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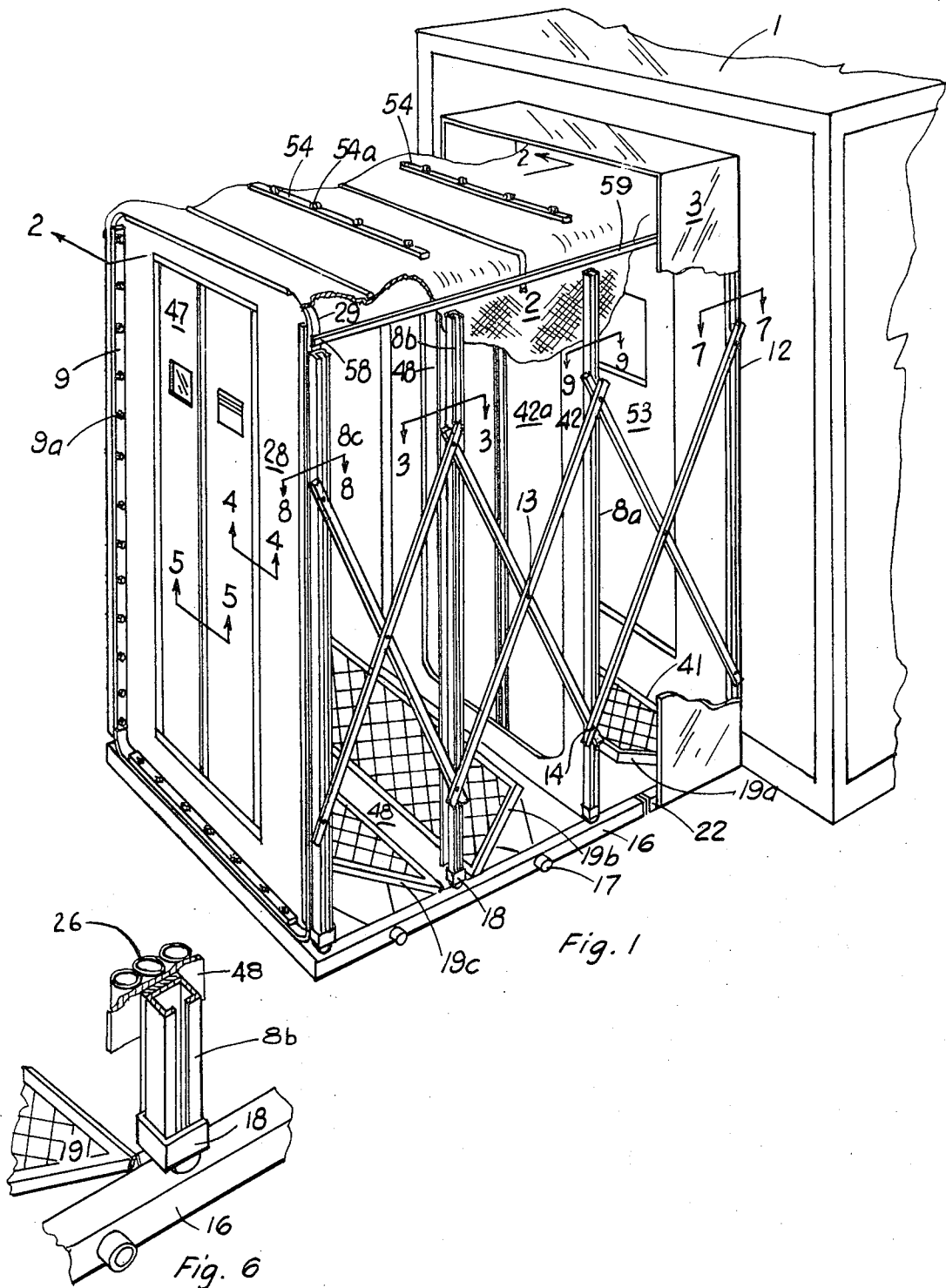
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3,526,063

