Recent Ohio Patent Awards (2011-2012)

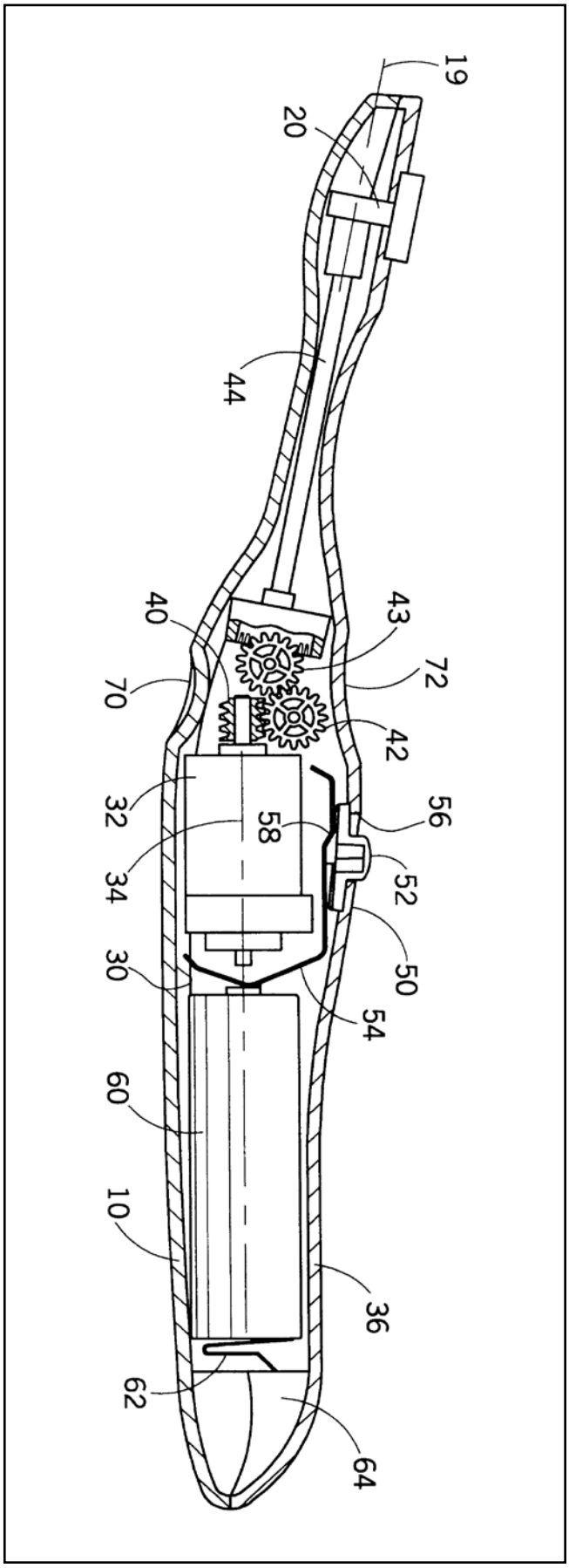
ELECTRIC TOOTHBRUSH

USP 6,178,579 B1; Jan. 30, 2001; Nottingham, Spirk, Blaustein, Osher, and Gall

Patent Abstract

An electric toothbrush comprising an elongated body portion and a head including a static portion and a circular portion, a handle, and an angled shaft between the head and the handle. The circular portion rotates or reciprocates about an axis normal to a longitudinal axis of the head. The circular portion includes stiff bristles, and the static portion includes soft bristles. The elongated body portion is hollow and further includes a motor in the hollow portion, which is operatively connected to the circular portion for rotating or oscillating or reciprocating the circular portion. A battery is located within the hollow section for powering the motor. A switch is operatively connected to the motor to provide momentary and continuous operation of the toothbrush. A worm gear and a pair of step gears are located in the hollow portion. The motor is operatively connected to the worm gear, and the step gears are operatively connected to the worm gear and to each other. One of the step gears is offset with respect to a longitudinal axis of the elongated body portion. A shaft is operatively connected to the offset step gear and to a second end to the circular portion. Alternately, the toothbrush comprises a plurality of gears and swivel arms which move the brush head moving portion in a rotating, oscillating, or reciprocating manner.

