

## ANTISEPTIC CONTAINMENT FOR BIOHAZARDOUS MATERIAL

This is a continuation of copending application Ser. No. 07/614,902, filed on Nov. 16, 1990, now abandoned.

### BACKGROUND OF THE INVENTION

#### I. Field of the Invention

This invention relates generally to the design of sealable plastic containers and more particularly to a barrier and self-contained environment for enclosure of biohazardous materials.

#### II. Discussion of the Prior Art

Biohazardous material is difficult to handle without creating secondary contamination. Approaches to this problem involve containment of either the material itself or the person handling the material. Particular difficulty is encountered when the material being manipulated is large and infectious, yet requires manipulation with precision. The present invention combines approaches previously taken in hospital incubation equipment and in asbestos removal systems, in order to isolate materials and prevent contamination of the user or the surrounding environment.

The hazards of asbestos removal are well known. Particles are easily air-borne and inhaled. The result may be the devastating disease of asbestosis. For this reason, asbestos is being removed from homes and public areas, but such removal is complicated and costly. FIG. 1a depicts a typical approach to this problem. The material to be removed, such as pipe covering 4, is surrounded with heavy grade flexible plastic sheeting 2, 6 of approximately 6 to 10 mils and taped into place as at 8, 10. Access is possible by what is known in the industry as a HEPA-port. This is a hole 12 in the sheeting that is constructed so as to permit equipment to be passed into the contained region, while limiting the escape of particles. This port may alternatively be fitted with a glove 14. The removal worker stands outside of the clear plastic containment and cuts away the asbestos wrapping on pipes, etc. without worry of inhaling airborne contamination. When the asbestos removal is completed, the sheeting is removed in a way that limits the escape of the particles.

The alternative to containing an object in order to prevent contamination to humans is to contain the uncontaminated human. This problem is encountered in the neonatal ward of a typical hospital. Some babies must be shielded from disproportionate outside contamination or heated to keep them comfortable. They are typically placed in an incubator, shown in FIG. 1b, that is fitted with access ports 18, 20 along the sides and covered with a hard plastic dome 30. These access ports can be sealed with a hard plastic door 22, 24 that can be made to swing to the side to expose an iris-type port 26 once the door latch is opened, all as described in greater detail hereinafter. When the iris is open 28, it is possible to reach into the unit.

An extreme extension of this principle of containment of a human has been its application to protect a boy who was born with a deficient immune system. He was effectively sealed within a "bubble" and lived for over a decade in relative seclusion from outside contamination.

This principle has also been adopted in the fields of asbestos removal, orthopaedic surgery and aeronautics. The appearance of a space suit for extraterrestrial use is well known. A jumpsuit for asbestos removal, shown in

FIG. 1c, features a drawstring 32, a zipper closure 33, and elasticized hand holes 34, 35. A similar suit has been devised to protect surgeons from the hazards of airborne viruses and particles while they use instruments that create a fine mist, such as bone saws. This suit, shown in FIG. 1d, features a helmet 36 and surgical gloves 37, 38. Without such protection, it is possible that the mist containing viruses could be inhaled after passing through the standard-issue surgical masks currently provided in most operating rooms. The most significant problem with this approach is that the surgeon remains protected while in the suit, but the remainder of the room becomes potentially temporarily contaminated with particles of bodily fluids as the mist settles.

A similar mist is created by use of bone saws during post-mortem autopsy. In addition to this hazard, there is contamination of instruments by blood and tissue, and the need to absorb escaping fluids as the procedure progresses. This is of particular concern as the number of HIV+ and non-A, non-B hepatitis cases increase. It is the purpose of the present device to provide a way to contain the contaminated field while permitting precision manipulation of the contents.

### OBJECTS

It is accordingly a principal object of the present invention to provide a new and improved apparatus for working on biohazardous materials within a closed field.

It is another object of the invention to provide a reliably self-contained environment to eliminate the worry of contamination due to performing necessary procedures on potentially infectious materials.

Another object of the present invention is to provide a means to safely provide access to a contaminated field for performing intricate procedures while maintaining a barrier between contaminated and uncontaminated regions.

A further object of the present invention is to provide a means to permanently seal a contaminated object and odors into a confined space to facilitate safe transport of the contents to a new location.

A still further object of the present invention is to provide a means to contain waste material while performing a refuse inventory for the purpose of compliance with Joint Council for the Accreditation of Hospitals (JCAH) standards.

Yet another object of the present invention is to provide a containment means in which to perform post-mortem autopsies on infectious cadavers in order to prevent the possibility of infection of the pathologists performing the surgery, due to airborne biohazards.

A further object of the present invention is to assist ambulance personnel by providing a containment means for on-site confinement of an infectious person after death while still at the scene of an accident, in order to prevent contamination by contact with potentially infectious bodily fluids.

A further object of the present invention is to provide a means for safe transport of a potentially infectious cadaver between hospital and funeral home.

A further object of the present invention is to provide a means for safely performing embalming procedures within a closed environment in order to prevent contamination by contact with potentially infectious bodily fluids.