developed by graduate student Tae Park of MIT's Statistical Metrology Group.

According to Buchanan, the essence of the licensed patent is a process for testing how well dielectric films—an essential part of silicon chip contruction—are working. "It's not enough to just produce these films," says Buchanan. "You need to demonstrate that you can integrate them into a manufacturable process flow. We'll use MIT's design to do just that."

The company supplies equipment for a number of processes in the manufacture of semiconductor devices, such as chemical and physical vapor deposition and plasma etching. The group has operations in North America, Europe, South Korea, and Japan. Keith Buchanan can be contacted at Keith.Buchanan@trikon.com.

FDA Clears Cancer Test

With 56,000 cases diagnosed in the United States each year, bladder cancer is the fourth most common cancer among men in the nation. Catching its early symptoms is crucial: if it is diagnosed in the first stages, the patient survival rate exceeds 90 percent.

Matritech Inc. (NASDAQ: NMPS) this month announced that the U.S. Food and Drug Administration has granted clearance to market the NMP22 BladderChek, which the company says will speed detection of the disease through the use of proteomics technology developed at MIT in 1992. By placing four drops of urine on the BladderChek cassette, which looks and works much like a home pregnancy test, a physician is able to detect the presence of NMP22, a nuclear matrix protein correlated with bladder cancer. A purple line appears on the strip to mark the presence of bladder cancer.

According to the company, NMP22 BladderChek detected four times more early stage bladder tumors and 2.5 times more life-threatening, high-grade tumors than cytology, the current bladder-cancer urine test.

The company is exploring ways to use similar techniques for detecting other cancers, such as breast and prostate. Go to www.matritech.com for more information.

The Next Tech Boom

DESPITE ALL THE BEARISH TALK, THE INFLUX OF INNOVATIONS FOR BUSINESS IS JUST BEGINNING **BY REBECCA M. HENDERSON**

> "These technologies are not 'out there' where they can't touch you. They will not happen somewhere else. How can you manage them strategically?"

MIT's Sloan School of Management will turn 50 this year, and in preparation for the celebration, it commissioned a number of papers that explore the technologies likely to emerge over the next 20 years and how they will affect the world economy.

The results of this effort make clear that the massive changes we have seen in the last 20 years will most likely be equaled or surpassed by those of the next 20, no matter the present mood in the investment community toward research and development.

The computing and telecommunications revolution is nowhere near over. Computers built around biological molecules or according to quantum principles will continue to make computing even cheaper and more convenient. Genomics will yield concrete results in terms of a number of new treatments and, most interestingly, perhaps, new diagnostic capabilities. The science of the small—nanotechnology—will introduce a proliferation of products, services, and industries that at the moment we can only begin to imagine: turbines as small as a fingernail that will replace batteries; molecular machines that will deliver drugs to precise targets within the body; fabricated nanomaterials that exceed the strength of steel at a fraction of the weight and cost.

How will these technologies impact organizations? There are likely to be disruptive effects on particular sectors of industry. The increasingly popular move to "personalized medicine" that genomics makes possible, for example, has the potential to render the business models of many large pharmaceutical firms obsolete. Biological-based polymers threaten the current capabilities of many of the world's largest and most successful materials companies. When engines smaller than a finger are in operation, when computers are wired to cells, then present-day engineering knowledge will most certainly become outdated as well.

But change also brings promise. There will be space for a host of entrepreneurial firms, as well as opportunities for larger firms to leverage existing assets and organizational skills into new applications. We have already seen recent advances in telecommunications make it possible for ten-person firms to become truly global in a way that would have been unthinkable 20 years ago.