PORTABLE SHELTER

Filed Nov. 6, 1968

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

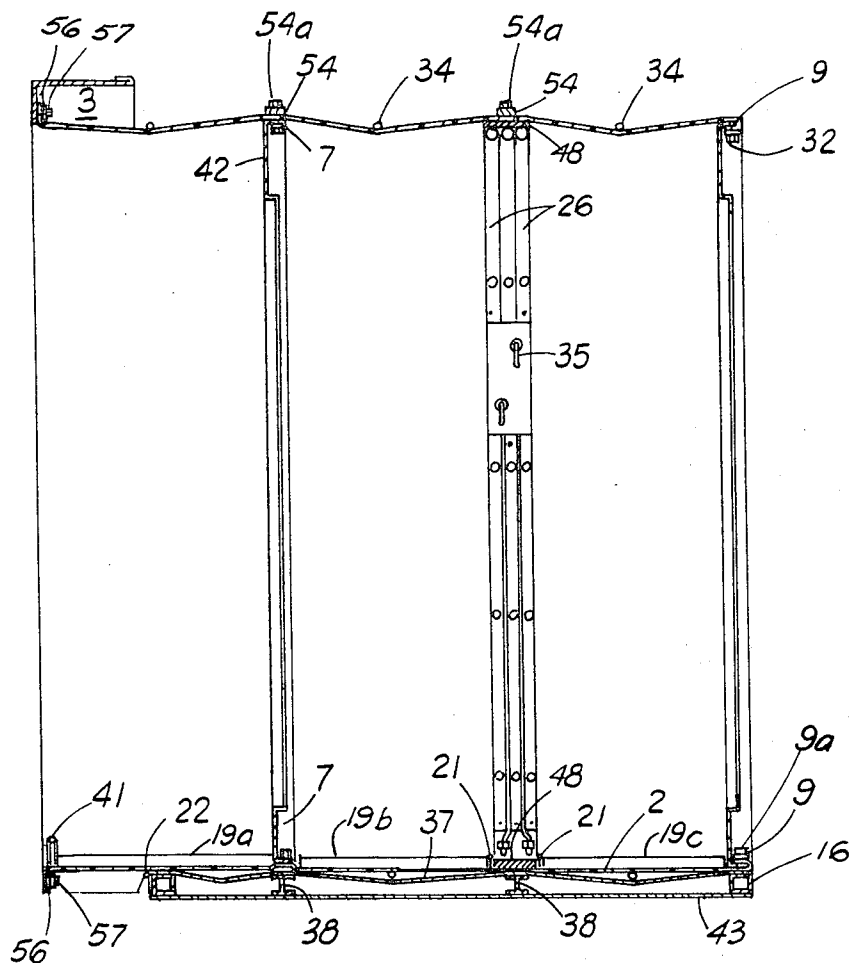


Fig. 2

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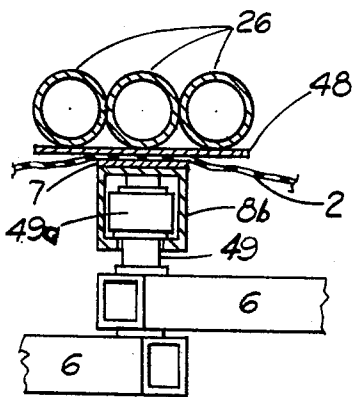