Inventors John R. Nottingham, John W. Spirk, and Attorney Patrick Roche
2012 Ohio Patent Impact Award



American consumers have been told for years that electric toothbrushes do a better job than manual ones in removing foods that cause cavities and gum disease. Yet the high cost of electric toothbrushes made that a pie-in-the-sky proposition for most households. The Spinbrush—more of a technological breakthrough than a scientific discovery—changed all that in 2001 with a $5 appliance priced within dollars of its manual competitors.

That year, John Nottingham and John Spirk of Nottingham Spirk Design Associates in Cleveland secured a patent on an ergonomic, oscillating brush design that sold 40 million units and earned Proctor & Gamble's Crest brand $120 million in 2001 alone. With legal expertise from attorney Patrick Roche of intellectual property firm Fay Sharpe LLP, the budget-minded toothbrush went on to earn all three the Ohio

Academy Science and the Ohio State Bar Association's OSBA Ohio Impact Patent Award for 2012.

Until the Spinbrush, electric toothbrushes priced around $100 had attracted only 1 percent of the dental market. Introduced in Europe as an AC-powered appliance in 1954, the Broxo-Dent was brought to the U.S. by Squibb five years later, maintaining its place in the electric toothbrush market through the 1980s. Meanwhile, GE had tried out a bulky nickel cadmium battery version, and when safety regulators began to balk at the bathroom AC cord in the 1990s, smaller, sleeker battery-driven models gained momentum.

But Americans -- indeed most cultures familiar with oral hygiene -- were used to having their own toothbrush. With the price of a single electric unit out of reach for many consumers, the idea of multiple rechargeable toothbrushes in a given household was a non-starter, whatever their potential health benefits.

Nottingham and Spirk decided to change that with low-cost production, a simple oscillating head, standard AAA batteries, and an aggressive promotional campaign. Over the next decade, electric toothbrushes grew to more than 30 percent of the oral hygeine market. Proctor & Gamble later sold Spinbrush to Arm & Hammer, where the brand now includes toothbrushes that reciprocate at much higher speeds than standard electric models, and at much lower cost than expensive "sonic" toothbrushes.

They'll have plenty more opportunities of their own. At last count, Nottingham Spirk was responsible for over 900 commercial patents worldwide, with many more ideas in the works.

Messrs. Nottingham and Spirk received engraved plaques in recognition of the Ohio Patent Impact Award at the academy's annual meeting on April 14, 2012 at Ashland University. A panel of five members from the academy's Board of Trustees and the Intellectual Property Law Section of OSBA reviewed their work among 13 nominations for the Ohio Patent Awards, which also include the 2012 Legacy Award. Nominees were judged by several criteria, including (a) largest number of patents in a single year, or (b) a patent that has contributed to Ohio's economy, workforce, social welfare, health status, or other concerns.

The two inventors met in their formative years at the Industrial Design Department of the Cleveland Institute of Art, where they were reputed to be the star pupils of artist, ceramist, and industrial designer Viktor Schreckengost, regarded by many as the founder of industrial education in the U.S. Nottingham and Spirk received offers from Fortune 500 companies upon graduation but chose to start their own design firm by the same name in 1972. They have been at it ever since.

