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Business

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Leading edge inventions distinguish businesses

By Gerald Frawley
staff writer

Invention, innovation, ingenuity, creativity — the three I's and big C long rumored to be dead in America — are alive and kicking.

At least that's what one is led to believe after perusing the accomplishments of local companies honored for excellence and achievement in technology with Michigan's Leading Edge Technologies award.

Gae Miller, executive director for the Michigan Technology Council, said the awards annually recognize the importance of invention in Michigan. The awards are given by the Michigan Technology Council, a statewide association of business, education and government leaders working to promote economic growth, the Detroit accounting firm of Arthur Andersen, and the Detroit Free Press.

"We feel there are so many of these small companies that don't get the recognition they deserve for what they're doing," Miller said.

Despite the economy, the world is beating a path to the doorstep of these companies — all of which bodes well for the Michigan economy.

The hope is other companies will follow suit, she said. There is already some evidence that indicates that variety in business is more than just wishful thinking.

"We're certainly seeing a lot of diversification."

Several of the Michigan Leading Edge Technology Award winners are from the Observer & Eccentric area.

American Dental Laser in Troy has developed a laser that's powerful enough to use in soft and hard tissue dental work.

AIR GAGE CO. in Livonia, working with the Industrial Technology Institute, created a video camera-based, three-dimensional measurement system.

For decades, companies have measured machined components with probes or air pressure — which is extremely accurate but also extremely slow.

The system developed by Air Gage makes roughly 250,000 independent measurements with each picture with a depth resolution of one micron — and it does it in seconds rather than days or weeks as required by existing measuring methods.

"In the world of inspection and measurement, it's desirable to find out what X, Y and Z (are)," said Len Bieman, manager of Air Gage CADEYES division. CADSEYE uses a camera to convert an image into three-dimensional representation that can be measured by a computer.

Bieman said it is unlikely the new system will make others obsolete. Although faster-at-measuring, the system is limited by what the camera lens can see.

Despite this limitation, the camera-based measuring system has numerous automotive and other manufacturing applications where precision measuring is absolutely critical.

"The U.S. mint is looking at it to measure coins (see photo), and there are other applications (including medical applications) as well."

Perhaps one of the most unusual uses, he said, is the ability to use this device in reverse engineering.

"If we have a part that we want to reproduce — but original plans for that part are no longer available, we can take a picture of it and work backward."

AIRFLOW SCIENCES CORP., a Livonia-based consulting engineering firm, developed computer software to solve problems in fluid flow and heat transfer — a deceptively simple term for a complex problem.

Prior to the development of the software, fluid networks were balanced mainly by trial and error, according to Jim Paul, Airflow Sciences executive vice president.

Paul said Airflow Sciences Corp. developed the software because it kept running into situations in its consulting work that necessitated it.

"We've used this for everything from looking at the dimples in a golf ball to seeing what happens inside a boiler," he said.

Fluid flow and heat transfer begins where structural analysis leaves off. For example, when an engineer designs a bridge there are numerous load and stress measurements of mass, shape and weight that determine the structure's integrity.

Which would be fine if a bridge is built in a vacuum, but there are external factors like air movement or water movement across the structure including heat and cold effects, Paul said. "These are not the type of things you'd do on the back of a napkin."

Paul said the company has used the software on a variety of applications from Indy Formula One racer design to developing a more efficient baking method.

The key benefit to improved fluid flow and heat transfer is a savings in time, and therefore, money.

"Chrysler, when they would design a defrosting system, would have a six-week turnaround from design to prototype *with no guarantee it would work. With this,* we take the design and within a couple of hours we can tell if it will work or not — complete with ice melting patterns — so when they build the prototype they know it will work."

AMERICAN DENTAL LASER in Troy has developed a laser powerful enough to use in soft and hard tissue dental work, subtle enough for use in a person's mouth, and flexible and small enough for use in a dentist's office.

The three-watt, neodymium yttrium-aluminum-garnet (Nd:YAG) pulsed laser is delivered through an optic fiber, making it possible to reach most remote areas of the mouth, according to Bob Daulton, marketing director for American Dental Laser. The contact point is as small as the period at the end of this sentence, making it the first laser suitable for general dental work.

Daulton said ADL's dental laser has not been approved for hard tissue dental work, like removing tooth decay, in the United States, but it is being used for this type of work in Europe.

ADL is working with the FDA to gain approval for use in hard tissue dental work.

The laser has only been approved for soft tissue dental work, which includes removing diseased and infected gum tissue, Daulton said. The laser is far faster, less painful and kills bacteria that causes the problems, he said.

Daulton said earlier lasers were not suitable for dentistry because they were too powerful, and there was tremendous heat buildup. "You can see where that wouldn't be a good thing in a mouth."

The typical medical laser is 10 to 50 watts, he said. The Nd:YAG laser is a pulsed laser — meaning the laser beam fires rapidly for milliseconds at a time — which has a peak beam of three watts and allows a cooling period.

