

## INVENTION

# Current U.S. Patents

**A new method for breathing underwater uses a membrane to extract the oxygen dissolved in water to make it available for breathing—By Ann Ewing**

## See Front Cover

► A MAN-MADE GILL with which man can breathe underwater was granted a patent by the U.S. Patent Office.

The pioneer patent covers a method for using a membrane to extract the oxygen dissolved in water to make it available for breathing. It also covers a method for disposing of exhaled carbon dioxide to purify the respired air for rebreathing by dissolving the carbon dioxide in the water outside the membrane.

Waldemar A. Ayres of Rutherford, N. J., who does research on medical equipment for Becton-Dickinson and Company, received patent 3,228,394 for his gill-type breathing equipment.

He believes the uses to which his oxygen-extraction method could be put in the future include underwater swimming, exploration, construction work, salvage, prospecting, scientific studies and submarines.

Mr. Ayres has been studying the respiration of fishes and the principles of diving equipment for more than 10 years in his research to develop artificial gills so that humans can breathe underwater. He said he had proved to the Patent Office that his apparatus works by breathing through the equipment exclusively for an hour, part of the time with his head submerged in water as shown on this week's front cover.

Mr. Ayres is now testing designs that could make his methods compact enough to be carried by a man as scuba equipment.

## Cell for Rocket Fuel

The use of a honeycomb cell structure for storing rocket fuel earned patent 3,226,928 for Wells A. Webb of Berkeley, Calif., and Wendell T. Jackson of Pleasant Hills, Calif. They assigned rights to their method of reinforcing solid rocket grains to Hexcol Products, Inc., Berkeley.

The metal foil from which the honeycomb holding the solid rocket propellant is made is itself combustible and, therefore, increases the burning rate of the fuel to give higher efficiency.

The honeycomb structure can be used either in end-burning or center-burning rockets. Aluminum foil is recommended by the inventors for making the honeycomb.

## Other Interesting Patents

An instrument that continuously tells the time of day at any place on the earth and also shows the date at any place has been developed by James Kilburg of San Carlos, Calif. He was granted patent 3,226,926 for

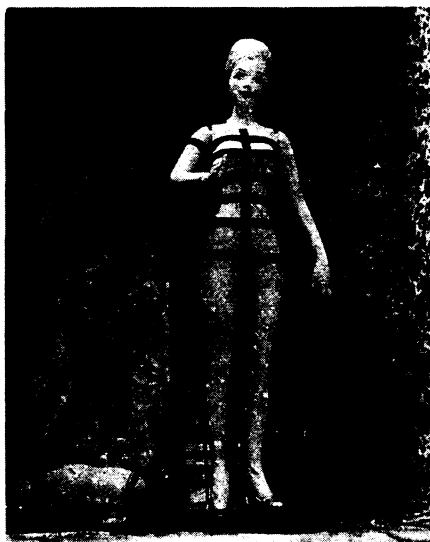
his combination of map and time-teller, which he calls a "geographical horological instrument." Mr. Kilburg assigned patent rights to Geochron Corporation in San Carlos.

To house such small laboratory animals as mice, hamsters, guinea pigs or rabbits used in research involving radioactive tracers, two Illinois scientists have devised a cage from which the liquid and solid matter can be removed without personal contact. George H. Gass and Charles A. Bunten of Carbondale, Ill., assigned rights to patent 3,227,139 for their "animal metabolism cage" to Southern Illinois University Foundation.

A method for generating electrical energy directly from a fuel and an oxidant in a fuel cell earned patent 3,337,585 for David Langford of Manchester, Conn., and Alfred W. Stubner of Glastonbury, Conn.

High purity hydrogen in large commercial quantities can be obtained using the diffusion unit developed by George G. Pinney of Park Ridge, Ill., and Hugh G. Hempill of Chicago. They assigned rights to patent 3,226,915 to Chemetron Corporation, Chicago.

• Science News Letter, 89:54 January 22, 1966



Fremont Davis

**MINIKIN FOR STUDENTS**—This minikin, one of many dolls proportioned to the form of a college girl, is used to train student dress designers. Developed by Profs. Eileen Heagney and June C. Wilbur of the University of Maryland, the minikins stand 15 inches high and are made of latex.

## TECHNOLOGY

## New Method of Welding Uses Particle Impact

► A NEW METHOD of spot-welding using the high-speed impact of tiny plastic strips on aluminum or copper plates has been discovered.

Scientists have obtained welds by firing tiny Mylar cylinders at velocities up to 28,200 feet per second into both metals. The projectile impact usually but not always produces a rippled weld.

Details of the ripple structure were reported in *Nature* 208:1273, 1965, by Dr. Robert F. Rolsten of Technical Operations Research, Burlington, Mass., Alan K. Hopkins of Wright-Patterson Air Force Base, Dayton, Ohio, and Harold H. Hunt of La Mesa, Calif.

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## GENERAL SCIENCE

## New Dress Form Helps Home Economics Students

► COEDS at the University of Maryland are playing with "dolls" made in their own image. Actually, the dolls are scientifically designed minikins proportioned to the form of a college girl and used for the purpose of training fledgling dress designers.

Dubbed Miss Dot Jr., the minikins stand 15 inches high, are made of latex and have the small waist and slim figure common to today's coed. Profs. Eileen Heagney and June C. Wilbur, at the University's College of Home Economics, developed the form with the help of Dr. Dorothy Siegert Lyle of the National Institute of Dry Cleaning.

Their aim was to create a youthful and elegant figure with which to inspire the student designers.

Ordinarily dress designers and seamstresses use the traditional human-sized but legless dress form. Over the years a few changes have occurred in this mature female form, but basically it is the same as the thing collecting dust in Grandma's attic.

Her students do not usually make the dress itself in miniature, noted Prof. Heagney. First they start a simple classical dress for both themselves and Miss Dot Jr. using some firm lining material. Next, they begin slashing, pleating, tucking and folding the small pattern. When a good design has been found, it can be easily transferred to the large pattern with "all the bugs worked out."

Besides saving the students time and money, Miss Dot Jr. produces greater precision in the students' work, Prof. Heagney believes.

A superfluous bit of material can perhaps be hidden on the human figure, but not on the minikin. There an error as small as an eighth of an inch is plainly visible. Unless corrected, the mistake will be multiplied when the dress is enlarged.

The two professors began using the instrument last fall. They expect to analyze its effectiveness at the end of the school year.

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