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## Thermal Protective Visor for Entering High Temperature Areas

A chamber observer suit visor has been designed to provide thermal protection for the eyes and the face area while the wearer is performing rescue operations during a fire. A review of prior art devices indicated relatively low temperature limitations on the exterior surfaces.

In order to meet the general requirements of thermal protection, impact resistance, noncombustibility, and reasonable visibility the following configuration was designed. The overall shape of the visor assembly is a simple curved sandwich of selected glass plates, gold coated polyester plastic film, and a dead air space, all mounted in an aluminum frame. In viewing a cross section of the assembly, the layers are as follows: starting from the inside (1) 1/4-inch thick annealed glass plate, (2) a sheet of gold coated polyester film, (3) a dead air space, and (4) a thin plate of highly tempered glass. The primary functions of the respective layers are as follows: (1) 1/4-inch thick "Pyrex"—the relatively thick glass provides resistance to the generation of small glass particles, in case the inner layer should be shattered, plus providing thermal lag time due to its mass, (2) gold coated polyester film—the gold coating on the outermost surface provides a highly reflective surface to radiant thermal energy (i.e., greater than 75% at 0.8 microns and greater than 85% at 1.0 micron), (3) dead air space—precludes a direct thermal short between the gold coated polyester film and the outer glass and also increases the thermal lag time, and (4) highly tempered glass "Chemcor"—provides high impact resistance for the assembly and precludes the undesirable combustion of the gold coated polyester plastic film during extended flame impingement.

**Notes:**

1. The use of the glass outer layer over the gold coated polyester film precludes the undesirable possible combustion of the gold coated polyester film during the expected periods of use. The assembly has been subjected to a 1640°F average temperature flame on the outside surface with a resulting inside surface temperature of approximately 210°F after a period of 10 minutes. This test was conducted in a normal laboratory environment.
2. The gold coating on the polyester film performs essentially as a band-pass filter or the familiar one-way glass used in discreet surveillance applications. It effectively reflects radiant energy while reducing human vision by only a negligible amount.
3. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas 77058
   Reference: B68-10277

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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Category 05