Also, previous lasers were large and bulky; the laser developed by ADL is approximately the size of a suitcase with a laser output device. It is designed to be similar in size and shape of current dental tools — connected to the case by an optic fiber.

The dental laser is already being used by more than 1,000 dentists, including 600 dentists in the United States.

FUTURE THREE SOFTWARE of Livonia developed software — called Automotive Release Shipping Control — that allows an automotive supplier to comply with basic electronic data interchange requirements of the original equipment manufacturers.

In a nutshell, this means better tracking and more efficient shipping in an industry that demands on-time delivery.

Sarah Eatherly, marketing director for Future Three Software, said the software allows the small auto supplier and the original equipment manufacturers to share computer data relating to shipping information.

Previously, data used by the original equipment manufacturers have been incompatible with the software used by the suppliers, Eatherly said.

Even after 1983, when electronic data transmissions were somewhat standardized, suppliers were still left out in the cold because each manufacturer's computer data had its own quirks, she said.

"That's why this has always been done with paper, which is slow and more likely to result in errors," Eatherly said.

The auto supplier would copy the data into its own system and use the copied data to generate shipping and receiving reports, inventory and manufacturing information, she said.

Automotive Release Shipping Control takes the raw data from the original equipment manufacturer and converts it into a form that can be readily used by the supplier. "It ties into the shipping, manufacturing and financials."

But the innovation in the product lies in software's ability to integrate the shipping and receiving data with other business applications, Eatherly said.

"Now the data from the original equipment manufacturers can be manipulated for use within the supplier company," she said.

One of the especially useful features of the package, Eatherly said, is the ability to quickly make comparisons between previous and current reports, and daily and weekly reports.

"Now a supplier knows if an order he received today is a duplicate order that has already been sent," Eatherly said. That means fewer mistakes and less waste in shipping and manufacturing.

XYSYS, INC. of Bingham Farms developed computer

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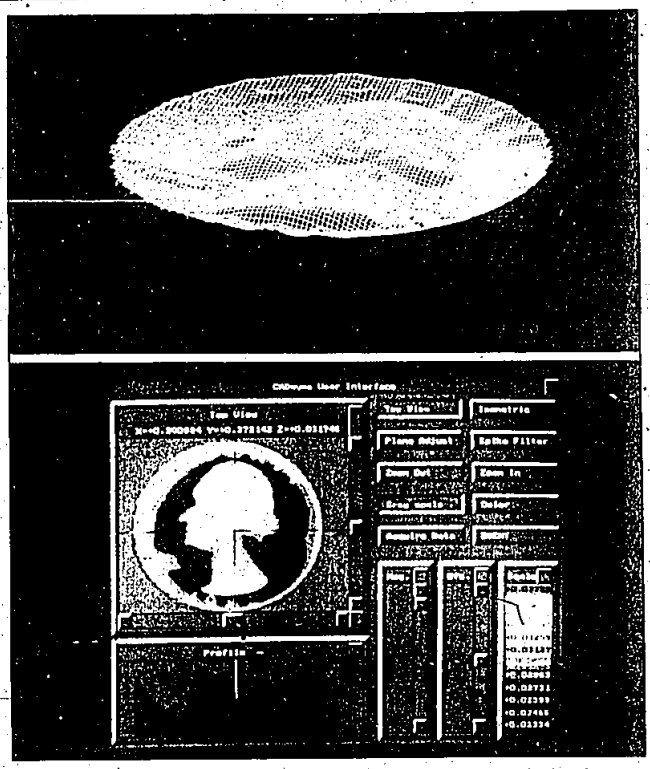

AIR GAGE CO. in Livonia, working with the Industrial Technology Institute, created a video camera-based, three-dimensional measurement system. One of its applications is measuring the thickness of coins.

Hats tipped to inventors

By Gerald Frawley
staff writer

There are as many — if not more — inventions developed by backyard mechanics and home handymen as there are by corporations.

Never has this been more obvious than at a recent Inventor's Council of Michigan's second annual reception at the Henry Ford Estate in Dearborn where more than 150 guests from Michigan business and scientific community gathered to watch as awards were presented to six Michigan inventors who have successfully built businesses around their inventions.

Local winners include:

Peter A. Hochstein, principal and project manager of Quantex Engineering in Troy that licenses automotive and consumer electronic products. His most recent products include a high powered performance audio amplifier, a battery-powered automatic video light and an integrated automotive mirror and compass.

Skip McWilliam, president and owner of Teacher's Discovery in Troy, has invented and sold more than 1,000 teaching aids for foreign language phrases. His company now creates 200 products per year.

Other inventors, although not necessarily award winners, who made presentations at the show include Jack Sibrila and Bob Kaiser of Garden City, who brought there air-operated roof shingle removal tool.