Fig. 3

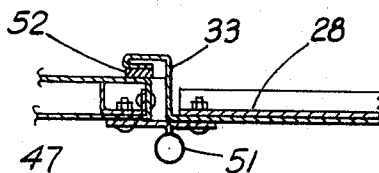


Fig. 4

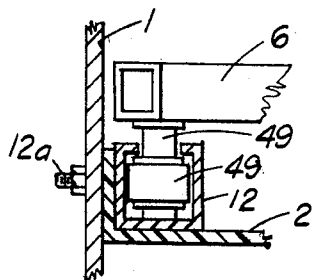


Fig. 7

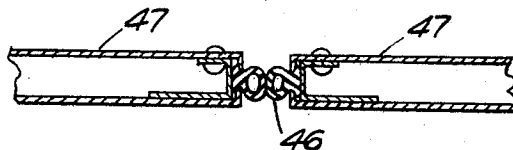


Fig. 5

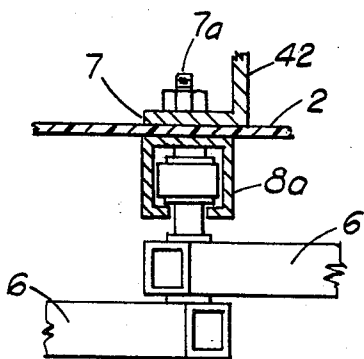


Fig. 9

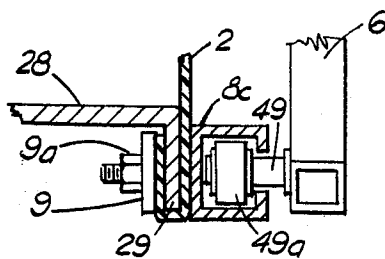


Fig. 8

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3,526,066

PORTABLE SHELTER

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U.S. Cl. 52—27

5 Claims

ABSTRACT OF THE DISCLOSURE

A collapsible shelter defined by flexible wall means suspended from telescoping frame means which are extended and retracted along a base to open and collapse the shelter. Shower means can be provided within the chamber to move to a selected position when the frame is extended.

BACKGROUND OF THE INVENTION

Air lock arrangements are used in various applications, for example to provide entry means to selected areas without exposing such areas to direct communication with the atmosphere or surrounding conditions.

In some applications such air lock arrangements can provide integral shower or spray means for decontamination of personnel or equipment prior to entering associated clean or uncontaminated areas. Such arrangements have significant value to the military for removal or elimination of radioactive or chemical contaminants from personnel or objects prior to transfer to clean areas to prevent contamination of living quarters or work areas.

In some applications such decontamination shelters are attached to the entryway of portable work facilities and to provide the utmost advantage in such applications the shelter should be easily collapsed to be folded into a compact package occupying minimum storage space. Likewise, such shelters should be easily and rapidly opened with a minimum of effort.

SUMMARY OF THE INVENTION

It is recognized that the present invention provides an inexpensive, straightforward, collapsible shelter which can, for example, be used as an air lock entry to a work area and can be adapted to provide means for decontamination of personnel or objects prior to admission to the work area.

It is further recognized that the present invention provides a collapsible, inexpensive, shelter which can be adapted to receive spray means for removal of contaminants from personnel or selected objects before transfer to an adjacent uncontaminated area where the spray means can be integral with the shelter arrangement and collapsed with the shelter.

Various other features of the present invention will become obvious to those skilled in the art upon reading the disclosure set forth hereinafter.

More particularly, the present invention provides a shelter comprising: first frame means; base means pivotably connected along one edge to said first frame means to be pivoted from a position parallel to the first frame means to a position extending outwardly from the first frame means; telescoping frame means fixed to the first frame means to travel along said base means from a closed position adjacent the first frame means to an open position extended outwardly from the first frame means; flexible wall means suspended from the telescoping frame means to form an air lock chamber as the telescoping frame means is extended; first doorway means communicating with the chamber defined by the flexible wall means.

It is to be understood that the description of one example given hereinafter is not by way of limitation and that various changes can be made in the arrangement, form, or configuration of the apparatus disclosed without departing from the scope or spirit of the present invention.

Referring now to the figures which illustrate one example of an apparatus in accordance with the present invention:

FIG. 1 is an isometric view, partly in section, of one example of a shelter assembly in accordance with the present invention;

FIG. 2 is an enlarged view taken along a line passing through line 2—2 of FIG. 1;

FIG. 3 is an enlarged view taken along a plane passing through line 3—3 of FIG. 1;

FIG. 4 is an enlarged view taken along a plane passing through line 4—4 of FIG. 1;

FIG. 5 is an enlarged view taken along a plane passing through line 5—5 of FIG. 1;

FIG. 6 is an enlarged view of a segment of the base section of FIG. 1;

FIG. 7 is an enlarged view taken along a plane passing through line 7—7 of FIG. 1;

FIG. 8 is an enlarged view taken along a plane passing through line 8—8 of FIG. 1; and,

FIG. 9 is an enlarged view taken along a plane passing through line 9—9 of FIG. 1.

FIG. 1 shows one example of a shelter in accordance with the present invention adapted to be used as an air lock entry chamber for a shelter 1, for example a personnel work area, where the chamber is defined by flexible wall 2, for example plastic covered fabric, which extends from shelter 1 to an entry door assembly 28 hereinafter described.

Frame 12 is fastened to shelter 1 adjacent door 53 provided in the shelter and a telescoping frame, including separate but interconnected frame assemblies carrying channels 8a, 8b, 8c respectively as hereinafter described, is connected to frame 12 to extend outwardly therefrom along a base member 16.

