U.S. industry buys Soviet technology

There has been much discussion since President Nixon's Moscow visit (SN: 6/3/72, p. 356) about increased scientific and technological exchanges with the Soviet Union. Working groups have been formed in both countries.

Now, however, it appears that the actual exchange of technology is well under way. Last week, an agreement was signed between Kaiser Aluminum and Chemical Corp. of Oakland, Calif., and V/O Licensintorg of Moscow. Kaiser will purchase the know-how and patent licenses for a Soviet-developed electromagnetic casting process.

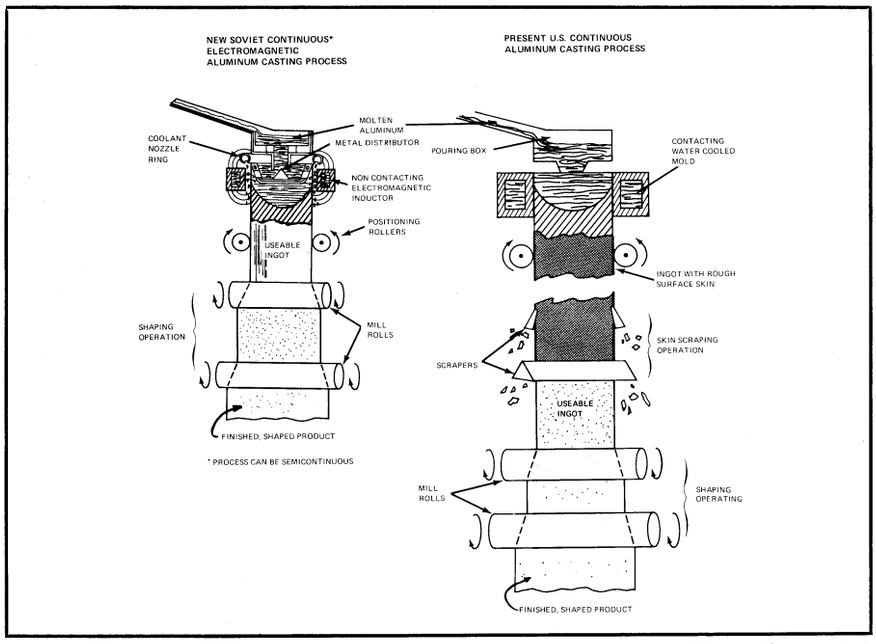
Boris E. Kurakin, director of Licensintorg, announced the sale last week at a Washington press conference sponsored by Licensintorg and Patent Management, Inc. of Washington, D.C. Patent Management is a technology transfer and patent holding company that is concentrating on importation of Soviet technology to U.S. industries. Licensintorg is a trade organization that has the exclusive authority to export all Soviet-developed technology and grant patent licenses.

Kaiser is not the only American firm to buy the process. Reynolds Metal Co. of Richmond, Va., bought it last year. The Soviet method has a specific advantage over the U.S. technique. Standard and special aluminum ingots can be cast in such a way as to eliminate the rough ingot "skin." This skin has to be scalped or scraped off in the U.S. process before the material can be made into specific shapes, such as aluminum sheets. The scalping process is costly and results in wasted metal.

"The U.S.S.R. is the world's largest single concentrated source of high technology," says Henry Shur, president

Patent Management

Shur (left) and Kurakin tell of sales.



Patent Management

Soviet aluminum casting technique eliminates costly "skin" removal process.

of Patent Management. One feature that seems to be enticing U.S. industry is the price. "The technology is available at reasonable prices that eliminate the risk of costly R&D factors in the United States," says Shur. V. A. Salimovsky, president of Licensintorg, says that all of the technology has been proven and is in industrial use in the U.S.S.R.

Licensintorg has been marketing technology now in Japan and Europe for 10 years. Patent Management began talks with the Soviet trade firm in 1968 about exploitation of the American market, particularly in areas of ferrous metallurgy, nonferrous metallurgy, metalworking systems and equipment, welding and electrometallurgy. Both parties admit that business has picked up since the U.S.-U.S.S.R. trade agreements began this year.

Recently Andco of Buffalo, N.Y., bought a Soviet license to manufacture an evaporative cooling system for blast furnaces. The American Magnesium Co. of Tulsa, Okla., signed an agreement to use a Soviet system for the extraction of magnesium. Licensintorg purchased the rights to build cash registers from the National Cash Register Co. of Dayton, Ohio. It also bought licenses from the Cooper-Bessemer Co. of Mt. Vernon, Ohio, to manufacture large gas compressors for transporting natural gas. Boeing recently sold Licensintorg the technology for manufacturing doors and door frames such as those used on the Boeing 727. The agreement was made by a Boeing subsidiary, the Boeing Associated Products of Seattle.

U.S. industry also seems to be interested in Soviet "HPTR tube mills." These mills make high-quality thin-wall tubing from tough metals such as zirconium, titanium and stainless steel. The tubing is used for nuclear reactors, aircraft and other precision applications. Carpenter Technology Corp. of San Diego and Wolverine Tube Division of Universal Oil Products acquired HPTR mills from Patent Management. Patent set up and ran a full-scale demonstration of the plant facilities for a year in Raleigh, N.C.

Another Soviet technology of interest is the electroslag refining (ESR) process and equipment developed at the Paton Electrowelding Institute in Kiev. It is also marketed by Patent Management. In June, representatives from six major American steel and alloy producers went to Kiev for an evaluation of the process. The technique is for refining and upgrading the quality of a broad range of steel and alloys to produce superior materials. Both the Soviet TU-144 and the British-French Concord supersonic transports use substantial amounts of ESR metals.