Inventors John R. Nottingham and John W. Spirk
Nottingham Spirk Design Associates
2200 Overlook Road
Cleveland, OH 44106-2326
216.231.7830
jnottingham@nottinghamspirk.com
jspirk@nottinghamspirk.com

Attorney Patrick Roche
Fay Sharpe LLP
The Halle Building
1228 Euclid Ave., 5th Floor
Cleveland, OH 44115-1834
216.363.9000
proche@faysharpe.com

STIRLING CYCLE TYPE THERMAL DEVICE

USP 3,552,120; Jan. 5, 1971; William T. Beale

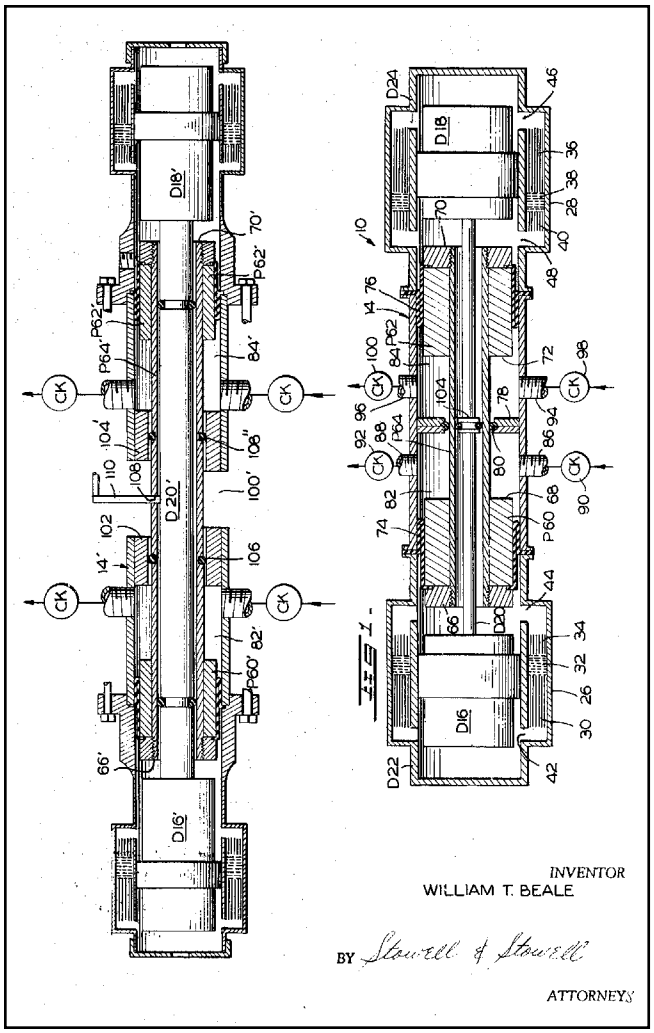
Patent Abstract

A Stirling cycle thermal engine or refrigerating device wherein there is no primary mechanical connection between the displacer pistons and their associated power pistons, including various mechanical and pressure fluid means for varying the power output from or the power input to the device.

William T. Beale
2012 Ohio Patent Legacy Award

A half century ago an engineering professor and full-time tinkerer tossed aside his crankshaft and his university job to create a better Stirling engine—a hot and cold idea that had rattled around since the early 1800s, when it took its name from a forward-thinking Scottish minister. The external combustion "air" piston would give way to steam power and then internal combustion engines, reemerging over a century later as the "free-piston" design of Mr. William T. Beale.

His "eureka" moment at Ohio University in 1964, when he realized the dormant Stirling concept could do without the traditional drive mechanism and its lubrication problems, led to a U.S. patent in 1971, the formation of Athens-based Sunpower, Inc. in 1974, and his selection for the Ohio Academy of Science and the Ohio State Bar Association's (OSBA) Ohio Patent Legacy Award in 2012.



The closed-cylinder design conceived by Rev. Dr. Robert Stirling in 1816 was not prone to the high-pressure explosions of early steam engines and offered improved efficiency over older hot air designs. His included the traditional power piston and passive "displacer" piston, which moves the alternatively cooling/expanding gas back and forth between hot and cold chambers. It also included his patented "Heat Economizer"—a regenerator by any other name—which provided much better thermal exchange: the foundation of the external combustion air engine.