As shown in FIGS. 3, 7, 8, and 9, a pin 49 is received in the open side of each channel 8a, 8b, 8c and 12 in sliding relation to move longitudinally along the respective channel. Each pin 49 is pivotably connected to one end of a connecting rod member 6 and the opposite end of each connecting rod member is pivotably connected to an adjacent frame assembly for example by means of a pin 14. A follower 49a is received within each channel and is rotatably connected to the other end of each pin 49 and each follower 49a is slidably received within the chamber defined in the respective channel. Follower 49a is free to move longitudinally through channel 8b in response to movement of rods 6 as the frame assembly is extended and retracted as hereinafter described. As hereinbefore stated, the lower end of each connecting rod 6 can be rotatably connected to pin 14 fixed to a selected frame assembly, so rod 6 rotates about pin 14 but there is no longitudinal movement of the lower end of connecting rods 6 along the frame assembly as the telescoping frame is extended and retracted. In the example of the figures, one end of a connector rod 6 is connected to a pin 49 of one frame assembly while the other end is connected to a fixed pin 14 of an adjacent frame assembly. It will be understood that similar connector rod and frame assemblies can, advantageously, be provided on both sides of the collapsible shelter arrangement to form the telescoping frame.

As best shown in FIG. 6, a caster assembly 18 is provided at the lower end of the channel 8a, 8b, 8c to facilitate movement of the respective frame assemblies

along cooperative track means, for example a base 16 hereinafter described.

A door assembly 28 is connected to outermost channel 8c and includes swinging doors 47 to provide access to the shelter arrangement defined by flexible covering 2. Referring to FIG. 4, each door 47 is connected to assembly 28 by hinge means 51 and the movement of doors 47 is restricted by adjustable stop means 33 attached to frame member 28. Each hinge means 51 can include spring means (not shown) to urge the door in a selected direction. Each stop means 33 can be provided with a pad 52, as shown, to limit the movement of door 47 in the selected direction and the "at rest" position of doors 47 can be adjusted by changing the thickness of pads 33. Referring to FIG. 5, flexible seals 46 can be provided along the meeting edges of doors 47 to form a seal to restrict air flow into the chamber formed by flexible covering 2 when doors 47 are in selected position.

Referring to FIG. 8, which shows a cross-section of a part of the frame assembly carried by channel 8c door assembly 28 is provided with outturned peripheral flanges 29 to be connected to channel 8c by bolts 9a and it will be noted that flexible covering 2 passes between flanges 29 and channel 8c. Clamping bars 9 are provided around the inner edge of flange 29 and, as shown, covering 2 can be wrapped around the edge of flange 29 with the end of the covering retained between clamping bar 9 and flange 29. Nut and bolt assemblies 9a are provided to secure clamping bars 9 to flange 29 and channel 8c.

A second door assembly 42 having swinging doors 42a similar to doors 47 of assembly 28 can be connected to channel 8a to define a compartment within the shelter. Referring to FIG. 9 which shows cross-section of the part of the frame assembly carried by channel 8a, door assembly 42 includes peripheral flanges 7 to connect the door assembly to channel 8a with flexible wall member 2 retained between flange 7 and channel 8a. Nut and bolt assemblies 7a are provided to fasten channel 8a to flange 7. As shown, clamping bars 54, fastened by nut and bolt assemblies 54a, are provided across the top of door assembly 42 and frame 48, as hereinafter described, to secure flexible covering 2 to the frame assembly.

As shown in FIGS. 1, 2, and 3, channel 8b can be connected to carry a wall support frame 48 disposed on the inside of the shelter between door assembly 28 and 42. Flexible covering 2 is retained between channel 8b and frame 48 and a clamping bar 54, secured by bolts 54a, can be provided on top of frame 48.

A spray system 26 can be connected to frame 48 with pipe 26 connected to a source of fresh water (not shown) so the chamber defined between frame 28 and 42 can be used as a shower chamber. Water flow can be controlled by means of valves 35 (FIG. 2) to selectively wash objects or personnel located in the chamber.

Flexible wall member 2 extends from door assembly 28 to shelter 1 and, as shown in FIG. 7, is retained between shelter 1 and channel members 12 secured by bolts 12a. Clamping bars 56, secured by nut and bolt assemblies 57a, are provided across the top and bottom of the wall of shelter 1 to retain flexible wall member 2.

