

shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An isolator for providing a continuously changing contamination-free atmosphere in which a surgical procedure can be performed or equipment that is sensitive to environmental contamination can be assembled, said isolator comprising an inflatable bag having a bottom, side walls, and end walls of flexible, impervious, material, and an upper side of relatively stiff, optically transparent, material forming a window through which the inside of the isolator can be viewed, a plurality of open-ended sleeves attached to the bag through which hands for performing a surgical procedure or assembly can enter the bag, blower means for continuously supplying the bag from one end with a sufficient volume of air to maintain the pressure in the bag above atmospheric pressure and to change the air in the bag at least two times per minute, means for filtering the air before the air enters the bag and exhaust means in the opposite end of the bag to cause the air to flow through the bag from one end to the other end to restrict the flow of air out of the bag sufficiently to maintain the pressure in the bag above atmospheric pressure sufficiently to inflate the bag.

2. The isolator of claim 1 in which a portion of the bottom of the bag is made of surgical drape material for placing over the patient where the incision is to be made during a surgical procedure.

3. The isolator of claim 1 in which the end of the bag in which the exhaust means are located has an opening therein through which surgical instruments and other equipment can be moved into and out of the bag and a flap for restricting the flow of air through the opening when surgical instruments and other equipment are not being moved through the opening but which allows sufficient air to be exhausted to cause air to flow through the bag from end to end.

4. The isolator of claim 3 further provides with an open-ended chamber having an end attached to the end of the bag with the flap positioned to close the opening between the bag and the chamber and a second flap closing the other end of the chamber to form an air lock through which surgical instruments and other equipment can be moved into and out of the bag, said flaps being provided with openings through which air can be exhausted from the bag through the air lock when either or both of the flaps are closed.

5. The isolator of claim 4 in which the top of the air lock includes a section of relatively stiff, optically transparent plastic providing a window through which the instruments and equipment in the air lock can be viewed and in which the air lock is further provided with sleeve means through which the instruments and equipment in the air lock can be handled.

6. The isolator of claim 1 in which the blower means includes a housing having an interior wall that divides the housing into first and second chambers, said first chamber having an opening through which air can enter the first chamber, an air filter located in the opening to filter larger airborne contaminants including larger bacteria, dust particles, and the like from the air entering the first chamber, a blower located in the first chamber to pump air from the first chamber into the second chamber, a plenum in the second chamber into which the air from the blower is discharged, a second filter attached to the plenum to filter the remaining contaminants from the air, said plenum and second filter

being spaced from the outside walls of the second chamber so that the pressure in the second chamber will be higher than the pressure in the first chamber to insure any leakage between the chambers will be filtered air flowing from the second to the first chamber, and means connecting the second chamber to the bag.

7. The isolator of claim 1 in which the window is convex in cross-section.

8. The isolator of claim 1 in which the window is V-shaped in cross-section.

9. The isolator of claim 1 further provided with a plurality of sleeve through which the arms and hands of the workers can and move into the work place, each sleeve comprising four triangular panels attached at their base to the bag and attached to each other along the sides to form a sleeve that is rectangular in cross-section.

10. The isolator of claim 1 in which a portion of the bottom of the bag is made of surgical drape material through which an incision is made during a surgical procedure, said surgical drape material being elastic to allow a body member, upon which a surgical procedure is to be performed, to be pulled into the work space through the incision in the drape that is smaller than the member to cause the stretched elastic material to tightly surround the member and reduce the chances of disease organisms entering the work space from the outside.

11. The isolator of claim 1 in which the means supplying the air include a blower, a sterile air duct through which air from the blower is supplied to the interior of the bag at a pressure at least slightly higher than atmospheric pressure, and a sterile filter located in the air duct downstream from the end of the duct to be connected to the blower so that the connection between the sterile air duct and the blower is made upstream from the sterile filter to allow any non-sterile particles or disease organisms that are introduced into the air duct when the connection is made or in the air supplied by the blower to be trapped by the filter before they enter the bag.

12. The isolator of claim 1 in which a plurality of open-ended sleeves are attached to the bag, through which the hands and arms of the workers can extend into the work space, each sleeve having elastic material encircling the sleeve adjacent its outer end to hold the sleeve tightly around an arm extending through the sleeve to reduce the flow of air from the bag between the air and the sleeve and to cause the sleeve to intussuscept as required to allow the arm to move freely into and out of the bag.

13. An isolator for reducing the chances of disease organisms entering the surgical wound of a patient during a surgical procedure, said isolator comprising an inflatable bag having side and end walls of flexible material, a lower side of flexible material, a portion of which is of an elastic surgical drape material in which an incision can be made to allow a body member upon which a surgical procedure is to be performed to be pulled into the work space and substantially isolated from the ambient conditions outside the isolator by pulling the member through the incision in the drape that is smaller than the member to cause the stretched elastic material to tightly surround the member, and an upper side portion of which is of flexible material and a portion of which is of relatively stiff, optically transparent, material through which the surgeon can view the area of the surgery, a plurality of open-ended sleeves attached to the bag through which the surgeon can extend his hands