But the limited power range of the Stirling engine still required high temperatures that led to mechanical failures. It was ultimately supplanted by its external combustion cousin, the steam engine, which in turn yielded to electric motors and internal combustion engines.

The air engine eked out a living as a water pump and a few other domestic implements until Phillips began fiddling with a portable radio and a Stirling generator in the 1930s powered, of all things, by lamp oil. After two decades of development, however, the company decided its air engine was too unwieldy for commercial production.

"Too heavy, too complicated, too slow to respond, and way too expensive," says Beale. Low-powered transistor radios had done them in.

Phillips' research would continue into the 1970s with hundreds of millions of dollars spent on a failed automotive program, which the Stirling has still to see on a commercial scale. The company wanted to tap the engine's potential with better manufacturing processes and materials—a goal that had taken a major leap forward with Prof. Beale's free piston design. He was lecturing on the "rhombic" Stirling, which got by without pivoting connecting rods but retained a crank and double flywheels, when he realized, "This engine will still run if we simply throw away this complex drive mechanism," according to Ohio University lore.

"All of sudden, I got rid of half the cost. I also got rid of the slow response," Beale says.

Instead of driving a mechanical crank, the fixed connecting rod could operate an inline generator or pump at higher temperatures and higher pressure, without lubrication. Using hydrogen or other suitable gases, a typical temperature range between cold and hot ends of the cylinder would be 100–1000 degrees Fahrenheit.

As a co-generator or heat pump, the free-piston Stirling has many possible applications, he says, including solar-powered air conditioners, cryogenic coolers, efficient gas-fired refrigerators and home heating systems, and yes, cars.

"Some of the most important automotive manufacturers came around to look at what we were doing at OU," says Beale. "The engineers loved it. The business guys who make the decisions said, 'We're making money now.'"

Sunpower has drawn renewed interest from the auto industry in the past year, however, and engineers say the economics are catching up with the technology.

"It will easily beat the diesel in cost," they tell him, which could include cars powered partly by sun. "A solar sterling engine can beat a photovoltaic cell by a large margin," says Beale.

He says the U.S. is already behind much of the rest of the industrialized world when it comes to energy policy.

"We're just backward on energy compared to the Europeans," Beale says of the Stirling's cogeneration potential. "It's two or three times as efficient in heating a house as a gas furnace."

With NASA employing the air engine as a cryogenic

cooler and a deep space generator for many years, he says the science is sound and the economics of the Stirling more competitive than ever.

Mr. Beale received an engraved plaque acknowledging his Ohio Patent Legacy Award from Dr. Jimmy Tong, Academy past-president. Five panel members from the academy's Board of Trustees and the Intellectual Property Law Section of OSBA judged Mr. Beale's work among 13 nominations for the Ohio Patent Awards, which also include the 2012 Impact Award. Applications were judged by several criteria, including (a) largest number of patents in a single year, or (b) a patent that has contributed to Ohio's economy, workforce, social welfare, health status, or other concerns.

A World War II veteran, Mr. Beale obtained his bachelor's degree on the G.I. Bill and later earned master's degrees from both MIT and Cal Tech, where he secured a full-ride scholarship on the strength of his undergraduate performance. He went on to work for NASA in Cleveland before accompanying his wife during her studies at Cambridge University. Returning stateside, he applied for several faculty positions and eventually accepted the post at Ohio University, where Beale began his journey with the Stirling engine.

Inventor Mr. William T. Beale
Sunpower, Inc.
1055 East State St., Ste. D
Athens, Ohio 45701-7911
740.594.2221
rennich@sunpower.com

THERMOPLASTIC ELASTOMERS OF ISOBUTYLENE AND PROCESS OF PREPARATION

USP 34,640 (formerly 4,946,899); June 14, 1994; Kennedy, Puskas, Kaszas and Hager

Patent Abstract

Block copolymers compose a polyisobutylene rubbery soft segment of M, of about 5,000 to above 500,000 and glassy hard segments of M.sub.n of about 5,000 or higher and usually about 10,000 to 35,000 or more, are made by preparing a living polymer block of the polyisobutylene and then polymerizing on said living polyisobutylene block the glassy hard segments by adding thereto an electron donor having a donor number of 15 to 50 and then adding and polymerizing the monomers for the glassy hard segments. The monomers for the glassy hard segments are styrene and its derivatives and indene and its derivatives and mixtures thereof.

