

have scoffed at as impractical because vibration would break the joints holding the top to its supports. Now the top can be attached by Cyclewelding a thin rubber sandwiched between the plastic and the metal.

That is only a beginning, Saunders says. When you find a gunk that will stick anything to anything else, the sky is the limit.

For much of the technical data in this article the author gratefully acknowledges indebtedness to Lloyd Stouffer, author of "Cycleweld—a New Bonding Process," published by *Modern Plastics*, September, 1943.

Science News Letter, March 11, 1944

CHEMISTRY

Paper Shipping Sacks Receive Specifications

► THE FIRST extensive federal specifications for paper shipping sacks have just been issued by the National Bureau of Standards. War uses of paper sacks, now necessarily replacing metal, wood or textile containers, make these of particular importance at the present time.

Specifications include construction details for five types of sacks, and for waterproofing the ends of sewn sacks. They cover four different kinds of kraft paper: shipping sack paper, paper treated for high wet strength, paraffined paper, and asphalted paper. For wet-strength paper a wet tensile strength of about 27.5% of the dry strength is specified.

Science News Letter, March 11, 1944

CHEMISTRY

Process for Obtaining Magnesium from Sea Water

► MAGNESIUM, super-light metal needed alike for airplane construction and illuminating flares, has been obtained in quantity from sea water during the present war. Patent 2,342,666, on a process for doing this, has been granted to S. B. Heath and F. R. Minger of Midland, Mich., and assigned by them to the Dow Chemical Company. Basic steps in the process are the treatment of the sea water first with a lime slurry, then with calcium chloride, to remove undesired compounds (principally sulfates), and introducing carbon dioxide to unite with the magnesium to form magnesium chloride. Since this compound is highly soluble, it remains in solution while the insoluble sulfates are precipitated and filtered out. Then the magnesium chloride is reduced to solid form by evaporation.

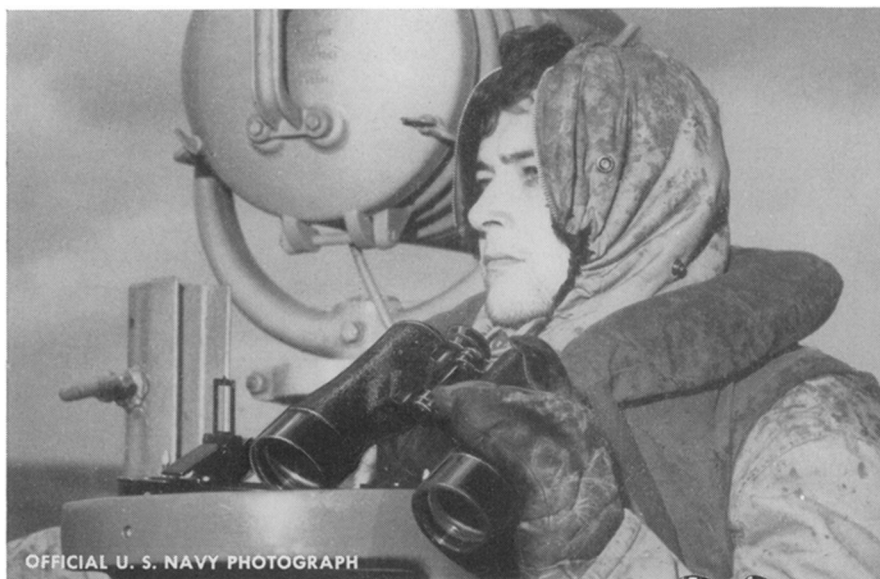
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CHEMISTRY

Oil-Treated Shoe Soles

► SOLES of wartime rationed shoes last longer if treated before attached with special oil preparations, or impregnated with wax. In tests made during the past year by the National Bureau of Standards, an improvement was found of 14% in wear of sole leather of grades available to civilians, and a possible improvement of from 30% to 40% indicated by a few service tests of wax-impregnated soles.

Some thirty commercial mixtures for water-proofing and improving wear were examined at the Bureau, but the service tests on oil-treated soles were confined to two, both of which are made of available materials and may be applied without special equipment. In the service tests a considerable number of cadets were used, the cadets being in a Washington, D. C., high school military unit.



BINOCULARS LIKE THIS MUST PASS

a "swimming" test

Bausch & Lomb developed the first waterproof binocular—a binocular which can be immersed in a tank of water, yet due to its water-tight construction, not a drop of water can get into the interior to fog the optics or interfere with its perfect functioning.

This engineering achievement required a complete redesign of the instrument, complete re-tooling and revised manufacturing procedure. All this was accomplished without interrupting the scheduled even flow of needed binoculars to the armed forces.

Based on this redesign, both the Army and Navy now specify that *all* binoculars supplied to them be of waterproof construction.



