

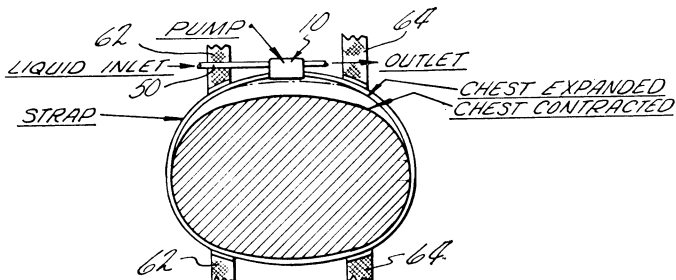
# current patents

## LIFE SUPPORT SYSTEMS

### Spacesuit cooler is chest-powered

In the complex life support systems of a spacesuit, simplicity means reliability. One of the biggest problems is the fact that everything—heat, cooling, communications—needs its own power supply, with accompanying switches, connectors and encumbrances.

A large step toward simplicity has been taken by David C. Jennings, an engineer with United Aircraft Corp. in East Hartford, Conn. Jennings developed a



spacesuit coolant pump that is driven by the wearer's inhaling and exhaling. As the man breathes, he causes a band stretched around his chest to expand and contract, which in turn operates the piston of the pump.

Though just patented, the pump was developed more than two years ago. It has not been carried further, however, since the spacesuit for the Apollo astronauts uses an electric pump built into its backpack.

Patent 3,366,060

## MATERIALS

### Radiation sets glass fiber

A process for permanently setting glass fiber material into a desired shape by exposing it to ionizing radiation has been patented by two Japanese engineers. Previously, they say, there was no known way to permanently deform inorganic high polymer glass fiber material without reducing its mechanical strength and changing its chemical properties.

X-rays, gamma rays, beta- and alpha-rays, neutron beams and molecular beams with ionizing properties can all be used in the process, according to Shunji Ohnishi and Hiroshi Tsuboi, both of Tokyo, although gamma rays are cited in the patent claim.

Glass fiber materials based on organic high polymers can be deformed with heat alone, because when they are heated, part of their molecular structure remains rigid while the other part moves. This creates stress in the direction of the desired deformation.

With inorganic high polymers, no such structural changes occur in response to heat. Exposing the material to radiation, however, after it has first been deformed, works because the individual atoms in the material arrange themselves along the paths where the rays have passed, eliminating the internal stress caused by the deforming and allowing the material to relax in its new shape.

The engineers assigned patent rights to the Agency of Industrial Science and Technology in Tokyo.

Patent 3,366,467

154/science news/vol. 93/17 february 1968

## SURVEYING

### Radar separates trees from ground

A radar system for aerial surveys, accurate to within five feet and able to distinguish tree-top readings from the ground, has been developed in Canada.

The system can be used for topographical surveys, map making, forest inventories and similar jobs, says the inventor, Ray L. Westby of Ottawa. It need not be confined to aerial observations, however, and can be used for horizontal and even upward measurements.

"When one begins to deal in heights as small as five feet," Westby says, "any vegetation on the ground being surveyed can become a very significant factor." Vegetation can mean that even with very sharp radar pulses being sent out, each return pulse will be less sharp, with the extreme leading portion of the return pulse representing reflection from trees and other above-ground objects, and the peak of the pulse representing the ground.

The usual radar receiver measures the distance to its target by comparing the line between the outgoing pulse and the leading portion of the return signal. To counteract the effects of vegetation, Westby's system compares the leading edge of the outgoing pulse with the strong peak portion of the returning one.

Westby's system was granted a patent less than 13 months after he applied for it, a very short time compared to most technical patents. He assigned rights to Canadian Patents and Development Ltd. of Ottawa.

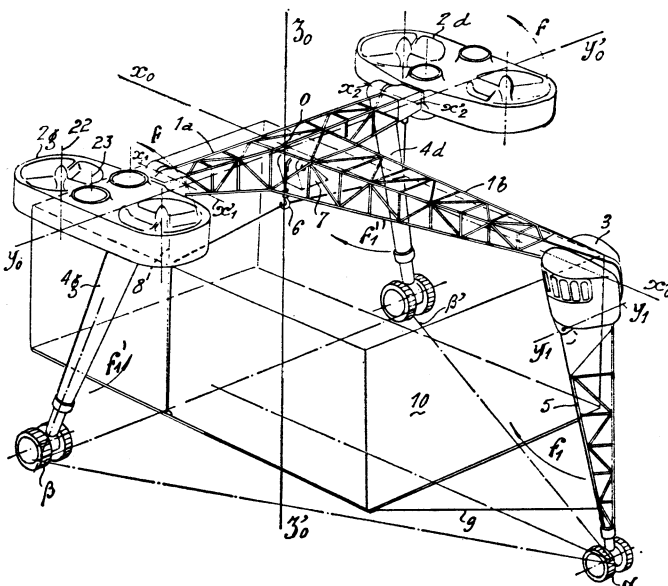
Patent 3,366,956

## AIR TRANSPORT

### France's answer to the Skycrane

A design for an unusual aircraft, most closely resembling the Sikorsky CH-54A Skycrane, has been patented by an engineer with Nord Aviation of France.

The craft is in the shape of a huge 'T', raised on legs and powered by two pairs of enclosed rotors at the ends



of the crossbar. It would carry large loads by straddling them on the ground, then picking them up between its legs for flight.

Patent 3,366,347