Dist. Prof. Joseph P. Kennedy and Attorney Ray. L. Weber 2011 Ohio Patent Legacy Award

Complex chemistry, rewarding years of polymer research. For heart patients, a simple chance at life. The 2011 Ohio Patent Legacy Award celebrates an impressive run of 107 U.S. patents marked by the discovery of a chemical process that joins rubbery and heat-sensitive polymers in a unique solution to the biotechnological challenges of coronary artery stents -- only one of the medical and industrial uses credited to the 1994 patent of Dist. Prof. Joseph P. Kennedy of the Goodyear Polymer Center at University of Akron. The joint award of the Ohio Academy of Science and the Ohio State Bar Association's Intellectual Property Law Section also recognizes Dr. Kennedy's legal counsel, Ray L. Weber of Renner Kenner Intellectual Property Law in Akron.

Dr. Kennedy's invention built on decades of work with polyisobutylene (PIB), the primary rubber material used in party balloons, adhesives, and tire linings. More than 60 years after its development in the 1930s, the Hungarian native discovered that cross-linking or bonding isobutylene with styrene produces the co-polymer styrene-isobutylene-styrene (SIBS), which is very compatible with the human body. So-called in vivo devices, such as those made possible by the polymer, help people with a range of medical conditions live longer, healthier, and more productive lives.

Carbocationic polymerization, as it's called, can be used to produce "block" polymer chains with the elasticity of rubber and the heat sensitivity of plastic. They become softer at higher temperatures and harder at lower temperatures, returning to the consistency of vulcanized rubber without the required chemical and heat curing. This imparts a similar strength and stability to adhesives, threads, coatings, and other products that are not good candidates for vulcanization.

Boston Scientific Corporation has taken advantage of those properties to produce the TRANSLUTE® polymer coating for its TAXUS® coronary stents, which are based on Dr. Kennedy's invention. Unlike bare metal stents, they are permeable and allow for the controlled release of medications to slow the build-up of platelets that narrow the arteries -- the hallmark of coronary artery disease.

Today, an estimated six million heart patients owe their quality of life to Dr. Kennedy's co-polymer research. Its application to drug-eluting stents has produced revenues exceeding $1 billion.

Mr. Weber and Dr. Kennedy received two engraved plaques in recognition of the Ohio Patent Legacy Award at the academy's annual meeting on April 16, 2011 at Otterbein University. A panel of five members from the Academy's Board of Trustees and the Intellectual Property Law Section of OSBA evaluated their work among 13 nominations for the Ohio Patent Awards, which also include the 2011 Impact Award. (See below.) Applications were judged by several criteria, including (a) largest number of patents in a single year, or (b) a patent that has contributed to Ohio's economy, workforce, social welfare, health status, or other concerns. Nominees together represent more than 480 patents and millions of dollars in sales for Ohio businesses.

Dr. Kennedy earned his B.S. in chemistry at University of Budapest in 1948 and his PhD in bio-chemistry at University of Vienna in 1954 before post-doctoral work at Sorbonne University in Paris and McGill University in Montreal. He began full-time academic research at UA in 1970 after 14 years in the business world at Celanese Corp. and Exxon Research and Engineering Co., becoming the university's distinguished professor of polymer science and chemistry in 1980. By then, he had already secured over 30 U.S. patents, starting with his first in 1967. His most prolific period yielded eight patents in 1990, followed several years later by the co-polymer discovery. Its use in life-changing coronary stents also won Kennedy a second honor in 2011: the American Heart Association's Heart Champion Award.