New technologies will only accelerate this trend. Micro machines may dramatically reduce economies of scale in manufacturing. Ubiquitous data, available in common formats, may make economies of scale in information outmoded. There is also a real possibility that these new technologies will open up qualitatively different development paths for some economies, enabling some regions of the world to "leapfrog" their way to leadership. Just as some areas may never see the wholesale deployment of land-based telecommunications systems to wire them to the rest of the world, so others may never need to labor under conventional large-scale materials production techniques. Technologies such as "three-dimensional printing", for example, may make it possible for a single small-scale facility to manufacture an almost infinitely wide range of products at significantly lower costs than is possible today.

Of course, these technologies also come with a host of controversial issues. The initial rumblings as to the importance of individual privacy in the face of increasing commercial database consolidation are soon to become shouts. To have the power to instantly obtain information at any point, to track every transaction, every movement of every "connected" individual—this carries an obvious potential for abuse. Advances in medical technology raise similar concerns. It will very soon be possible to implant a sensor that will transmit detailed data about your moment-to-moment physiological condition. Would you like that sent to your employer? How about your estranged spouse?

These technologies of the next 20 years are not "out there" where they can't touch you. They will not happen somewhere else. How can you manage these technologies and their inherent issues strategically? Will you be aware of the changes as they happen? Have you thought through how your organization will respond while simultaneously maintaining a "conventional" business? I venture to predict that the ability to answer these sorts of questions is likely to be the critical factor that will determine the business winners of tomorrow.

Rebecca Henderson is the Eastman Kodak Professor of Management at the MIT Sloan School. She is also a faculty research fellow in the National Bureau of Economic Research's Productivity Program. She can be reached at rhenders@mit.edu.

Patents for Hire

PATENTS ISSUED TO THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY DURING THE FIRST QUARTER OF 2002.

Few academic institutions can claim as much technology transfer activity as MIT, which files nearly 200 patent applications each year—powering scores of high-tech startups and generating more than $30 million of license income each year *(see "Big Patents on Campus,"* technologyreview.com, *August 28, 2002)*. Innovations are marketed through MIT's Technology Licensing Office, which provided the list below as an exclusive to the *Insider*. The list details all patents, U.S. and international, issued to MIT for the first quarter of 2002, as well as the inventors to whom they were granted. For more information visit web.mit.edu/tlo/www/.

PATENTS

PATENT TITLE	INVENTOR	PATENT NO (U.S. UNLESS NOTED)	ISSUE DATE	COUNTRIES ISSUED†
Stress Proteins and Uses Therefore	Richard A. Young et al	6335183 & 6338952; EP0700445	Jan 01, 2002; Jan 23, 2002	USA, AT, BE, CH, DE, GR,ES,FR,IE, IT, MC, EP, LU, NL, PT, SE
Preparation of Medical Devices by Solid Free-Form Fabrication Methods	Linda G. Cima et al	2173318	Jan 01, 2002	CA
System Method and Product for Distortion-Compensated Information Embedding Using an Ensemble of Non-Intersecting Embedding Generators	Brian Chen et al	6400826	Jan 04, 2002	USA
Biological Applications of Semiconductor Nanocrystals	Frederick V. Mikulec et al	GB2342651	Jan 04, 2002	GB
Supermicrocellular Foamed Materials	Chul B. Park et al	EP0580777	Jan 07, 2002	AT, BE, CH, DE, DK, EP, ES, FR, GB, GR, IT, LU, MC, NL, SE
Method and Apparatus for Imaging Electrical Activity in a Biological System	Richard J. Cohen et al	CA2094804	Jan 08, 2002	CA
Tapered Semiconductor Laser Gain Structure with Cavity Spoiling Grooves		JP3267295	Jan 11, 2002	JP
Method for Producing Novel Polyester Biopolymers	Oliver P. Peoples et al	EP0688865	Jan 16, 2002	AT, BE, CH, DE, EP, FR, GB, IT, LI, LU, NL, SE
Methods and Compositions for Transforming Cells	Philippe Leboulch et al	AU733016	Jan 21, 2002	AU
Method for Determining Storm Predictability	Marilyn Wolfson et al	6340946	Jan 22, 2002	USA
Compensation for Measurement Due to Atmospheric Effects	Lyle Shirley	6341015	Jan 22, 2002	USA
Methods of Forming Features of Integrated Circuits Using Modified Buried Layers and Integrated Circuits Having Features So Formed	Andrew P. Ritenour	6346446	Feb 12, 2002	USA
Asymmetric Ring-Closing Metathesis Reactions Involving Achiral and Meso Substrates	Richard R. Schrock	6346652	Feb 12, 2002	USA
Load Matched Alternator System	David J. Perreault et al	6346797	Feb 12, 2002	USA

