

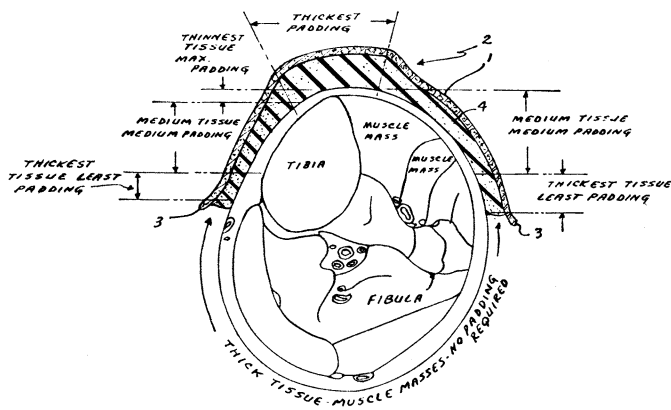
# current patents

## SPACE MEDICINE

### Pad protects astronaut from safety harness

A contoured pad to protect an astronaut's knee and lower leg areas from his own protective straps has been developed by an Air Force researcher.

In space vehicles such as the Air Force's planned Manned Orbiting Laboratory, an astronaut's comfort and tolerance are often limited by "the squeezing of blood from tissues subjected to concentrated pressure of the straps or other restraining devices," says Robert E.



Van Patten of Wright-Patterson Air Force Base, Dayton, Ohio. Most of the discomfort, he adds, is concentrated in areas where there is relatively little body tissue between the restraint and the astronaut's bone. A prime candidate is the lower leg.

Van Patten's pad therefore consists of a rigid glass fiber shell, lined with padding whose thickness varies according to the tissue beneath it. Where the tissue is thinnest, such as directly in front of the tibia (the main bone in the lower leg), the padding is thickest, and vice versa.

Patent 3,368,222

## FLUIDICS

### Respiration apparatus for hospitals

Noel F. Beasley of Bennett Respiration Products, Santa Monica, Calif., is looking into ways to use fluid amplifiers to improve the administration of oxygen to patients who need temporary help in breathing, such as those who have taken an overdose of sleeping pills or who have had lung operations. One such system won him a patent last week.

Mechanical equipment to accomplish this objective is found in virtually all hospitals. However, the fluidics method for assisting respiration devised by Mr. Beasley has almost no moving parts and the breathing cycle requires very little effort on the part of the patient.

An additional advantage of the respiration apparatus is that it is simply constructed and capable of mass production. The fluid amplifier controls the air or oxygen flow to the patient, maintaining a high peak flow at the beginning and a low flow toward the end of the inspira-

tion, thus assuring sufficient pressure on the lung passages for the required ventilation.

Mr. Beasley assigned rights to Puritan Compressed Gas Company, of which Bennett is a subsidiary.

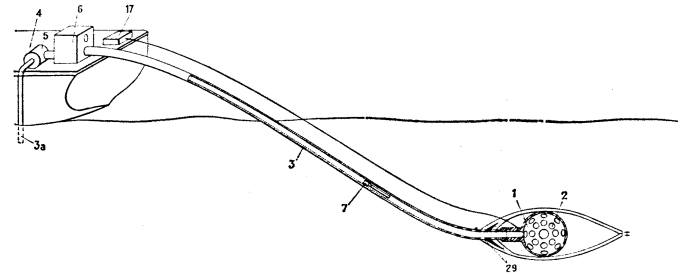
Patent 3,368,555

## SEISMOLOGY

### Improving underwater explosions

The vibrations produced by controlled underwater explosions are useful in such diverse tasks as prospecting for oil and developing new underwater communications systems.

Just dropping a few bombs over the side, however, won't do the trick, especially for the prospectors, who need extremely precise shock waves to examine soil and rock strata beneath the water. The trouble is that a charge set off at great depth or near the bottom creates a large bubble at the moment of explosion. This bubble pulsates as it rises to the surface, with an action similar to that of a taut spring which is suddenly released. The



pulsations in turn cause secondary disturbances which interfere with the recording of the main shock wave.

One way around this is to put the explosive charge in a perforated sphere, which causes the bubble to break up into smaller bubbles that do not disturb the seismic recordings. This, however, poses the problem of reloading the sphere somehow when a series of successive explosions are necessary, as is often the case. Two approaches to the problem have been patented this week, one from France and the other from the U.S.

The French method is simply to trail the perforated sphere from the end of a long tube leading to the deck of a ship. The explosive charges are dropped down the tube and set off with timers or depth sensors. One variation is to pour explosive ingredients down the tube to the sphere, then set them off with electrodes.

Three French engineers assigned rights to Institut Francais du Petrole des Carburants et Lubrifiants, Seine-et-Oise.

The American approach does away with the perforated sphere. Instead, a highly-conductive liquid is poured into the water between a pair of electrodes, which vaporize it into a super-hot plasma. This forms a huge bubble of hot steam which then collapses to produce shock waves that are predominantly low-frequency. The increased low-frequency content helps obtain data from as far as several miles below the water bottom.

Rights were assigned to Geotech Division of Teledyne Industries, Inc., of California.

Patents 3,368,641 (France)  
3,369,218 (U.S.)