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## Cleveland, Akron are tech patent powers

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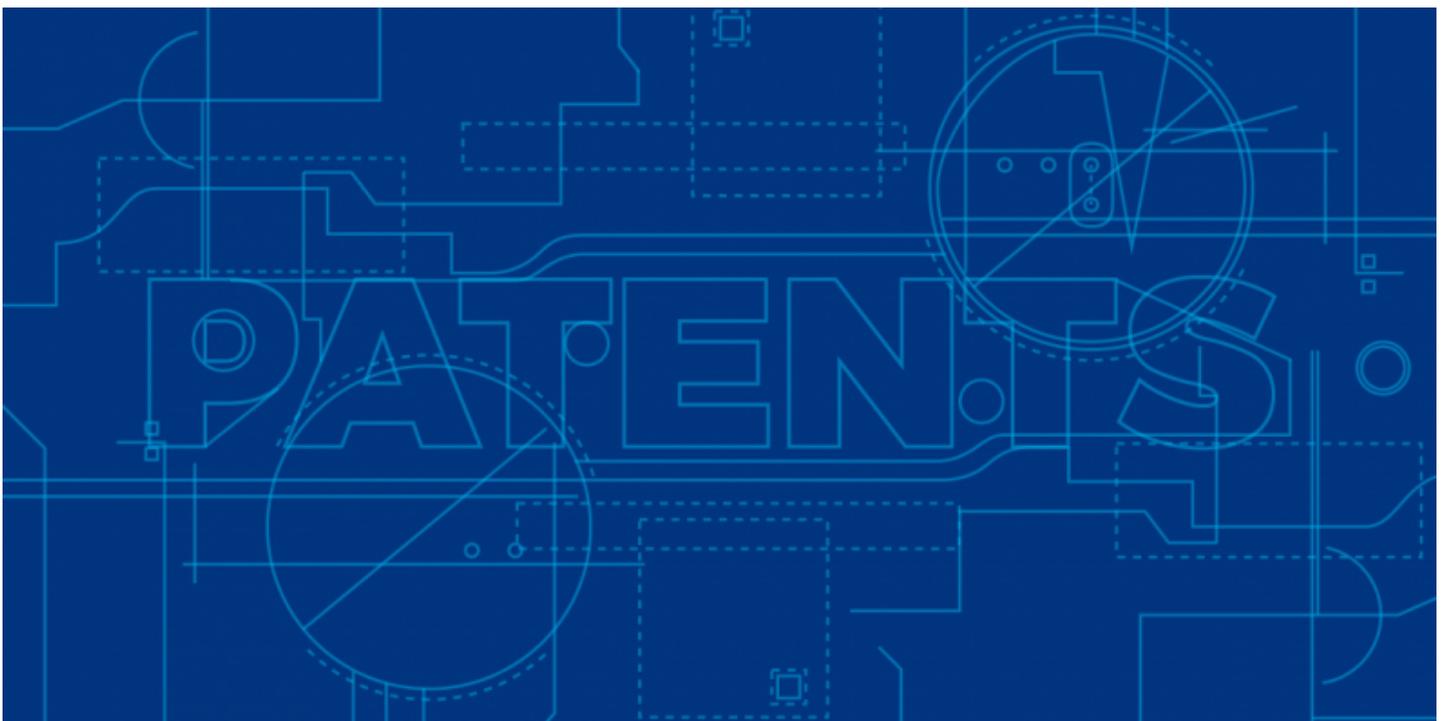
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On Dec. 18, 2013, Lincoln Global Inc., a subsidiary of Euclid's [Lincoln Electric Co.](#), filed patent application number 14/132,496 for a weld sequence editor. It is one of several

patent applications the company, a maker of arc welding equipment, is seeking for a piece of equipment connected to a computer that steps a welder through any number of welds needed for a piece of work.

"Say a thing has 20 welds in it, (the sequencer) will tell you you should do this one first, and then it sends the parameters for that weld to the power supply, and then it shows where to go for the second weld," said Tom Matthews, Lincoln's senior vice president for technology and research and development. "It steps the human through the welds, optimizing the power supply and the welding procedures for each weld. It's a pretty good poster child of what IoT (the Internet of Things) can do."

