

Patents of the Week

A new superconducting device that could fit inside an eggshell produces extremely high magnetic fields important in the study of the nature of matter—By Ann Ewing

► A NEW WAY of obtaining strong magnetism, important in finding methods of harnessing fusion reactions for peaceful power, earned recognition for two General Electric scientists from the U.S. Patent Office.

They developed three "magnetic pumps"—each small enough to fit into an eggshell with room to spare—that produce magnetic fields so high that several hundred pounds of equipment would be needed to produce equivalent fields by conventional means.

High magnetic fields are also of growing importance in studies of the basic nature of matter, in magnetohydrodynamics and in guiding charged particles accelerated in atom smashers.

The new magnetic pumps are built with superconducting materials, which offer no observable resistance to an electric current at temperatures near absolute zero, which is 459.7 degrees below zero Fahrenheit. Superconductors also resist penetration of a magnetic field into their interior, the key to the new devices.

One of the magnetic pumps consists basically of a small tube and a loose-fitting, tapered piston, both of which are made of a superconductor such as niobium-tin. The tube is placed in an external magnetic field and then cooled below its superconducting temperature, thus trapping the lines of magnetic force within the "hole" of the tube.

The tapered piston is then thrust into this

hole. Since neither the superconducting piston nor the tube walls can be penetrated significantly by the magnetic field within the hole, the lines of magnetic force are pushed closer together, creating a concentrated field.

Laboratory versions of these devices have achieved fields of 15,000 gauss, and fields of 100,000 are believed possible. The earth's magnetic field at its surface is about half a gauss, a unit of magnetic measurement.

Paul S. Swartz of General Electric Company, Schenectady, N.Y., is the inventor of two of the devices and co-inventor, with Carl H. Rosner, also of GE, of the third. They assigned rights to patents 3,158,792, 793 and 794 to GE.

Shirt With Removable Sleeves

A summer-winter shirt with sleeves that zips on and off earned a patent.

The sleeves are attached to the shirt or blouse by a zipper that is hidden from view and that is sewn on the sleeve. When the wearer wishes to make the apparel sleeveless, all he need do is unzip it.

Isaac Rosenberg, Clayton, Mo., who was awarded patent 3,154,790 for his invention, foresees a long-sleeved shirt or blouse that can be unzipped and made short-sleeved, or can be still further unzipped to be worn sleeveless.

Other Patents Issued

A magnetohydrodynamic generator to supply power to a space vehicle with the atmosphere through which the craft passes being used for the fuel, or plasma. Several prototypes of such a generator have been built, Edward A. White, Jr. of the Naval Ordnance Laboratory, White Oak, Md., said. Mr. White assigned rights of patent 3,156,433 to the Government through the Secretary of the Navy.

A life raft for use by astronauts that can be easily boarded even by a person in a pressure suit and having a covering to protect the occupant and to increase radar reflections. Glenn A. Shewmake and Matthew I. Radnofsky of Houston assigned rights to patent 3,155,992 to the Government through the National Aeronautics and Space Administration.

A method for melting silicon to obtain the very high purity required in making semiconductors. Denis G. Kelemen of Wilmington, Del., earned patent 3,156,549 and assigned rights to E. I. du Pont de Nemours and Company.

For a list of registered patent attorneys and other Patent Office information, write the Commissioner of Patents, Washington, D.C. 20231, or call 202-967-4058 for specific information.

• Science News Letter, 86:381 December 12, 1964



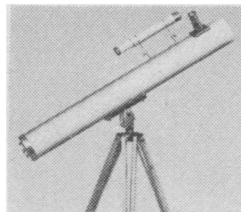
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SUPERCONDUCTING "MAGNETIC PUMP" — High magnetic fields are produced in this device by thrusting the piston into the tube and concentrating the lines of magnetic force originally confined in the "hole."

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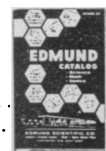
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