PATENTS

PATENT TITLE	INVENTOR	PATENT NO (U.S. UNLESS NOTED)	ISSUE DATE	COUNTRIES ISSUED
Scan Independent Array Antenna for Reception and Transmission of Signals Having Circular Polarization	Peter Munk	6346918	Feb 12, 2002	USA
Acoustic Tree and Wooden Member Imaging Apparatus	Roger M. Turpening et al	6347551	Feb 19, 2002	USA
Engineering of Strong, Pliable Tissues	Joseph P. Vacanti et al	6348069	Feb 19, 2002	USA
Quasi-Optical Transceiver	Simon Verghese et al	634868	Feb 19, 2002	USA
Computer Handbook of Processes	Thomas W. Malone et al	6349298	Feb 19, 2002	USA
Immobilized Polyethylene Oxide Star Molecules for Bioapplications	Edward W. Merrill	2074730	Feb 19, 2002	CA
Polymer Membranes and Polymer Articles Having Hydrophilic Surface Sand Method for Their Preparation	Jonathan F. Hester et al	740682	Feb 21, 2002	AU
Circuit Technique for Logic Integrated DRAM with SIMD Architecture and a Method for Controlling Low-Power, High-Speed and Highly Reliable Operation		3260692	Feb 25, 2002	JP
Class B1 and C1 Scavenger Receptors	Monty Krieger et al	6350859	Feb 26, 2002	USA
Autostereoscopic Display System	Stephen A. Benton	6351280	Feb 26, 2002	USA
Output Couplers for Lasers	John J. Zayhowski	6351484	Feb 26, 2002	USA
Oxidation of Silicon on Germanium	Hsin-Chiao Luan et al	6352942	Mar 05, 2002	USA
Program-Listing Appendix	Henry Lieberman	6353822	Mar 05, 2002	USA
Tooling Made by Solid Free Form Fabrication Techniques Having Enhanced Thermal Properties	Emanuel Sachs et al	6354361	Mar 12, 2002	USA
Rolling Toy with Motion Recording And Playback Capability	Philipp A. Frei	6354842	Mar 12, 2002	USA
Chemically Induced Plastic Deformation	David C. Dunand et al	6355120	Mar 12, 2002	USA
Contrast Agent	Venkatram R. Shastri et al	6355224	Mar 12, 2002	USA
Polariton Wave Imaging	Richard A. Koehl et al	6356349	Mar 12, 2002	USA
Fast Variable Optical Delay	Katherine L. Hall et al	6356677	Mar 12, 2002	USA
Method for Scheduling Transmissions in a Buffered Switch	Kai-Yeung S. Sui et al	6359861	Mar 19, 2002	USA
Method and System for Interpreting And Utilizing Multimode Dispersive Acoustic Guided Waves	Shi-Chang Wooh	6359861	Mar 19, 2002	USA
Inertial Orientation Tracker Apparatus Having Automatic Drift Compensation For Tracking Human Head and Other Similarly Sized Body	Eric M. Foxlin	6361507	Mar 26, 2002	USA
Method for Production of Aluminum	Sven Plahte et al	6361580	Mar 26, 2002	USA
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†Countries: AT Austria, AU Australia, BE Belgium, CA Canada, CH Switzerland, DE Germany, DK Denmark, EP Europe, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, JP Japan, LI Liechtenstein, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, USA United States.