Manufacturing regions like Northeast Ohio long have measured their economic growth in things like tons of steel produced, widgets made and cars that roll off assembly lines. As knowledge produced has come to matter more than the volume of metal bent, new yardsticks for economic growth are needed, and, to the extent patents are a fair measure of a region's potential of economic growth through innovation, Northeast Ohio should be holding its own among the nation's regions in the years ahead.

Thanks to the research at Lincoln Electric and other Northeast Ohio businesses and research labs, the combined Cleveland and Akron metropolitan areas rank 21st among regions producing technology-related patents over the 2000-2015 period, according to a tally by the [U.S. Patent and Trademark Office](#) (USPTO). That's one shy of the same spot it holds on a list of the country's largest urban regions.

The patent office report excluded design patents and trademarks.

That patent ranking puts Northeast Ohio above comparable regions around cities such as Baltimore, Pittsburgh and St. Louis, but behind smaller metro areas like San Jose, Calif. — which includes Silicon Valley — and Austin, Texas; and just behind 20th-ranked Boise, Idaho.

According to the Patent Office [tally](#), research operations in the Cleveland and Akron metros received 16,570 patents over the 15 years. That compares with 10,907 for the Pittsburgh metro, 10,574 for the Baltimore and 10,290 for St. Louis. The San Jose–Sunnyvale–Santa Clara, Calif., metro area led the list with 143,473. The much smaller Austin metro had 33,753, putting it in 12th place, and Boise, home of Micron Technology Inc., a semiconductor designer and partner of the giant chipmaker Intel Corp., had 19,188.

While patents issued is not an exact measure of a region's future economic growth, they are "a major driver of long-term regional economic performance, especially if the patents

are of higher quality," according to a 2013 study by the Metropolitan Policy Program at the Washington, D.C.-based Brookings Institution.

The Brookings study found that "patenting is associated with higher metropolitan area productivity" and that, while some new technologies reduce the need for workers, "Overall, the evidence is that patenting is good for metro area labor markets. The higher productivity does not seem to come at the expense of workers."

Among the top technology patent generators in the region are corporations Goodyear Tire & Rubber Co. (858 patents issued), Bridgestone Corp. (482), Lincoln Electric Co. (477), Rockwell Automation Technologies Inc. (449) and Bendix Commercial Vehicle Systems LLC (190). The ranks of top patent generators also includes the Cleveland Clinic Foundation (357), Case Western Reserve University (296) and the NASA Glenn Space Center (215).

There is no guarantee that patents generated in a specific location will generate wealth in that region. A set of regional conditions – the presence of a skilled and diverse labor force, an "ecosystem" of businesses providing complementary goods and services, financing and marketing capabilities among them – have to be met for invention to be commercialized in that region.

Because Lincoln Electric has business units around the world, Matthews couldn't say how much Lincoln's patent development adds to the Northeast Ohio economy. But he said the company has about 215 local research engineers working on a variety of products and services, some of which will be designed, made and sold from the company's sprawling Euclid campus.

In addition to adding to the product lines of existing companies, patents spawn startup companies that take root and grow in Northeast Ohio.

In 2003, researchers at [Cleveland Clinic](#) developed a test that assesses a patient's risk for cardiovascular disease. Clinic researchers got patent number 7223552B2 and several others that became the basis for [Cleveland Heart Lab Inc.](#), which was spun off from the Clinic in 2009. While it has had its ups and downs, it has created jobs and brought investment to Northeast Ohio and, by its fourth year in business, it had \$27 million in annual revenue and 120 employees.

Last December it was sold by the Clinic and follow-on investors to [Quest Diagnostics Inc.](#) for \$94 million.

Another way patents spur regional economic growth comes from what's called technology transfer.

On March 10, 2009, the Patent Office issued patent number 7,501,032 to a group of researchers at the NASA Glenn Research Center on Cleveland's West Side for a unique shape-memory material.

A crumpled object made of a complex titanium, nickel and platinum alloy will return to its original shape when heated. What made the material in 7,501,032 patentable was its ability to return to its original shape at a high temperature.

As a federal research center, NASA Glenn can't turn this material into a commercial product, so it may only use it in outer space. Back on the ground, though, it's available for licensing to some company, in Northeast Ohio or elsewhere, that can figure out how to use it, hire workers to make it and turn a little profit.

"At NASA Glenn, we are a research center. We don't sell products," said Sandra Reehorst, acting director of Glenn's Technology Incubation and Innovation Office. "But we have the foundation of something a company could take and turn into a product."