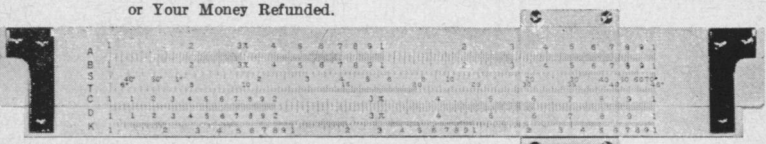


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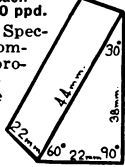
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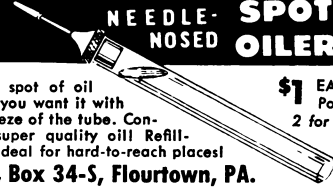


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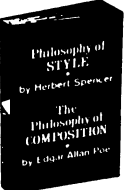
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## INVENTION

# Patents of the Week

A method devised by Government researchers to convert mustard seed into a high protein animal food by removing its toxicity won a patent—By Elizabeth Hall

► A METHOD for converting the seed of worthless mustard weed into a high-protein animal feed, as the result of Government research, received patent 3,106,469 from the U.S. Patent Office. This weed is frequently seen in back yards.

The deadly mustard gas that was used in World War I comes from the action of an enzyme naturally found in mustard on the ground mustard seed meal, producing an irritating, poisonous oil. Gus C. Mustakas, Peoria, and Larry D. Kirk of East Peoria, Ill., use the same chemical reaction of this enzyme, myrosinase, on the poisonous glucoside allyl isothiocyanate contained in the mustard seed, to separate the seed from its poisonous element.

A third of a percent of freshly ground mustard seed containing the enzyme is added to heat-inactivated mustard seed. With 15% moisture and temperature at 50 degrees Centigrade (122 degrees Fahrenheit), the enzyme will take about 45 minutes to free the glucoside allyl isothiocyanate from the ground mustard seed.

The temperature is then increased to distill the glucoside and moisture into condensable vapor, leaving the mustard meal free of toxic elements. The natural vegetable oil of the mustard seed is then extracted and the meal defatted, leaving an animal feed of 35% to 40% protein.

The moisture percentage in the mixture is very important since 17% would also free insoluble vegetable gums that interfere with further extraction of oil.

The mustard seed meal in use today must be diluted with at least nine parts of other seed before it is acceptable for animal consumption. The pure allyl isothiocyanate can be used as an industrial chemical in making plastics and producing perfumes, after being distilled from the seed meal.

The mustard weed, which originally comes from the Mediterranean area, grows in temperate climates all over the world today. California, Montana and Kentucky lead in mustard production in the United States.

Some of the plants are grown for mustard "greens," while other are grown at a different season of the year to produce the seeds that yield oil. The part now used as condiment is such a small part of the plant that the rest of it is wasted, although the entire weed is sometimes used for a cover crop or manure.

The U.S. Department of Agriculture, to whom patent rights were assigned, hopes that more uses for mustard seed will be developed with this relatively inexpensive and easy way to remove toxicity. The patent is available for sub-licensing by manufacturing firms, royalty-free.

## Personal Life Raft

A personal inflatable life raft that may someday take the place of "Mae Wests" earned patent 3,105,981 for William B. Bennett of North Miami, Fla. The raft can be worn strapped to the body by aircraft pilots, astronauts or passengers on a ship. It is inflated after the wearer reaches the water.

When inflated, the raft is 51 inches wide and six feet long, but when not in use it is contoured to fit comfortably the back of an adult. An open zipper allows freedom of movement for the part strapped to the legs, and the two air bottles of compressed gas fit under the knees of the person when seated. Rings are provided with the raft so that a group of rafts could be joined together after a boat or plane sinks in the water.

## Restoring Typewriter Ribbons

An Ohio inventor has patented a solution for restoring tired typewriter ribbons. Erwin H. Ellerin of South Euclid uses a fast-evaporating combination of hexane, trichlorethane and methylene chloride to soften the used ribbon, to carry the rejuvenating part of the solution to the worn-out parts and to dry the ribbon quickly after treatment. He earned patent 3,105,769 for the solution.

In order to restore the body of the ribbon, one or more of such ingredients as mineral oil, silicones, sperm oil, lard oil, corn oil, cottonseed oil, spermaceti wax, castor oil and many others are used.

A fishing net especially designed for holes in the ice no more than seven inches wide for which Lawrence J. Jaster of Bellevue, Iowa, earned patent 3,099,888. The net consists of a vertical, elongated hollow body, screened across the bottom and containing a sawtoothed front edge that holds the fish in place.

• Science News Letter, 84:270 Oct. 26, 1963