Inventor Dist. Prof. Joseph P. Kennedy
The University of Akron
Goodyear Polymer Center
170 University Avenue
Akron, Ohio 44325-0044
330.972.7512
josep19@uakron.edu

Attorney Ray L. Weber
Renner Kenner Intellectual Property Law
First National Tower
106 S. Main St., Fourth Floor
Akron, Ohio 44308-1431
330.376.1242
iplaw@rennerkenner.com

GROWTH HORMONE ANTAGONISTS

USP 5,350,836; Sep.27, 1994; John Kopchick, Wen Y. Chen

Patent Abstract

The present invention relates to antagonists of vertebrate growth hormones obtained by mutation of the third alpha helix of such proteins (especially bovine or human GHs). These mutants have growth inhibitory or other GH-antagonizing effects. These novel hormones may be administered exogenously to animals, or transgenic animals may be made that express the antagonist. Animals have been made which exhibited a reduced growth phenotype.

Prof. John Kopchick
2012 Ohio Patent Impact Award

A genetic discovery that blocks growth hormone linked to rare childhood "gigantism" may one day benefit a much larger population afflicted with breast and prostate cancer.

Human growth hormone (GH), or somatropin, has 191 amino acids. The mutation of a single one retards instead of spurs growth, resulting in a unique treatment for persons battling acromegaly, or "large extremities." The invention has earned Ohio University Prof. John Kopchick the Ohio Academy of Science's 2012 Ohio Patent Impact Award and the university's Edison Biotechnology Institute more than $73.5 million in royalty income from Pfizer Inc., which markets the drug Somavert as an alternative treatment for acromegaly.

Kopchick, a plain-spoken man with an extraordinary history of patented research, has been Ohio University's (OU) Goll Ohio professor of molecular and cellular biology since 1987. He arrived at the university that year and quickly discovered the gene mutation with the assistance of graduate student Wen Chen.

"We were working on the growth hormone to come up with a more potent molecule to treat dwarfism. Instead, we found something to treat acromegaly," Kopchick says.

The discovery was granted a U.S. patent in 1994 and approved by the U.S. Food and Drug Administration in 2003 after 15 years of research and clinical trials. The tens of millions of dollars his invention has brought the university are largely responsible for OU's national fourth-place ranking for "return on research investment," says Director David Wight of the Edison Biotechnology Institute (EDI). The university is the top royalty producing institution in Ohio.

Acromegaly, whose juvenile-onset form is seen in Andre the Giant, "Jaws" (Richard Kiel) of James Bond fame, and even, according to speculation, President Abraham Lincoln, is caused in nine out of 10 cases by a benign tumor of the pituitary gland. This type of

adenoma, and thus gigantism or adult-onset acromegaly itself, is believed to be an environmental condition rather than an inherited gene trait.

"If a child has this tumor, and it's untreated, that person will grow up to be a giant," says Kopchick, noting that the pituitary tumor appears more frequently in adults. They do not develop unusual height but can experience enlargement of the hands and feet, facial disfiguration, throat problems that can lead to apnea, and organ disorders that can lead to death.

By blocking excess growth hormone in adults or children, pegvisomant—the chemical name for Somavert—is helping individuals suffering from acromegaly live more normal lives, Kopchick says.

"It's used all over the world -- I would say three fourths of it outside the U.S.," he says of the tens of thousands of individuals diagnosed with gigantism and adult adenomas.

Kopchick says ongoing research suggests the GH inhibitor could also treat a far more pervasive problem. He is currently an advisor for human clinical trials on use of the gene mutation in breast and prostate cancer patients.

He is careful to note, however, that the GH inhibitor is not a type of a gene therapy, which has yet to be approved in the United States in any form.

Buried in his 30-page patent, however, is a quiet acknowledgement of the drug's potential: "Conceivably, a mammal could be genetically modified after birth, i.e., 'gene therapy.'"

The immediate outcome in someone not suffering from acromegaly, however, would be dwarfism -- as Prof. Kopchick notes, hardly a goal of growth hormone research.

