

chemistry

GARBAGE DISPOSAL

Squeezing and coating

A Japanese scientist has invented a combination compacting and coating machine to overcome two of the chief problems of garbage disposal: size and putrefaction.

Devised by Dr. Kunitoshi Tezuka and tested by the Science and Technology Agency and Kyoto University, the machine employs multiple pressure points that compress the garbage into rock-hard blocks. The liquid runoff is chemically treated in collecting tanks.

To prevent chemical decomposition and the accompanying problems of pollution, pests and disease, the garbage blocks are dipped in asphalt or concrete.

PHOTOGRAPHY

New color film

The Japanese have a new color film that they claim gives sharper pictures.

Konishiroku Photo Industry, Ltd., Tokyo, achieves better color separation with new emulsions and coloring materials as well as new thin-coating techniques in the manufacturing process.

The new film also offers a wider range of exposure. Previously, under very fast or very slow exposure, an undesirable change occurred in the emulsion or color sensitiveness. The change had to be corrected by wider exposure or by using a correction filter. The new film can take pictures at exposures of one second to 1/2,000 of a second.

MATERIALS

Method for concrete mixing

Maximum strength in concrete depends on the correct blend of water and cement. In turn, the size of the particles or aggregates making up the cement determines how much water the cement can hold. Cement made of small aggregates will retain less water than cement with large aggregates.

The American Concrete Institute has devised a method for determining the correct mixture of water and cement for concrete composed of lightweight cement aggregates. Key to the method is the determination of a common density factor for lightweight aggregates. By applying this factor, the correct proportion of water and cement can be calculated for any lightweight aggregate concrete.

AEROSOLS

Tear gas antidote

Mounting criticism of tear gas sprays has prompted metropolitan police departments to consider a new tear gas antidote (TGA). This aerosol, applied by squirting, is not an anti-tear gas agent. Instead of chemically neutralizing a tearing agent, it flushes out the eyes.

Its main ingredients are 2-diphenylmethoxy-N,N-dimethylamine—an antihistamine to combat allergic reactions—and benzalkonium, a germicide. It has a protein base that acts as an anti-irritating agent.

The spray is claimed to be more effective than soap,

water or other flushing agents by its producers, Partner Industries of America, Inc. of Chicago.

METALLURGY

Easier tungsten fabrication

Chemical vapor deposition (CVD), a process used mainly for coating materials with metal, has been adapted by Fansteel, Inc., Pacoima, Calif., for making tungsten crucibles. The crucibles are vital in the growth of crystals for use in optical lasers, for taking the temperature of nuclear reactors and for melting metals and salts.

Tungsten's high melting point (6,170 degrees F.) and toughness make it one of the most difficult metals to fabricate. In the CVD method tungsten hexafluoride is heated in a vacuum with hydrogen and the vaporized tungsten atoms are deposited on the hot surface of a stainless steel crucible form. Because of the difference in heat conductivity, the form shrinks from the tungsten during cooling, leaving a pure tungsten crucible.

The method produces high-purity, high-density tungsten at a fraction of the cost of conventionally produced, or forged, tungsten.

COMPOSITES

Unsinkable lifeboat

A new fiber glass lifeboat, termed a major breakthrough in sea safety, promises to eliminate the dangers of tipping over upon lowering, capsizing or being swamped. Developed by Whittaker Corp., Los Angeles, the completely enclosed vessel owes its stability to its spherical shape.

Weighing 5,500 pounds fully equipped and measuring 12 feet in diameter, the capsule can accommodate 28 people. The capsule, which is made of fiber glass with polyurethane foam for buoyancy, comes with a 40-horsepower engine, food and water for five days, a toilet, fishing gear and flares.

Tests conducted over a three-year period with human occupants indicate that regardless of the ship's list, the capsule's impact with the water or the condition of the sea, the vessel would remain upright and afloat.

PETROLEUM

Gasoline recovery method

A newly patented process will permit oil companies to get gasoline more economically from coal tar. The new process, from FMC Corp., offers an economic advantage in that coal tar can be treated with a cheap iodine catalyst, enabling impure hydrogen rather than expensive high purity hydrogen to be used. The method produces a thinner, less viscous coal tar, which can be processed by conventional petroleum equipment to obtain gasoline.

With conventional catalysts, unless high-cost hydrogen is used, the coal tar becomes a thick, viscous residue from which gasoline yield is poor. Dr. Louis D. Friedman of FMC's Princeton, N.J., laboratory believes the iodine and hydrogen work by breaking oxygen bonds in the coal tar, thus making it less viscous and able to flow more easily. The patent is 3,453,202.

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