A hood 3 can be provided, as shown, to receive the collapsed frame assembly, as hereinafter described.

Frame assemblies 8a, 8b, 8c are moved along base 16 to extend the collapsible shelter and are retracted along base 16 to collapse the shelter in hood 3. Base 16 is pivotably connected to shelter 1 by means of the hinge 22 so the base member can be pivoted from a generally vertical position when the hood is collapsed to a generally horizontal position as shown in FIGS. 1 and 2 when the shelter assembly is opened.

Referring to FIG. 2, brace members 38 are provided intermediate the edges of base 16 and drain pans 37 are connected between supports 38 to receive liquid emitted from the chamber defined by flexible wall 2. Each drain pan 37 is provided with an outlet 17 (FIG. 1) on one

side of base 16 for emission of water from the corresponding drain pan 37. A panel 43 can be provided on the underside of base 16 to provide stability and strengthen the base section.

Perforated panels 19 are pivotably connected to the respective frame members to provide rigid walking surfaces through the air lock chamber defined by flexible covering 2. Panels 19b and 19c, as shown, are advantageously connected to frame member 18 by means of hinges 21 to be pivoted from a horizontal position when the air lock assembly is extended to a vertical position within frame 18 when the air lock assembly is collapsed.

Perforated panel 19a is pivotably connected to shelter 1 by means of hinge 41 to likewise be pivoted from a horizontal position when the air lock assembly is extended to a vertical storage position when the air lock assembly is retracted into hood 3.

Elastic bands 34 can be wrapped around the outside of flexible wall 2 intermediate frame assemblies to contract the flexible walls and take up slack as the telescoping frame assembly is retracted into hood 3.

A support bar 59 can be pivotably mounted to shelter 1 and adapted to be fastened to frame 29 by catch means 58 when the hood assembly is extended to support this upper portion of the telescoping frame assembly.

To extend the collapsible hood assembly from a closed position, base assembly 16 is released from hood 3 and dropped to a horizontal position as shown in the figures. The telescoping frame assembly, which is collapsed in hood 3 in stored position (not shown) is then pulled outwardly along base member 16. As the telescoping frame assembly moves along base assembly 16 followers 49a move downwardly in channels 8 and cover 2 is opened to define the shelter.

Stop means (not shown) can be provided within the channel means to limit travel of followers 49a and the length of the extended frame assembly. When the telescoping frame assembly is fully extended support members 58 are fastened to frame 29 to support the frame assembly in the extended position.

The invention claimed is:

1. A collapsible shelter comprising: first frame means; track means connected pivotally along one edge of said first frame means to be pivoted from a position generally parallel to said first frame means to a position extending outwardly from said first frame means; telescoping frame means fixed to said first frame means to be collapsed against said first frame means and to travel along said track means from a collapsed position adjacent said first frame means to an open position extending outwardly from said first frame means, said telescoping frame means including separate pairs of oppositely disposed longitudinally extending channel members interconnected by rod members with one end of each of said rod members being movable longitudinally relative the channel of said channel members with which it is associated as said telescoping frame means is extended and retracted along said track means; flexible wall means connected to said separate pairs of oppositely disposed longitudinally extending channel members to form an air lock chamber as the telescoping frame means are extended; passageway means communicating with said chamber defined by said flexible wall means and collapsible walkway means supported by said track means.

2. The apparatus of claim 1, said collapsible walkway means including walkway panels pivotably connected to said telescoping frame means to be pivoted from a first storage position generally parallel to said frame means when said assembly is collapsed to a second position generally parallel to said base means when said frame means is extended to provide walking surface through said shelter.

3. The apparatus of claim 1 including a first doorway means mounted between said first frame means, and a second doorway means mounted to a pair of said op-

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positely disposed longitudinally extending channel members to define an intermediate chamber within said shelter means.

4. The apparatus of claim 1 including elastic bands wrapped around said flexible wall means intermediate said pairs of oppositely disposed longitudinally extending channel members of said telescoping frame assembly to draw said flexible wall means inwardly between said pairs of channel members as said telescoping frame means is retracted.

5. The apparatus of claim 4, including shower means mounted to a separate pair of oppositely disposed longitudinally extending channel members to be disposed within said intermediate chamber defined within said flexible wall means wherein the floor portion of said flexible wall means includes perforations to permit emission of liquid.

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4—146; 52—63, 64, 109