Beyond the 15 U.S. patents and five pending patents he currently holds, his ongoing work is instead focused on the role of human growth hormone in aging and the identification of genes involved in diabetes, obesity, and aging, among other challenges in molecular biology

Prof. Kopchick received his bachelor's of science degree in biology from the Indiana University of Pennsylvania (IUP) in 1972, a master's of science degree in biology and chemistry from IUP in 1975, and a Ph.D. in virology and biomedical sciences from the University of Texas - MD Anderson Hospital, Houston in 1980. He was a postdoctoral fellow for Roche Institute of Molecular Biology in Nutley, NJ from 1980 to 1982 and a research fellow at the Merck Institute of Therapeutic Research in Rahway, NJ from 1982 to 1986. While there, he developed a system for cloning human growth hormone. In addition to his 26 years as Goll professor of molecular and cellular biology at OU's Department of Biological Sciences, he has also been director of EBI's Growth, Diabetes and Obesity Section since 1987.

Inventor Prof. John J. Kopchick
Ohio University
Edison Biotechnology Institute
Building 25, The Ridges
Athens, Ohio 45701
740.592.5221
kopchick@ohio.edu

METHOD AND APPARATUS FOR DETECTING PHYCOCYANIN-PIGMENTED ALGAE AND BACTERIA FROM REFLECTED LIGHT

USP 7,132,254; Nov. 7, 2006; Robert K. Vincent

Patent Abstract

The present invention relates to a method of detecting phycocyanin algae or bacteria in water from reflected light, and also includes devices for the measurement, calculation and transmission of data relating to that method.

Prof. Robert K. Vincent
and Attorney Roger A. Gilcrest
2011 Ohio Patent Impact Award

Local news coverage has familiarized most Ohioans with the blue-green algae, as it's popularly known, which can restrict lake and river recreation and threaten drinking water. Fewer know of the satellite imaging technology that now allows authorities to quickly detect the growth of algal "blooms" and warn communities against toxic exposure. A mathematical algorithm that measures the presence of the algae by analyzing reflected light—the larger field of spectroscopy—won Bowling Green State University (BGSU) a U.S. patent in 2006 and geology Prof. Robert K. Vincent primary credit as its inventor. The Ohio Academy of Science and the Ohio State Bar Association's (OSBA) Intellectual Property Law Section followed by honoring Dr. Vincent and his attorney, Roger A. Gilcrest, formerly of Scholtenstein, Zox & Dunn, with the 2011 Ohio Patent Impact Award.

Algae, or more properly, bacteria rich in phycocyanin ("cyan" being derived from the ancient Greek word for blue), was a problem in Lake Erie decades ago and saw a resurgence there and in other parts of the U.S. in the mid-late 1990s. Older types of detergent containing

phosphorus had multiplied cyanobacteria through human waste water.

"Now the phosphorous is coming back for different reasons," says Dr. Vincent, laying major blame on fertilizers that run off from farms into Lake Erie and other bodies of water. But he says there is another cause.

"Global warming seems to be adding to cyanobacteria. Lake Erie is not freezing as much as it used to," Dr. Vincent says, suggesting more $C0_2$ in the atmosphere is also making the lake more acidic—a favorable environment for cyanobacteria.

The thick scum covering large areas of Lake Erie during parts of the year has spurred research at the Geology Department of BGSU, not far from the Western Basin where the bacteria has seen some its worst outbreaks.

Though not algae, the waterborne microbe is often referred to as such because of its appearance and ability to photosynthesize food. Far more ancient than its Greek name, it is credited with the oxygenation of Earth's atmosphere billions of years ago, making it one of the planet's oldest fossils. The curiosity is that bacteria which can threaten fish, birds, and various mammals also made it possible for humans and other animals to live.

Toxins present in some cyanobacteria, called microcystin, are linked to health problems as minor as skin, stomach, and eye irritations, and as serious as Parkinson's, Lou Gehrig's, and Alzheimer's disease, along with certain kinds of tumors.