Soviet engineers have developed a "water cannon" capable of creating water jets at pressures up to almost 1 million pounds per square inch. This equipment is useful for shattering rock in quarrying, tunneling and coal mining operations. Patent Management licensed Terraspace, Inc. of Rockville, Md., for the water cannon process. Terraspace is also working under a $175,000 contract received in July from the Federal Railroad Administration to adapt and test this process for use in American industries.

According to Kurakin, more than 500 items are now available to U.S.

industry through Licensintorg. Beginning in January 1973, Licensintorg and Patent Management will hold a series of symposia in various American cities. Soviet inventors and scientists will present to American industry specific technology now available. The first symposium will be in Washington, D.C.

In addition to the reputed cost benefits to the U.S. industries, the increased trade activity with the Soviet Union will have other results. With hard currency in hand—estimated to be potentially $250 million a year over the next 10 years—the Soviets can buy more U.S. goods and services. □

NAS staff fellows: Eyes on science policy

Last April, Philip Handler, president of the National Academy of Sciences, mentioned at a press conference that the Academy planned to bring onto its staff a number of postdoctoral fellows or, as he called them, "in-house residence scholars" to assist the Academy and study science policy (SN: 5/6/72, p. 294). This was greeted with some interest because, among other reasons, the Academy has never been accused of favoring the young in hiring its professional staff.

Last week the NAS announced that it has received a $250,000 grant from the Alfred P. Sloan Foundation to initiate the program. It will allow some eight scientists each year to study selected aspects of science and public policy while participating "in staff work of their choosing" within the NAS complex. That includes the National Research Council, National Academy of Engineering and Institute of Medicine.

The general criteria for selection are a Ph.D. degree or the equivalent and five to ten years experience in science, engineering, medicine or the social sciences—which probably excludes the under-30 generation from the NAS "youth corps." The criteria obviously also rule out young lawyers and other nonscientists who might be just as capable of contributing to staff work and as adept at studying science policy.

The Academy said four fellowships would be awarded for the 1972-73 year and eight each year thereafter. Fellows will be chosen by an NAS committee upon recommendation "by designated individuals." The NAS said the Sloan money is expected to be supplemented by other funds so that the staff fellows will be able to be paid about the same level earnings they are receiving in their present positions.

In the announcement, Handler noted that the staff fellowships are a potential rich opportunity for persons interested in studying the interrelations between science and public policy issues. □

Visualizing genes: The possible dream

Scientific progress leans heavily on advances in instrumentation. Molecular biology, for example, has exploded into one of the most fertile fields of research as instruments for detecting cellular structures and functions have become available. Molecular biologists can now visualize the larger structures of the cell, such as the nucleus and chromosomes, under the powerful electron microscope. But they have not been able to obtain images of genes (DNA) on the chromosomes. Nor have they been able to see RNA (nucleic acids that transform DNA into proteins) or the intricate details of cell membranes, enzymes and viruses. If they could, it would be an enormous boost to probing the secrets of life at the molecular level.

But obtaining images at such a minute level of detail in biological specimens has often been considered an impossibly difficult task. Scientists thought that as the energy of the electron beam of the electron microscope rises, the damage it causes to biological materials increases. At one million volts the damage was thought to increase again because of effects associated with Einstein's theory of relativity.

Now two Lawrence Berkeley Laboratory scientists have demonstrated an opposite effect. Their work shows that, given a powerful enough microscope, biologists may be able to visualize DNA and other intricate cell structures.

Gareth Thomas and Robert Glaeser worked with the two most powerful electron microscopes in the world, at the National Center of Scientific Research in Toulouse, France. The diffraction patterns they obtained from the amino acids valine and glycine between 1 million and 2.5 million electron-volts show that as the beam rises above 1 MeV, damage decreases rapidly and smaller structures can be seen.

Lawrence Berkeley Laboratory

Glaeser, Thomas: Can DNA be seen?

"With an electron microscope of 5 MeV," they told the meeting of the Electron Microscope Society of America in Los Angeles, "we believe we would be able to obtain at last a true molecular picture of the DNA and RNA chains, thus permitting a direct read-out of the code used in these important genetic structures." At high energy, they explain, delicate specimens of nucleic acids, enzymes, viruses, cell membranes and other biological components could be imaged and their true molecular structure revealed, without the complications and limitations of staining. □

ERTS' TV is shut down; other instrument fine

Engineers at the Goddard Space Flight Center were still searching this week for the location and cause of two power surges that affected one of the two key sensing systems in the newly orbited Earth Resources Technology Satellite (SN: 8/5/72, p. 90).

The first power surge occurred Aug. 3 in one of the two onboard tape recorders. That recorder was shut off. Then on Aug. 6 during a pass over Alaska the voltage suddenly increased again. Engineers believe this second problem is associated with the relay system that feeds power to the Return Beam Vidicon (television) system. The television camera has been shut down until engineers can determine the cause.

Technicians at RCA's Astro-Electronics Division in Princeton, contractor for the RBV, were also running tests this week. They have set up equipment to try to reproduce the power surges in a ground-based model of the camera.

The spacecraft's multispectral scanner system (MSS) is still working. It also produces data that are reconstructed into visual images and was designed to complement the RBV. Since the MSS is working much better than was anticipated, the loss of the RBV photos is not considered a severe problem. Since ERTS was orbited July 23 (SN: 7/29/72, p. 72), it has returned more than 6,000 pictures of earth in multispectral imagery. □