Bausch & Lomb
7X, 50mm Binocular

Facilities of this plant—developed through 90 years of service to outdoor enthusiasts, to science and industry—are busy today fighting a war. After Victory new miracles of optical science for better living will come from the drafting tables, the glass furnaces and the precision finishing rooms of Bausch & Lomb, optical headquarters of America.

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AN AMERICAN SCIENTIFIC INSTITUTION PRODUCING OPTICAL GLASS AND INSTRUMENTS FOR MILITARY USE, EDUCATION, RESEARCH, INDUSTRY AND EYESIGHT CORRECTION

For them special shoes were made to their individual measurements.

Each pair of shoes for the cadets had a treated sole on one and an untreated sole on the other. In half the cases the treated sole was for the right foot, in the other half for the left. Oil-treated half-soles for repairs were prepared and held in reserve until a hole appeared in a sole. Then the pair were re-soled, the treated half-sole being put on the shoe which had the untreated original sole. This was done to give "balanced" tests.

The preparations used in the tests were mixtures of mineral oils and a solvent. The soles were put in the solutions long enough to become well filled with the preparation, then they were dried at room temperature. They gained from 10% to 12% in weight, and lost very slightly in thickness. Commercially, the treatment should not cost over two cents a pair. No difficulties were experienced in fabricating the shoes because of the oil treatment. The repairs were made in an ordinary shoe repair shop.

The treatment of leather soles on shoes in the home by this method is not recommended by the Bureau as complete immersion of the sole is not practical when it is attached to the shoe. The commercial treatment, the Bureau says, "appears to be effective, inexpensive and practical, and it would seem desirable that such treatments should be generally adopted in the industry."

The wax-impregnation method is more costly because of special heating and other equipment required.

A recent progress report of the U. S. Interdepartmental Committee on Leather indicates a way in which oil or wax-treated soles may be used in so-called "cement constructed shoes," or shoes to which the soles are attached by cement rather than by sewing. In the process recommended the section of the outsole which is to be cemented is roughened and pyroxylin applied before the sole is dipped in the oil mixture or wax.

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CHEMISTRY

Plywood Bathtubs

► WOOD, the "Sleeping Beauty" of materials, is beginning to awaken.

Bathtubs of molded plywood, wood floors which can be cut from rolls, fire-proofed wood structures 17 stories high, bakers' yeast, anti-freeze and photographic developers are only a few of the products we may expect from wood in the post-war world, according to Prof. Robert W. Hess of Yale University in an article in *Tropical Woods*, technical publication of the Yale school of forestry.

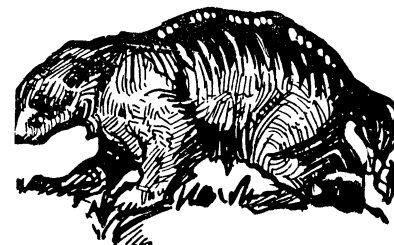
And wood, unlike metals, coal, oil and other exhaustible natural resources can, he said, be continuously supplied from lands unneeded for other purposes.

Until recently, Prof. Hess pointed out,

all progress in the wood industry has been in the methods of manufacture, while the product has remained the same: lumber. Now, he said, new discoveries are promising a material of varied personality and uses.

Already plywoods, synthetic resin adhesives and resin impregnation to improve the properties of various woods have been developed, forecasting a change in the conventional picture of wood and the use of many species of woods not previously utilized. Resin-impregnated woods, which do not swell or shrink, Prof. Hess said, can even be used for gears and bearings.

Science News Letter, March 11, 1944



No Gentleman

► FINE FEATHERS do not make fine birds, we are assured in one of the most familiar of old adages. The same might be said with ditto marks, about fur and mammals. Among the most prized of all furs is wolverene—that is, except when the beast himself is still wearing the pelt.

The wolverene is just about the "orn-eriest" of all quadrupeds. Trappers hate him because he steals bait, also because he tears up and partly eats other trapped animals. And he is so cunning that he almost never steps into a trap himself.

He is such a greedy feeder that he has well earned that alias of "glutton," and after he has stuffed himself he befouls whatever is left so that no one else would want it.

The wolverene is practically extinct in the United States. Nobody seems to regret it much.

Science News Letter, March 11, 1944

INVENTION

Illuminated Target For Anti-Aircraft Fire

► FOR THE TRAINING of night-fighter pilots and for anti-aircraft gunners on the ground or surface ships, A. D. Dirksen, of Dayton, Ohio, has invented an illuminated target to be towed through the air by a plane. It consists of several tubular cloth sleeves, with a strong, battery-powered electric lamp suspended in the center of the frame at the forward end. This eliminates the use of searchlights from the ground, or of a long, power-eating electric cable from the towing plane, hitherto in use.

Rights in patent 2,342,651, covering this invention, are assigned, royalty-free, to the government.

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