"The World Health Organization has a standard that's pretty much accepted," says Dr. Vincent. "It says you should not drink water with one part per billion of microcystin or engage in recreation around water with 20 parts per billion."

He says a toxicologist at BGSU assisted him in evaluating the presence of cyanobacteria and microcystin at Port Clinton.

"It was 50 parts per billion, and people were swimming in it," he says.

In 2003, Dr. Vincent published preliminary results of his Landsat research that showed satellite data can be used to accurately map the growth of algal blooms. By 2006, he had confirmed his findings and secured BGSU a patent for use of spectral imaging to measure cyanobacteria colonies in their infancy.

This is possible because the phycocyanin pigment gathers light through photosynthesis, producing what Dr. Vincent calls its own "spectral signature." The advantage to scientists and health authorities, previously limited to more direct methods of observing and measuring cyanobacteria in water, is that mapping can now be done quickly and remotely. This allows the public to be warned and those responsible for water conditions to take corrective action.

The benefit can also be measured in tax dollars. In the case of public reservoirs, remote imaging of cyanobacteria can lower the cost of water sampling from $375 per 0.2 acres to less than $2 -- a 200 percent reduction. With more than 150 drinking water reservoirs in Ohio and more than 11,000 of them in the U.S., the savings—and the business potential—are real.

Recognizing its practical and commercial uses, Dr. Vincent co-founded Blue Water Satellite, Inc. in 2008 while remaining a full-time faculty member at BGSU. He got some help from the state's private development initiative, JobsOhio, and its northwest Ohio partner, Regional Growth Partnership, which awarded Blue Water the funding to perform its first market analysis. Blue Water's clients now include the U.S. Army Corps of Engineers, the National Oceanic and Atmospheric Administration, Pacific Gas and Electric, and other private and public entities.

The technology currently has a margin of error of plus or minus 10 percent. But Dr. Vincent says he's developing a new satellite algorithm to better measure not only the presence of cyanobacteria, but also the concentration of microcystin.

"I would like people to be able to look at a website and decide whether they want to go to this lake or that lake," he says.

While health and environmental concerns have driven blue algae detection, Dr. Vincent says there is virtually no end to the chemicals that can be measured by remote satellite imaging.

"This is a precursor to our mapping the chemistry of water, of land, and of biological forms," he says of earth-based spectroscopy.

The academy and OSBA presented the Ohio Patent Impact Award to Dr. Vincent and Mr. Gilcrest on April 16, 2011 at the academy's annual meeting, held at Otterbein University. Five panelists from the academy's Board of Trustees and OSBA's Intellectual Property Law Section of reviewed their work among 13 nominations for the Ohio Patent Awards, which also include the 2011 Legacy Award. (See above.) Applications were judged by several criteria, including (a) largest number of patents in a single year, or (b) a patent that has contributed to Ohio's economy, workforce, social welfare, health status, or other concerns. Nominees have together produced more than 480 patents and millions of dollars in sales for Ohio businesses.

Dr. Vincent earned a PhD in geology from University of Michigan in 1973, a master's of science in physics from the University of Maryland in 1966, and bachelor's degrees in physics and mathematics from Louisiana Tech University in 1963. After completing his doctorate, he founded and ran GeoSpectra Corporation for 19 years before joining BGSU as associate professor. He now holds the title of emeritus professor of geology.

Inventor Prof. Emeritus Robert K. Vincent
Bowling Green State University
Department of Geology
190 Overman Hall
Bowling Green, Ohio 43403-0211
419.372.0160
rvincen@bgsu.edu

Attorney Roger A. Gilcrest
Ice Miller LLP [Schottenstein Zox and Dunn Co., LPA at time of patent; later merged with Ice Miller]
250 West St., Ste. 500
Columbus, Ohio 43215-7509
614.462.1055
roger.gilcrest@icemiller.com